

# Angle Seat Valves

## PA Series - Pneumatically Actuated



ENGINEERING YOUR SUCCESS.



## **WARNING - USER RESPONSIBILITY**

**FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN, OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY, AND PROPERTY DAMAGE.**

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**Possible consequences of failure or improper use of these Products include but are not limited to:**

- Gas leakage leading to explosion or rupture of a pressure vessel.
- Leakage or other release of toxic or otherwise hazardous liquids or gases.
- Unintended or mistimed cycling or motion of machine members, or failure of machine members to cycle.
- Sudden moving or falling objects.
- Work piece or component parts being thrown off at high speeds.
- Failure of a device to function properly. For example, failure to clamp or unclamp an associated item or device.
- Electrical shorts, burns, burn out of equipment or fires.

Before selecting or using any of these Products, it is important that you read and follow instructions herein and those at [www.parker.com/safety](http://www.parker.com/safety)



### **CALIFORNIA PROP 65: WARNING:**

This product can expose you to chemicals including lead which is known to the State of California to cause cancer and birth defects, or other reproductive harm.

For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

# Online Resources

## Connecting you to Parker Angle Seat Valves



Configure  
PA Series



Locate a  
Distributor

Build your solution step-by-step with the PA Series Configurator, complete with CAD models, specification sheets, installation manuals, and links to other relevant supporting documents - all available at [parker.com/fcd](http://parker.com/fcd).

Range	
Port Size	3/8" - 2-1/2"
Flow	5.5 - 81.7 Cv
Pressure	Up to 232 psi
Media Temp.	Up to 356 °F
Ambient Temp.	Up to 140 °F
Pilot Pressure	44 - 145 psi

**CHEMICAL PROCESSING | COMMERCIAL LAUNDRY | FOOD & BEVERAGE**  
**INDUSTRIAL PROCESS CONTROL | MACHINE TOOLS | STERILIZATION**  
**WATER TREATMENT | AGGREGATE PROCESSING | COOLING & CHILLING**

## Parker Cross Reference & Competitor Interchange

Parker's all-new competitive crossover tool provides a quicker, easier way to access competitive and legacy product cross reference information. The comprehensive tool spans diverse product technologies and products, including those from Fluid Control Division.



Competitor Cross  
Reference

Cross reference competitor Angle Seat Valves, specify a Parker solution, and download key resources such as CAD models and specification sheets with ease - all in one easy-to-use interface.

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# Design Your Solution

## PA Series Angle Seat Valves

Step 1: Angle Seat Valve

&

Step 2: Pilot Valve

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Step 3: Solution

### Example:

PA20SAN5S050A

&

U131B01NDAF

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PA20SAN5S050A

&

U131B01NDAF

### Angle Seat Valve Numbering System

PA	10		S1		G3			S	063S		-	
Series	Valve Size		Valve Type		Body Thread Standard *			Body Material	Actuator Description		Special	
	mm	(in)										
PA	10	(3/8")	S1	2-Way Normally Closed, Flow Over Seat	N3	3/8	NPT	S 304 SS	Stainless Steel 304			
PA	15	(1/2")	S3	2-Way Normally Open, Flow Under Seat	N4	1/2	NPT	R 316L SS	032S	32 mm actuator		
PA	20	(3/4")	SA	2-Way Normally Closed Anti-Water Hammer, Flow Under Seat	N5	3/4	NPT		040S	40 mm actuator		
PA	25	(1")			N6	1	NPT		050S	50 mm actuator		
PA	32	(1-1/4")	C1	2-Way Normally Closed, Compact Model, Flow Over Seat	N7	1-1/4	NPT		063S	63 mm actuator		
PA	40	(1-1/2")			N8	1-1/2	NPT		080S	80 mm actuator		
PA	50	(2")	C2	2-Way Normally Closed Compact Model, Flow Under Seat	N9	2	NPT		100S	100 mm actuator		
PA	65	(2-1/2")			NT	2-1/2	NPT					
											Aluminum	
											040A	40 mm actuator
											050A	50 mm actuator
											063A	63 mm actuator
											080A	80 mm actuator
											100A	100 mm actuator
Example: PA25SAN6S063A - 1" 304 Stainless Steel body valve, 2 Way Normally Closed, Flow Under Seat for Anti-Water Hammer,												

Example: PA25SAN6S063A - 1" 304 Stainless Steel body valve, 2 Way Normally Closed, Flow Under Seat for Anti-Water Hammer, NPT ports, with 63 mm Aluminum actuator

\* For other body port options, consult factory.

# Series Overview

## Introduction

Parker Angle Seat Valves seat valves are actuated by a pneumatically driven piston and are capable of handling slurry solutions with particles, or corrosive solutions, at high temperature up to 356°F and operating pressure up to 232 psi. Angle seat valves are suitable for a diverse array of markets and applications.

**CHEMICAL PROCESSING | COMMERCIAL LAUNDRY**

**FOOD & BEVERAGE | INDUSTRIAL PROCESS CONTROL**

**MACHINE TOOLS | STERILIZATION | WATER TREATMENT**

**AGGREGATE PROCESSING | COOLING & CHILLING**



## Applications

- Food and Beverage processing
- Water Treatment
- Textile Industry
- Cooling systems on injection molding machines
- Pharmaceutical & cosmetic industry
- Chemical Process technology
- Refrigeration & Cooling heat exchangers
- Sterilizer Steam Supply
- Mining, Concrete/ Aggregate, Pulp & Paper
- General industrial applications of aggressive fluids
- Industrial Laundry Equipment
- Industrial Air Dryers

## Replaceable Technologies

Parker Angle Seat Valves offer improved economics and/or performance vs. competitive technologies.



Automated Ball Valves



Globe Valves



Process Control Valves



Others



## Series Overview

### Customer Value Proposition

PA Series Angle Seat Valves excel in applications that demand **high cycle rates and counts**, **high temperatures**, and **challenging media types** like steam or slurries.

PA Series is well suited for applications where **conventional solenoid valves are not adequate**, whether driven by temperature, life, media, or pressure requirements.

PA Series Angle Seat Valves **tolerate back pressure** and are capable of high flow - low pressure **fluid transfer applications**.

These economical valves are also excellent **substitutes for costly process control valves**.

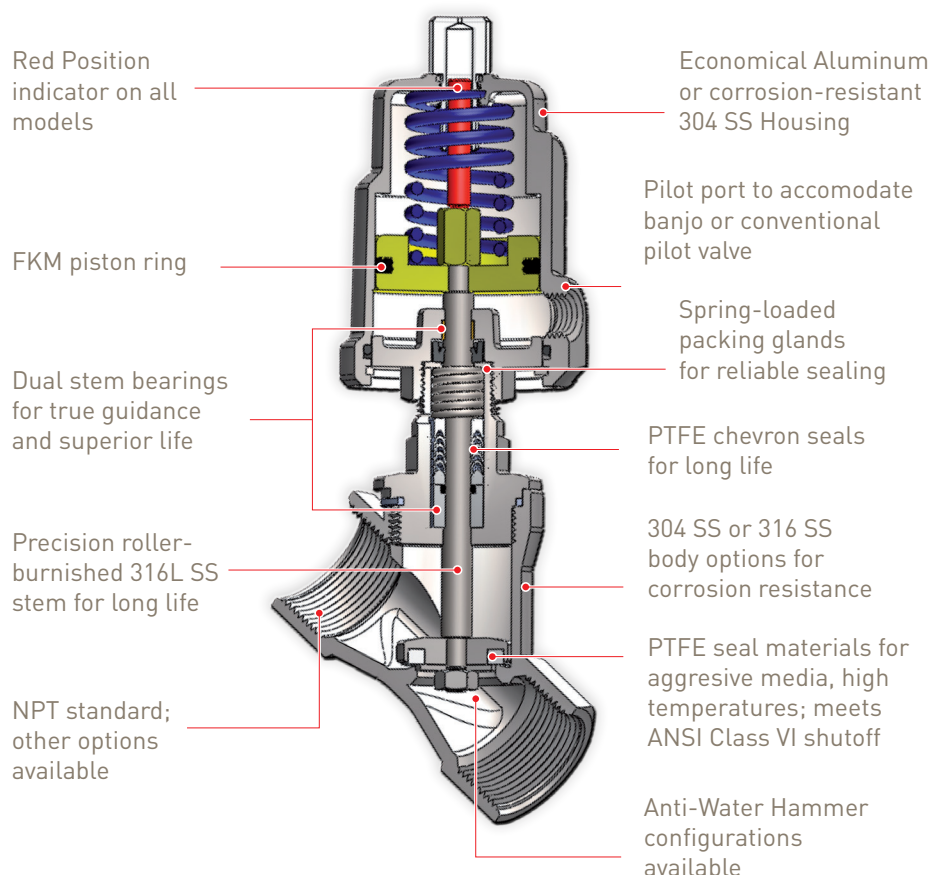
### Features

- High flow rates up to 81.7 Cv
- Media temperature up to 356°F
- Ambient temperature up to 140°F
- Working pressures up to 232 psi
- Anti-Water Hammer design available
- 304 or 316L Stainless Steel bodies
- Aluminum or 304 Stainless Steel housings
- 304 or 316L Stainless Steel bodies
- PTFE seal materials
- PTFE and PTFE with carbon packing glands
- Multi-poisable; mountable in any position
- Pilot Control Media Air, Neutral Gas
- Fluids handled: Inert gases, hot water, oils, steam, aggressive and corrosive fluids
- Manages viscosities up to 600 mm<sup>2</sup>/s (600cSt, 80° E, 2700 SSU)
- Compliant to the terms of directive 94/9/CE specific to non-electrical equipment for use within potentially explosive environments - zone 2/22 - Protection II 3 GD T4
- Compliant to Pressure Equipment Directive 97/23/EC



# Series Overview

## Features



**CORROSION RESISTANT**

**DEBRIS TOLERANT**

**ECONOMICAL**

**LONG SERVICE LIFE**

Range	
Port Size	3/8" - 2-1/2"
Flow	5.5 - 81.7 Cv
Pressure	Up to 232 psi
Media Temp.	Up to 356 °F
Ambient Temp.	Up to 140 °F
Pilot Pressure	44 - 145 psi

## Benefits

- High flow with compact footprint
- Capable of managing high temperatures
- Debris tolerant and capable of managing slurries for maximum system uptime and application flexibility
- Pressure rating accomodates diverse applications
- Anti-Water Hammer reduces system wear
- Corrosion resistant materials accomodate diverse media types and offer protection from corrosion for longer service life
- Suitable for use in hazardous locations
- PTFE seal materials and bubble tight shutoff delivers sealing performance and chemical compatibility for excellent application coverage
- PTFE and PTFE with carbon packing glands accomodate corrosive media types for long service life
- Visual position indicator and multi-positions design for flexible installation
- Valves are capable of managing diverse media types and viscosities
- Economical replacement for many process control valves



# PA Series - 2 Way Normally Closed

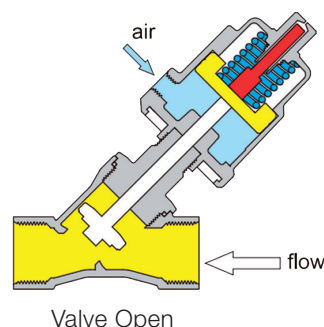
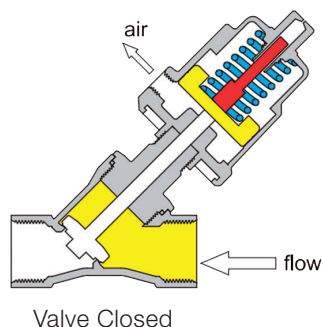
# Flow Over Seat

## 304 Stainless Steel Bodies - Aluminum Actuators

Valve Size	Port Size NPT	Orifice in.	Cv	Actuator			Operating Pressure - Air, Inert Gases psi	Operating Pressure - Steam psi	Minimum Pilot Control Pressure Range psi	Model Number	Net Weight Lb.
				dia mm	dia in.	Port BSP					
3/8"	3/8"	0.51	5.5	50	1.97	1/8	0 - 232	0 - 130	43.5	PA10S1N3S050A	1.65
1/2"	1/2"	0.51	5.5	50	1.97	1/8	0 - 232	0 - 130	43.5	PA15S1N4S050A	1.76
3/4"	3/4"	0.71	10.5	50	1.97	1/8	0 - 232	0 - 130	43.5 - 58	PA20S1N5S050A	1.98
1"	1"	0.94	18.7	50	1.97	1/8	0 - 232	0 - 130	43.5 - 80	PA25S1N6S050A	2.79
			18.7	63	2.48	1/8	0 - 232	0 - 130	43.5 - 58	PA25S1N6S063A	3.63
1-1/4"	1-1/4"	1.22	28.0	63	2.48	1/8	0 - 232	0 - 130	43.5 - 80	PA32S1N7S063A	4.16
1-1/2"	1-1/2"	1.38	37.3	63	2.48	1/8	0 - 232	0 - 130	43.5 - 94.3	PA40S1N8S063A	4.73
2"	2"	1.77	58.3	63	2.48	1/8	0 - 145	0 - 130	43.5 - 94.3	PA50S1N9S063A	6.56
			58.3	80	3.15	1/4	0 - 232	0 - 130	43.5 - 95.7	PA50S1N9S080A	7.83
			58.3	100	3.94	1/4	0 - 232	0 - 130	43.5 - 72.5	PA50S1N9S100A	10.45
2-1/2"	2-1/2"	2.56	81.7	100	3.94	1/4	0 - 145	0 - 130	43.5 - 87	PA65S1NTS100A	12.10

## 316L Stainless Steel Bodies - 304 Stainless Steel Actuators

Valve Size	Port Size NPT	Orifice in.	Cv	Actuator			Operating Pressure - Air, Inert Gases psi	Operating Pressure - Steam psi	Minimum Pilot Control Pressure Range psi	Model Number	Net Weight Lb.
				dia mm	dia in.	Port BSP					
3/8"	3/8"	0.51	5.5	40	1.57	1/8	0 - 232	0 - 130	58.0	PA10S1N3R040S	1.72
			5.5	50	1.97	1/8	0 - 232	0 - 130	43.5	PA10S1N3R050S	2.22
1/2"	1/2"	0.51	5.5	40	1.57	1/8	0 - 232	0 - 130	58.0	PA15S1N4R040S	1.76
			5.5	50	1.97	1/8	0 - 232	0 - 130	43.5	PA15S1N4R050S	2.27
3/4"	3/4"	0.71	10.5	50	1.97	1/8	0 - 232	0 - 130	43.5 - 58.0	PA20S1N5R050S	2.33
1"	1"	0.94	18.7	50	1.97	1/8	0 - 232	0 - 130	43.5 - 80	PA25S1N6R050S	3.04
			18.7	63	2.48	1/8	0 - 232	0 - 130	43.5 - 50.8	PA25S1N6R063S	4.51
1-1/4"	1-1/4"	1.22	28.0	63	2.48	1/8	0 - 232	0 - 130	43.5 - 72.5	PA32S1N7R063S	5.28
1-1/2"	1-1/2"	1.38	37.3	63	2.48	1/8	0 - 232	0 - 130	43.5 - 87	PA40S1N8R063S	6.05
2"	2"	1.77	58.3	63	2.48	1/8	0 - 145	0 - 130	43.5 - 94.3	PA50S1N9R063S	7.70
			58.3	80	3.15	1/4	0 - 232	0 - 130	43.5 - 95.7	PA50S1N9R080S	10.16
			58.3	100	3.94	1/4	0 - 232	0 - 130	43.5 - 72.5	PA50S1N9R100S	11.35
2-1/2"	2-1/2"	2.56	81.7	100	3.94	1/4	0 - 145	0 - 130	43.5 - 87	PA65S1NTR100S	19.03



## PA Series - 2 Way Normally Closed

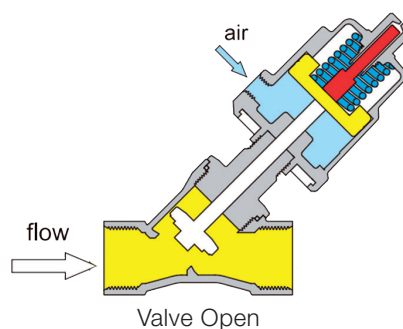
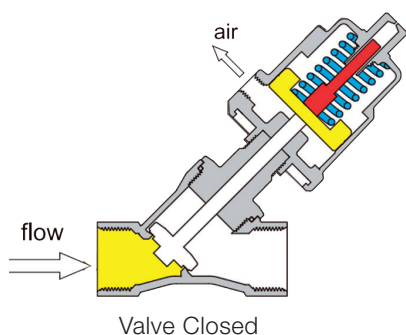
## Flow Under Seat

### 304 Stainless Steel Bodies - Aluminum Actuators Anti-Water Hammer

Valve Size	Port Size	Orifice	Cv	Actuator			Operating Pressure - Air, Gases, Liquids psi	Operating Pressure - Steam psi	Minimum Pilot Control Pressure Range psi	Model Number	Net Weight Lb.
				dia mm	dia in.	Port BSP					
3/8"	3/8"	0.51	5.5	50	1.97	1/8	0-232	N/A	65.3	PA10SAN3S050A	1.65
1/2"	1/2"	0.51	5.5	50	1.97	1/8	0-232	N/A	65.3	PA15SAN4S050A	1.76
3/4"	3/4"	0.71	10.5	50	1.97	1/8	0-145	N/A	65.3	PA20SAN5S050A	1.98
1"	1"	0.94	18.7	63	2.48	1/8	0-116	N/A	65.3	PA25SAN6S063A	3.63
1-1/4"	1-1/4"	1.22	28.0	80	3.15	1/4	0-160	N/A	58.0	PA32SAN7S080A	6.16
1-1/2"	1-1/2"	1.38	37.3	80	3.15	1/4	0-116	N/A	58.0	PA40SAN8S080A	6.82
			37.3	100	3.94	1/4	0-232	N/A	58.0	PA40SAN8S100A	9.13
2"	2"	1.77	58.3	100	3.94	1/4	0-130	N/A	58.0	PA50SAN9S100A	10.45

### 316L Stainless Steel Bodies - 304 Stainless Steel Actuators Anti-Water Hammer

Valve Size	Port Size	Orifice	Cv	Actuator			Operating Pressure - Air, Gases, Liquids psi	Operating Pressure - Steam psi	Minimum Pilot Control Pressure Range psi	Model Number	Net Weight Lb.
				dia mm	dia in.	Port BSP					
3/8"	3/8"	0.51	5.5	50	1.97	1/8	0-232	N/A	65.3	PA10SAN3R050S	2.22
1/2"	1/2"	0.51	5.5	50	1.97	1/8	0-232	N/A	65.3	PA15SAN4R050S	2.27
3/4"	3/4"	0.71	10.5	50	1.97	1/8	0-145	N/A	65.3	PA20SAN5R050S	2.33
1"	1"	0.94	18.7	63	2.48	1/8	0-116	N/A	65.3	PA25SAN6R063S	4.51
1-1/4"	1-1/4"	1.22	28.0	80	3.15	1/4	0-160	N/A	58.0	PA32SAN7R080S	8.40
1-1/2"	1-1/2"	1.38	37.3	80	3.15	1/4	0-116	N/A	58.0	PA40SAN8R080S	8.95
			37.3	100	3.94	1/4	0-232	N/A	58.0	PA40SAN8R100S	10.14
2"	2"	1.77	58.3	100	3.94	1/4	0-130	N/A	58.0	PA50SAN9R100S	11.35

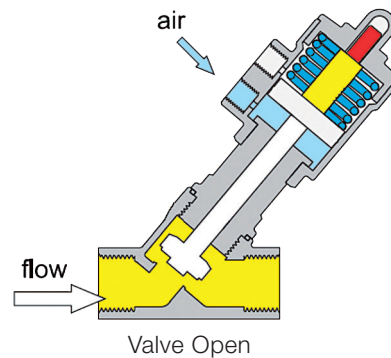
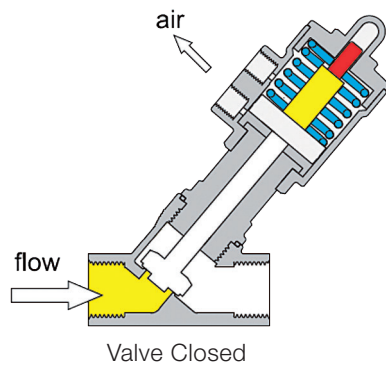


## PA Series - 2 Way Normally Closed

## Flow Under Seat

### Compact - 316L Stainless Steel Bodies - 304 Stainless Steel Actuators Anti-Water Hammer

Valve Size	Port Size	Orifice	Cv	Actuator			Operating Pressure - Air, Inert Gases psi	Operating Pressure - Steam psi	Minimum Pilot Control Pressure Range psi	Model Number	Net Weight Lb.
	NPT	in.		dia mm	dia in.	Port BSP					
3/8"	3/8"	0.51	5.5	32	1.26	1/8	0 - 87	N/A	73 - 87	PA10C2N3R032S	1.39
1/2"	1/2"	0.51	5.5	32	1.26	1/8	0 - 87	N/A	73 - 87	PA15C2N4R032S	1.43
3/4"	3/4"	0.59	6.3	32	1.26	1/8	0 - 58	N/A	73 - 87	PA20C2N5R032S	1.56



## PA Series - 2 Way Normally Open

## Flow Under Seat

### 304 Stainless Steel Bodies - Aluminum Actuators

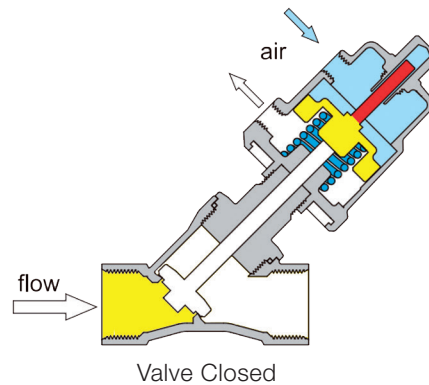
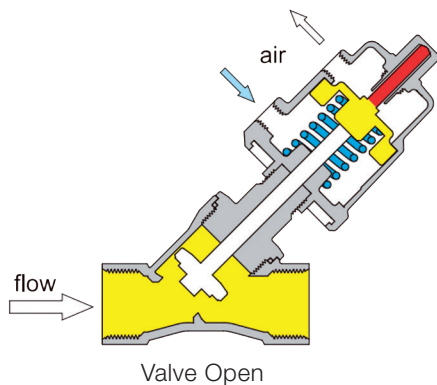
#### Anti-Water Hammer

Valve Size	Port Size NPT	Orifice in.	Cv	Actuator			Operating Pressure - Air, Gases, Liquids psi	Operating Pressure - Steam psi	Minimum Pilot Control Pressure Range psi	Model Number	Net Weight Lb.
				dia mm	dia in.	Port BSP					
3/8"	3/8"	0.51	5.5	50	1.97	1/8	0 - 232	0 - 130	50.8	PA10S3N3S050A	1.65
1/2"	1/2"	0.51	5.5	50	1.97	1/8	0 - 232	0 - 130	50.8	PA15S3N4S050A	1.76
3/4"	3/4"	0.71	11.1	50	1.97	1/8	0 - 232	0 - 130	50.8	PA20S3N5S050A	1.98
1"	1"	0.94	18.1	63	2.48	1/8	0 - 232	0 - 130	65.3	PA25S3N6S063A	3.63
1-1/4"	1-1/4"	1.22	27.0	80	3.15	1/4	0 - 232	0 - 130	43.5	PA32S3N7S080A	6.16
1-1/2"	1-1/2"	1.38	36.2	80	3.15	1/4	0 - 232	0 - 130	43.5	PA40S3N8S080A	6.82
2"	2"	1.77	58.3	80	3.15	1/4	0 - 232	0 - 130	43.5	PA50S3N9S080A	7.83

### 316L Stainless Steel Bodies - 304 Stainless Steel Actuators

#### Anti-Water Hammer

Valve Size	Port Size NPT	Orifice in.	Cv	Actuator			Operating Pressure - Air, Gases, Liquids psi	Operating Pressure - Steam psi	Minimum Pilot Control Pressure Range psi	Model Number	Net Weight Lb.
				dia mm	dia in.	Port BSP					
3/8"	3/8"	0.51	5.5	50	1.97	1/8	0-232	0 - 130	50.8	PA10S3N3R050S	2.22
1/2"	1/2"	0.51	5.5	50	1.97	1/8	0-232	0 - 130	50.8	PA15S3N4R050S	2.27
3/4"	3/4"	0.71	11.1	50	1.97	1/8	0-232	0 - 130	50.8	PA20S3N5R050S	2.33
1"	1"	0.94	18.1	63	2.48	1/8	0-232	0 - 130	65.3	PA25S3N6R063S	4.51
1-1/4"	1-1/4"	1.22	27.0	80	3.15	1/4	0-232	0 - 130	43.5	PA32S3N7R080S	8.40
1-1/2"	1-1/2"	1.38	36.2	80	3.15	1/4	0-232	0 - 130	43.5	PA40S3N8R080S	8.91
2"	2"	1.77	58.3	80	3.15	1/4	0-232	0 - 130	43.5	PA50S3N9R080S	10.16



# Pilot Valves - 3 Way Normally Closed

## Banjo Series - Direct Mount, Compact

Port Size	Actuator Enclosure Port	Flow Factor (PRS) Cv	Flow Factor (EXH) Cv	Operating Pressure Differential (MOPD) psi		Max. Media Temp °F	Seal Material	Power AC / DC Watts	Model Number
1/8" NPT	G 1/8"	0.04	0.04	0	150	185	FKM	6.9 / 4.8	<b>U131B01NDAx</b>
1/8" NPT	G 1/4"	0.04	0.04	0	150	185	FKM	6.9 / 4.8	<b>U131B02NDAx</b>
G 1/8"	G 1/8"	0.04	0.04	0	150	185	FKM	6.9 / 4.8	<b>131B03NDAx</b>
G 1/8"	G 1/4"	0.04	0.04	0	150	185	FKM	6.9 / 4.8	<b>131B04NDAx</b>



- Body: Aluminum
- NEMA 4,4X
- Directly mounts to PA Series actuator
- Standard locking manual override
- Coil: DIN 43650B
- Coil is cURus
- Cycle Life: up to 5 million cycles
- Compatible Fluids: Air, Inert Gas

### Voltage Codes for Coils

A= 12VDC, B= 24VDC, E= 24/60, F= 120/60, 110/50, G= 240/60, 220/50  
Replace "x" in the part number with one of the above Coil Voltage Codes

## G4 Series - Miniature, More Performance

Port Size	Orifice Size	Flow Factor (PRS) Cv	Flow Factor (EXH) Cv	Operating Pressure Differential (MOPD) psi		Max. Media Temp °F	Seal Material	Power AC / DC Watts	Model Number
	in.			Min	Air, Inert Gas, Light Oil				
1/8" NPT	3/64	0.05	0.05	0	200	240	FKM	10 / 8	Conduit Coil: <b>30CC02EV4C4x</b> DIN Coil: <b>30CC02EV4D6x</b>



- Body: 303 Stainless Steel
- NEMA 4,4X
- Compatible with push-to-connect fittings on page 14
- Coil: 1/2" NPT Conduit 18" leads
- Coil: DIN 43650A
- Water-tight solenoid coils
- Valves are cULus, cURus
- Cycle Life: up to 20 million cycles
- Compatible Fluids: Air, Light Oils

### Voltage Codes for Coils

A= 12VDC, B= 24VDC, E= 24/60, F= 120/60, 110/50, G= 240/60, 220/50  
Replace "x" in the part number with one of the above Coil Voltage Codes

# Pilot Valves - 3 Way Normally Closed

## G7 Series - Full Size, Best Performance

Port Size	Orifice Size	Flow Factor (PRS)	Flow Factor (EXH)	Operating Pressure Differential (MOPD) psi		Max. Media Temp	Seal	Power AC / DC	Model Number
	in.	Cv	Cv	Min	Air, Inert Gas, Water, Light Oil	°F		Watts	
1/4" NPT	1/16	0.18	0.17	0	160	185	NBR	10	Conduit Coil: <b>30CC04LN7C7xM0</b> DIN Coil: <b>30CC04LN7D7xM0</b>
1/4" NPT	1/16	0.18	0.17	0	160	185	FKM	10	Conduit Coil: <b>30CC04LV7C7xM0</b> DIN Coil: <b>30CC04LV7D7xM0</b>

### Voltage Codes for Coils

A= 12VDC, B= 24VDC, E= 24/60, F= 120/60, 110/50, G= 240/60, 220/50

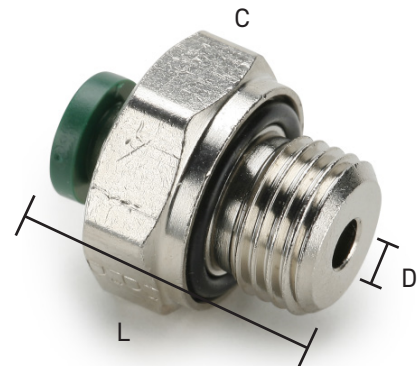
Replace "x" in the part number with one of the above Coil Voltage Codes



- Body: 303 Stainless Steel
- IP69 Rated (Conduit Coil)
- High Flow for Fast Piloting
- Standard 1/4-turn manual override
- Compatible with push-to-connect fittings on page 14
- Coil: 1/2" NPT Conduit 18" leads
- Coil: DIN 43650A
- Water-tight and thermal shock resistant solenoid coil design
- Valves are cULus, cURus
- Cycle Life: up to 20 million cycles
- Compatible Fluids: Air, Water, Light Oils

## Push-to-Connect Fittings for Pilot Valves - Adapts PA Series Actuator Port

Tube Size	Pipe Thread	C Hex	L Length	D Flow Dia.	Part Number
in.	BSPP (G)	in.	in.	in.	
1/4	1/8 - 28	11/16	1.13	0.188	V122149
1/4	1/4 - 19	3/4	1.13	0.188	V122150
3/8	1/4 - 19	3/4	1.26	0.256	V122151





# Construction & Technical Reference

## Stainless Steel Actuators Sizes 40, 50, 63, 80, 100 mm

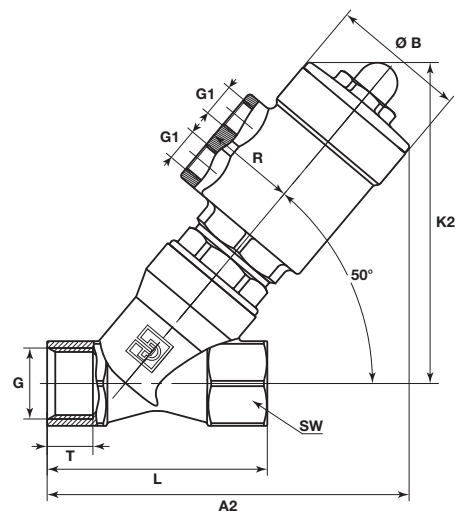
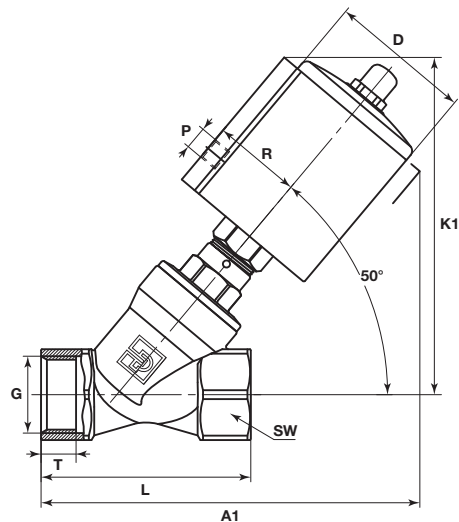
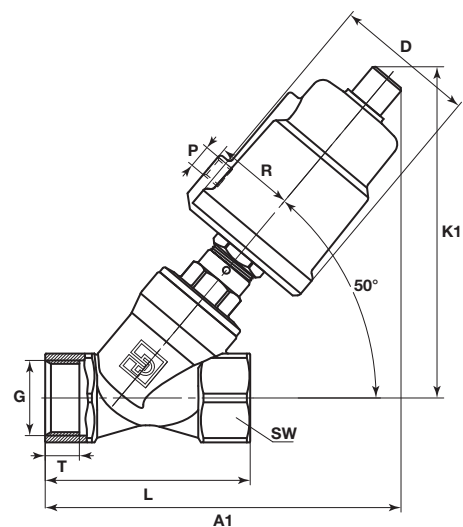
Type	Actuator mm	D in	R in	P bsp	K1 in	A1 in	G NPT	L in	T in	SW in	
DN10 (3/8")	40	1.99	1.06	G1/8	4.57	4.76	3/8	2.36	0.39	.87	hexagon
	50	2.44	1.34	G1/8	5.12	5.24	3/8	2.36	0.39	.87	hexagon
DN15 (1/2")	40	1.99	1.06	G1/8	4.65	4.88	1/2	2.56	0.45	.98	hexagon
	50	2.44	1.34	G1/8	5.16	5.31	1/2	2.56	0.45	.98	hexagon
DN 20 (3/4")	50	2.44	1.34	G1/8	5.28	5.55	3/4	2.95	0.55	1.22	hexagon
DN25 (1")	50	2.44	1.34	G1/8	5.55	6.02	1	3.54	0.59	1.53	hexagon
	63	3.03	1.63	G1/8	6.46	6.89	1	3.54	0.59	1.53	hexagon
DN32 (1 1/4")	63	3.03	1.63	G1/8	6.69	7.40	1 1/4	4.33	0.71	1.97	octagon
	80	3.86	2.05	G1/4	7.24	8.07	1-1/4	4.33	0.71	1.97	octagon
DN40 (1 1/2")	63	3.03	1.63	G1/8	7.13	7.91	1-1/2	4.72	0.71	2.20	octagon
	80	3.86	2.05	G1/4	7.68	8.54	1-1/2	4.72	0.71	2.20	octagon
	100	4.76	2.48	G1/4	8.39	9.25	1-1/2	4.72	0.71	2.20	octagon
DN50 (2")	63	3.03	1.63	G1/8	7.44	8.50	2	5.91	0.87	2.68	octagon
	80	3.86	2.05	G1/4	7.99	9.17	2	5.91	0.87	2.68	octagon
	100	4.76	2.48	G1/4	8.70	9.84	2	5.91	0.87	2.68	octagon
DN65 (2 1/2")	100	4.76	2.48	G1/4	9.76	11.22	2-1/2	7.09	0.98	3.35	octagon

## Aluminum Actuators Sizes 50, 63, 80, 100 mm

Type	Actuator mm	D in	R in	P bsp	K1 in	A1 in	G NPT	L in	T in	SW in	
DN10 (3/8")	50	2.40	1.50	G1/8	5.20	5.55	3/8	2.36	0.39	.87	hexagon
DN15 (1/2")	50	2.40	1.50	G1/8	5.24	5.67	1/2	2.56	0.45	.98	hexagon
DN20 (3/4")	50	2.40	1.50	G1/8	5.35	5.91	3/4	2.95	0.55	1.22	hexagon
DN25 (1")	50	2.40	1.50	G1/8	5.67	6.38	1	3.54	0.59	1.53	hexagon
	63	2.95	1.77	G1/8	6.57	7.20	1	3.54	0.59	1.53	hexagon
DN32 (1-1/4")	63	2.95	1.77	G1/8	6.81	7.72	1-1/4	4.33	0.71	1.97	hexagon
	80	3.70	2.13	G1/4	7.56	8.43	1-1/4	4.33	0.71	1.97	hexagon
DN40 (1-1/2")	63	2.95	1.77	G1/8	7.24	8.23	1-1/2	4.72	0.71	2.20	octagon
	80	3.70	2.13	G1/4	7.99	8.90	1-1/2	4.72	0.71	2.20	octagon
	100	4.53	2.52	G1/4	8.78	9.65	1-1/2	4.72	0.71	2.20	octagon
DN50 (2")	63	2.95	1.77	G1/8	7.56	8.82	2	5.91	0.87	2.68	octagon
	80	3.70	2.13	G1/4	8.31	9.53	2	5.91	0.87	2.68	octagon
	100	4.53	2.52	G1/4	9.09	10.24	2	5.91	0.87	2.68	octagon
DN65 (2-1/2")	100	4.53	2.52	G1/4	10.12	11.57	2-1/2	7.09	0.98	3.35	octagon

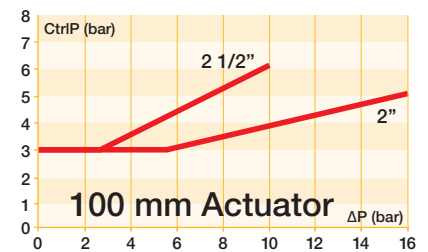
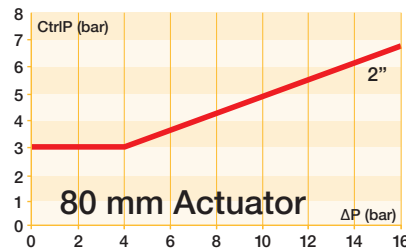
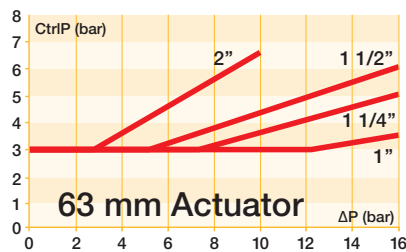
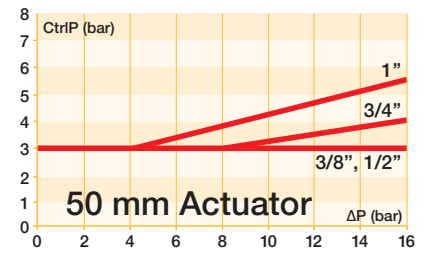
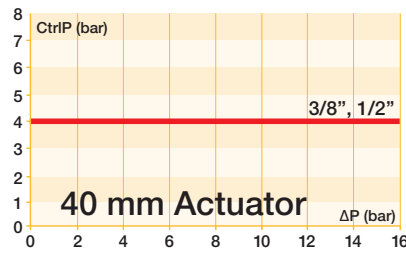
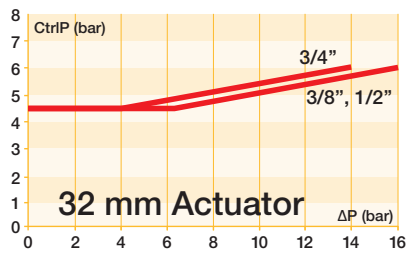
## Stainless Steel Actuators Size 32 mm

Type	Actuator mm	Ø B in	R in	G1 bsp	K2 in	A2 in	G NPT	L in	T in	SW in	
DN10 (3/8")	32	1.56	1.06	G1/8	4.21	4.61	3/8	2.36	0.39	.87	hexagon
DN15 (1/2")	32	1.56	1.06	G1/8	4.29	4.69	1/2	2.56	0.45	.98	hexagon
DN20 (3/4")	32	1.56	1.06	G1/8	4.41	4.96	3/4	2.95	0.55	1.22	hexagon

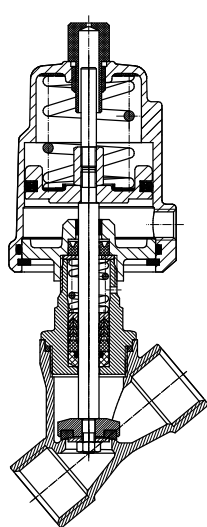
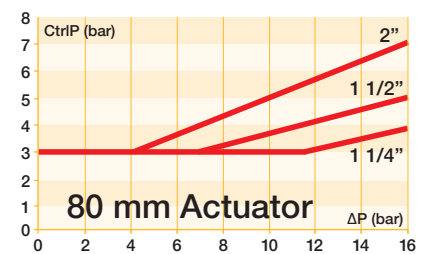
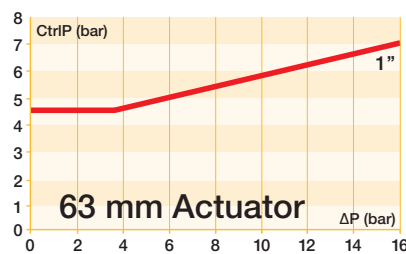
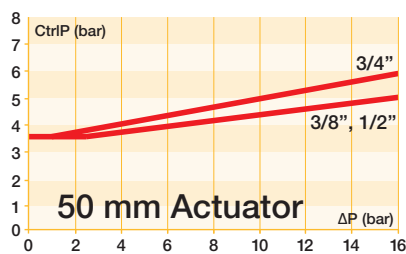


# Construction & Technical Reference

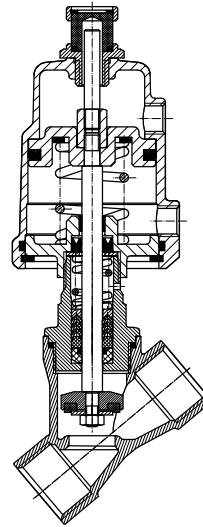
## Control Pressure & Operating Pressure Charts for Normally Closed Valves



## Control Pressure & Operating Pressure Charts for Normally Open Valves



Normally Closed Valve



Normally Open Valve

# OFFER OF SALE – PARKER FLUID CONTROL DIVISION

**1. DEFINITIONS.** As used herein, the following terms have the meanings indicated.

Buyer:	means any customer receiving a Quote for Products from Seller.
Goods:	means any tangible part, system or component to be supplied by the Seller.
Products:	means the Goods, Services and/or Software as described in a Quote provided by the Seller.
Quote:	means the offer or proposal made by Seller to Buyer for the supply of Products.
Seller:	means Parker-Hannifin Corporation, including all divisions and businesses thereof.
Services:	means any services to be supplied by the Seller.
Software:	means any software related to the Products, whether embedded or separately downloaded.
Terms:	means the terms and conditions of this Offer of Sale or any newer version of the same as published by Seller electronically at <a href="http://www.parker.com/saleterms">www.parker.com/saleterms</a> .

**2. TERMS.** All sales of Products by Seller are contingent upon, and will be governed by, these Terms and, these Terms are incorporated into any Quote provided by Seller to any Buyer. Buyer's order for any Products whether communicated to Seller verbally, in writing, by electronic date interface or other electronic commerce, shall constitute acceptance of these Terms. Seller objects to any contrary or additional terms or conditions of Buyer. Reference in Seller's order acknowledgement to Buyer's purchase order or purchase order number shall in no way constitute an acceptance of any of Buyer's terms of purchase. No modification to these Terms will be binding on Seller unless agreed to in writing and signed by an authorized representative of Seller.

**3. PRICE; PAYMENT.** The Products set forth in Seller's Quote are offered for sale at the prices indicated in Seller's Quote. Unless otherwise specifically stated in Seller's Quote, prices are valid for thirty (30) days and do not include any sales, use, or other taxes or duties. Seller reserves the right to modify prices at any time to adjust for any raw material price fluctuations. Unless otherwise specified by Seller, all prices are F.C.A. Seller's facility (INCOTERMS 2010). All sales are contingent upon credit approval and payment for all purchases is due thirty (30) days from the date of invoice (or such date as may be specified in the Quote). Unpaid invoices beyond the specified payment date incur interest at the rate of 1.5% per month or the maximum allowable rate under applicable law.

**4. SHIPMENT; DELIVERY; TITLE AND RISK OF LOSS.** All delivery dates are approximate. Seller is not responsible for damages resulting from any delay. Regardless of the manner of shipment, delivery occurs and title and risk of loss or damage pass to Buyer, upon placement of the Products with the shipment carrier at Seller's facility. Unless otherwise agreed, Seller may exercise its judgment in choosing the carrier and means of delivery. No deferment of shipment at Buyer's request beyond the respective indicated shipping date will be made except on terms that will indemnify, defend and hold Seller harmless against all loss and additional expense. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer's acts or omissions.

**5. WARRANTY.** The warranty related to the Products is as follows: (i) Goods are warranted against defects in material or workmanship for a period of twenty four

(24) months from the date of shipment or 2,000 hours of use, whichever occurs first; Exception to this is the Angle Body Valve line and the FTS Pump system which have twelve (12) months warranty (ii) Services shall be performed in accordance with generally accepted practices and using the degree of care and skill that is ordinarily exercised and customary in the field to which the Services pertain and are warranted for a period of six (6) months from the completion of the Services by Seller; and (iii) Software is only warranted to perform in accordance with applicable specifications provided by Seller to Buyer for ninety (90) days from the date of delivery or, when downloaded by a Buyer or end-user, from the date of the initial download. Warranties are void if the FTS PUMP is not used with a SOFT START or system which provides a soft start function in accordance with the Operation Manual provided with the product. All prices are based upon the exclusive limited warranty stated above, and upon the following disclaimer:

**DISCLAIMER OF WARRANTY:** THIS WARRANTY IS THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING DESIGN, NONINFRINGEMENT, MERCHANTABILITY, AND FITNESS FOR A PARTICULAR PURPOSE. SELLER DOES NOT WARRANT THAT THE SOFTWARE IS ERROR-FREE OR FAULT-TOLERANT, OR THAT BUYER'S USE THEREOF WILL BE SECURE OR UNINTERRUPTED. BUYER AGREES AND ACKNOWLEDGES THAT UNLESS OTHERWISE AUTHORIZED IN WRITING BY SELLER THE SOFTWARE SHALL NOT BE USED IN CONNECTION WITH HAZARDOUS OR HIGH RISK ACTIVITIES OR ENVIRONMENTS. EXCEPT AS EXPRESSLY STATED HEREIN, ALL PRODUCTS ARE PROVIDED "AS IS".

**6. CLAIMS; COMMENCEMENT OF ACTIONS.** Buyer shall promptly inspect all Products upon receipt. No claims for shortages will be allowed unless reported to the Seller within ten (10) days of delivery. Buyer shall notify Seller of any alleged breach of warranty within thirty (30) days after the date the non-conformance is or should have been discovered by Buyer. Any claim or action against Seller based upon breach of contract or any other theory, including tort, negligence, or otherwise must be commenced within twelve (12) months from the date of the alleged breach or other alleged event, without regard to the date of discovery.

**7. LIMITATION OF LIABILITY.** IN THE EVENT OF A BREACH OF WARRANTY, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE THE NON-CONFORMING PRODUCT, RE-PERFORM THE SERVICES, OR REFUND THE PURCHASE PRICE PAID WITHIN A REASONABLE PERIOD OF TIME. IN NO EVENT IS SELLER LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, NON-COMPLETION OF SERVICES, USE, LOSS OF USE OF, OR INABILITY TO USE THE PRODUCTS OR ANY PART THEREOF, LOSS OF DATA, IDENTITY, PRIVACY, OR CONFIDENTIALITY, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER'S WRITTEN CONSENT, WHETHER BASED IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE PAID FOR THE PRODUCTS.

**8. LOSS TO BUYER'S PROPERTY.** Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which are or become Buyer's property, will be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer ordering the Products manufactured using such property. Seller shall not be responsible

for any loss or damage to such property while it is in Seller's possession or control.

**9. SPECIAL TOOLING.** Special Tooling includes but is not limited to tooling, jigs, fixtures and associated manufacturing equipment acquired or necessary to manufacture Products. A tooling charge may be imposed for any Special Tooling. Such Special Tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in Special Tooling belonging to Seller that is utilized in the manufacture of the Products, even if such Special Tooling has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller has the right to alter, discard or otherwise dispose of any Special Tooling or other property in its sole discretion at any time.

**10. SECURITY INTEREST.** To secure payment of all sums due, Seller retains a security interest in all Products delivered to Buyer and, Buyer's acceptance of these Terms is deemed to be a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest.

**11. USER RESPONSIBILITY.** The Buyer through its own analysis and testing, is solely responsible for making the final selection of the Products and assuring that all performance, endurance, maintenance, safety and warning requirements of the application of the Products are met. The Buyer must analyze all aspects of the application and follow applicable industry standards, specifications, and other technical information provided with the Product. If Seller provides Product options based upon data or specifications provided by the Buyer, the Buyer is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products. Parker has no liability or responsibility in connection with: (a) improper selection, application, design, specification or other misuse of Products purchased by Buyer from Parker; (b) any act or omission, negligent or otherwise, of Buyer; or (c) Parker's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Products. In the event the Buyer is not the end-user, Buyer will ensure such end-user complies with this paragraph.

**12. USE OF PRODUCTS, INDEMNITY BY BUYER.** Buyer shall comply with all instructions, guides and specifications provided by Seller with the Products. Unauthorized Uses. If Buyer uses or resells the Products for any uses prohibited in Seller's instructions, guides or specifications, or Buyer otherwise fails to comply with Seller's instructions, guides and specifications, Buyer acknowledges that any such use, resale, or non-compliance is at Buyer's sole risk. Buyer shall indemnify, defend, and hold Seller harmless from any losses, claims, liabilities, damages, lawsuits, judgments and costs (including attorney fees and defense costs), whether for personal injury, property damage, intellectual property infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, application, design, specification or other misuse of Products provided by Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, tooling, equipment, plans, drawings, designs or specifications or other information or things furnished by Buyer; (d) damage to the Products from an external cause, repair or attempted repair by anyone other than Seller, failure to follow instructions, guides and specifications provided by Seller, use with goods not provided by Seller, or opening, modifying, deconstructing or tampering with the Products for any reason; or (e) Buyer's failure to comply with these Terms. Seller shall not indemnify

# OFFER OF SALE – PARKER FLUID CONTROL DIVISION

Buyer under any circumstance except as otherwise provided in these Terms.

**13. CANCELLATIONS AND CHANGES.** Buyer may not cancel or modify any order for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller, at any time, may change Product features, specifications, designs and availability.

**14. LIMITATION ON ASSIGNMENT.** Buyer may not assign its rights or obligations without the prior written consent of Seller.

**15. FORCE MAJEURE.** Seller does not assume the risk and is not liable for delay or failure to perform any of Seller's obligations by reason of events or circumstances beyond its reasonable control ("Events of Force Majeure"). Events of Force Majeure shall include without limitation: accidents, strikes or labor disputes, acts of any government or government agency, acts of nature, delays or failures in delivery from carriers or suppliers, shortages of materials, or any other cause beyond Seller's reasonable control.

**16. WAIVER AND SEVERABILITY.** Failure to enforce any provision of these Terms will not invalidate that provision; nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of these Terms by legislation or other rule of law shall not invalidate any other provision herein and, the remaining provisions will remain in full force and effect.

**17. TERMINATION.** Seller may terminate any agreement governed by or arising from these Terms for any reason and at any time by giving Buyer thirty (30) days prior written notice. Seller may immediately terminate, in writing, if Buyer: (a) breaches any provision of these Terms (b) appoints a trustee, receiver or custodian for all or any part of Buyer's property (c) files a petition for relief in bankruptcy on its own behalf, or one if filed by a third party (d) makes an assignment for the benefit of creditors; or (e) dissolves its business or liquidates all or a majority of its assets.

**18. OWNERSHIP OF SOFTWARE.** Seller retains ownership of all Software supplied to Buyer hereunder. In no event shall Buyer obtain any greater right in and to the Software than a right in the nature of a license limited to the use thereof and subject to compliance with any other terms provided with the Software.

**19. INDEMNITY FOR INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS.** Seller is not liable for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights ("Intellectual Property Rights") except as provided in this Section. Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on a third party claim that one or more of the Products sold hereunder infringes the Intellectual Property Rights of a third party in the country of delivery of the Products by the Seller to the Buyer. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of any such claim, and Seller having sole control over the defense of the claim including all negotiations for settlement or compromise. If one or more Products sold hereunder is subject to such a claim, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Products, replace or modify the Products so as to render them non-infringing, or offer to accept return of the Products and refund the purchase price less a reasonable allowance for depreciation. Seller has no obligation or liability for any claim of infringement: (i) arising from information provided by Buyer; or (ii) directed to any Products provided hereunder for which the designs are specified in whole or part by Buyer; or (iii) resulting from the modification, combination or use in a system of any Products provided hereunder. The foregoing provisions of this Section constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for such claims of infringement of Intellectual Property Rights.

**20. GOVERNING LAW.** These Terms and the sale and delivery of all Products are deemed to have taken place in, and shall be governed and construed in accordance with, the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to the sale and delivery of the Products.

**21. ENTIRE AGREEMENT.** These Terms, along with the terms set forth in the main body of any Quote, forms the entire agreement between the Buyer and Seller and constitutes the final, complete and

exclusive expression of the terms of sale. In the event of a conflict between any term set forth in the main body of a Quote and these Terms, the terms set forth in the main body of the Quote shall prevail. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter shall have no effect. These Terms may not be modified unless in writing and signed by an authorized representative of Seller.

**22. COMPLIANCE WITH LAWS.** Buyer agrees to comply with all applicable laws, regulations, and industry and professional standards, including those of the United States of America, and the country or countries in which Buyer may operate, including without limitation the U.S. Foreign Corrupt Practices Act ("FCPA"), the U.S. Anti-Kickback Act ("Anti-Kickback Act"), U.S. and E.U. export control and sanctions laws ("Export Laws"), the U.S. Food Drug and Cosmetic Act ("FDCA"), and the rules and regulations promulgated by the U.S. Food and Drug Administration ("FDA"), each as currently amended. Buyer agrees to indemnify, defend, and hold harmless Seller from the consequences of any violation of such laws, regulations and standards by Buyer, its employees or agents. Buyer acknowledges that it is familiar with all applicable provisions of the FCPA, the Anti-Kickback Act, Export Laws, the FDCA and the FDA and certifies that Buyer will adhere to the requirements thereof and not take any action that would make Seller violate such requirements. Buyer represents and agrees that Buyer will not make any payment or give anything of value, directly or indirectly, to any governmental official, foreign political party or official thereof, candidate for foreign political office, or commercial entity or person, for any improper purpose, including the purpose of influencing such person to purchase Products or otherwise benefit the business of Seller. Buyer further represents and agrees that it will not receive, use, service, transfer or ship any Product from Seller in a manner or for a purpose that violates Export Laws or would cause Seller to be in violation of Export Laws.



# USER RESPONSIBILITY – PARKER FLUID CONTROL DIVISION

## 1.0 GENERAL INSTRUCTIONS

1.1 Scope: This safety guide is designed to cover general guidelines on the selection, installation, operation, and maintenance of these Products. This safety guide is a supplement to and is to be used with the specific Parker publication for the valve, assembly or related accessory being considered for use. Parker publications are available at [www.parker.com](http://www.parker.com) or by calling 1-800-CPARKER.

1.2 Fail-Safe: All Products can and do fail without warning for many reasons. Design all systems in a fail-safe mode so that failure of the Products will not endanger persons or property.

1.3 Distribution: Provide a copy of this safety guide to each person that is responsible for installation, operation, and maintenance of these Products. Do not select or use these Products without thoroughly reading and understanding this safety guide as well as the specific Parker publications for the Products considered or selected.

1.4 User Responsibility: Due to the wide variety of operating conditions and applications for these Products, Parker, and its distributors do not represent or warrant that any particular Parker Fluid Control Product is suitable for any specific end use system. This safety guide does not analyze all technical parameters that must be considered in selecting a Product. The user, through its own analysis and testing, is solely responsible for:

- Making the final selection of the Product;
- Assuring that the user's requirements are met, and that the application presents no health or safety hazards;
- Providing all appropriate health and safety warnings on the equipment on which the Products are used; and
- Assuring compliance with all applicable government and industry standards.



### CALIFORNIA PROP 65: WARNING:

This product can expose you to chemicals including lead which is known to the State of California to cause cancer and birth defects, or other reproductive harm.

For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

1.5 Additional Questions: Call the appropriate Parker technical service department if you have any questions or require any additional information. See the Parker publication for the Product being considered or used, or call 1-800-CPARKER, or go to [www.parker.com](http://www.parker.com) for telephone numbers of the appropriate technical service department.

## 2.0 PRODUCT SELECTION INSTRUCTIONS

2.1 Selection: Consult the specific Parker Fluid Control publication for the Product being considered for use. Confirm the choice of Product with Parker Fluid Control's technical consultants prior to placing orders for the Product or installing and using the Product.

2.2 Chemical Compatibility: Elastomer seal material used in the Products must be properly selected based on compatibility with the gases, liquids or additives being conveyed in the Product. Any exposure to non-compatible gases, liquids or additives may result in failure or degradation of the seals and leakage from the Product. Such failure or degradation could happen immediately or at any time over the life of the Product.

## 3.0 PRODUCT ASSEMBLY AND INSTALLATION INSTRUCTIONS

3.1 Inspection: Prior to assembly, all components must be checked for correct style, part number, and

physical properties such as size or the presence of physical damage. Do NOT use any component that displays any signs of non-conformance.

3.1.1 A careful examination of the Unit Valve and Unit Solenoid must be performed. If you purchase a Unit Valve and a Unit Solenoid, be sure that the last two digits of the Unit Valve match the first two digits of the Unit Solenoid. If they do not match, then do not install.

3.1.2 Check nameplate for correct catalog number, pressure, voltage and service. Do not install if unsuitable.

3.1.3 Valves to be installed in Hazardous Locations must be outfitted with Hazardous Location coils only. Verify nameplate data and coil part number before installing the valve.

3.2 Product Assembly: Do not assemble, install or use a Parker Fluid Control Division Product in any end use or application that exceeds the specified operating parameters as listed by Parker such as but not limited to, pressure, voltage and frequency, and medium. Do not mix components or solenoids from a Parker valve with valves or solenoids from another manufacturer. Do not mix components or solenoids from one Parker valve with components or solenoids from another Parker valve.

3.2.1 Threaded Connections: Proper procedures for the application of tape or liquid pipe sealant or thread compound must be followed so these contaminants do not enter the Product.

3.2.2 Sweating or Brazing: Products requiring the sweating or brazing of pipe connections must have precautions taken to protect the internal product components from excessive heat during the sweating or brazing operation. Follow the directions in the specific Parker Fluid Control Division publication for the Product in question.

3.2.3 Mounting: Check the specific Parker Fluid Control Division publication for the Product in question for limitations on mounting prior to mounting the Product.

3.2.4 Electrical Connection: Turn off electrical power before connecting or disconnecting the Product to the power source. Wiring must comply with local and national electrical codes.

3.2.5 Voltage: Some coils contain solid state components that can be damaged by voltage spikes, transient voltage, over temperature, over voltage, or improper assembly. To protect against premature failure, please read the instructions in the specific Parker Fluid Control Division publication for the Product in question.

3.2.6 Port Connection: Parker Product operating parameters assume that the user connects the fluid to the proper inlet, outlet and exhaust ports. Connecting to the wrong ports may result in a complete failure or degraded performance. Use caution when applying and activating the fluid connection. Take the necessary precautions to protect personnel and property from injury and damage when turning on the fluid to the Product. Make sure the voltage is in the correct state (on or off) to control the applied pressure as required for the application in question.

3.2.7 Screw Terminal Coil and Terminal Box Assembly: When the DIN or screw terminal coils are used with the terminal box assembly, be sure to apply a wrench to the wrench flats on the conduit hub when installing electrical conduit.

3.2.8 Pressure: Turn off line pressure and bleed off trapped pressure from the lines before installing, removing or disassembling the Product.

## 4.0 PRODUCT AND SYSTEM OPERATION INSTRUCTIONS

4.1 Pressure Differential: Pressure differential

dependent Products require a minimum pressure differential to operate properly. Make sure the chosen Product is sized properly for the application to maintain the required pressure differential across the Product.

4.2 System Check-Out: Once installed, the Product installation must be tested to insure proper operation and that no external leakage exists. All safety equipment must be in place including but not limited to safety glasses, helmets, ear protection, splash guards, coveralls and any shields on the equipment. All air entrapment must be eliminated, and the system pressurized to the maximum system pressure (at or below the Product maximum working pressure) and checked for proper function and freedom from leaks. Personnel must stay out of potentially hazardous areas while testing and using.

## 5.0 PRODUCT MAINTENANCE AND REPLACEMENT INSTRUCTIONS

5.1 Maintenance: Even with proper selection and installation, Product life or performance may be significantly reduced without a continuing maintenance program. The severity of the application, risk potential from a possible Product failure, and experience with any Product failures in the application or in similar applications should determine the frequency of the inspection and the replacement for the Products so that Products are replaced before any failure occurs. A maintenance program must be established and followed by the user and, at minimum, must include instructions 5.1.1 through 5.1.3.

5.1.1 Product Lubrication and Filtration: Almost all products require filtration. Consult the specific Parker Fluid Control Division publication for the Product in question. Note, too, that some Products require lubrication or filtration or both as a regular maintenance item due to the nature of the application's environment. Consult the specific Fluid Control Division publication for the Product in question to determine this. Other Products, such as proportional valves, do not require any maintenance if the fluid is properly filtered. If a failure should occur, then these proportional valves should not be repaired but replaced.

5.1.2 Cleaning: Do not expose plastic or elastomeric materials to any type of commercial cleaning fluid. Parts should be cleaned with a mild soap and water solution.

5.1.3 Fluid Spills: Necessary precautions should be taken during maintenance to avoid exposing personnel or the surrounding area to any spilled fluid if the fluid is regulated, harmful, or damaging when exposed to or in contact with personnel or the surrounding environment.

### 5.2 Service and Repair:

5.2.1 General: Do not repair Products unless the specific Fluid Control Division publication for the Product in question allows this procedure. Not all Products can be safely repaired in the field. Repair and replacement must be in accordance with the specific Parker Fluid Control Division publication for the Product in question and any Parker replacement kit instructions.

5.2.2 Replacement Parts: If you purchase any replacement parts they must be original equipment manufactured by Parker Fluid Control Division.

5.2.3 Lock-Out / Tag-Out: Follow all lock-out and tag-out procedures before undertaking service or repairs. This includes de-energizing all electrical, fluid and mechanical energy sources.

5.2.4 Hazardous Location Coils -When replacing coils, Products equipped with Hazardous Location coils must use Hazardous Location replacement coils only. Verify nameplate data and coil part number before installing the replacement coil.

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