

# Parker Gen II R-max™ Stream Switching System

Catalog 4141-R

March 2013

aerospace  
climate control  
electromechanical  
filtration  
fluid & gas handling  
hydraulics  
pneumatics  
process control  
sealing & shielding



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## Introduction

The Parker Gen II *R-max*™ is a multi-functional system capable of integrating both stream switching and filtering into one unique compact assembly. The system is designed to control both gases and liquids in analytical systems ranging from vacuum to 500 psig (34 bar) while requiring only 65 psig (5 bar) actuating air pressure. The system was engineered with a focus on improved product reliability and reduced cost of ownership. The Parker Gen II *R-max*™ Stream Switching System utilizes state-of-the-art surface mount technology to reduce leak paths, internal volume, and dead volume. With surface mounting, system components may be easily removed and replaced without breaking process connections. In addition, the Parker Gen II *R-max*™ system utilizes an internal self-purging outlet header to eliminate the need for an additional outlet loop.

## Features

- **Captured vent** provides a low pressure header that separates sample stream from actuation air preventing cross contamination.
- **Enhanced position indicator** enables easy recognition of valve position for **maximum** system safety.
- **Backward compatibility** allows the enhanced features to be added to existing units.
- **Surface mount technology** enhances **maximum** system flexibility and enables the user to add additional streams to a system without interrupting installed units.
- **Low internal volume** insures **maximum** system efficiency by reducing purge time and expensive purge gas.
- **Modular valve design** offers **maximum** serviceability for quick and easy in-system repair and reduced downtime.
- The Gen II *R-Max*™ is available for **ANSI/ISA-76.00.02 (NeSSI) mounting**.
- **US Patent 6619321**

## Specifications

### Pressure Rating

500 psig (34 bar) CWP

### Temperature Rating

Fluorocarbon Rubber –

-15°F to 400°F (-26°C to 204°C)

Buna-N Rubber –

-30°F to 275°F (-34°C to 135°C)

Ethylene Propylene Rubber –

-70°F to 275°F (-57°C to 135°C)

Neoprene Rubber –

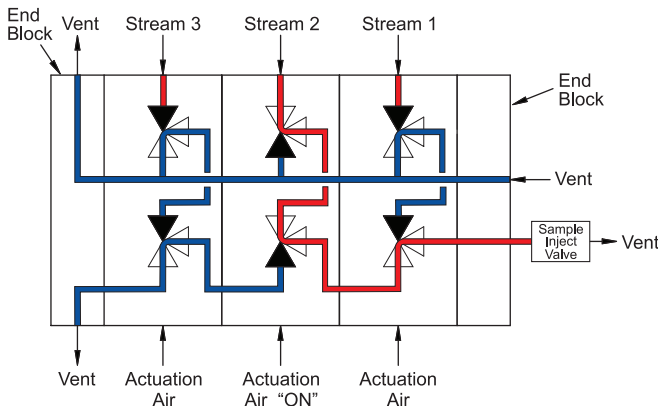
-45°F to 250°F (-43°C to 121°C)

Highly Fluorinated Fluorocarbon Rubber –  
-25°F to 300°F (-32°C to 150°C)

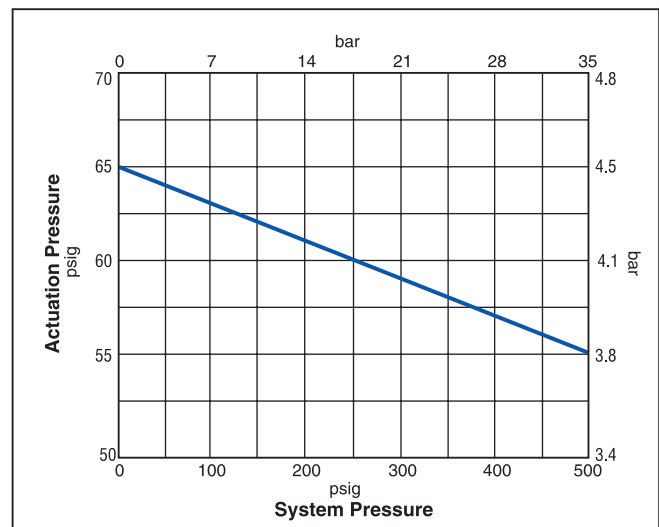
### Flow Data (in a two stream system)

Stream 1:  $C_v = 0.154$

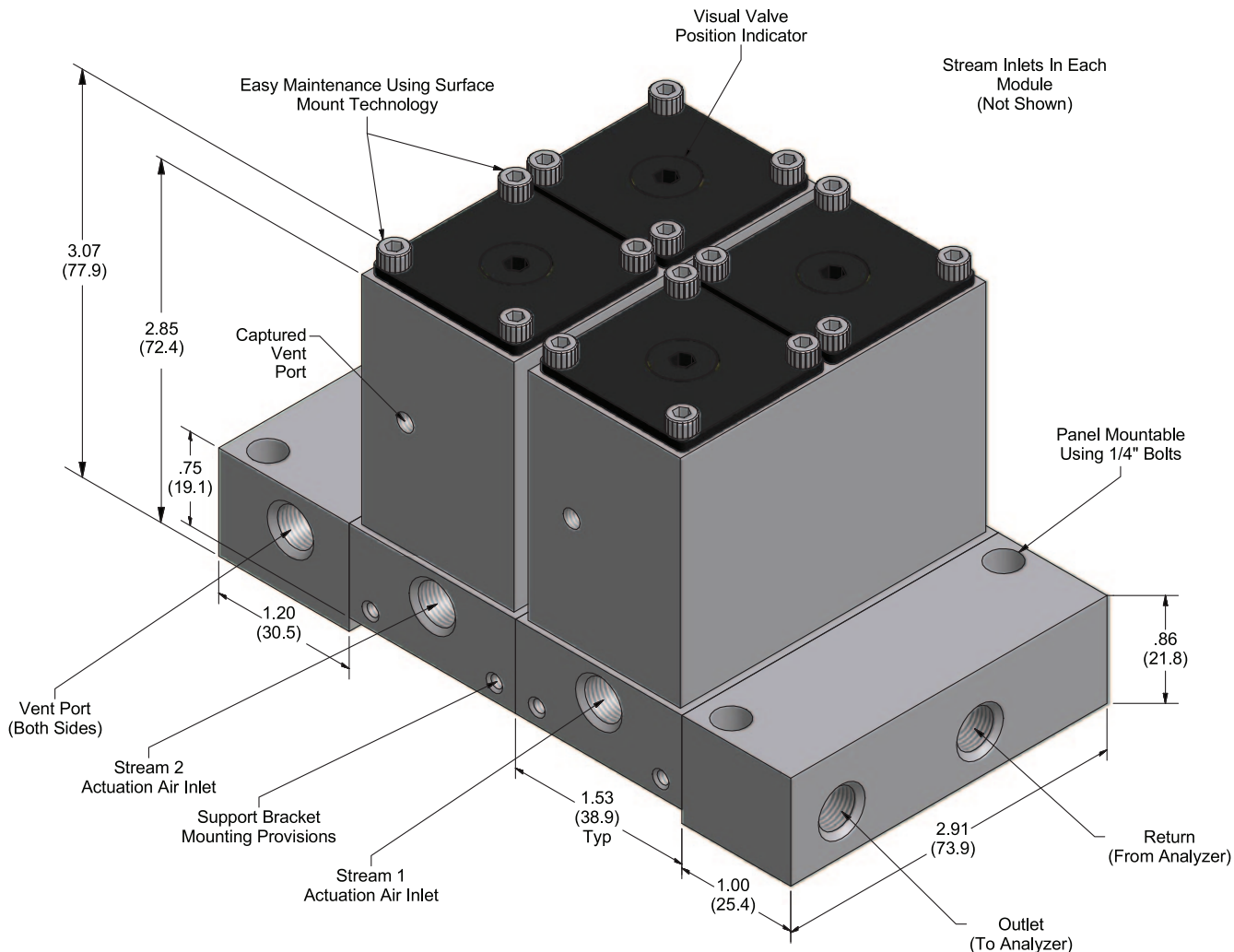
Stream 2:  $C_v = 0.104$



## Actuation Pressure vs. System Pressure

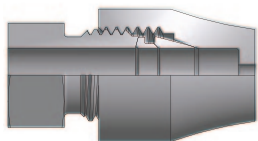


## Exterior Dimensions

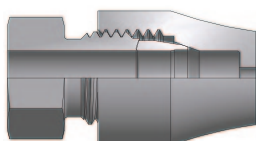


## Available End Connections

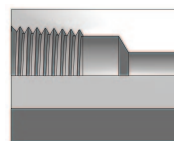
**4A7** – 1/4" inverted two ferrule A-LOK® compression port



**4Z7** – 1/4" inverted single ferrule CPI™ compression port

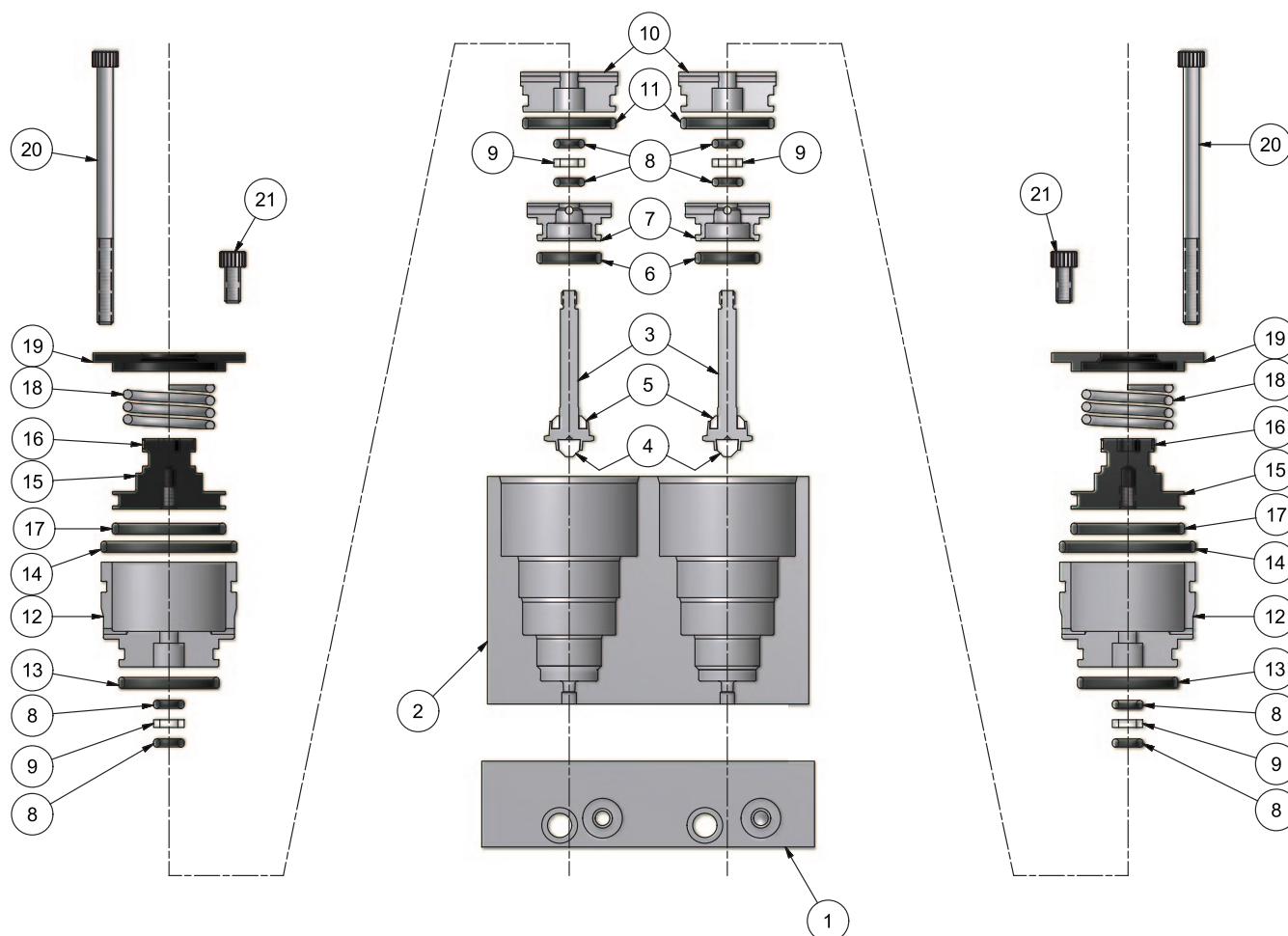


**2F** – 1/8" ANSI/ASME B1.20.1 internal pipe threads



Note: Actuator air porting and vent porting is always 1/8" FNPT.

## Valve Module Exploded View



## Materials of Construction

Item	Part Description	Material	Item	Part Description	Material
1	Base	ASTM A 479, type 316	12	Upper Bonnet	ASTM A 479, type 316
2	Valve Body	ASTM A 479, type 316	13	2-018 O-Ring	Optional elastomers
3	Stem	ASTM A 479, type 316	14	2-023 O-Ring	Optional elastomers
4	Seat	PCTFE	15	Piston	ASTM B 611, Alloy 6061
5	Backseat	PCTFE	16	Indicator	Flexible polyolefin
6	2-013 O-Ring	Optional elastomers	17	2-020 O-Ring	Optional elastomers
7	Lower Bonnet	ASTM A 479, type 316	18	Spring	ASTM A 546, type 630
8	2-007 O-Ring	Optional elastomers	19	Cap	ASTM B 211, Alloy 6061
9	Backup Ring	PTFE	20	Bolt (6-32 x 2.25)	Stainless steel
10	Center Bonnet	ASTM A 479, type 316	21	Bolt (6-32 x 5/16)	Stainless steel
11	2-017 O-Ring	Optional elastomers			

**Note:** Material for Stream Switching Vent and Analyzer End Plates (not shown) is ASTM A 479, type 316.  
Material for Base Plate Bolts is ASTM A 276, type 316.

**Lubrication:** Perfluorinated polyether

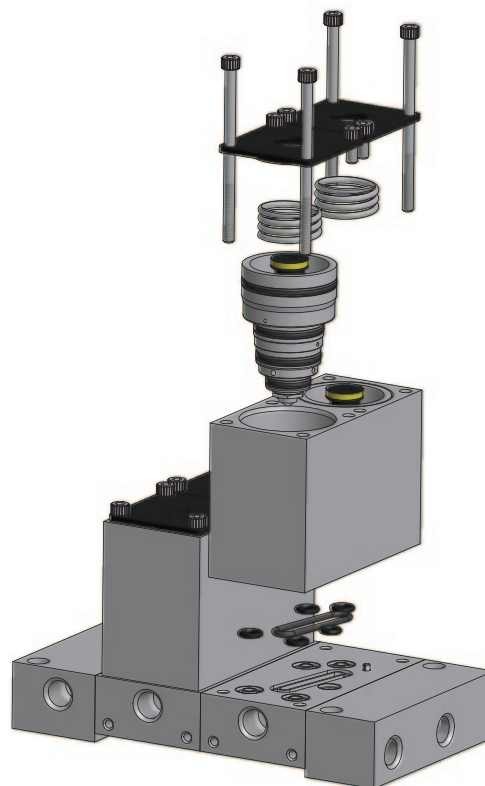
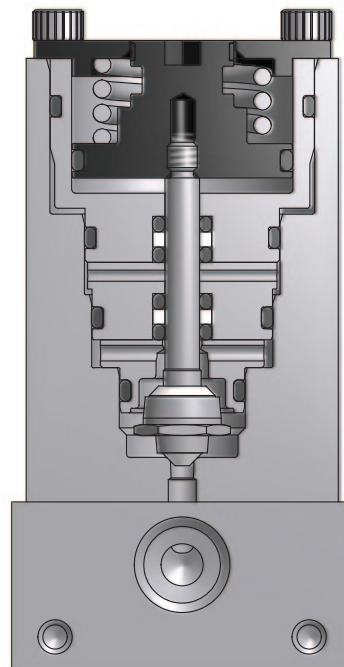
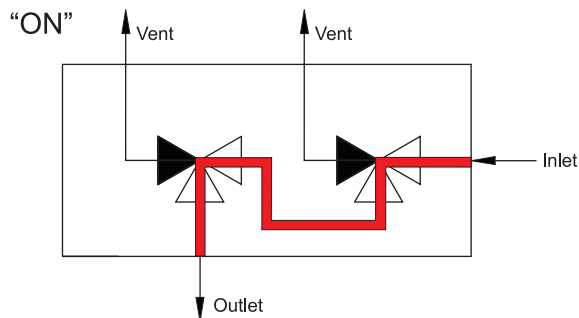
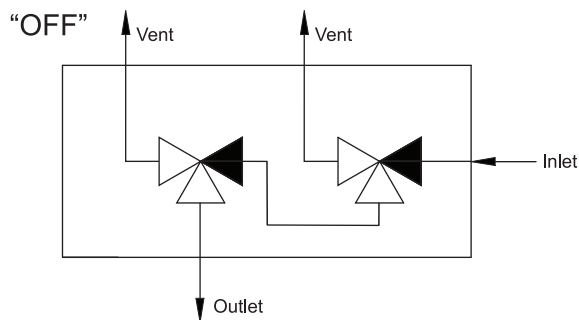
## Valve Module

The Parker Gen II *R-max*<sup>TM</sup> Stream Switching System centers around the Valve Module, which contains two 3-way valves. Each Valve Module is factory mounted to a base plate configured to provide the desired function. The Stream Switching Valve Module provides a double block and bleed arrangement preventing cross contamination of the sample streams.

### Valve Module Features

- Each Valve Module has a flow inlet (1/8" FNPT or 1/4" Inverted Compression) and a 1/8" FNPT valve air actuation port.
- Each Valve Module employs two valves.

### Valve Module Flow Diagram



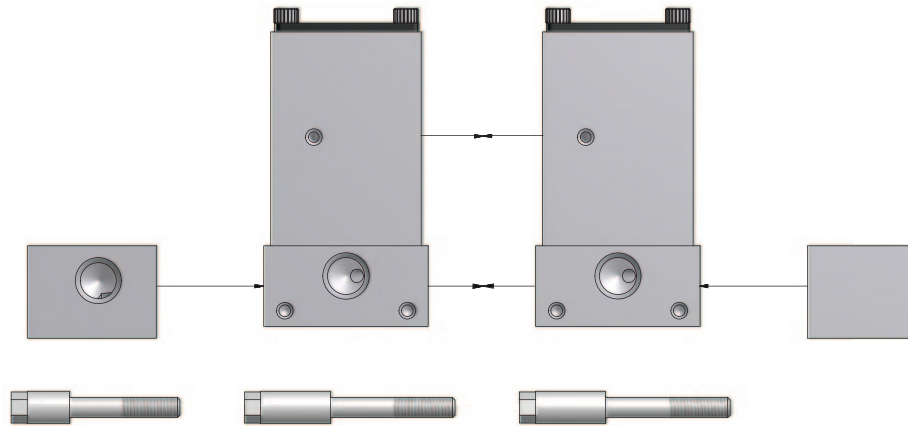
### Valve Expansion Module – R3EM

Valve Expansion Modules may be added or removed from the Parker Gen II *R-max*<sup>TM</sup> Stream Switching System. The Valve Expansion Module consists of a Valve Module plus two base plate bolts. They may be inserted between the vent and analyzer end plates to add one or more streams to a system. (See How to Order on pages 10-12.)

**Note:** Valve Modules may only be added to an existing stream switching system.

## Multi-Stream Switch – R3

A Multi-Stream Switch consists of individual Valve Modules bolted together between vent and analyzer end plates to create an internal, self-purging system with an integral outlet header. This unique design eliminates dead volume and the need for an external loop.

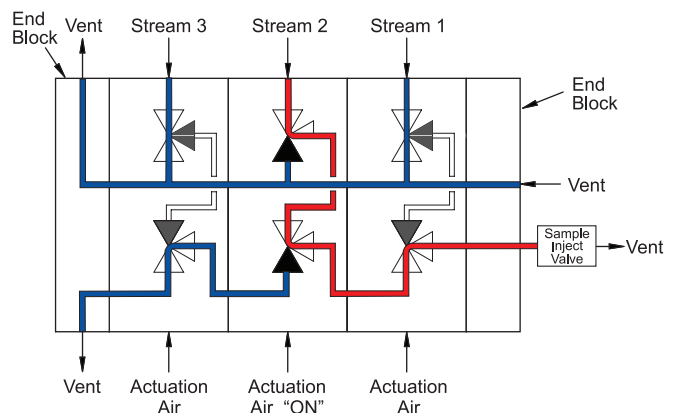


## Fast Loop Options

### Internal Fast Loop

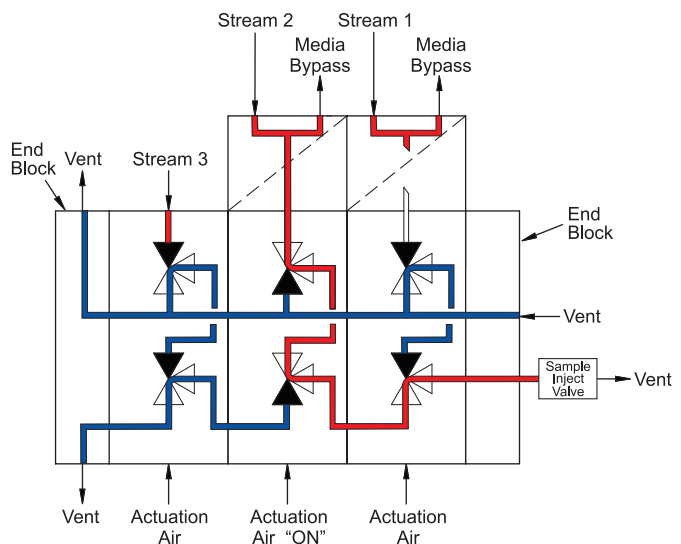
Example shown is a three stream switching system with an internal fast loop that maintains the double block and bleed feature. Illustrates Streams 1 and 3 in the “off” position, with these two streams flowing to the common vent. Stream 2 is illustrated in the “on” position, closing the bypass and directing the flow to the analyzer. To order, add the suffix -IF to the end of the Stream Switching System part number. (How to Order; see pages 10-12.)

**Example:** 2F-R3K-BN-SS-3-IF



### Fast Loop Filters

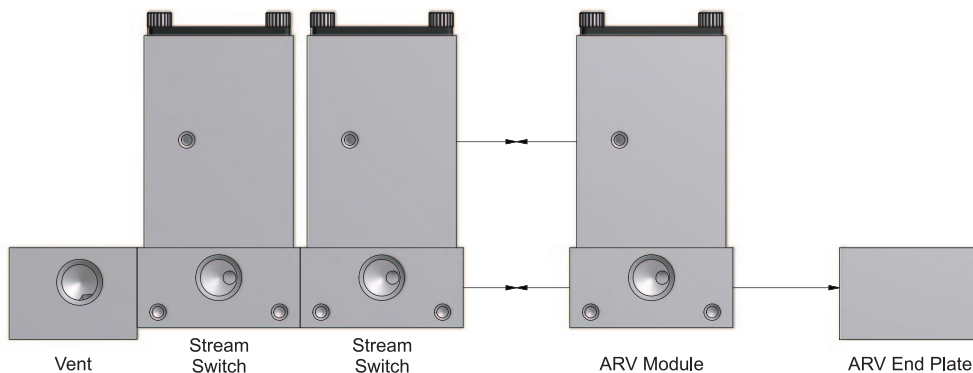
Example shown is a three stream switching system with two filter bypasses. Bypass Filter Kits may be incorporated into the Parker Gen II *R-max*™ Stream Switching System to enhance your system design. (How to Order; see pages 10-12 and 18-19.)





## Stream Switch with ARV Module

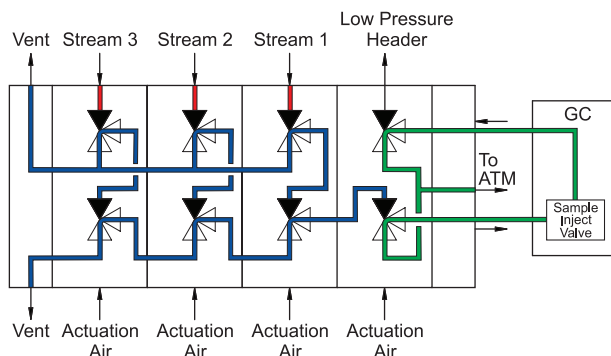
The ARV Module (Atmospheric Reference Vent) is positioned between the analyzer and stream switching units for sample shut-off and equilibration of the sample loop pressure to atmosphere. This insures a consistent sample pressure in repetitive analysis. When the ARV Module is actuated, the sample flows from the actuated (open) stream, through the GC analyzer and is routed to the low pressure header.



## ARV Module Function – Three Stream Examples

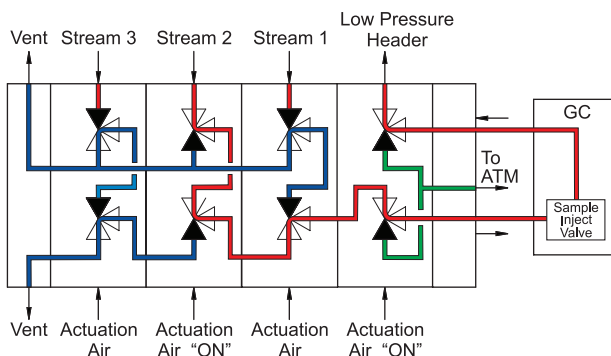
### Example 1

All valves are in the “off” position. The system is “open” to vent.



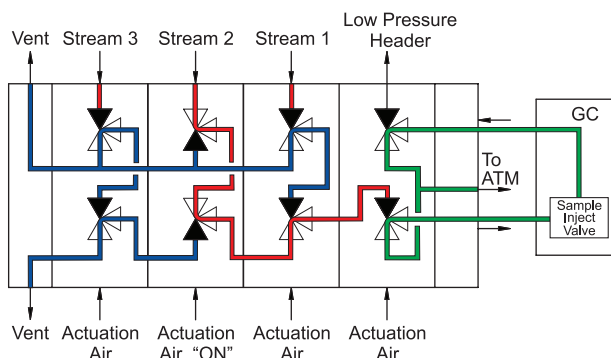
### Example 2

Stream 2 and the ARV Module are in the “on” position, purging the sample loop to the low pressure header.



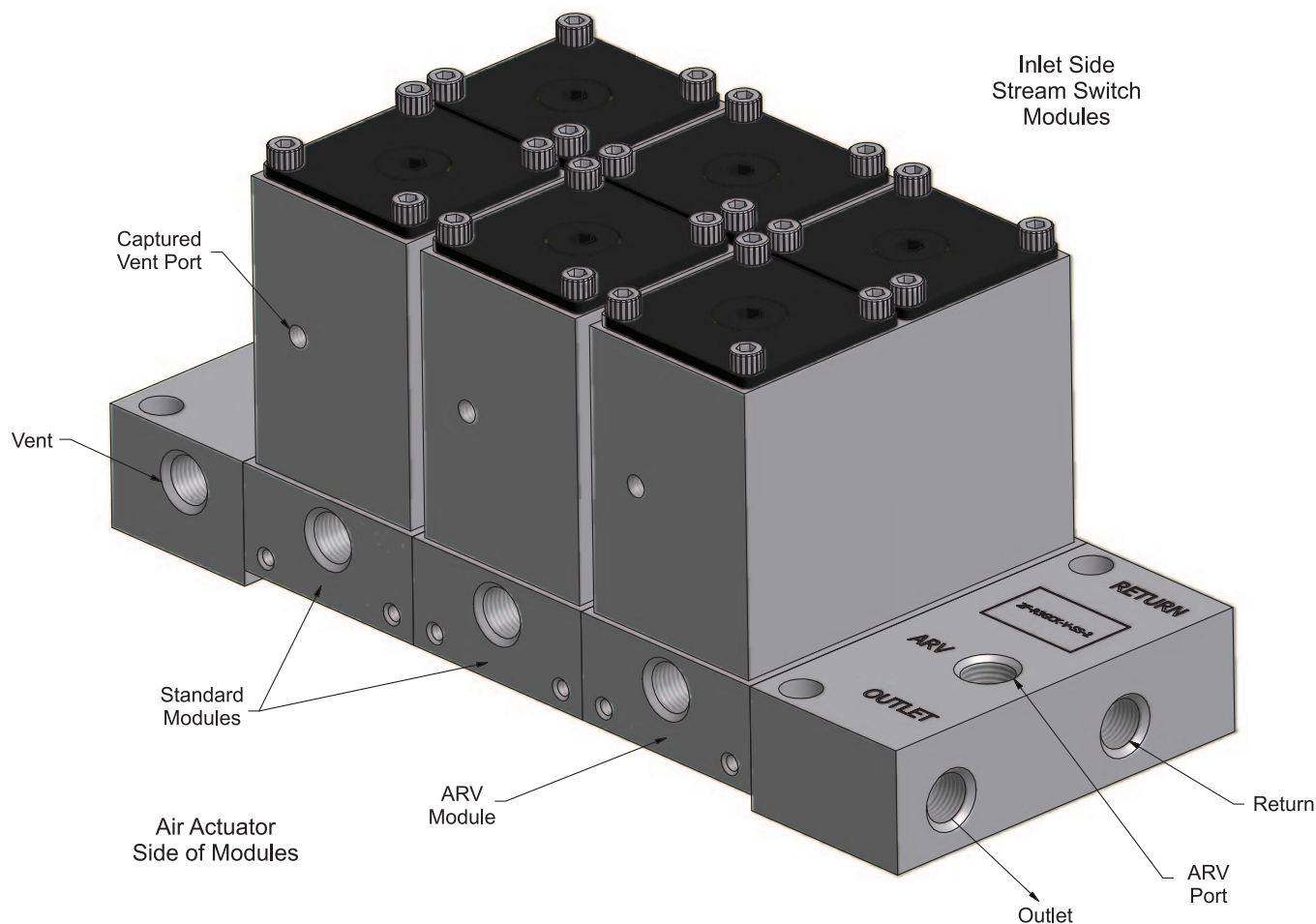
### Example 3

Stream 2 is in the “on” position and the ARV Module is in the “off” position, equilibrating the sample loop pressure to vent pressure.



## Atmospheric Reference Vent (ARV) Module

The Atmospheric Reference Vent Module provides many advantages and benefits within a modular footprint. It can be installed inline with existing Stream Switching Modules or act as a stand alone unit. The improved features on the Stream Switching Units are included on the ARV Modules. It is provided with a new end block which has a dedicated atmosphere reference port and the re-designed ARV Modules can be used with Fast Loop Filtration.



## Backwards Compatibility

Aspects of the R3 Series Gen II *R-max*™ can be applied for use with existing R2 Series units. Retrofitting the existing R2 Series *R-max*™ is easily accomplished by following the provided instructions.

**Valve Modules:** The valve modules are maintained using four 6-32 bolts. Removing these allows the existing R2 Series Module to be removed and the new R3 Series Module to be installed with new 6-32 bolts.

**Position Indicator:** The Enhanced Position Indicator used on the R3 Series Gen II *R-max*™ provides a yellow indicator that is easily identifiable against a black background. This Indicator can be fitted onto the R2 Series *R-max*™ for the same easy identification of valve position.

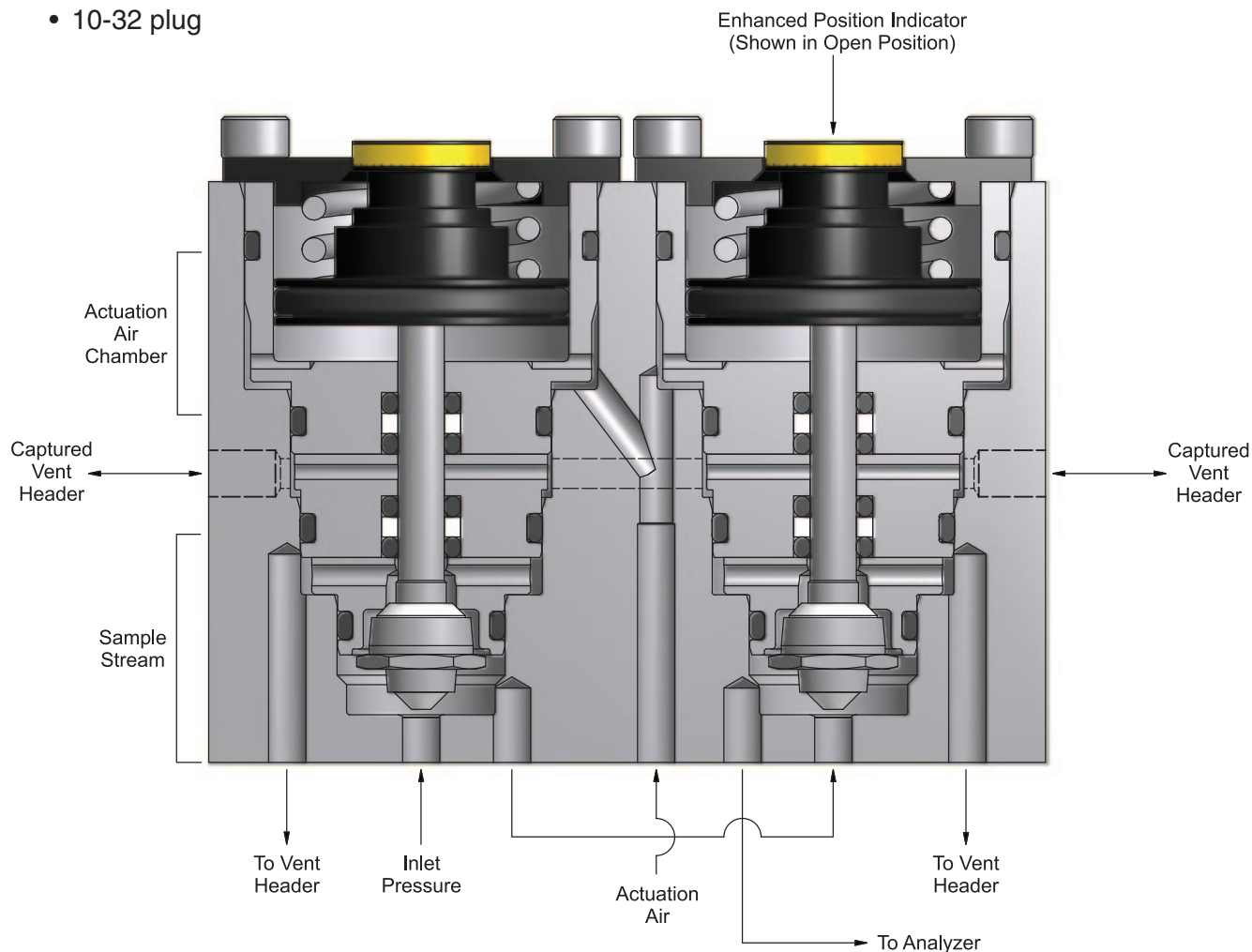
**Redesigned ARV (Atmospheric Reference Vent) Option:** R2 Series Stream Select Units can be installed with the redesigned ARV End Plate. Note, this also requires a special stream select module to block the ARV Port from the Vent Port.

## Captured Vent

The Parker Gen II *R-max*™ is designed with a captured vent header which isolates the sample stream from the actuation air preventing cross contamination. The Captured Vent has 10-32 threads which allows the captured vent to be directed to a containment device.

Porting options include fittings for use with:

- 1/8" plastic tubing
- 1/8" SS tubing
- 1/8" pipe
- 10-32 plug



## Enhanced Position Indicator

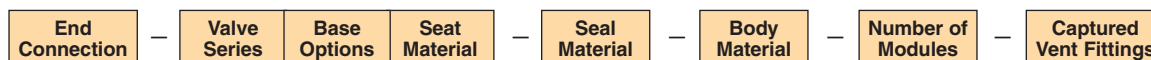
The Parker Gen II *R-max*™ is designed with an enhanced position indicator. The cap and piston are black anodized aluminum. The visual indicator, when actuated open, shows bright yellow against the black background giving easy indication for the open stream.

The visual indicator is also backwards compatible with the R2 Series *R-max*™ Stream Select System. Any *R-max*™ Stream Select Systems in service can easily be retrofitted with the enhanced indication.

The position indicator can be color coded. Contact the factory for more information.

## How to Order Stream Switching Systems and Accessories

The correct part number is easily derived by following the sequence shown below. The eight product characteristics required are coded as shown below.



**Example:** 2F – R3 K – V – SS – 2 – A E

The example above describes a two stream switching system having 1/8" female NPT inlet and outlet ports, PCTFE valve seats, fluorocarbon rubber seals, stainless steel construction, a fitting for 1/8" plastic tubing on the captured vent port (inlet side) and a 10-32 plug on the other captured vent port.

End Connection*	Valve Series	Base Options	Seat Material	Seal Material	Body Material**	Number of Modules	Captured Vent Fittings***
2F 4A7 4Z7	R3	Blank None GC ARV Module EM Valve Expansion Module NO Normally Open	K PCTFE PK Virgin PEEK VE Vespel	V Fluorocarbon Rubber BN Buna-N Rubber EPR Ethylene Propylene Rubber NE Neoprene Rubber KZ Highly Fluorinated Fluorocarbon Rubber	SS Stainless Steel	Numeric value  Blank EM Base Options	A 1/8" plastic tubing B 1/8" CPI™ compression C 1/8" A-LOK® compression D 1/8" FNPT E 10-32 plug F No fitting

\* See page 3.

\*\* Contact Customer Service for availability of exotic alloys such as Monel® and Hastelloy®.

\*\*\* In the part numbering scheme, the first captured vent letter designator is for the inlet side of the *R-max*™ Module. All captured vent fittings have a 10-32 thread for assembly into the valve body.

## How to Order Additional Options

**Oxygen Cleaning:** Add the suffix –C3 to the end of the part number to receive stream switching systems or accessories cleaned and assembled for oxygen service in accordance with Parker specification ES8003.

Add the suffix –RTK to the end of the part number to receive stream switching systems or accessories coated with the inert, silicon-based chemical coating Silconert™ 1000 (formerly Silcosteel®).

Add the suffix –SUL to the end of the part number to receive stream switching systems or accessories coated with the inert, silicon-based chemical coating Silconert™ 2000 (formerly Sulfinert®).

**NACE:** Add the suffix –NC to the end of the part number to receive stream switching systems or accessories that meet the material requirements of ANSI/NACE MRO175/ISO 15156-1.

**Internal Fast Loop:** Add the suffix –IF to the end of the part number to receive an internal fast loop on all modules. To designate a portion of the total number of modules contact Customer Service.

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## How to Order Kits

In using this section, the items in **BOLD CAPITALIZED PRINT** are included within the part number of the Kit. The *italicized items* require a designator to complete the part number. Refer to the How To Order section on page 10 for the designators.

**Stem Seal Kit:** Components required to rebuild the soft goods in one cartridge.

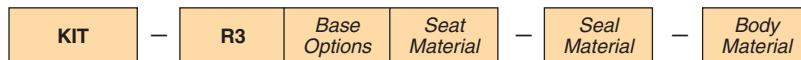


**Example:** **KIT** - **R3** **K** - **V** - **SS**

This example describes a kit consisting of one stainless steel stem with PCTFE upper and lower seats, fluorocarbon O-rings, associated PTFE back-up rings and maintenance instructions.

**Note:** This kit is also used for Single Valve Cartridge maintenance.

**Valve Module Kit:** Components required to rebuild the soft goods in one valve module. This includes the base and cartridges.

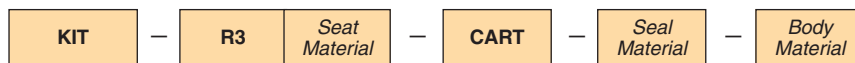


**Example:** **KIT** - **R3** **EM** **K** - **BN** - **SS**

This example describes a kit consisting of two stainless steel stems with PCTFE upper and lower seats, Buna-N O-rings, associated PTFE back-up rings and maintenance instructions.

**Note:** For kit part numbers, choose GC, NO and EM for the base option.

**Valve Cartridge Kit:** Components to replace one valve cartridge.



**Example:** **KIT** - **R3** **K** - **CART** - **EPR** - **SS**

This example describes a kit consisting of one completely assembled valve cartridge having PCTFE seats, ethylene propylene O-rings, stainless steel metallic components and maintenance instructions.

**Valve Body Kit:** Components required to replace one valve body assembly. This includes the cartridges.



**Example:** **KIT** - **R3** **K** - **BODY** - **V** - **SS**

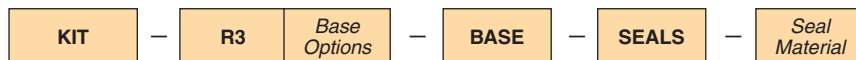
This example describes a kit consisting of one complete valve body and cartridge assembly having PCTFE seats, fluorocarbon O-rings, stainless steel metallic components and maintenance instructions.

**Note:** The springs, screws and caps are included, but not assembled.

*Kits continued on the following page.*

## How to Order Kits (continued)

**Base Seal Kit:** Components to replace the soft goods in one base.



**Example:** **KIT** - **R3** **GC** - **BASE** - **SEALS** - **KZ**

This example describes a kit consisting of highly fluorinated fluorocarbon O-rings and maintenance instructions.

Note: For the base option, choose GC, EM or NO.

**End Block Seal Kit:** Components to replace the soft goods in one end block.



**Example:** **KIT** - **R3** **EM** - **END** - **SEALS** - **V**

This example describes a kit consisting of fluorocarbon O-rings and maintenance instructions.

Note: For the base option, choose GC or EM.

### Position Indication Kits:

The R3 Series Gen II *R-max*™ Position Indicator is backwards compatible to R2 Series *R-max*™ Units. Simply remove the piston and cap from an existing R2 Series Cartridge and replace with the R3 Series piston and cap. Functionality and performance will remain the same but will include enhanced visual awareness of when the unit is actuated open.



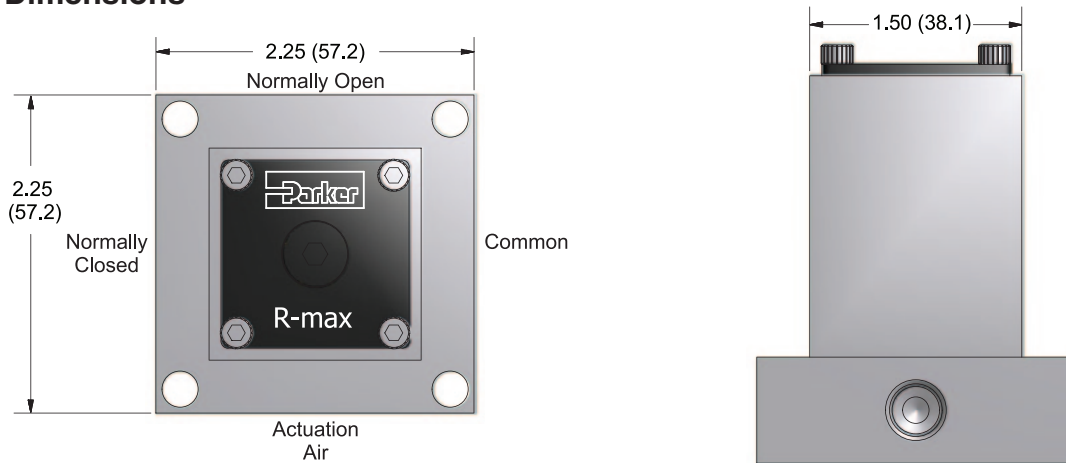
**Example:** **KIT** - **R3** - **EPI** - **V**

This example describes a kit consisting of enhanced visual indicator piston and cap, fluorocarbon O-ring and maintenance instructions.

## Single Valve

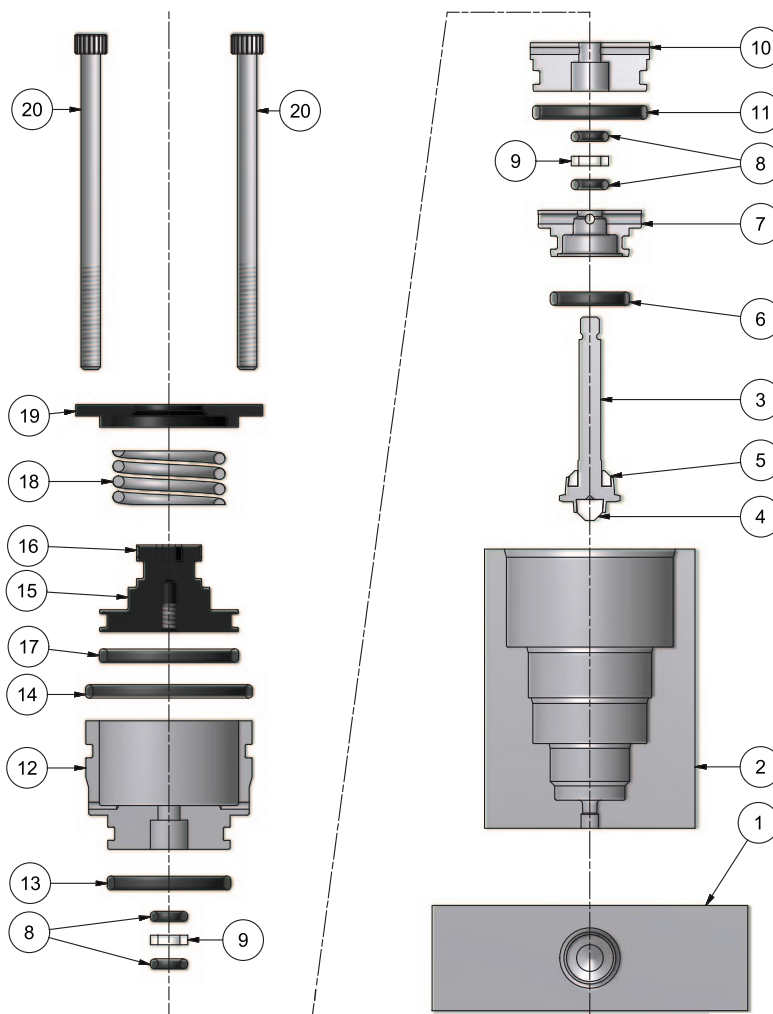
The Parker Gen II *R-max*™ Single Valve shares the same technology, features, and options found in the Stream Switching System. The pneumatically actuated valve serves as a three-way diverting valve with common, normally open, and normally closed porting.

### External Dimensions



### Exploded View

The Single Valve shares similar components with the Double Block and Bleed Unit. With the exception of the Valve Body and Base, the components are identical and can be identified using the numbering system on page 4. Materials are identical and also can be identified on page 4.



## How to Order – Single Valve

The correct part number is easily derived by following the sequence shown below. The six product characteristics required are coded as shown below.



**Example:** 2F – R3S K – V – SS – A

The example above describes a two stream switching system having 1/8" female NPT inlet and outlet ports, PCTFE valve seats, fluorocarbon rubber seals, stainless steel construction and fitting for 1/8" plastic tubing on the captured vent.

End Connection*	Valve Series	Seat Material	Seal Material	Body Material**	Captured Vent Fittings***
2F 4A7 4Z7	R3S	K PCTFE PK Virgin PEEK VE Vespel	V Fluorocarbon Rubber BN Buna-N Rubber EPR Ethylene Propylene Rubber NE Neoprene Rubber KZ Highly Fluorinated Fluorocarbon Rubber	SS Stainless Steel	A 1/8" plastic tubing B 1/8" CPI™ compression C 1/8" A-LOK® compression D 1/8" FNPT E 10-32 plug F No fitting

\* See page 3.

\*\* Contact Customer Service for availability of exotic alloys such as Monel® and Hastelloy®.

\*\*\* Only one captured vent fitting is required for the single valve. All fittings have a 10-32 thread for assembly into the valve body.

## How to Order Additional Options

**Oxygen Cleaning:** Add the suffix **–C3** to the end of the part number to receive stream switching systems or accessories cleaned and assembled for oxygen service in accordance with Parker Specification ES8003.

Add the suffix **–RTK** to the end of the part number to receive stream switching systems or accessories coated with the inert, silicon-based chemical coating Silconert™ 1000 (formerly Silcosteel®).

Add the suffix **–SUL** to the end of the part number to receive stream switching systems or accessories coated with the inert, silicon-based chemical coating Silconert™ 2000 (formerly Sulfinert®).

**NACE:** Add the suffix **–NC** to the end of the part number to receive stream switching systems or accessories that meet the material requirements of ANSI/NACE MRO175/ISO 15156-1.

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## How to Order Kits – Single Valve

In using this section, the items in **BOLD CAPITALIZED PRINT** are included within the part number of the Kit. The *italicized items* require a designator to complete the part number. Refer to the How To Order section on page 14 for the designators.

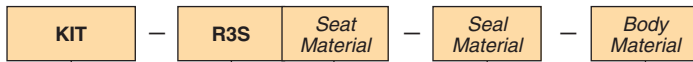
**Stem Seal Kit:** Components required to rebuild the soft goods in one cartridge.



**Example:** **KIT** – **R3** **K** – **V** – **SS**

This example describes a kit consisting of one stainless steel stem with PCTFE upper and lower seats, fluorocarbon O-rings, associated PTFE back-up rings and maintenance instructions.

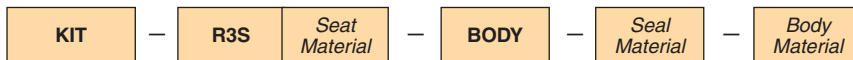
**Valve Module Kit:** Components to rebuild the soft goods in one Single Valve Module. This includes the base and cartridges.



**Example:** **KIT** – **R3S** **K** – **V** – **SS**

This example describes a kit consisting of one stainless steel stem with PCTFE upper and lower seats, fluorocarbon O-rings, associated PTFE back-up rings and maintenance instructions.

**Valve Body Kit:** Components to replace one valve body and cartridges.



**Example:** **KIT** – **R3S** **K** – **BODY** – **V** – **SS**

This example describes a kit consisting of one complete valve body and cartridge having PCTFE seats, fluorocarbon O-rings, stainless steel metallic components and maintenance instructions.

**Note:** The springs, screw and caps are included, but not assembled.

**Base Seal Kit:** Components to replace the soft goods in one base.



**Example:** **KIT** – **R3S** – **BASE** – **SEALS** – **KZ**

This example describes a kit consisting of highly fluorinated fluorocarbon O-rings and maintenance instructions.

## Fast Loop Filters

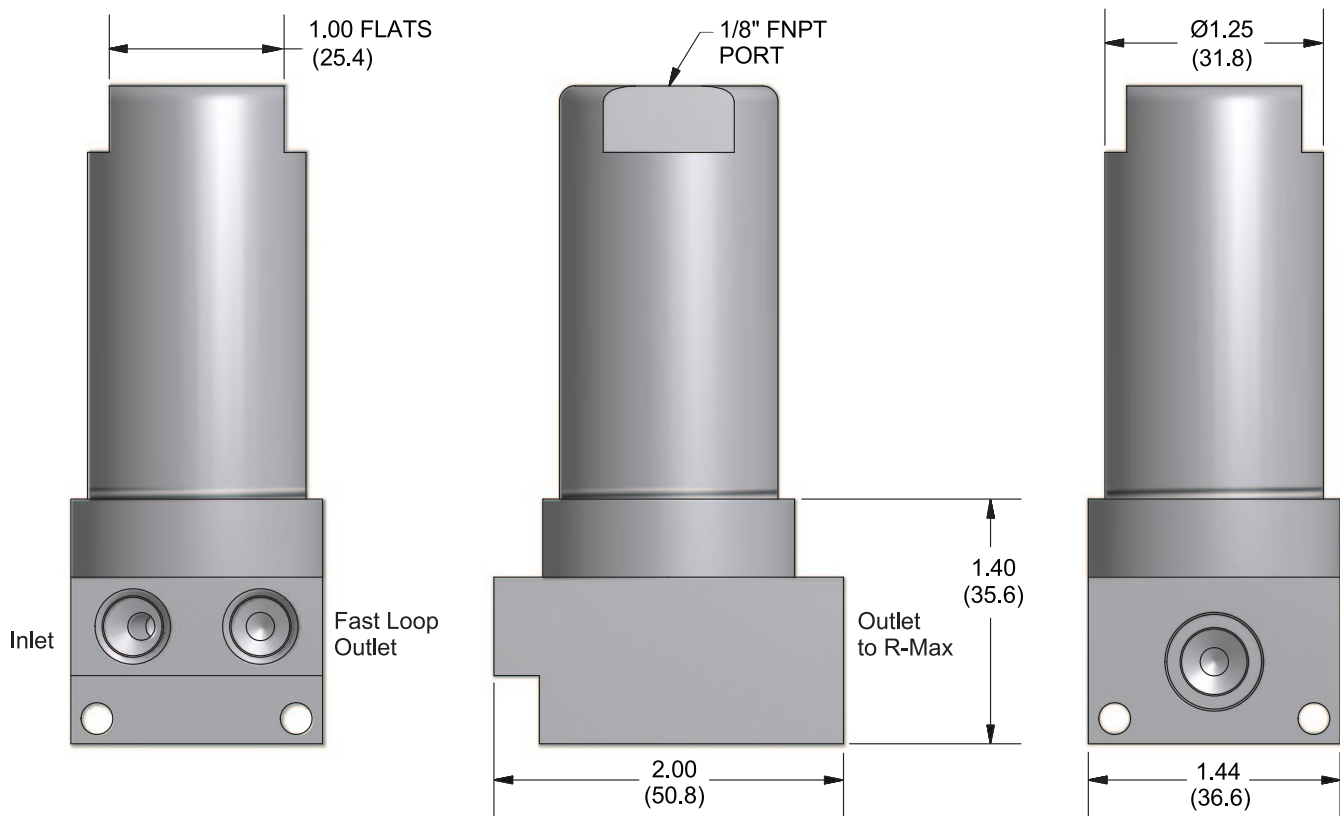
Designed to be used on the stream inlet ports of the Parker Gen II *R-max*™ Stream Switching System. Multiple filtration options are available using technology developed and designed by Parker Filtration and Separation Divisions. Filtration options include particulate, coalescing and SS sintered.

The **particulate filter** is housed in a bypass filter that diverts approximately 90% of the inlet flow around the cartridge filter and provides fresh filtered media to the stream switch.

The **coalescing filter** allows liquid droplets to collect and drain from the media as it enters the stream switch.

The **SS sintered filters** are designed to protect the Stream Switching System from dirt, chips, scale and other contaminants.

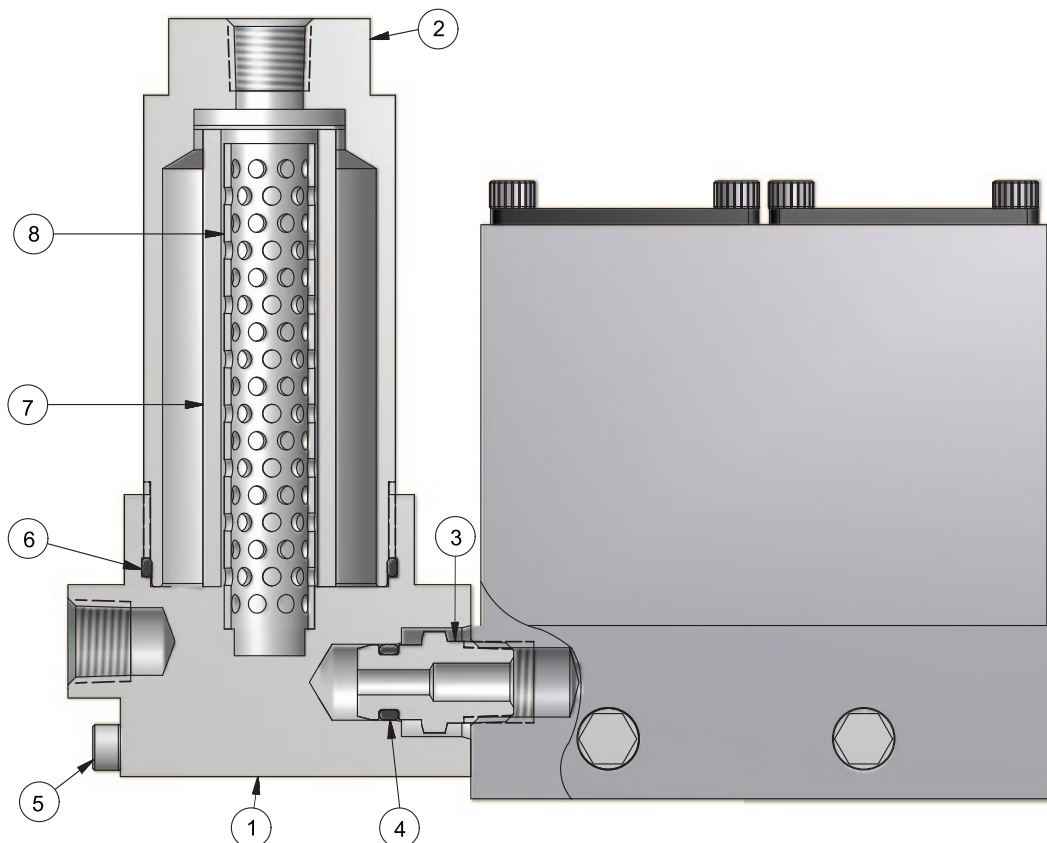
## Exterior View and Dimensions



## Fast Loop Filters

Designed to bolt directly to the stream inlet ports of the Parker Gen II *R-max*™ Stream Switching System to provide reduced transport time of filtered sample stream media from the process line through the stream switch to the analyzer.

### Cross Section View



**Note:** The captured vent port nearest an assembled filter must be a plug or an open port.

### Materials of Construction

Item	Part Description	Material
1	Body	ASTM A 479, type 316
2	Bowl	ASTM A 479, type 316
3	Adapter	ASTM A 479, type 316
4	O-Ring 2-008	Optional elastomers
5	Body Bolt	Stainless steel
6	O-Ring 2-025	Optional elastomers
7	Element	316SS and Microfibre
8	Support Core	316SS

## How to Order – Fast Loop Filters

The correct part number is easily derived by following the sequence shown below. The seven product characteristics required are coded as shown below.



**Example: 2F – FR2 – EPR – S 100 – SS – B**

The example above describes an FR2 Series Fast Loop Filter with 1/8" FNPT inlet and bypass outlets, ethylene propylene rubber seals, 100 micron 316SS sintered metal filter element and stainless steel construction. It is designed to be attached to a Parker Gen II *R-max*™ Stream Switch having inverted CPI™ or A-LOK® stream inlet ports.

Inlet and Bypass Outlet	Filter Series	Seal Material	Filtration Type	Element Type		Body Material	<i>R-max</i> ™ Connection Type
				Balston® (P and C)	Sintered Metal (S)		
2F	FR2	V	Fluorocarbon Rubber	P Particulate	93 93% microfibre	100 100 micron	SS Stainless Steel
		BN	Buna-N Rubber	C Coalescing	70 70% microfibre	70 70 micron	
		EPR	Ethylene Propylene Rubber	S Sintered	99 99% microfibre	40 40 micron	
		NE	Neoprene Rubber			20 20 micron	
		KZ	Highly Fluorinated Fluorocarbon Rubber			10 10 micron	
						5 5 micron	

## How to Order Additional Options

**Oxygen Cleaning:** Add the suffix **–C3** to the end of the part number to receive stream switching systems or accessories cleaned and assembled for oxygen service in accordance with Parker specification ES8003.

Add the suffix **–RTK** to the end of the part number to receive stream switching systems or accessories coated with the inert, silicon-based chemical coating Silconert™ 1000 (formerly Silcosteel®).

Add the suffix **–SUL** to the end of the part number to receive stream switching systems or accessories coated with the inert, silicon-based chemical coating Silconert™ 2000 (formerly Sulfinert®).

**NACE:** Add the suffix **–NC** to the end of the part number to receive stream switching systems or accessories that meet the material requirements of ANSI/NACE MRO175/ISO 15156-1.

## How to Order Kits – Fast Loop Filters

In using this section, the items in **BOLD CAPITALIZED PRINT** are included within the part number of the Kit. The *italicized items* require a designator to complete the part number. Refer to the How To Order section on page 18 for the designators.

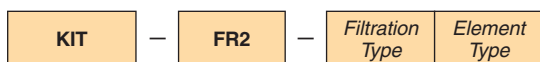
**Filter Seal Kit:** Components required to replace the O-rings.



**Example:** **KIT** – **FR2** – **V**

This example describes a kit consisting of fluorocarbon O-rings and maintenance instructions.

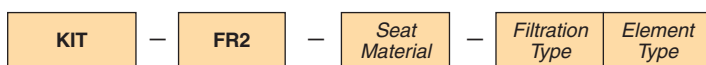
**Filter Element Kit:** Components to replace the filter element.



**Example:** **KIT** – **FR2** – **P** **93**

This example describes a kit consisting of a 93% filtration particulate filter element.

**Filter Element & Seal Kit:** Components to replace the filter element and O-rings.



**Example:** **KIT** – **FR2** – **V** – **C** **99**

This example describes a kit consisting of fluorocarbon O-rings, 99% filtration coalescing filter element and maintenance instructions.

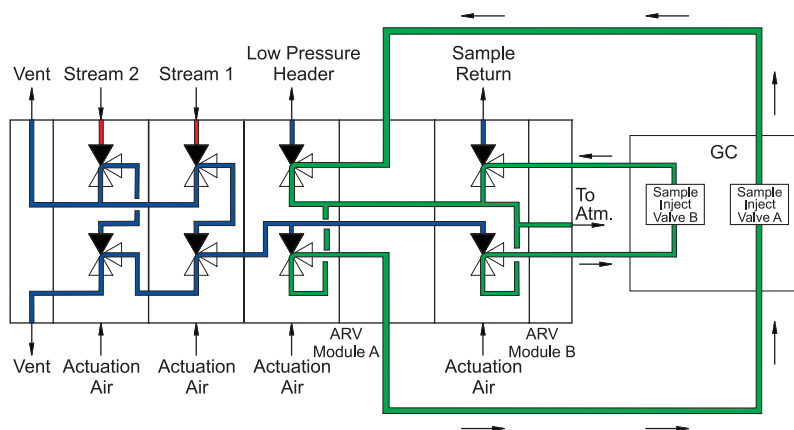
## Application: Dual ARV Modules

The Parker Gen II *R-max*™ stream selection system can be configured for delivering process stream to multiple Gas Chromatograph inject valves while maintaining the atmospheric reference essential for consistent sample injection. The use of dual ARV (Atmospheric Reference Vent) modules allows the process analyzer engineer to measure a single stream on separate column trains (i.e. parallel chromatography) or use different GC detectors for analyzing specific compound functional groups (i.e. sulfur, halogens, etc.).

The use of dual GC modules demonstrates Parker Gen II *R-max*™ valve flexibility and broad application scope for multiple stream selections.

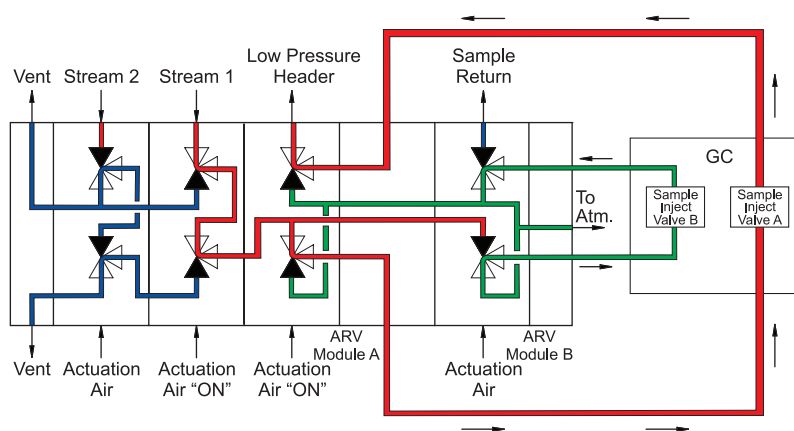
### Dual ARV Modules Example 1

All valves are in the “off” position. The system is “open” to atmospheric vent.



### Dual ARV Modules Example 2

Stream 1 and ARV Module A are in the “on” position. Sample Inject Valve A is receiving the sample from Stream 1 and is returned to the Low Pressure header through ARV Module A.



For further information, including part numbers, contact the factory.

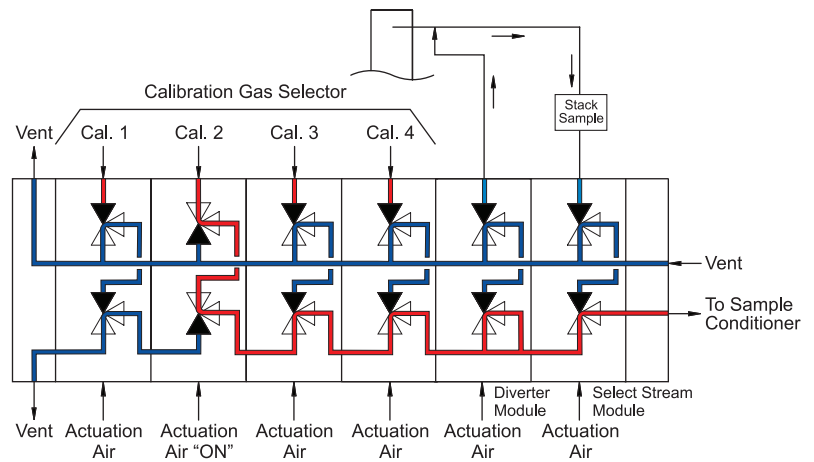
## Application: CEMS (Continuous Emissions Monitoring System)

The Parker Gen II *R-max*™ stream selection system can be configured for Continuous Emissions Monitoring and associated stack gas monitoring applications, analyzer calibration and validation routines that are crucial for maintaining environmental compliance. These environmental regulations require a complete system check and validation which includes the sample extraction probe, transport lines, sample conditioning system, as well as the analyzer.

The complete system check is called an “Up-Stack” calibration. This Up-Stack calibration can be easily achieved by inserting a “diverter” module into the Parker Gen II *R-max*™ system. The diverter valve will direct the selected calibration gas either up the stack or allow the gas to go directly to the analyzer. To perform an up-stack calibration simply actuate the diverter valve. Multiple diverter valves can be added if there is more than one stack.

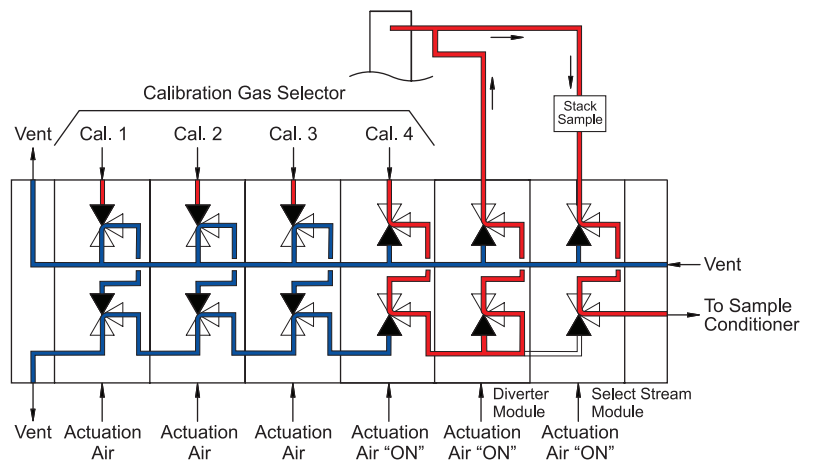
### CEMS Example 1

The Calibration Stream 2 is in the “on” position and flowing through the Parker Gen II *R-max*™ system and out to Sample Conditioner.



### CEMS Example 2

The Calibration Stream 4, Diverter Module and Stream Selector Module are in the “on” position. Calibration gas is flowing through the Diverter Valve to the Stack and then back through the Stream Selector Module to the Sample Conditioner.

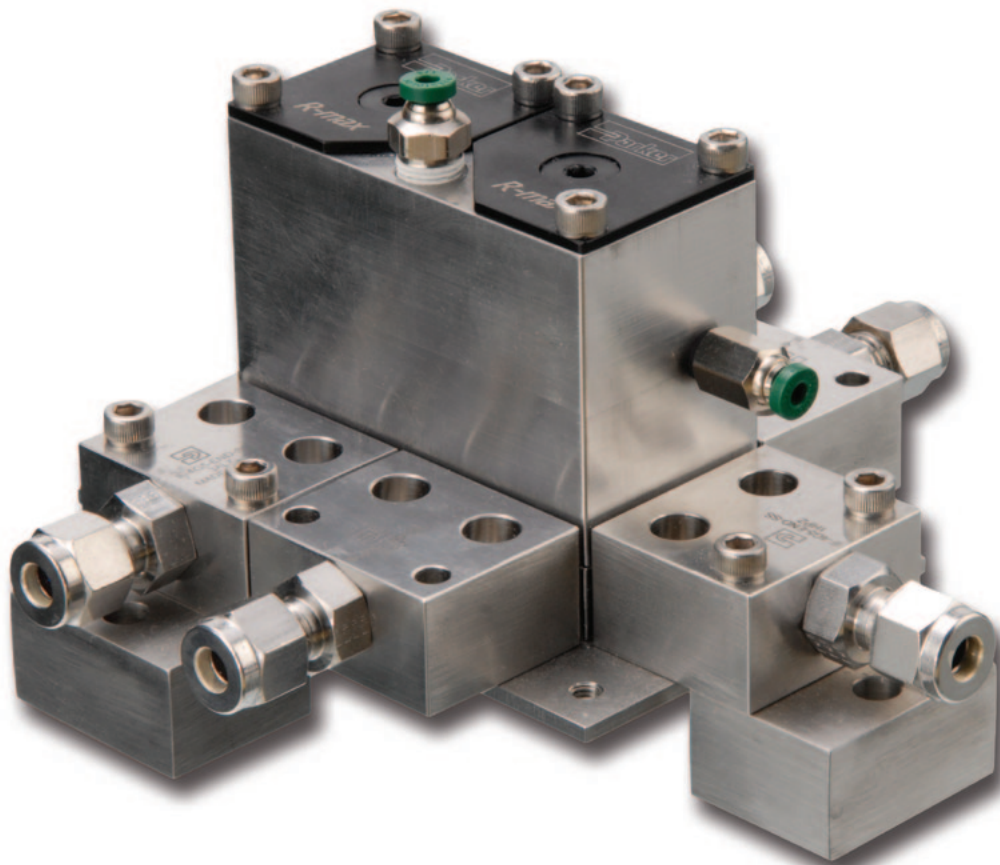


For further information, including part numbers, contact the factory.

## Parker Gen II *R-Max*™ Stream Switching System & Parker IntraFlow™

The Parker Gen II *R-max*™ Stream Switching System is also available on the IntraFlow™ ANSI/ISA-76.00.02 Compliant Modular Surface Mount System. All the features and benefits such as the enhanced visual indicator and captured vent available to the Parker Gen II *R-max*™ can also be achieved on the modular platform.

Refer to Catalog 4250 for further information regarding the Parker IntraFlow™ Modular Surface Mount Systems.



All aspects of the Parker Gen II *R-max*™ Stream Switching System are available within the IntraFlow™ product line. This includes standard modules, atmospheric reference vent (ARV) modules and normally open modules. Single valve units and filters are also available. The modular design of the IntraFlow™ system allows for maximum flexibility within a minimal space.





## Offer of Sale

The items described in this document and other documents and descriptions provided by Parker Hannifin Corporation, its subsidiaries and its authorized distributors ("Seller") are hereby offered for sale at prices to be established by Seller. This offer and its acceptance by any customer ("Buyer") shall be governed by all of the following Terms and Conditions. Buyer's order for any item described in its document, when communicated to Seller verbally, or in writing, shall constitute acceptance of this offer. All goods or work described will be referred to as "Products".

**1. Terms and Conditions.** Seller's willingness to offer Products, or accept an order for Products, to or from Buyer is expressly conditioned on Buyer's assent to these Terms and Conditions and to the terms and conditions found on-line at [www.parker.com/saleterms/](http://www.parker.com/saleterms/). Seller objects to any contrary or additional term or condition of Buyer's order or any other document issued by Buyer.

**2. Price Adjustments; Payments.** Prices stated on the reverse side or preceding pages of this document are valid for 30 days. After 30 days, Seller may change prices to reflect any increase in its costs resulting from state, federal or local legislation, price increases from its suppliers, or any change in the rate, charge, or classification of any carrier. The prices stated on the reverse or preceding pages of this document do not include any sales, use, or other taxes unless so stated specifically. Unless otherwise specified by Seller, all prices are F.O.B. Seller's facility, and payment is due 30 days from the date of invoice. After 30 days, Buyer shall pay interest on any unpaid invoices at the rate of 1.5% per month or the maximum allowable rate under applicable law.

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**4. Warranty.** Seller warrants that the Products sold here-under shall be free from defects in material or workmanship for a period of twelve months from the date of delivery to Buyer or 2,000 hours of normal use, whichever occurs first. This warranty is made only to Buyer and does not extend to anyone to whom Products are sold after purchased from Seller. The prices charged for Seller's products are based upon the exclusive limited warranty stated above, and upon the following disclaimer: **DISCLAIMER OF WARRANTY: THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS PROVIDED HEREUNDER. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

**5. Claims; Commencement of Actions.** Buyer shall promptly inspect all Products upon delivery. No claims for shortages will be allowed unless reported to the Seller within 10 days of delivery. No other claims against Seller will be allowed unless asserted in writing within 60 days after delivery or, in the case of an alleged breach of warranty, within 30 days after the date within the warranty period on which the defect is or should have been discovered by Buyer. Any action based upon breach of this agreement or upon any other claim arising out of this sale (other than an action by Seller for any amount due to Seller from Buyer) must be commenced within thirteen months from the date of tender of delivery by Seller or, for a cause of action based upon an alleged breach of warranty, within thirteen months from the date within the warranty period on which the defect is or should have been discovered by Buyer.

**6. LIMITATION OF LIABILITY.** UPON NOTIFICATION, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT, OR REFUND THE PURCHASE PRICE. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER'S WRITTEN CONSENT, EVEN IF SELLER HAS BEEN NEGLIGENT, WHETHER IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE OF THE PRODUCTS.

**7. Contingencies.** Seller shall not be liable for any default or delay in performance if caused by circumstances beyond the reasonable control of Seller.

**8. User Responsibility.** The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.

**9. Loss to Buyer's Property.** Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two consecutive years have elapsed without Buyer placing an order for the items which are 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.

**10. Special Tooling.** A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. 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 apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

**11. Buyer's Obligation; Rights of Seller.** To secure payment of all sums due or otherwise, Seller shall retain a security interest in the goods delivered and this agreement shall be deemed 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. Seller shall have a security interest in, and lien upon, any property of Buyer in Seller's possession as security for the payment of any amounts owed to Seller by Buyer.

**12. Improper use and Indemnity.** Buyer shall indemnify, defend, and hold Seller harmless from any claim, liability, damages, lawsuits, and costs (including attorney fees), whether for personal injury, property damage, patent, trademark or copyright infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, improper application or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Product; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.

**13. Cancellations and Changes.** Orders shall not be subject to cancellation or change by Buyer 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 may change product features, specifications, designs and availability with notice to Buyer.

**14. Limitation on Assignment.** Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.

**15. Entire Agreement.** This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of the agreement. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.

**16. Waiver and Severability.** Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.

**17. Termination.** This agreement may be terminated by Seller for any reason and at any time by giving Buyer thirty (30) days written notice of termination. In addition, Seller may by written notice immediately terminate this agreement for the following: (a) Buyer commits a breach of any provision of this agreement (b) the appointment of a trustee, receiver or custodian for all or any part of Buyer's property (c) the filing of a petition for relief in bankruptcy of the other Party on its own behalf, or by a third party (d) an assignment for the benefit of creditors, or (e) the dissolution or liquidation of the Buyer.

**18. Governing Law.** This agreement and the sale and delivery of all Products hereunder shall be 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 this agreement. Disputes between the parties shall not be settled by arbitration unless, after a dispute has arisen, both parties expressly agree in writing to arbitrate the dispute.

**19. Indemnity for Infringement of Intellectual Property Rights.** Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). 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 an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

**20. Taxes.** Unless otherwise indicated, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of Products.

**21. Equal Opportunity Clause.** For the performance of government contracts and where dollar value of the Products exceed \$10,000, the equal employment opportunity clauses in Executive Order 11246, VEVRAA, and 41 C.F.R. §§ 60-1.4(a), 60-741.5(a), and 60-250.4, are hereby incorporated.

01/09



# Parker's Motion & Control Technologies

At Parker, we're guided by a relentless drive to help our customers become more productive and achieve higher levels of profitability by engineering the best systems for their requirements. It means looking at customer applications from many angles to find new ways to create value. Whatever the motion and control technology need, Parker has the experience, breadth of product and global reach to consistently deliver. No company knows more about motion and control technology than Parker. For further info call 1-800-C-Parker.



## AEROSPACE

### Key Markets

- Aircraft engines
- Business & general aviation
- Commercial transports
- Land-based weapons systems
- Military aircraft
- Missiles & launch vehicles
- Regional transports
- Unmanned aerial vehicles

### Key Products

- Flight control systems & components
- Fluid conveyance systems
- Fluid metering delivery & atomization devices
- Fuel systems & components
- Hydraulic systems & components
- Inert nitrogen generating systems
- Pneumatic systems & components
- Wheels & brakes



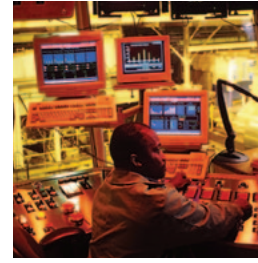
## CLIMATE CONTROL

### Key Markets

- Agriculture
- Air conditioning
- Food, beverage & dairy
- Life sciences & medical
- Precision cooling
- Processing
- Transportation

### Key Products

- CO<sub>2</sub> controls
- Electronic controllers
- Filter driers
- Hand shut-off valves
- Hose & fittings
- Pressure regulating valves
- Refrigerant distributors
- Safety relief valves
- Solenoid valves
- Thermostatic expansion valves



## ELECTROMECHANICAL

### Key Markets

- Aerospace
- Factory automation
- Life science & medical
- Machine tools
- Packaging machinery
- Paper machinery
- Plastics machinery & converting
- Primary metals
- Semiconductor & electronics
- Textile
- Wire & cable

### Key Products

- AC/DC drives & systems
- Electric actuators, gantry robots & slides
- Electrohydraulic actuation systems
- Electromechanical actuation systems
- Human machine interface
- Linear motors
- Stepper motors, servo motors, drives & controls
- Structural extrusions



## FILTRATION

### Key Markets

- Food & beverage
- Industrial machinery
- Life sciences
- Marine
- Mobile equipment
- Oil & gas
- Power generation
- Process
- Transportation

### Key Products

- Analytical gas generators
- Compressed air & gas filters
- Condition monitoring
- Engine air, fuel & oil filtration & systems
- Hydraulic, lubrication & coolant filters
- Process, chemical, water & microfiltration filters
- Nitrogen, hydrogen & zero air generators



## FLUID & GAS HANDLING

### Key Markets

- Aerospace
- Agriculture
- Bulk chemical handling
- Construction machinery
- Food & beverage
- Fuel & gas delivery
- Industrial machinery
- Mobile
- Oil & gas
- Transportation
- Welding

### Key Products

- Brass fittings & valves
- Diagnostic equipment
- Fluid conveyance systems
- Industrial hose
- PTFE & PFA hose, tubing & plastic fittings
- Rubber & thermoplastic hose & couplings
- Tube fittings & adapters
- Quick disconnects



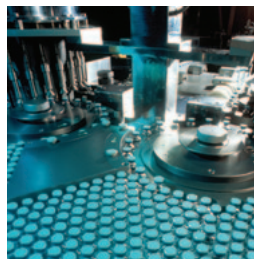
## HYDRAULICS

### Key Markets

- Aerospace
- Aerial lift
- Agriculture
- Construction machinery
- Forestry
- Industrial machinery
- Mining
- Oil & gas
- Power generation & energy
- Truck hydraulics

### Key Products

- Diagnostic equipment
- Hydraulic cylinders & accumulators
- Hydraulic motors & pumps
- Hydraulic systems
- Hydraulic valves & controls
- Power take-offs
- Rubber & thermoplastic hose & couplings
- Tube fittings & adapters
- Quick disconnects



## PNEUMATICS

### Key Markets

- Aerospace
- Conveyor & material handling
- Factory automation
- Life science & medical
- Machine tools
- Packaging machinery
- Transportation & automotive

### Key Products

- Air preparation
- Brass fittings & valves
- Manifolds
- Pneumatic accessories
- Pneumatic actuators & grippers
- Pneumatic valves & controls
- Quick disconnects
- Rotary actuators
- Rubber & thermoplastic hose & couplings
- Structural extrusions
- Thermoplastic tubing & fittings
- Vacuum generators, cups & sensors



## PROCESS CONTROL

### Key Markets

- Chemical & refining
- Food, beverage & dairy
- Medical & dental
- Microelectronics
- Oil & gas
- Power generation

### Key Products

- Analytical sample conditioning products & systems
- Fluoropolymer chemical delivery fittings, valves & pumps
- High purity gas delivery fittings, valves & regulators
- Instrumentation fittings, valves & regulators
- Medium pressure fittings & valves
- Process control manifolds



## SEALING & SHIELDING

### Key Markets

- Aerospace
- Chemical processing
- Consumer
- Energy, oil & gas
- Fluid power
- General industrial
- Information technology
- Life sciences
- Military
- Semiconductor
- Telecommunications
- Transportation

### Key Products

- Dynamic seals
- Elastomeric o-rings
- EMI shielding
- Extruded & precision-cut, fabricated elastomeric seals
- Homogeneous & inserted elastomeric shapes
- High temperature metal seals
- Metal & plastic retained composite seals
- Thermal management



ENGINEERING YOUR SUCCESS.

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Catalog 4141-R Mar 2013



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