

The Parker 5-Year Extended Warranty

Parker Hannifin Corporation will extend its warranty on all pneumatic components to sixty (60) months providing they are correctly installed and protected by Parker pneumatic filters which are properly maintained. Components covered by this warranty include all cylinders, valves and pneumatic automation components manufactured by Parker in any of our global facilities. This warranty covers our components anywhere in the world you may ship your equipment.

Parker's obligation under this warranty is limited to the replacement or repair of any failed components. The buyer understands that the seller will not be liable for any other costs or damages.

The buyers of quality Parker components and filters benefit by having ONE source for all pneumatic needs - Parker.



Roger Sherrard
President
Automation Group





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At Parker, we have the largest global distribution network in motion and control, with over 7,500 distributors serving more than 422,000 customers.

To find the distributor nearest you, please visit our DISTRIBUTOR LOCATOR at <http://www.parker.com/pneu/distributor>



ENGINEERING YOUR SUCCESS.

⚠ WARNING

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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The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

Offer of Sale

The items described in this document are hereby offered for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. This offer and its acceptance are governed by the provisions stated on the separate page of this document entitled "Offer of Sale".

The Isys Micro Valve System incorporates a space saving back to back valve mounting design, and achieves flow rates of 0.35 Cv per valve with 4 valves having a combined width of 42mm. This plug-in valve solution simplifies wiring with the use of 25 pin connectors or fieldbus systems.

Ports

- M7 on manifolds
- 3/8 Inch on end plates

Mounting

- Manifold

Solenoids

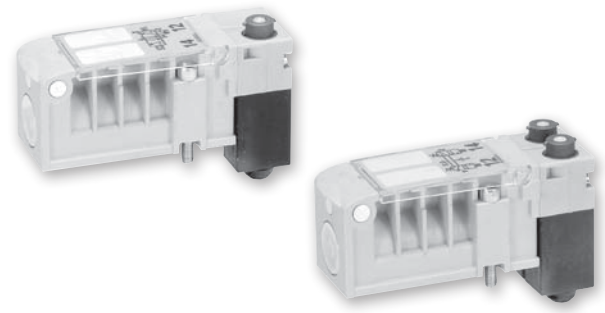
- 24 VDC, 1.0 watt

Certification / Approval

- IP65 rated
- EMC / CE Mark: According to EN 61 000-6-2

Materials

Body	Polyamide reinforced fiberglass
End plates	Aluminum
Fasteners	Zinc plated steel
Manifolds	Aluminum
Spool	Brass and nitrile rubber
Spool enclosure	Brass



Operating information

Operating pressure: Vacuum to 145 PSIG (Vacuum to 10 bar)

Pilot pressure requirements:

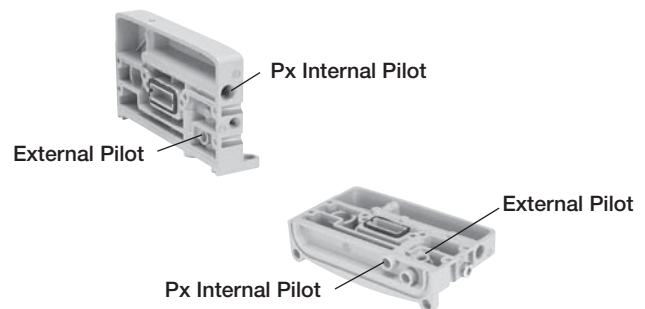
Valve number	Minimum pilot pressure	Maximum pilot pressure
HMEVX2049A	40 PSI	120 PSI
HM2VX2049A	25 PSI	120 PSI
HM5VX2049A	45 PSI	120 PSI
HMN VX2049A	40 PSI	120 PSI
HMPVX2049A	40 PSI	120 PSI
HMQVX2049A	40 PSI	120 PSI

Temperature range: 5°F to 120°F (-15°C to 49°C)

Pilot Configuration

Manifolds can be configured for either internal or external pilot in the field. Side ported manifolds are configured for internal pilot when the M7 plug is located in the Px port on the front of the right hand end plate. Moving this plug to the inside of the right hand end plate and replacing it with a fitting allows an external pilot to be used.

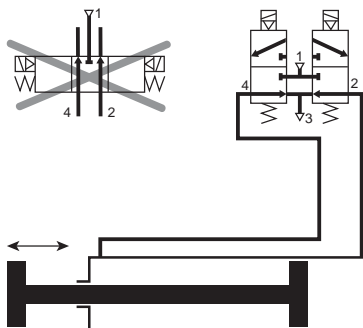
Bottom ported manifolds are configured for internal pilot when the M7 plug is located in the Px port on the bottom of the right hand end plate. Moving this plug to the inside of the right hand end plate and replacing it with a fitting allows an external pilot to be used.



Dual 3/2 Valves Replace 3-Position Valves for Better Performance

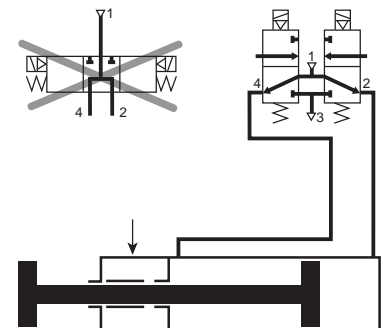
3-Position Center Exhaust

A traditional 5/3 center exhaust valve is now replaced by a double 3/2 NC+NC valve module. Both cylinder chambers are exhausted and rod and piston are free to move.






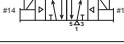






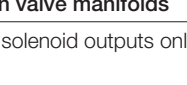

3-Position Pressure Center

A traditional 5/3 pressure center valve is now replaced by a double 3/2 NO+NO valve module. The function is identical.



Most popular. For technical information see CD








Isys Micro Valves

Symbol	Type	Cv	Operator	Part number
 	4-way, 2-position	0.35	Single solenoid	HMEVX2049A
 	4-way, 2-position	0.35	Double solenoid	HM2VX2049A
 	4-way, 3-position, all ports blocked	0.3	Double solenoid	HM5VX2049A
 	3-way, 2-position, dual valve, NC/NC	0.35	Double solenoid	HMNVX2049A
 	3-way, 2-position, dual valve, NO/NO	0.35	Double solenoid	HMPVX2049A
 	3-way, 2-position, dual valve, NO/NC	0.35	Double solenoid	HMQVX2049A

Manifold Bases

		Part numbers	
Plug-in valve manifolds		Side port	Bottom port
Single solenoid outputs only		PSM21JAP	PSM22JAP
Double or single solenoid outputs		PSM21MAP	PSM22MAP

Internal Pilot End Plate Kits

Electrical option	Porting	Side port	Bottom port
	NPT	PSML25AP	PSML26AP
	BSPP	PSML21AP	PSML22AP
	NPT	PSMT15AP	PSMT16AP
	BSPP	PSMT11AP	PSMT12AP
	NPT	PSMT25AP	PSMT26AP
	BSPP	PSMT21AP	PSMT22AP
	NPT	PSMM45AP	PSMM46AP
	BSPP	PSMM41AP	PSMM42AP
	NPT	PSML65AP	PSML66AP
	BSPP	PSML61AP	PSML62AP
	NPT	PSMM55AP	PSMM56AP
	BSPP	PSMM51AP	PSMM52AP
	NPT	PSMM65AP	PSMM66AP
	BSPP	PSMM61AP	PSMM62AP
	NPT	PSMM75AP	PSMM76AP
	BSPP	PSMM71AP	PSMM72AP

Simple Manifold Assemblies

Includes a valve manifold with 4 valves and fittings installed.
End Plates must be ordered separately.

PSM3

Base style
4-Station manifold with valve and / or fitting
PSM3

1

Mounting style
Side ported 1
Bottom ported 2

M

Enclosure / lead length
Single address circuit board J
Double address circuit board M

A

Engineering level
Current A

P

A

9 10
N 7

B

11 12
N 7

C

13 14
N 7

D

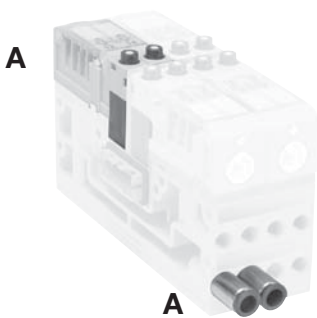
15 16
N 7

Fitting	
10, 12, 14, 16	
0	Without fitting
4	Straight fitting for 5/32 inch or 4mm OD tube
6	Straight fitting for 6mm OD tube
7	Straight fitting for 1/4 inch OD tube
P	Plug for blanking module

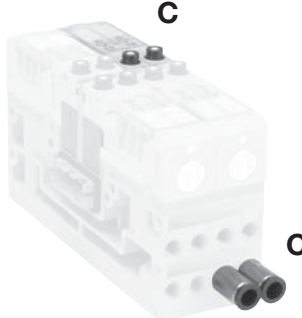
Valve Type	
9, 11, 13, 15	
N*	Double solenoid, dual 3/2, NC/NC
P*	Double solenoid, dual 3/2, NO/NO
Q*	Double solenoid, dual 3/2, 14 end NO - 12 end NC
E	Single solenoid, 2-position - air return, spring assist
2*	Double solenoid, 2-position
5*	Double solenoid, 3-position - APB
B**	Blanking module
C	Intermediate air supply module

* Requires double address circuit board, enclosure "M".
** Requires fitting "P".

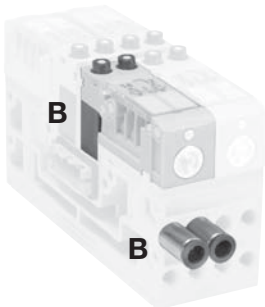
BOLD OPTIONS ARE MOST POPULAR.



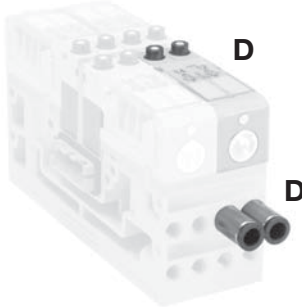
Valve Position A - Character 9
Fitting Position A - Character 10



Valve Position C - Character 13
Fitting Position C - Character 14



Valve Position B - Character 11
Fitting Position B - Character 12



Valve Position D - Character 15
Fitting Position D - Character 16

D

Subbase & Manifold
Valve Products

How To Order Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List Simple Manifold Assemblies. List left to right, LOOKING AT THE CYLINDER PORTS on the manifold.

**Maximum Number of Solenoids
(Maximum Energized Simultaneously)**

	Turck				
	25-pin D-sub	Modulflex	Isysnet*	16 Outputs	32 Outputs
24VDC	24 (24)	16 (16)	32 (32)	16 (16)	32 (32)

* Maximum of 32 solenoids per manifold. With Bus Extension functionality, 4 manifolds with up to 32 solenoids each can be connected on the same network.

Add-A-Fold Assembly Model Number

AAHM

Valve series

Isys micro add-a-fold AAHM

D

3

24

0

0

0

0

Pilot exhaust on end plate

0

Without fitting

M

Muffler

4

Straight fitting for 4mm OD tube

BSPP Threads

6

Straight fitting for 6mm OD tube

4

Straight fitting for 5/32 inch OD tube

NPT Threads

7

Straight fitting for 1/4 inch OD tube

M7 pilot port on end plate

Internal pilot end plate

0

With standard plug

External pilot end plate

0

Without fitting

4

Straight fitting for 4mm OD tube

BSPP Threads

6

Straight fitting for 6mm OD tube

4

Straight fitting for 5/32 inch OD tube

NPT Threads

7

Straight fitting for 1/4 inch OD tube

3/8" Exhaust on End Plate

0

Without fitting

M

Muffler

8

Straight fitting for 8mm OD tube

BSPP Threads

A

Straight fitting for 10mm OD tube

7

Straight fitting for 1/4 inch OD tube

NPT Threads

9

Straight fitting for 3/8 inch OD tube

3/8" Inlet Port on End Plate

0

Without fitting

8

Straight fitting for 8mm OD tube

BSPP Threads

A

Straight fitting for 10mm OD tube

7

Straight fitting for 1/4 inch OD tube

NPT Threads

9

Straight fitting for 3/8 inch OD tube

End plate option

Turck fieldbus with valve driver module - 16 outputs

A

Turck fieldbus with valve driver module - 32 outputs

B

25-pin, D-sub - 24 outputs

D

Isysnet with valve drive module - 32 outputs

Y

Isysnet with valve drive module and bus extension connector - 32 outputs

W

Isysnet with valve drive module and 24VDC connector - 32 outputs

X

Isysnet with valve drive module and bus extension and 24VDC connector - 32 outputs

Z

Modulflex - 16 outputs

T

End plate type

BSPP Threads

BSPP side port, internal pilot

1

BSPP bottom port, internal pilot

2

BSPP side port, external pilot

3

BSPP bottom port, external pilot

4

NPT Threads

NPT side port, internal pilot

5

NPT bottom port, internal pilot

6

NPT side port, external pilot

7

NPT bottom port, external pilot

8

Number of stations

4 Valve manifold

04

8 Valve manifold

08

12 Valve manifold

12

16 Valve manifold

16

20 Valve manifold

20

24 Valve manifold

24

28 Valve manifold

28

32 Valve manifold

32

Isysnet and Modulflex communication modules must be ordered separately.

Note:
BSPP fittings can only be used with BSPP Manifolds.
NPT fittings can only be used with NPT Manifolds.

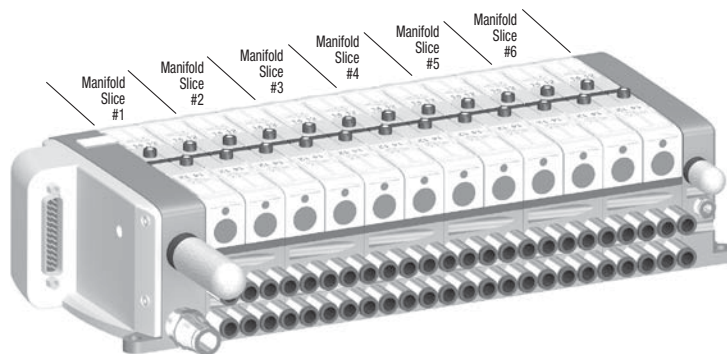
D87

Parker Hannifin Corporation
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics

D
Subbase & Manifold
Valve Products

25-Pin, D-Sub Manifolds

24 Single Solenoid Valves



Add-A-Fold

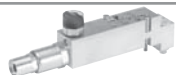
Manifold is factory assembled and tested for pneumatic leaks and electrical continuity.

Item	Qty	Description	Part number
01	1	24 valve Add-A-Fold with end plates	AAHMD5249M0M
02	6	4 valve simple manifold slices #1-6	PSM31JAPE7E7E7E7

Component Level

Item	Qty	Description	Part number
01	1	25-pin, D-sub, end plate	PSML25AP
02	24	Single solenoid valve	HMEVX2049A
03	6	Manifold, side ported, single address	PSM21JAP
04	50	1/4" Tube fittings (in box quantity)	PS567925
05	10	3/8" Tube fittings (in box quantity)	PS568338
06	1	3/8" Exhaust muffler	P6M-PAB3
07	1	1/8" Exhaust muffler	P6M-PAB1




Sandwich Regulator

Description	Kit number
 Common port regulator, 5 to 125 PSI with gauge	PSMRAX6AP


Note: Cv values are reduced when using a sandwich regulator to 0.20 for 2-Position and Dual 3/2 valves, and 0.17 for 3-Position APB valves.

Note: The sandwich regulator passes full pilot pressure from the manifold, allowing the regulated pressure to adjusted down to 5 PSI without affecting valve functionality.


Mufflers

Description	Part number
 1/8" pilot exhaust – BSPP or NPT	P6M-PAB1
 3/8" main exhaust – BSPP or NPT	P6M-PAB3
 M7 bottom port pilot exhaust (must be ordered in multiples of 10)	PS568800




Flow Controls

Description	Kit number
 4mm to 4mm or 5/32" to 5/32" OD tube	FC800-5/32
1/4" to 1/4" O.D. tube	FC800-4

25-Pin, D-Sub Cable (Female)

Description	Length	Part number
 25-pin, D-sub cable, IP20	3 meters	P8LMH25M3A
25-pin, D-sub cable, IP20	9 meters	SCD259D
25-pin, D-sub cable, IP65	3 meters	SCD253W
25-pin, D-sub cable, IP65	9 meters	SCD259WE

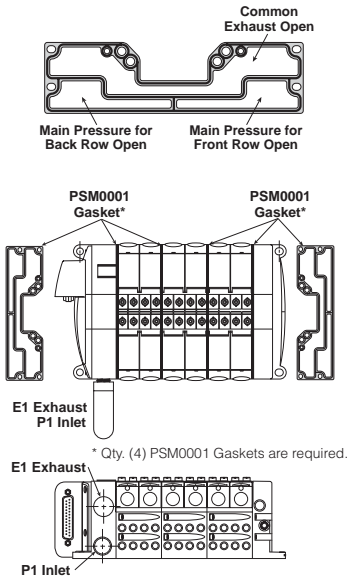
Fittings – Must be ordered in multiples of 10

Thread	Tube O.D.	Part number
Manifold or pilot supply ports – straight		
 M7	4mm or 5/32"	PS567904
M7	6mm	PS567906
M7	1/4"	PS567925
Main inlet or exhaust ports		
 3/8" NPT	1/4"	PS568325
3/8" NPT	3/8"	PS568338
3/8" BSPP	8mm	PS568308
3/8" BSPP	10mm	PS568310
Pilot exhaust ports		
 1/8" NPT	5/32"	PS568215
1/8" NPT	1/4"	PS568225
1/8" BSPP	4mm	PS568204
1/8" BSPP	6mm	PS568206

Multiple Pressure Zones

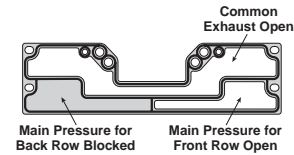
PSM0001 –

All ports open. Common pressure for front and rear manifold.
 Common exhausts.
 Standard gasket included with each manifold and end plate.

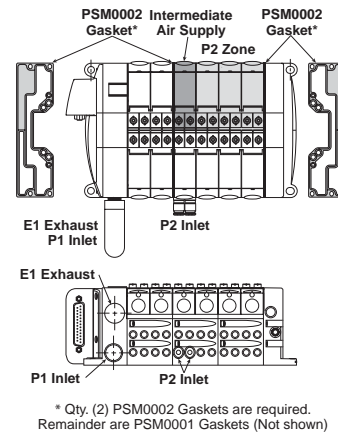


PSM0002 –

Rear manifold blocked for separate pressure supply.
 Common exhausts.
 Flip gasket to block front of manifold.

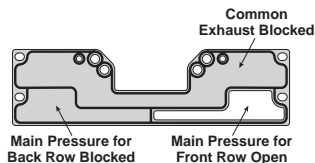


Internal Pilot Pressure from P1 Inlet

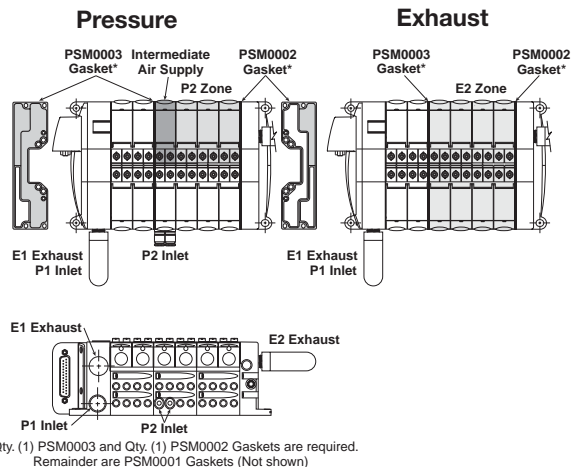


PSM0003 –

Rear manifold blocked for separate pressure supply.
 Exhaust blocked also.
 Flip gasket to block front of manifold.
 If used with bottom ported end plates, second exhaust must be piped from the side of the right end plate.

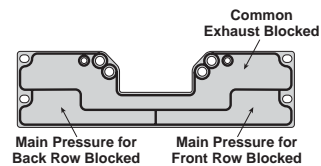


Internal Pilot Pressure from P1 Inlet

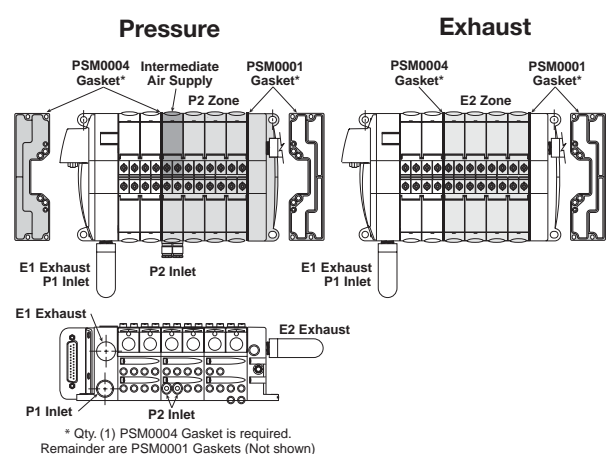


PSM0004 –



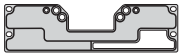

All galleys blocked.
 Two pressure zones and two exhaust zones.
 If used with bottom ported end plates, second exhaust must be piped from the side of the right end plate.



Internal Pilot Pressure from P2 Inlet




Manifold to Manifold Gaskets*

Description	Part number
 All galleys passing	PSM0001
 Main pressure to rear or front valves blocked, exhaust passing	PSM0002
 Main pressure to rear or front valves blocked, exhaust blocked	PSM0003
 All galleys blocked	PSM0004

* Includes 1 Gasket

Replacement Solenoid Kit


Description	Part number
 24VDC solenoid kit with screws	PSM0010

Valve Labels*


Description	Part number
Single solenoid diagram	PSM002E
Double solenoid diagram	PSM0022
Double solenoid diagram – APB	PSM0025
Double solenoid diagram – Dual 3/2 NC/NC	PSM002N
Double solenoid diagram – Dual 3/2 NO/NO	PSM002P
Double solenoid diagram – Dual 3/2, 14 end NO, 12 end NC	PSM002Q

*Includes 10 Labels.


Replacement Screws

Description	Part number
 Set of 10 manifold to manifold M3 screws	PSM0014


Replacement Override Caps

Description	Part number
 Set of 10 manual override caps	PSM0011

Replacement Regulator Gauge

Description	Part number
 5 to 125 PSI Gauge	P0566202


Replacement Gaskets and Valve Screws

Description	Part number
 Set of 5 valve to manifold gaskets and 10 screws	PSM0012

Replacement Protective Cover

Description	Part number
 Protective Polyester Cover Set of 10	PS5706

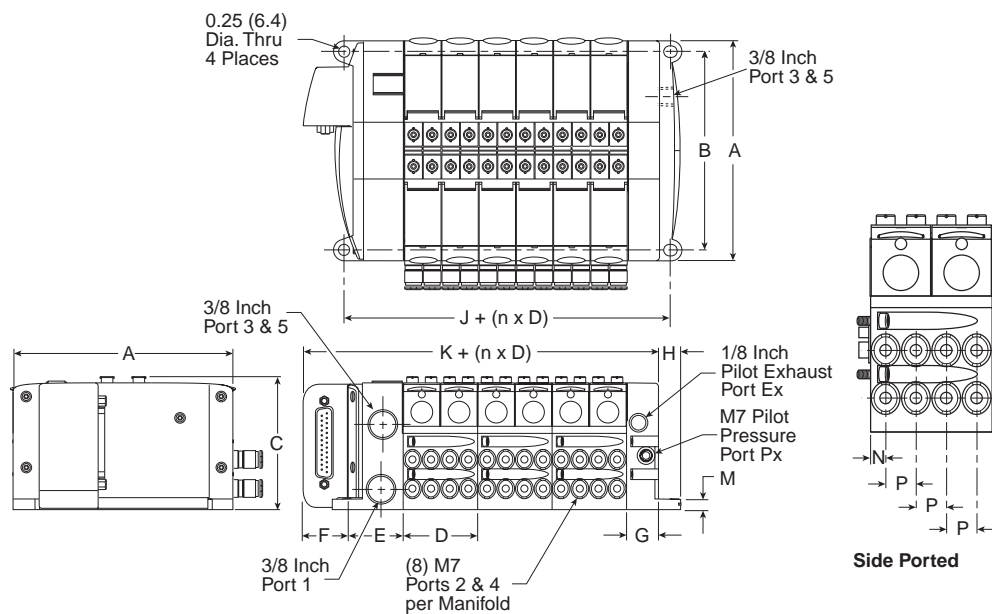
Replacement Plugs

Description	Part number
 Set of 10 M7 plugs (Part No. PS567900) for auxiliary and pilot pressure ports	PSM0013

D

Subbase & Manifold
Valve Products

25-Pin, D-Sub with Isys Micro Valves, Side Ported



Dimensions

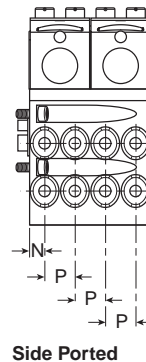
A	B	C	D
4.88 (124.0)	4.41 (112.0)	2.95 (75.0)	1.65 (42.0)

E	F	G	H
1.22 (31.0)	1.02 (26.0)	0.71 (18.0)	0.49 (12.5)

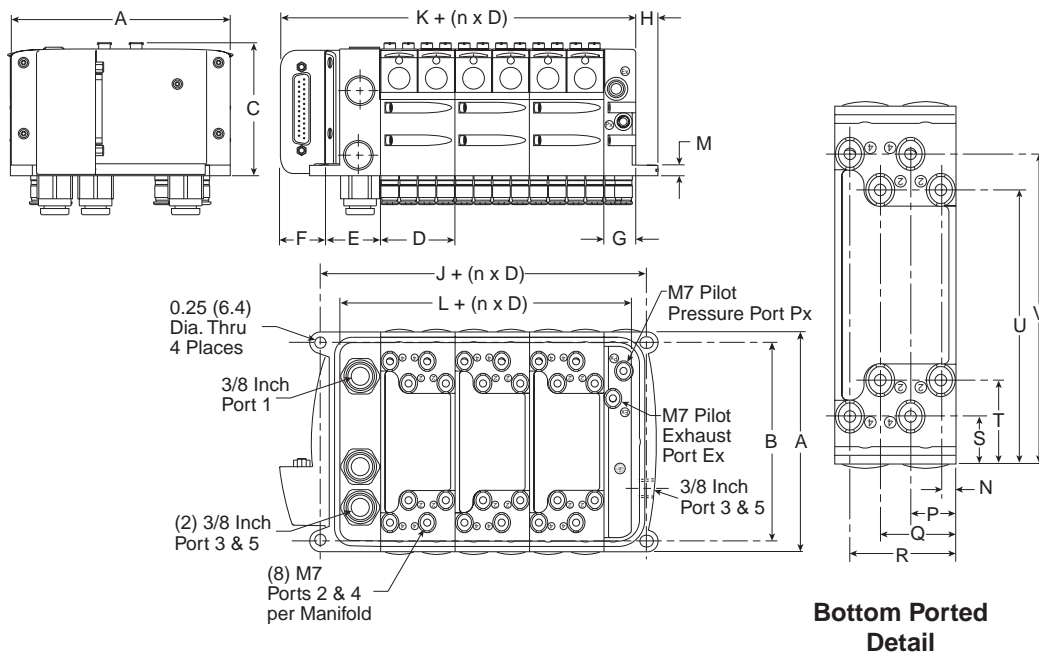
J	K	M	N
2.28 (58.0)	3.44 (87.5)	0.24 (6.1)	0.21 (5.2)

P
0.41
(10.5)

Inches (mm)
n = Number of manifolds



25-Pin, D-Sub with Isys Micro Valves, Bottom Ported



Dimensions

A	B	C	D
4.88 (124.0)	4.41 (112.0)	2.95 (75.0)	1.65 (42.0)

E	F	G	H
1.22 (31.0)	1.02 (26.0)	0.71 (18.0)	0.49 (12.5)

J	K	L	M
2.28 (58.0)	3.44 (87.5)	1.69 (43.0)	0.24 (6.1)

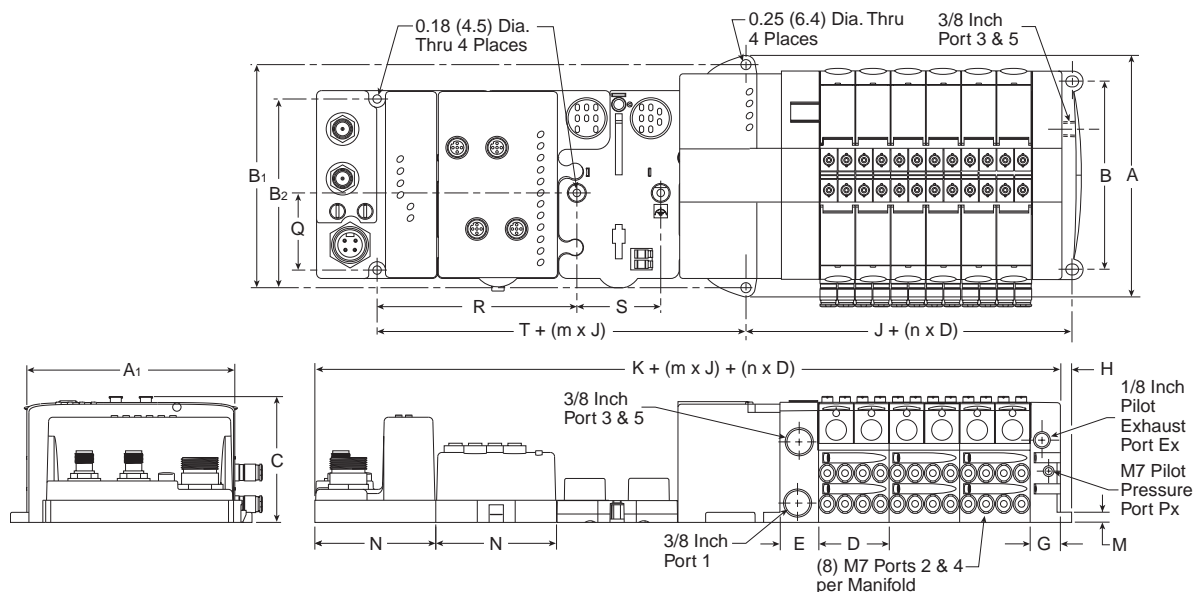
N	P	Q	R
0.21 (5.3)	0.62 (15.8)	1.03 (26.3)	1.45 (36.8)

S	T	U	V
0.64 (16.40)	1.14 (29.0)	3.73 (94.9)	4.23 (107.4)

Inches (mm)
n = Number of manifolds

**Bottom Ported
Detail**

Isysnet with Isys Micro Valves, Side Ported

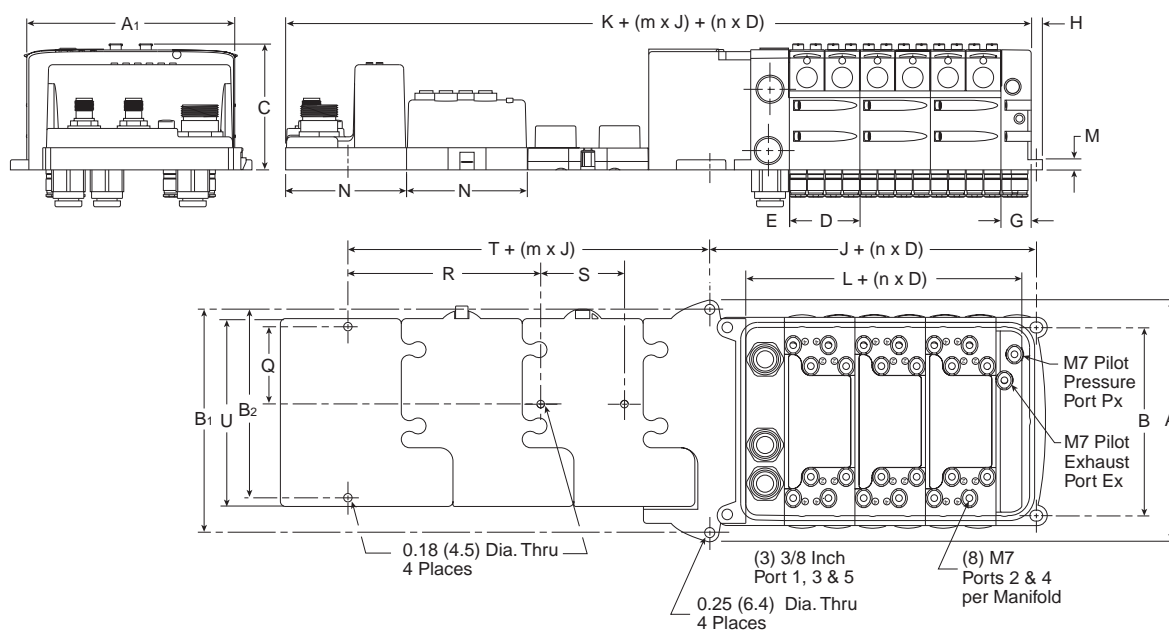


Dimensions

A	A ₁	B	B ₁	B ₂	C	D	E	G
5.67 (144.0)	4.88 (124.0)	4.41 (112.0)	5.24 (133.0)	4.02 (102.0)	2.95 (75.0)	1.65 (42.0)	0.91 (23.0)	0.71 (18.0)
H	J	K	M	N	Q	R	S	T
0.49 (12.5)	2.72 (69.0)	7.32 (186.0)	0.24 (6.1)	2.83 (72.0)	1.81 (46.0)	4.72 (120.0)	2.01 (51.0)	2.01 (51.0)

Inches (mm)
 n = Number of Manifolds
 m = Number of Modules

Isysnet with Isys Micro Valves, Bottom Ported



Dimensions

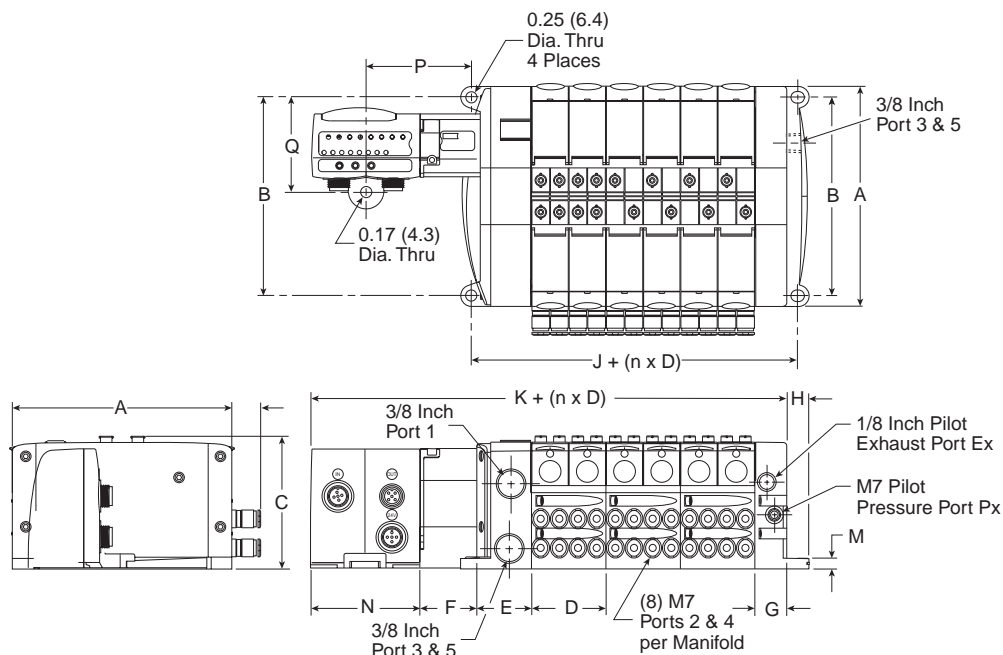
A	A ₁	B	B ₁	B ₂	C	D	E	G	H
5.67 (144.0)	4.88 (124.0)	4.41 (112.0)	5.24 (133.0)	4.02 (102.0)	2.95 (75.0)	1.65 (42.0)	0.91 (23.0)	0.71 (18.0)	0.49 (12.5)
J	K	L	M	N	Q	R	S	T	U
2.72 (69.0)	7.32 (186.0)	1.69 (43.0)	0.24 (6.1)	2.83 (72.0)	1.81 (46.0)	4.72 (120.0)	2.01 (51.0)	2.01 (51.0)	4.41 (112)

Inches (mm)
 n = Number of Manifolds
 m = Number of Modules

D

Subbase & Manifold
 Valve Products

Moduflex with Isys Micro Valves, Side Ported



Dimensions

A	B	C	D
4.88 (124.0)	4.41 (112.0)	2.95 (75.0)	1.65 (42.0)

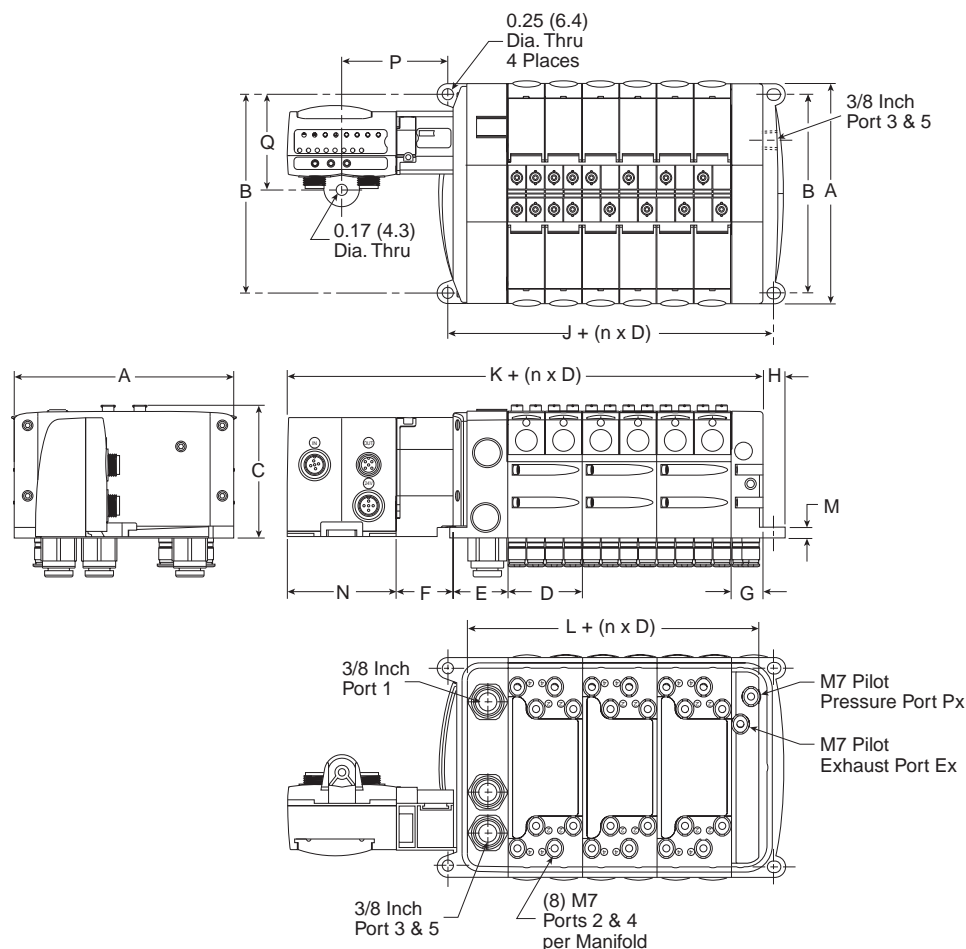
E	F	G	H
1.22 (31.0)	1.28 (32.5)	0.71 (18.0)	0.49 (12.5)

J	K	M	N
2.28 (58.0)	6.10 (155.0)	0.24 (6.1)	2.40 (61.0)

P	Q
2.36 (60.0)	2.07 (52.55)

Inches (mm)
n = Number of manifolds

Moduflex with Isys Micro Valves, Bottom Ported



Dimensions

A	B	C	D
4.88 (124.0)	4.41 (112.0)	2.95 (75.0)	1.65 (42.0)

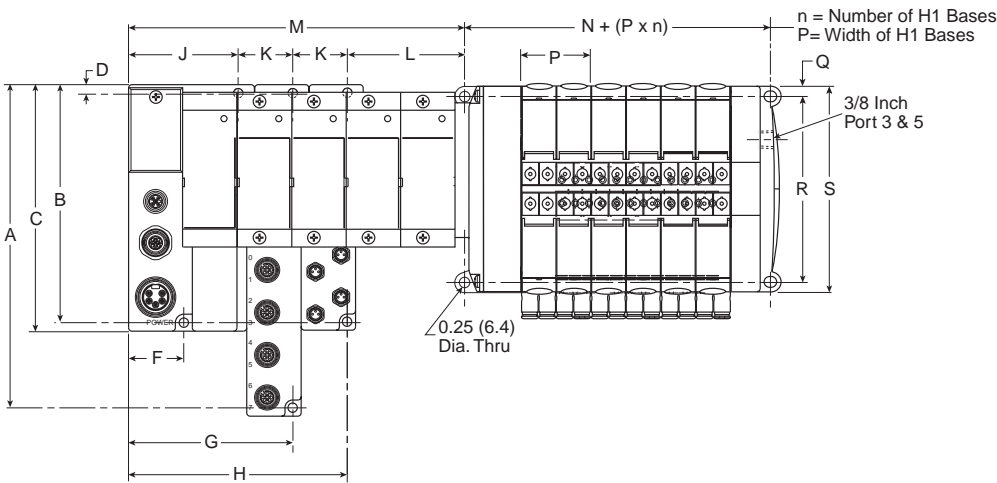
E	F	G	H
1.22 (31.0)	1.02 (26.0)	0.71 (18.0)	0.49 (12.5)

J	K	L	M
2.28 (58.0)	6.10 (155.0)	1.69 (43.0)	0.24 (6.1)

N	P	Q
2.40 (61.0)	2.36 (60.0)	2.07 (52.55)

Inches (mm)
n = Number of manifolds

Turck with Isys Micro Valves, Side Ported



Dimensions			
A	B	C	D
7.48 (190)	5.51 (140)	5.71 (145)	0.20 (5)
F	G	H	J
1.28 (32.5)	3.79 (96.5)	5.06 (128.5)	2.53 (64.5)
K	L	M	N
1.26 (32)	2.54 (64)	See note 1	2.28 (58)
P	Q	R	S
1.65 (42)	.19 (4.9)	4.41 (112)	4.88 (124)

Note 1: $M = J + L + n_2 \times K$, where n_2
= Number of Turck input / output
modules
Inches (mm)

Safety Guide For Selecting And Using Pneumatic Division Products And Related Accessories

WARNING:

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF PNEUMATIC DIVISION PRODUCTS, ASSEMBLIES OR RELATED ITEMS ("PRODUCTS") CAN CAUSE DEATH, PERSONAL INJURY, AND PROPERTY DAMAGE. POSSIBLE CONSEQUENCES OF FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THESE PRODUCTS INCLUDE BUT ARE NOT LIMITED TO:

- Unintended or mistimed cycling or motion of machine members or failure to cycle
- Work pieces 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.
- Explosion
- Suddenly moving or falling objects.
- Release of toxic or otherwise injurious liquids or gasses.

Before selecting or using any of these Products, it is important that you read and follow the instructions below.

1. GENERAL INSTRUCTIONS

- 1.1. Scope:** This safety guide is designed to cover general guidelines on the installation, use, and maintenance of Pneumatic Division Valves, FRLs (Filters, Pressure Regulators, and Lubricators), Vacuum products and related accessory components.
- 1.2. Fail-Safe:** Valves, FRLs, Vacuum products and their related components can and do fail without warning for many reasons. Design all systems and equipment in a fail-safe mode, so that failure of associated valves, FRLs or Vacuum products will not endanger persons or property.
- 1.3. Relevant International Standards:** For a good guide to the application of a broad spectrum of pneumatic fluid power devices see: ISO 4414:1998, Pneumatic Fluid Power – General Rules Relating to Systems. See www.iso.org for ordering information.
- 1.4. Distribution:** Provide a copy of this safety guide to each person that is responsible for selection, installation, or use of Valves, FRLs or Vacuum products. Do not select, or use Parker valves, FRLs or vacuum products without thoroughly reading and understanding this safety guide as well as the specific Parker publications for the products considered or selected.
- 1.5. User Responsibility:** Due to the wide variety of operating conditions and applications for valves, FRLs, and vacuum products Parker and its distributors do not represent or warrant that any particular valve, FRL or vacuum 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 appropriate valve, FRL, Vacuum component, or accessory.
 - Assuring that all user's performance, endurance, maintenance, safety, and warning requirements are met and that the application presents no health or safety hazards.
 - Complying with all existing warning labels and / or providing all appropriate health and safety warnings on the equipment on which the valves, FRLs or Vacuum products are used; and,
 - Assuring compliance with all applicable government and industry standards.
- 1.6. Safety Devices:** Safety devices should not be removed, or defeated.
- 1.7. Warning Labels:** Warning labels should not be removed, painted over or otherwise obscured.
- 1.8. 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, for telephone numbers of the appropriate technical service department.

2. PRODUCT SELECTION INSTRUCTIONS

- 2.1. Flow Rate:** The flow rate requirements of a system are frequently the primary consideration when designing any pneumatic system. System components need to be able to provide adequate flow and pressure for the desired application.
- 2.2. Pressure Rating:** Never exceed the rated pressure of a product. Consult product labeling, Pneumatic Division catalogs or the instruction sheets supplied for maximum pressure ratings.
- 2.3. Temperature Rating:** Never exceed the temperature rating of a product. Excessive heat can shorten the life expectancy of a product and result in complete product failure.
- 2.4. Environment:** Many environmental conditions can affect the integrity and suitability of a product for a given application. Pneumatic Division products are designed for use in general purpose industrial applications. If these products are to be used in unusual circumstances such as direct sunlight and/or corrosive or caustic environments, such use can shorten the useful life and lead to premature failure of a product.
- 2.5. Lubrication and Compressor Carryover:** Some modern synthetic oils can and will attack nitrile seals. If there is any possibility of synthetic oils or greases migrating into the pneumatic components check for compatibility with the seal materials used. Consult the factory or product literature for materials of construction.
- 2.6. Polycarbonate Bowls and Sight Glasses:** To avoid potential polycarbonate bowl failures:
 - Do not locate polycarbonate bowls or sight glasses in areas where they could be subject to direct sunlight, impact blow, or temperatures outside of the rated range.
 - Do not expose or clean polycarbonate bowls with detergents, chlorinated hydro-carbons, keytones, esters or certain alcohols.
 - Do not use polycarbonate bowls or sight glasses in air systems where compressors are lubricated with fire resistant fluids such as phosphate ester and di-ester lubricants.

2.7. Chemical Compatibility: For more information on plastic component chemical compatibility see Pneumatic Division technical bulletins Tec-3, Tec-4, and Tec-5

2.8. Product Rupture: Product rupture can cause death, serious personal injury, and property damage.

- Do not connect pressure regulators or other Pneumatic Division products to bottled gas cylinders.
- Do not exceed the maximum primary pressure rating of any pressure regulator or any system component.
- Consult product labeling or product literature for pressure rating limitations.

3. PRODUCT ASSEMBLY AND INSTALLATION INSTRUCTIONS

3.1. Component Inspection: Prior to assembly or installation a careful examination of the valves, FRLs or vacuum products must be performed. All components must be checked for correct style, size, and catalog number. DO NOT use any component that displays any signs of nonconformance.

3.2. Installation Instructions: Parker published Installation Instructions must be followed for installation of Parker valves, FRLs and vacuum components. These instructions are provided with every Parker valve or FRL sold, or by calling 1-800-CPARKER, or at www.parker.com.

3.3. Air Supply: The air supply or control medium supplied to Valves, FRLs and Vacuum components must be moisture-free if ambient temperature can drop below freezing

4. VALVE AND FRL MAINTENANCE AND REPLACEMENT INSTRUCTIONS

4.1. Maintenance: Even with proper selection and installation, valve, FRL and vacuum products service life may be significantly reduced without a continuing maintenance program. The severity of the application, risk potential from a component failure, and experience with any known failures in the application or in similar applications should determine the frequency of inspections and the servicing or replacement of Pneumatic Division 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 4.2 through 4.10.

4.2. Installation and Service Instructions: Before attempting to service or replace any worn or damaged parts consult the appropriate Service Bulletin for the valve or FRL in question for the appropriate practices to service the unit in question. These Service and Installation Instructions are provided with every Parker valve and FRL sold, or are available by calling 1-800-CPARKER, or by accessing the Parker web site at www.parker.com.

4.3. Lockout / Tagout Procedures: Be sure to follow all required lockout and tagout procedures when servicing equipment. For more information see: OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – (Lockout / Tagout)

4.4. Visual Inspection: Any of the following conditions requires immediate system shut down and replacement of worn or damaged components:

- Air leakage: Look and listen to see if there are any signs of visual damage to any of the components in the system. Leakage is an indication of worn or damaged components.
- Damaged or degraded components: Look to see if there are any visible signs of wear or component degradation.
- Kinked, crushed, or damaged hoses. Kinked hoses can result in restricted air flow and lead to unpredictable system behavior.
- Any observed improper system or component function: Immediately shut down the system and correct malfunction.
- Excessive dirt build-up: Dirt and clutter can mask potentially hazardous situations.

Caution: Leak detection solutions should be rinsed off after use.

4.5. Routine Maintenance Issues:

- Remove excessive dirt, grime and clutter from work areas.
- Make sure all required guards and shields are in place.

4.6. Functional Test: Before initiating automatic operation, operate the system manually to make sure all required functions operate properly and safely.

4.7. Service or Replacement Intervals: It is the user's responsibility to establish appropriate service intervals. Valves, FRLs and vacuum products contain components that age, harden, wear, and otherwise deteriorate over time. Environmental conditions can significantly accelerate this process. Valves, FRLs and vacuum components need to be serviced or replaced on routine intervals. Service intervals need to be established based on:

- Previous performance experiences.
- Government and / or industrial standards.
- When failures could result in unacceptable down time, equipment damage or personal injury risk.

4.8. Servicing or Replacing of any Worn or Damaged Parts: To avoid unpredictable system behavior that can cause death, personal injury and property damage:

- Follow all government, state and local safety and servicing practices prior to service including but not limited to all OSHA Lockout Tagout procedures (OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – Lockout / Tagout).
- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to system and Pneumatic Division products before installation, service, or conversion.
- Installation, servicing, and / or conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversions air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or if the product does not operate properly, do not put product or system into use.
- Warnings and specifications on the product should not be covered or painted over. If masking is not possible, contact your local representative for replacement labels.

4.9. Putting Serviced System Back into Operation: Follow the guidelines above and all relevant Installation and Maintenance Instructions supplied with the valve FRL or vacuum component to insure proper function of the system.

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/. 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.

3. Delivery Dates; Title and Risk; Shipment. All delivery dates are approximate and Seller shall not be responsible for any damages resulting from any delay. Regardless of the manner of shipment, title to any products and risk of loss or damage shall pass to Buyer upon tender to the carrier at Seller's facility (i.e., when it's on the truck, it's yours). Unless otherwise stated, Seller may exercise its judgment in choosing the carrier and means of delivery. No deferment of shipment at Buyers' request beyond the respective dates indicated 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 changes in shipping, product specifications or in accordance with Section 13, herein.

4. Warranty. Seller warrants that the Products sold hereunder 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 (b) the filing of a petition for relief in bankruptcy of the other Party on its own behalf, or by a third party (c) an assignment for the benefit of creditors, or (d) 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.