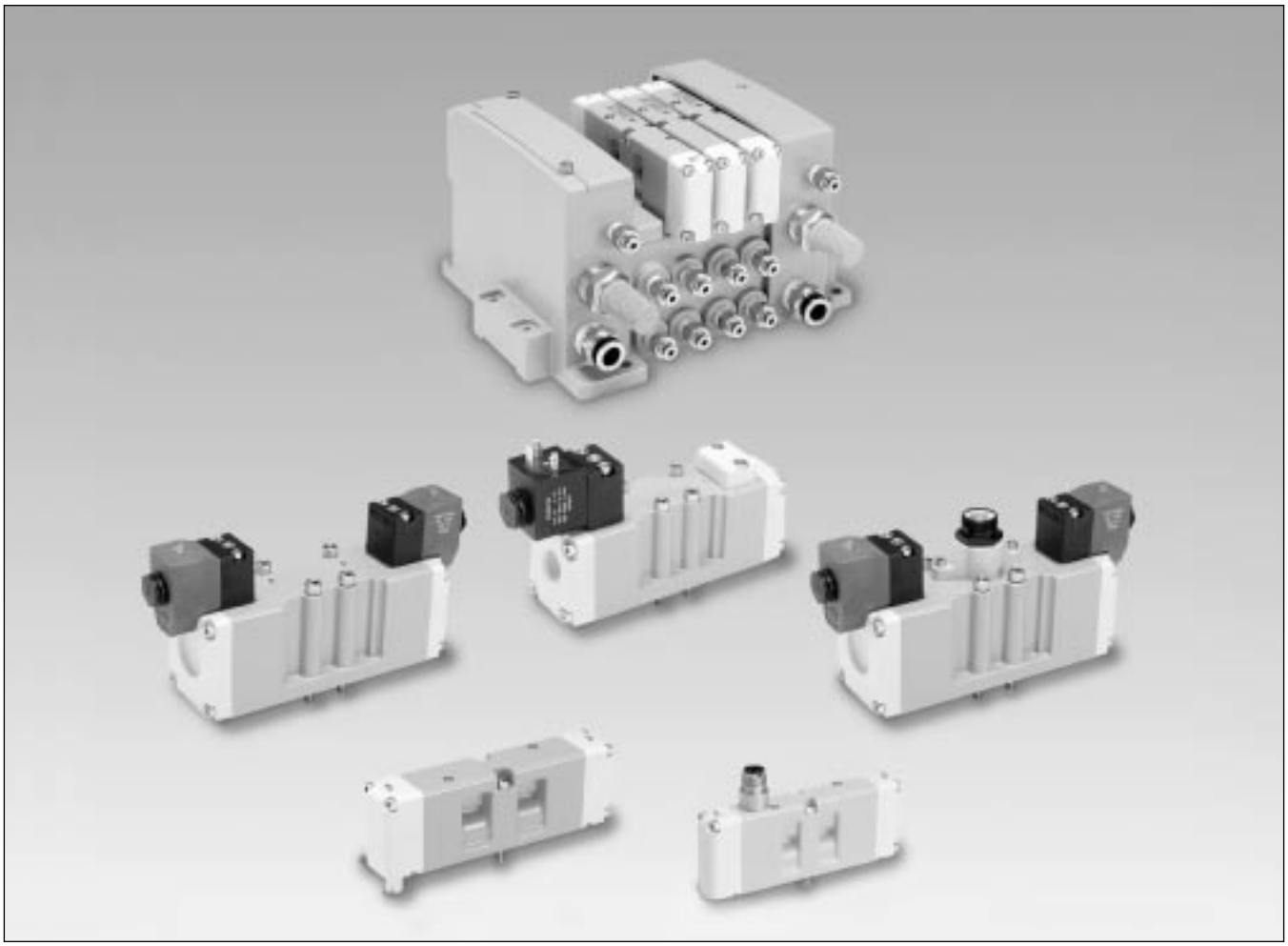
isys ISO Series

ISO Air Control Valves

15407-2 & 15407-1, 5599-2 & 5599-1
Sizes 18mm, 26mm, 1, 2, & 3

Section K

www.parker.com/pneu/isys



BOLD ITEMS ARE MOST POPULAR.

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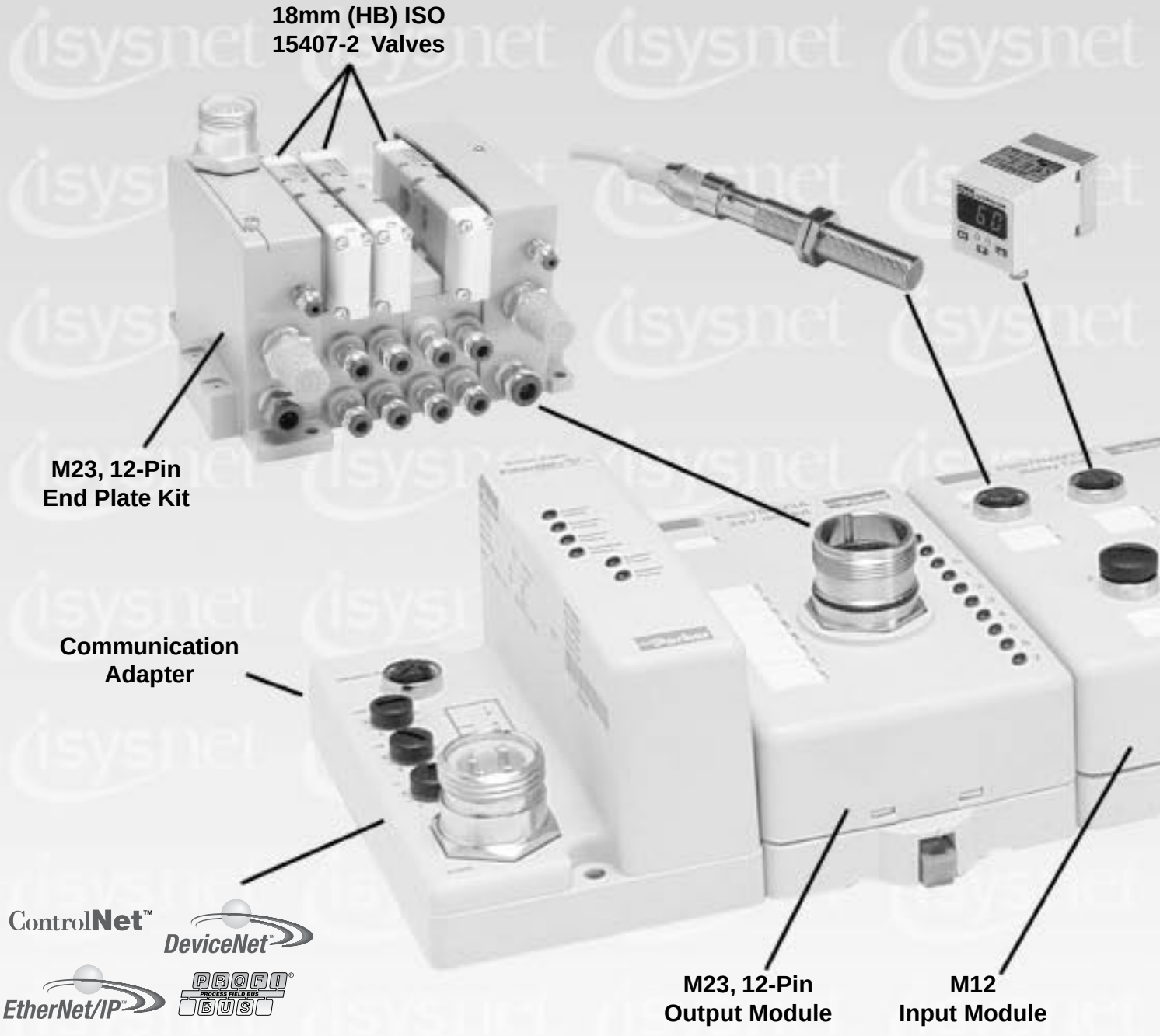
isys & isysnet Field Bus System

- A complete field bus communication offering for all ISO valves.
- UL, C-UL and CE certifications (as marked).



K

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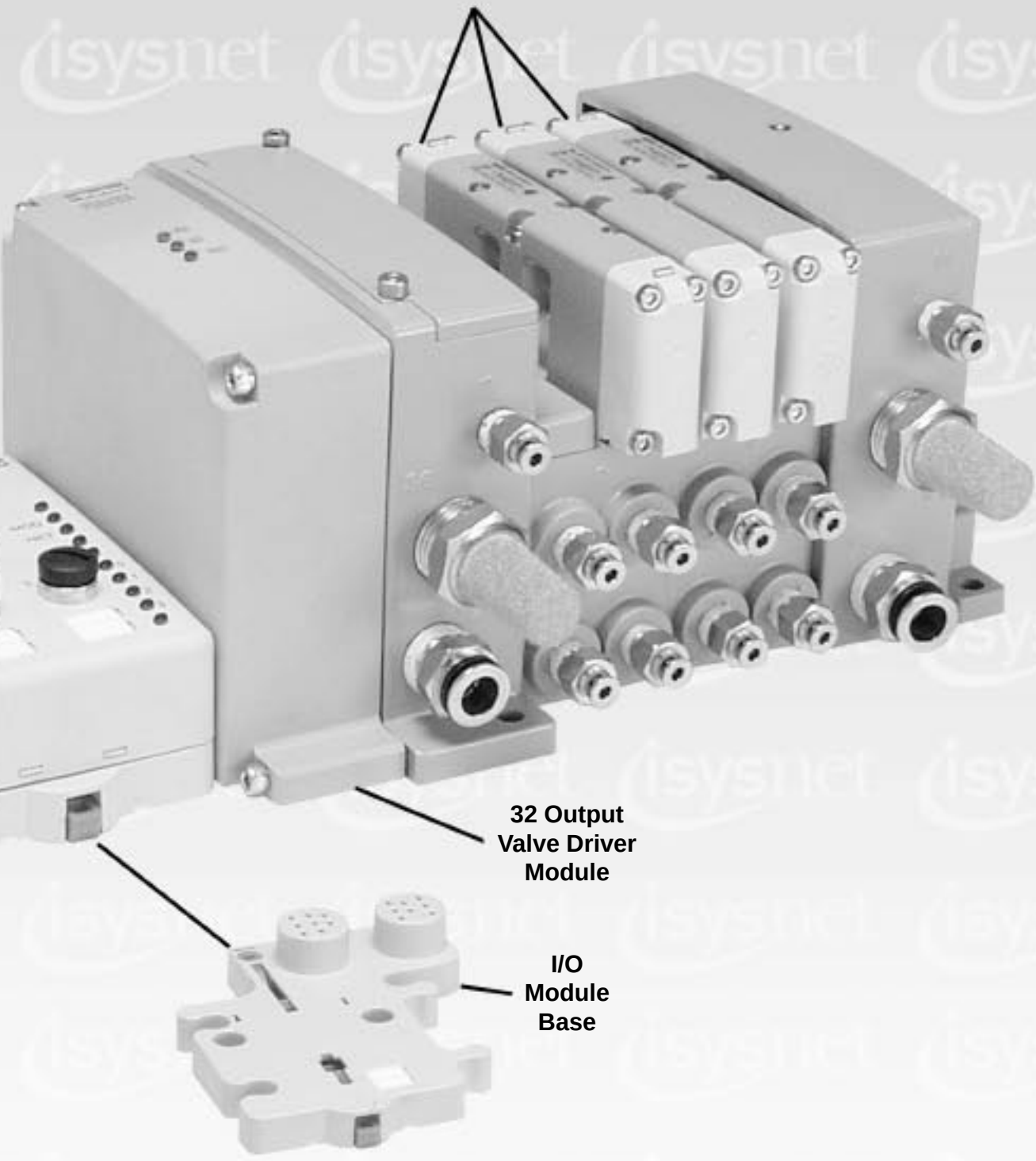
I/O Configuration

- Centralized isysnet system.
- Pneumatics and I/O are in close proximity to one another.
- I/O density per module = 8.



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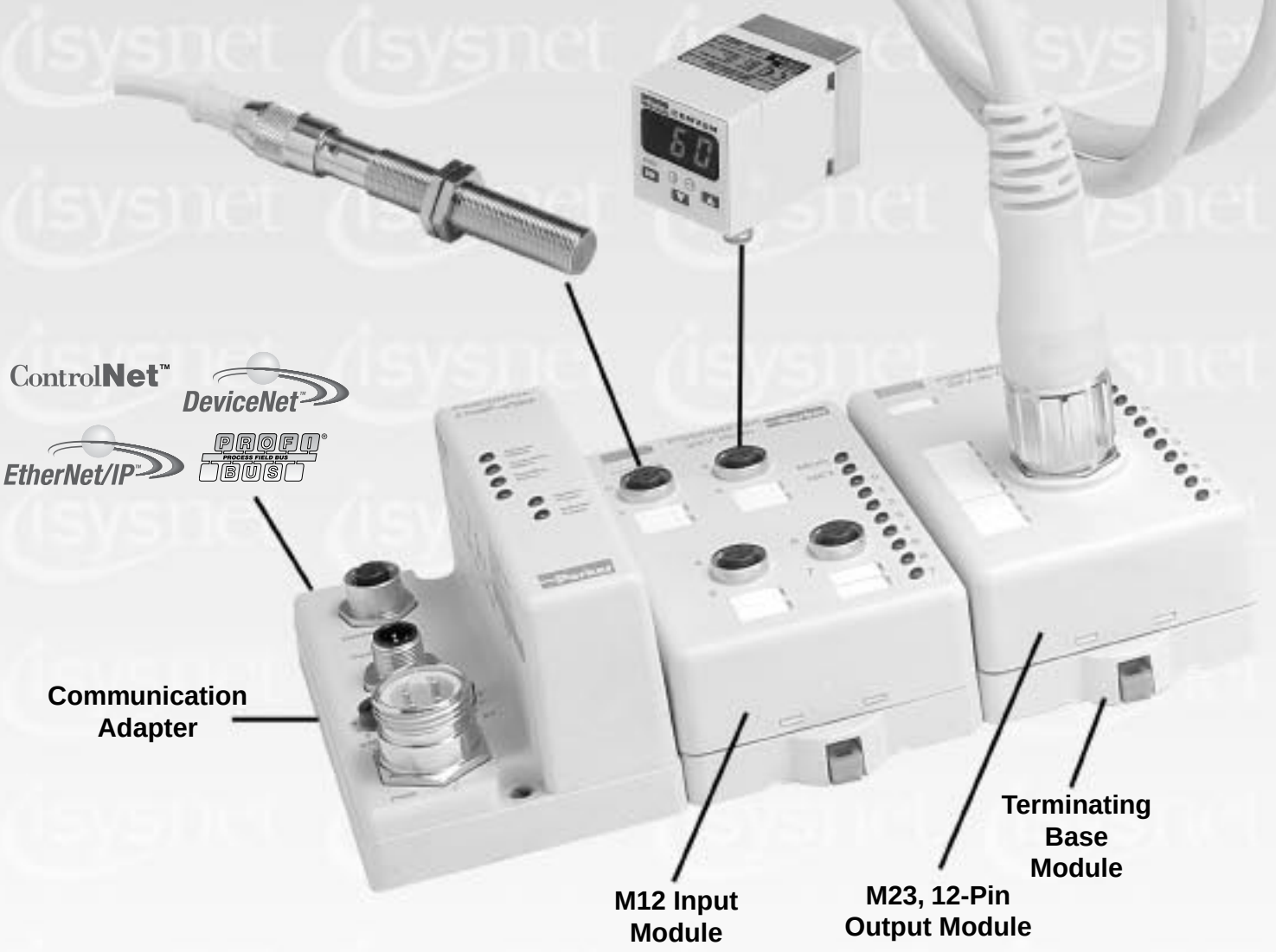
K



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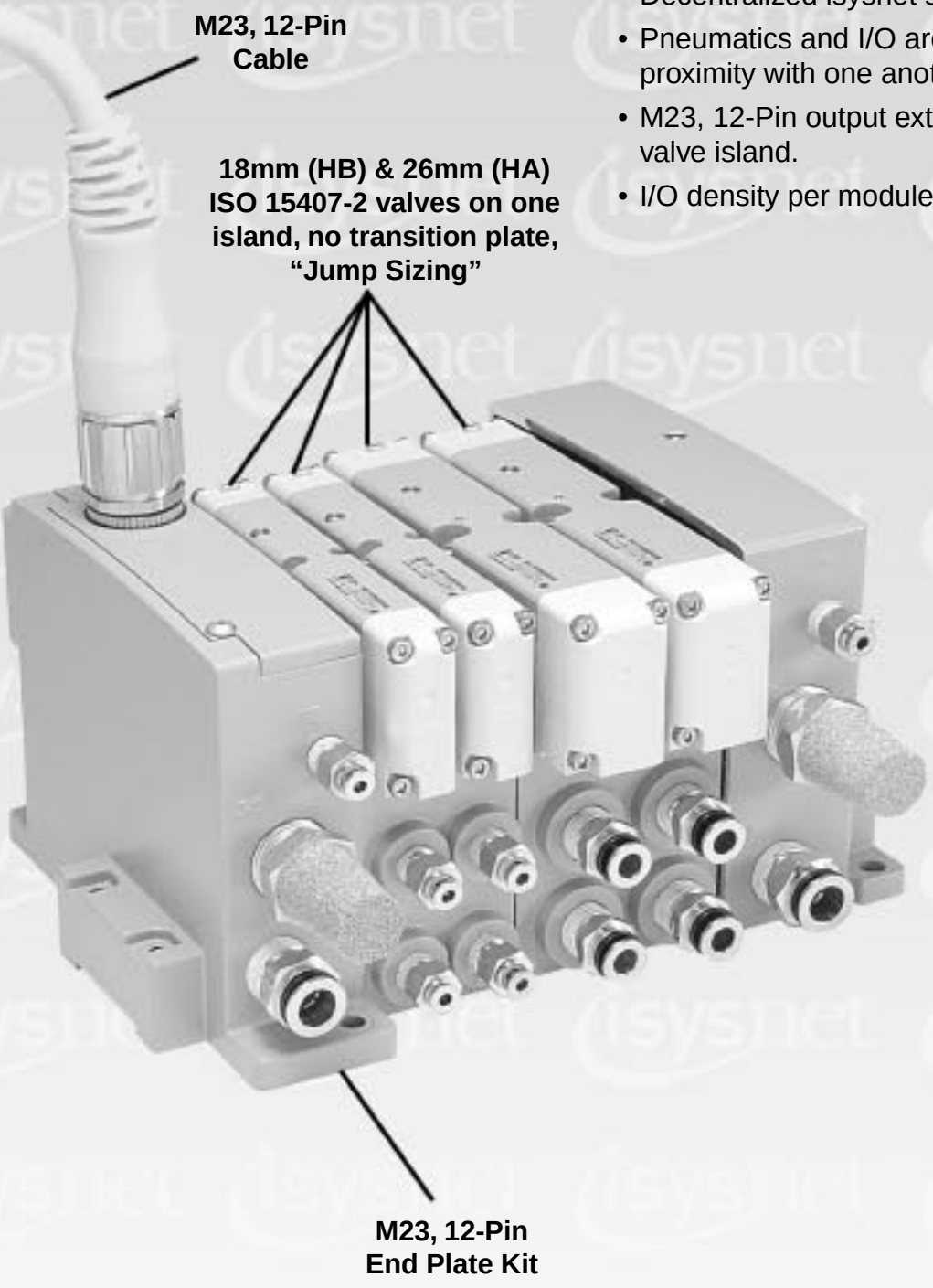
I/O Configuration

- Decentralized isysnet system.
- Pneumatics and I/O are not in close proximity with one another.
- M23, 12-Pin output extension to an isys valve island.
- I/O density per module = 8.



K

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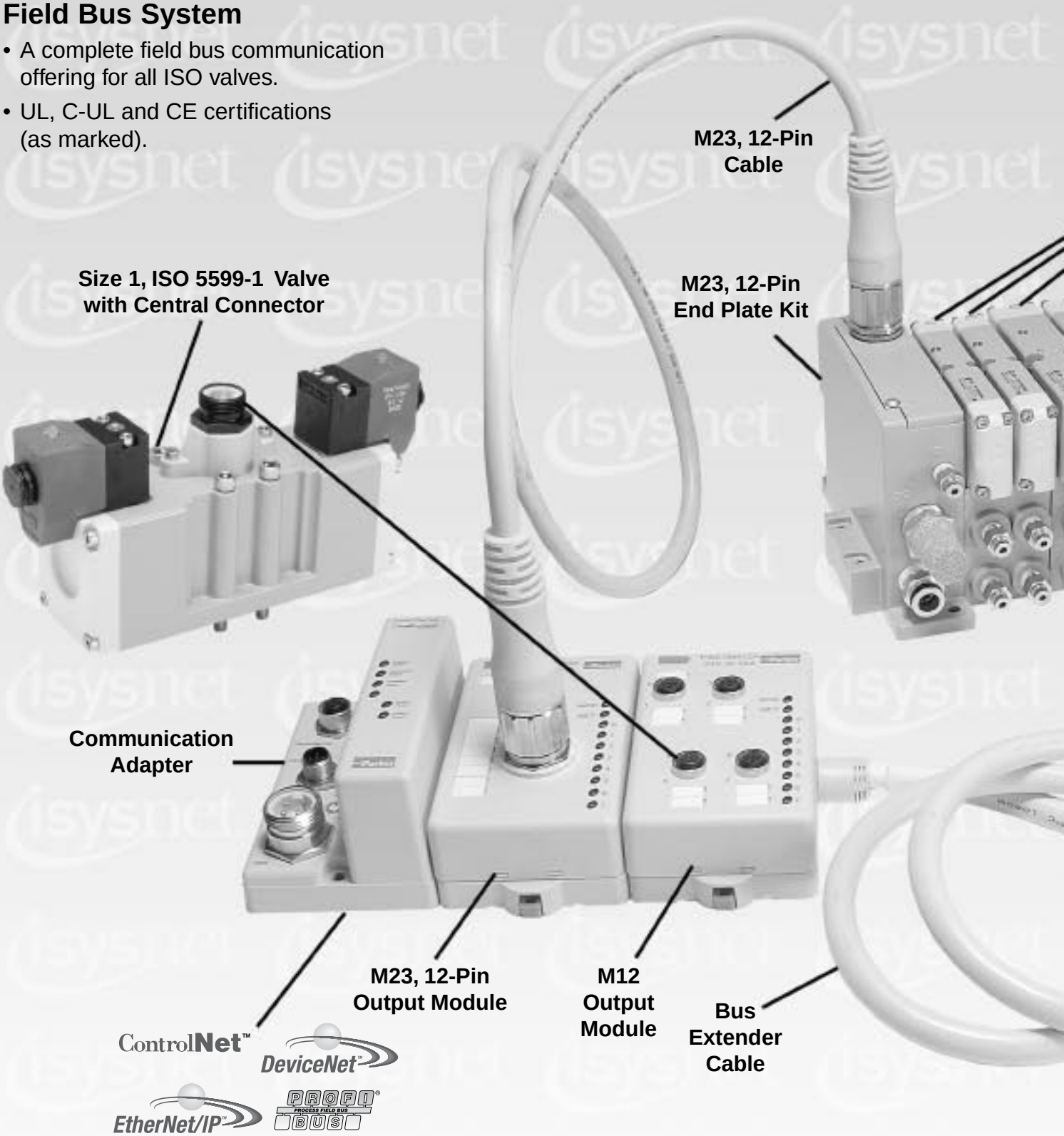

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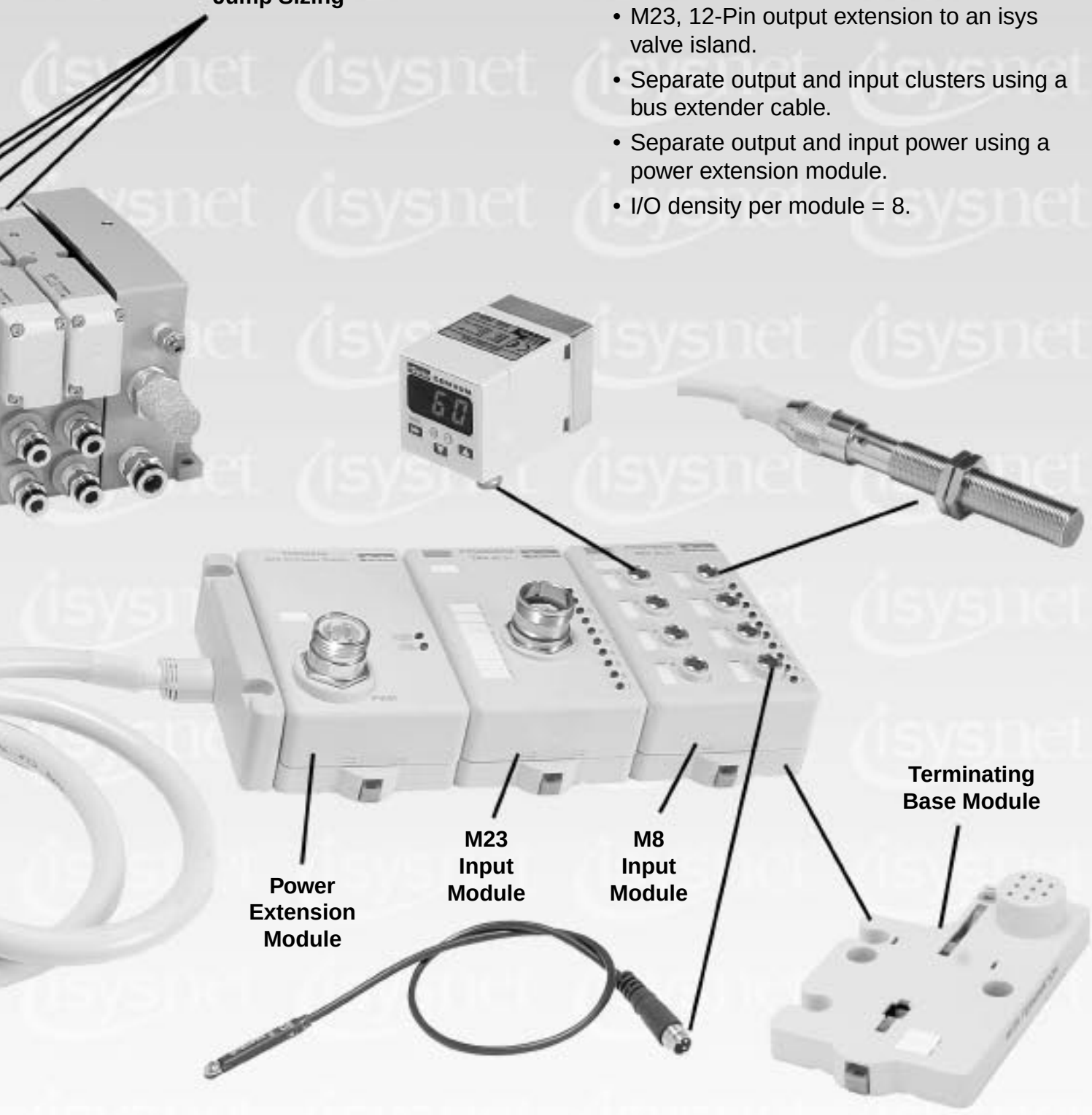
18mm (HB) & 26mm (HA) ISO 15407-2 valves on one island, no transition plate, "Jump Sizing"

I/O Configuration

- Decentralized isysnet system.
- Pneumatics and I/O are not in close proximity with one another.
- M23, 12-Pin output extension to an isys valve island.
- Separate output and input clusters using a bus extender cable.
- Separate output and input power using a power extension module.
- I/O density per module = 8.



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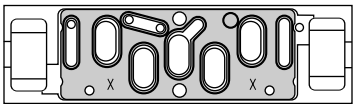
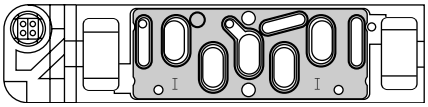
ISO Pneumatic Valve Standard Definitions

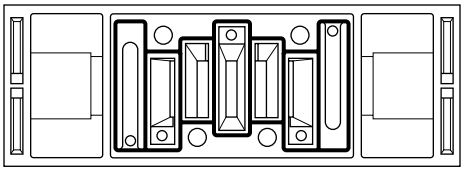
15407-1: Non-Plug-in Standards for Size 01 (26mm) & Size 02 (18mm) Wide Valves



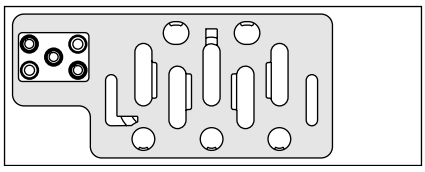
15407-2: Plug-in Standards for Size 01 (26mm) & Size 02 (18mm) Wide Valves



5599-1: Non-Plug-in Standards for Sizes 1, 2, 3



5599-2: Plug-in Standards for Size 1, 2, 3



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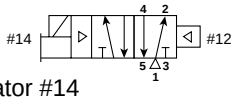
Single Solenoid

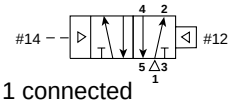


Single Pressure At Inlet Port 1:

De-energized position – Solenoid operator #14 de-energized. Pressure at inlet port 1 connected to outlet port 2. Outlet port 4 connected to exhaust port 5.

Energized position – Solenoid operator #14 energized. Pressure at inlet port 1 connected to outlet port 4. Outlet port 2 connected to exhaust port 3.

Single Remote Pilot

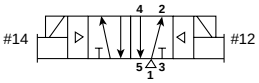


Single Pressure At Inlet Port 1:

Normal position – Pressure at inlet port 1 connected to outlet port 2. Outlet port 4 connected to exhaust port 5.

Operated position – Maintained air signal at port 14. Pressure at inlet port 1 connected to outlet port 4. Outlet port 2 connected to exhaust port 3.

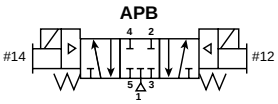
Double Solenoid



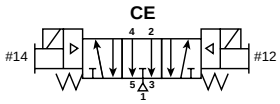
Single Pressure At Inlet Port 1:

Solenoid operator #14 energized last. Pressure at inlet port 1 connected to outlet port 4. Outlet port 2 connected to exhaust port 3.

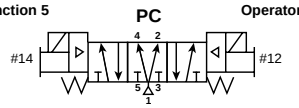
Solenoid operator #12 energized last. Pressure at inlet port 1 connected to outlet port 2. Outlet port 4 connected to exhaust port 5.



Operator / Function 5

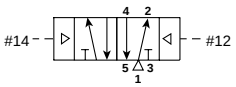


Operator / Function 6



Operator / Function 7

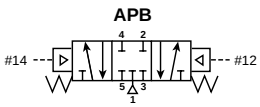
Double Remote Pilot



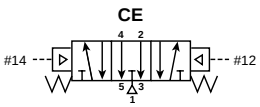
Single Pressure At Inlet Port 1:

Momentary air signal at port 14 last. Pressure at inlet port 1 connected to outlet port 4. Outlet port 2 connected to exhaust port 3.

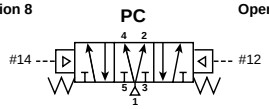
Momentary air signal at port 12 last. Pressure at inlet port 1 connected to outlet port 2. Outlet port 4 connected to exhaust port 5.



Operator / Function 8



Operator / Function 9



Operator / Function 0

Double Solenoid 3-Position

With #12 operator energized – inlet port 1 connected to cylinder port 2, cylinder port 4 connected to exhaust port 5.

With #14 operator energized – inlet port 1 connected to cylinder port 4, cylinder port 2 connected to exhaust port 3.

Function 5: All Ports Blocked
All ports blocked in the center position.

Function 6: Center Exhaust
Cylinder ports 2 and 4 connected to exhaust ports 3 and 5 in center position. Port 1 is blocked.

Function 7: Pressure Center
Pressure port 1 connected to cylinder ports 2 and 4, and exhaust ports 3 and 5 blocked in center position.

Double Remote Pilot 3-Position

With #12 operator signaled – inlet port 1 connected to cylinder port 2, cylinder port 4 connected to exhaust port 5.

With #14 operator signaled – inlet port 1 connected to cylinder port 4, cylinder port 2 connected to exhaust port 3.

Function 8: All Ports Blocked
All ports blocked in the center position.

Function 9: Center Exhaust
Cylinder ports 2 and 4 connected to exhaust ports 3 and 5 in center position. Port 1 is blocked.

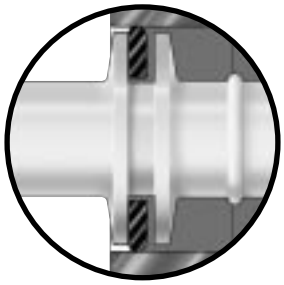
Function 0: Pressure Center
Pressure port 1 connected to cylinder ports 2 and 4, and exhaust ports 3 and 5 blocked in center position.

Dual Pressure:

May be used for dual pressure service with pressure at ports 3 & 5. (Use either external pilot source option “L” or “P” or internal pilot source option “E”.) If pilot source “E” is selected, the high pressure must be at port #3. If pilot source “L” or “P” is selected, the external pilot must be plumbed to either port #14 or #12 respectively. In the 3-Position valve, the effect of dual pressure is extremely important when the valve is in the center position, as the CE and PC functions are reversed. Therefore care should be used when selecting a 3-Position valve.

*W*ear *C*ompensation *S*ystem

- **Maximum Performance**
  - Low Friction -Lower Operating Pressures
  - Fast Response -Less Wear
- **Long Cycle Life** - Under pressure, radial expansion of the seal occurs to maintain sealing contact with the valve bore.
- **Non-Lube Service** - No lubrication required for continuous valve shifting.
- **Bi-Directional Spool Seals** - Common spool used for any pressure, including vacuum.



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15407-2 15407-1

Specifications

HB HB: 0.55 Cv (18mm)
HA HA: 1.1 Cv (26mm)

Materials of Construction

- End Caps: PBT
- Fasteners: Zinc Plated Steel
- Valve Body: Aluminum
- Coils: Thermoset Plastic

Operating Pressure

- Vacuum to 145 PSIG
- Minimum Operating Pressure
  – 2-Position: 25 PSI
  – 3-Position: 35 PSI

K

Ports

- NPT and BSPP “G” Standard

Manifolds

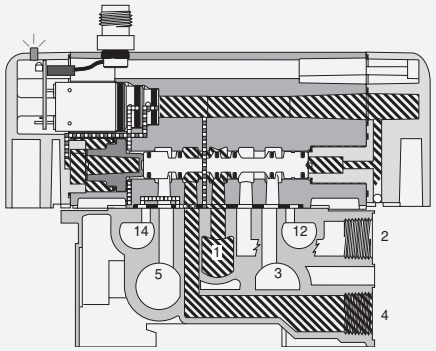
- Terminal Block Wiring (HA Only)
- Collective Wiring
  – 25-Pin, D-Sub
  – 19-Pin Round
  – 16 Point Terminal Strip
  – M23, 12-Pin
  – isysnet Field Bus

Certification / Approval

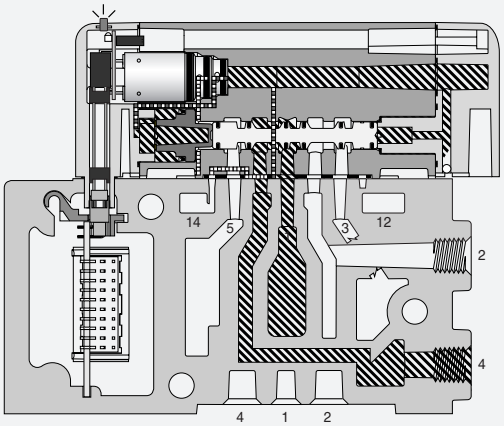
- CSA / C-US Approved
- NEMA 4
- IP65
- Manifold and Subbase Ports Meet ISO 1179 Specifications

Solenoids

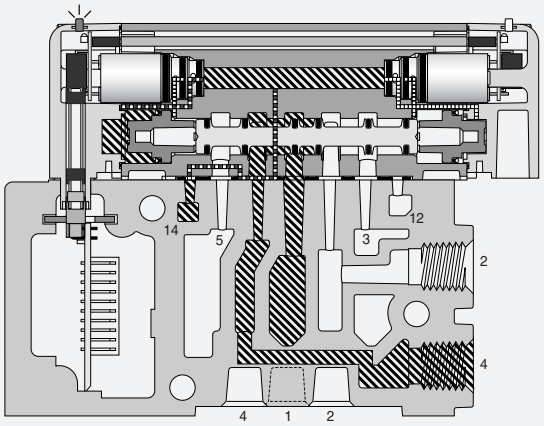
- Bi-Polar
- Surge Suppression (Standard)
- Low Watt – 1.0, 24VDC, 2.0VA, 120VAC
- Indicator Lights



15407-1 18mm Single Solenoid Internal Pilot Manifold Mounted



15407-2 18mm Single Solenoid Internal Pilot Manifold Mounted



15407-2 26mm Double Solenoid External Pilot Manifold Mounted

Pressure **Exhaust**

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5599-2 5599-1

Specifications

H1 H1: 1.5 Cv
H2 H2: 3.0 Cv
H3 H3: 6.0 Cv

Materials of Construction

- End Caps: PBT
- Fasteners: Zinc Plated Steel
- Valve Body: Die Cast Aluminum
- Coils: Thermoset Plastic

Operating Pressure

- Vacuum to 145 PSIG
- Minimum Operating Pressure
  – 2-Position: 25 PSI
  – 3-Position: 35 PSI

Ports

- NPT and BSPP “G”

Manifolds

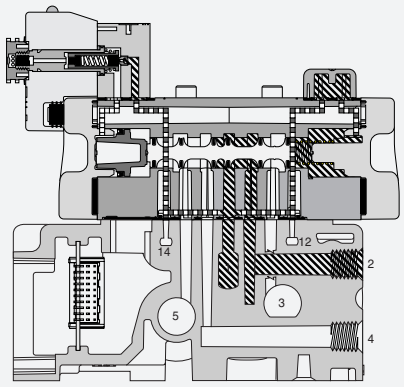
- Flying Leads
- Terminal Block Wiring
- Collective Wiring
  – 25-Pin, D-Sub
  – 19-Pin Round
  – M23, 12-Pin
  – isysnet Field Bus

Certification / Approval

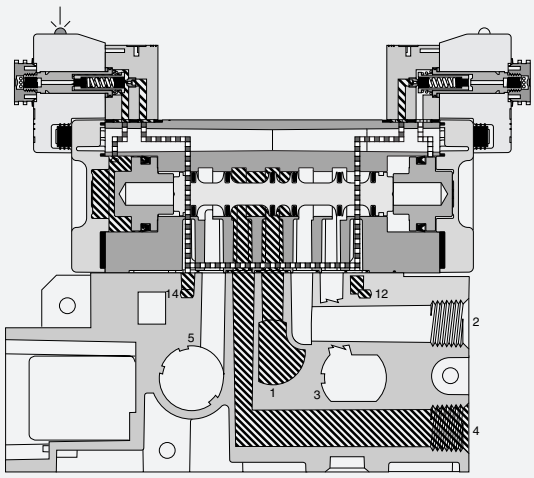
- CSA / C-US Approved
- NEMA 4
- IP65
- Manifold and Subbase Ports Meet ISO 1179 Specifications

Solenoids

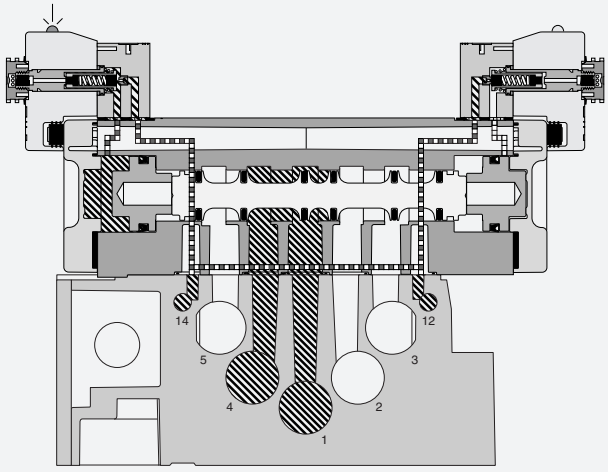
- Bi-Polar
- Surge Suppression (On Lighted Coils)
- Low Watt – 3.2, 24VDC, 4.5VA, 120VAC
- Indicator Lights, 24VDC & 120VAC



H1 5599-2 Single Solenoid Internal Pilot Manifold Mounted



H2 5599-2 Double Solenoid External Pilot Manifold Mounted



H3 5599-2 Double Solenoid External Pilot Subbase Mounted

Pressure **Exhaust**

K

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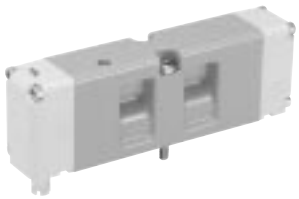
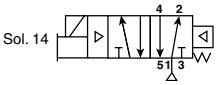
Plug-in, 15407-2, Size 18mm (HB) & 26mm (HA)

Single Solenoid
2-Position

HB: 18mm

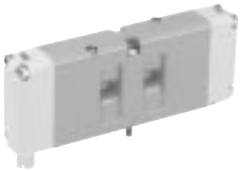


HA: 26mm

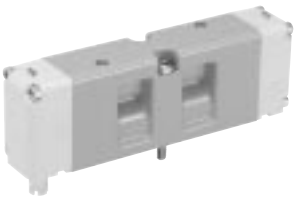


HB	**HBEVXBG023A**	120VAC	0.55 Cv
	HBEVXBG0G9A	24VDC	
HA	**HAEVXBG023A**	120VAC	1.1 Cv
	HAEVXBG0G9A	24VDC	

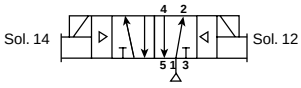
Double Solenoid
2-Position



HB: 18mm



HA: 26mm



HB	**HB2VXBG023A**	120VAC	0.55 Cv
	HB2VXBG0G9A	24VDC	
HA	**HA2VXBG023A**	120VAC	1.1 Cv
	HA2VXBG0G9A	24VDC	

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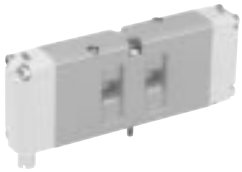
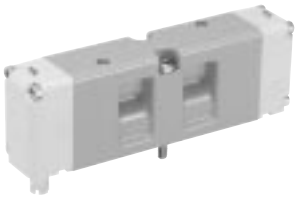
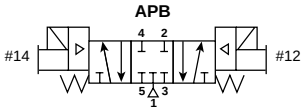
Double Solenoid
3-Position APB
3-Position CE
3-Position PC

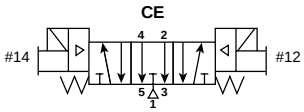


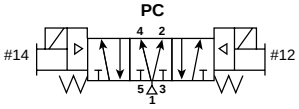
HB: 18mm



HA: 26mm







APB			
HB	**HB5VXBG023A**	120VAC	0.50 Cv
	HB5VXBG0G9A	24VDC	
HA	**HA5VXBG023A**	120VAC	1.0 Cv
	HA5VXBG0G9A	24VDC	
CE			
HB	**HB6VXBG023A**	120VAC	0.50 Cv
	HB6VXBG0G9A	24VDC	
HA	**HA6VXBG023A**	120VAC	1.0 Cv
	HA6VXBG0G9A	24VDC	

PC			
HB	**HB7VXBG023A**	120VAC	0.50 Cv
	HB7VXBG0G9A	24VDC	
HA	**HA7VXBG023A**	120VAC	1.0 Cv
	HA7VXBG0G9A	24VDC	

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Plug-in, 15407-2, Size 18mm (HB) & 26mm (HA)

BOLD OPTIONS ARE MOST POPULAR.

HB	1	VX	B	G	0	G9	A

Basic Series 15407-2	
ISO 15407-2 18mm	**HB**
ISO 15407-2 26mm	**HA**

15407-2 Operator / Function	
Single Solenoid, 2-Position - Air Return	**1**
Double Solenoid, 2-Position	**2**
Double Solenoid, 3-Position - APB	**5**
Double Solenoid, 3-Position - CE	**6**
Double Solenoid, 3-Position - PC	7
Single Solenoid, 2-Position - Air Return, Spring Assist	**E**
Double Solenoid, Dual 3/2, NC/NC	**N***
Double Solenoid, Dual 3/2, NO/NO	**P***
Double Solenoid, Dual 3/2, 14 End NC – 12 End NO	**Q***

*Available on HB Only.

Mounting	
15407-2 Valve Less Base	**VX**

15407-2 Pilot Source / Pilot Exhaust	
Internal Pilot, Port #1 / Vented	**B**
External Pilot #14 Port / Vented	L*

* Must be specified when using Sandwich Regulators.

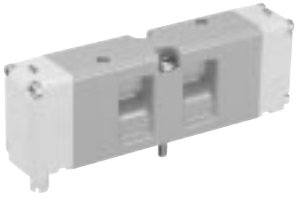
15407-2 Overrides / Lights	
G	**Non-Locking, Flush, Push - w/ Light**
H	Locking, Flush, Push / Turn - w/ Light

15407-2 Enclosure / Lead Length	
0	**Valve Less Base**

15407-2 Voltage & Frequency				
	AC		DC	Light & Surge Suppression
	60Hz	50Hz		
G9			**24**	**LED & Suppression**
23	**120**	**115**		**LED & Suppression**

15407-2 Engineering Level	
A	**Current**

K



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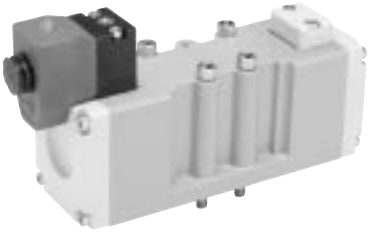
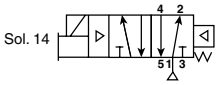
Plug-in, 5599-2, Size 1, 2, & 3

Single Solenoid

2-Position, Spring / Air Return

(H2 Series Shown)



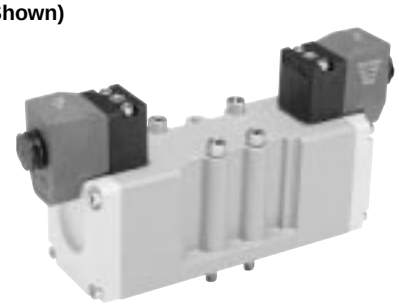


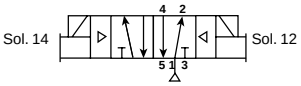
H1	**H1EVXBG023C**	120VAC	1.5 Cv
	H1EVXBG0B9C	24VDC	
H2	**H2EVXBG023C**	120VAC	3.0 Cv
	H2EVXBG0B9C	24VDC	
H3	**H3EVXBG023C**	120VAC	6.0 Cv
	H3EVXBG0B9C	24VDC	

Double Solenoid

2-Position

(H2 Series Shown)





H1	**H12VXBG023C**	120VAC	1.5 Cv
	H12VXBG0B9C	24VDC	
H2	**H22VXBG023C**	120VAC	3.0 Cv
	H22VXBG0B9C	24VDC	
H3	**H32VXBG023C**	120VAC	6.0 Cv
	H32VXBG0B9C	24VDC	

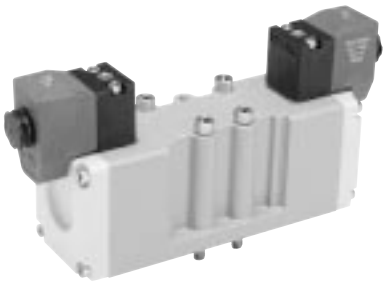
Double Solenoid

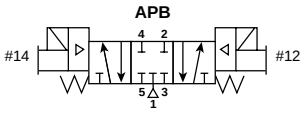
3-Position APB

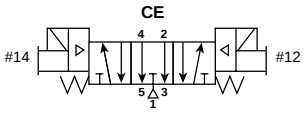
3-Position CE

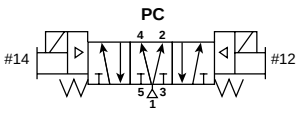
3-Position PC

(H2 Series Shown)









APB			
H1	**H15VXBG023C**	120VAC	1.2 Cv
	H15VXBG0B9C	24VDC	
H2	**H25VXBG023C**	120VAC	2.8 Cv
	H25VXBG0B9C	24VDC	
H3	**H35VXBG023C**	120VAC	5.0 Cv
	H35VXBG0B9C	24VDC	
CE			
H1	**H16VXBG023C**	120VAC	1.2 Cv
	H16VXBG0B9C	24VDC	
H2	**H26VXBG023C**	120VAC	2.8 Cv
	H26VXBG0B9C	24VDC	
H3	**H36VXBG023C**	120VAC	5.0 Cv
	H36VXBG0B9C	24VDC	

PC			
H1	**H17VXBG023C**	120VAC	1.2 Cv
	H17VXBG0B9C	24VDC	
H2	**H27VXBG023C**	120VAC	2.8 Cv
	H27VXBG0B9C	24VDC	
H3	**H37VXBG023C**	120VAC	5.0 Cv
	H37VXBG0B9C	24VDC	

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Plug-in, 5599-2, Size 1, 2, & 3

BOLD OPTIONS ARE MOST POPULAR.

H1 E VX B G 0 B9 C

Basic Series 5599-2	
ISO 5599-2 Size 1	H1
ISO 5599-2 Size 2	H2
ISO 5599-2 Size 3	H3

5599-2 Operator / Function	
Single Solenoid, 2-Position - Air Return	1
Double Solenoid, 2-Position	2
Double Solenoid, 3-Position - APB	5
Double Solenoid, 3-Position - CE	6
Double Solenoid, 3-Position - PC	7
Single Solenoid, 2-Position - Air Return, Spring Assist	E

5599-2 Mounting	
5599-2 Valve Less Base	VX

5599-2 Pilot Source / Pilot Exhaust	
Internal Pilot, Port #1 / Vented	B
External Pilot #12 or #14 Port / Vented	X*

* Must be specified when using Sandwich Regulators.

5599-2 Overrides / Lights	
B*	Non-Locking, Flush, Push - w/o Light
C*	Locking, Flush, Push / Turn - w/o Light
G**	Non-Locking, Flush, Push - w/ Light
H**	Locking, Flush, Push / Turn - w/ Light

* Apply to Voltage Codes "42", "45" & "57".
** Apply to Voltage Codes "B9" & "23".

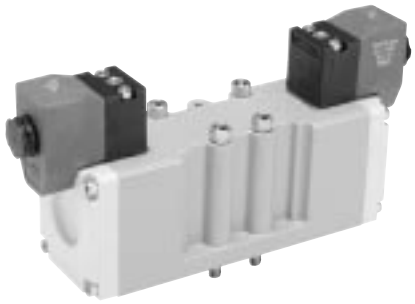
5599-2 Enclosure / Lead Length	
0	None, Valve Less Base

5599-2 Engineering Level	
C	Current

5599-2 Voltage & Frequency				
	AC		DC	Light & Surge Suppression
	60Hz	50Hz		
42	24			
45			12	
B9*			24	LED & Suppression
23	120	115		LED & Suppression
57	240			

* Solenoid is Blue color.

K



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Plug-in, 15407-2, Size 18mm & 26mm Manifold / Subbase Kits

BOLD OPTIONS ARE MOST POPULAR.

PS5511 13 C P

Basic Series	
ISO 15407-2 18mm, HB	**PS5611**
ISO 15407-2 26mm, HA	**PS5511**

Mounting Style / Port Size	
HB	
Manifold with 1/8 NPT End Ports	**51**
Manifold with 1/8 BSPP End Port	52*
Manifold with 1/8 NPT Bottom / End Port	61
Manifold with 1/8 BSPP Bottom / End Port	62*
HA	
Subbase with 1/4 NPT Side Ports	**13**
Subbase with 1/4 BSPP Side Ports	14*
Subbase with 1/4 NPT Bottom / Side Port	23
Subbase with 1/4 BSPP Bottom / Side Port	24*
Manifold with 1/4 NPT End Port	**53**
Manifold with 1/4 BSPP End Port	54*
Manifold with 1/4 NPT Bottom / End Port	63
Manifold with 1/4 BSPP Bottom / End Port	64*

* BSPP Conforms to ISO 1179-1 w 228-1 Theads.

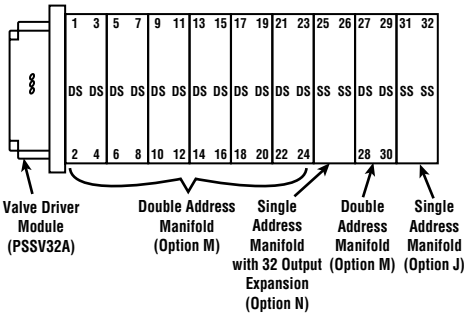
Enclosures / Lead Length	
C†	**Terminal Strip**
J*	Circuit Board, Single Address
M*	**Circuit Board, Double Address**
N*§	Single Address Circuit Board with 32 Output Expansion
P*‡	Double Address Circuit Board with 32 Output Expansion

* Manifolds Only.

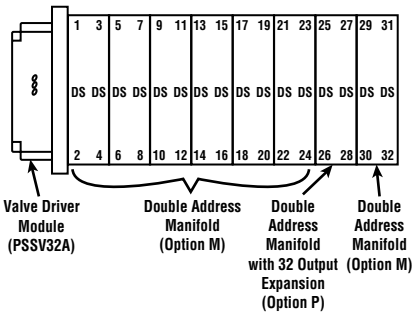
† Available with HA (26mm).

§ When using an HA or HB manifold base with the "N" Enclosure / Lead Length option:
- Outputs 1 – 24 can be single or double address bases. Use a base with "J" or "M" Enclosure / Lead Length option.
- Outputs 25 – 26 are a single address base. Use a base with "N" Enclosure / Lead Length option (this is a single address board with a ribbon connection from the valve driver module, PSSV32A).
- Outputs 27 – 32 can be single or double. Use a base with "J" or "M" Enclosure / Lead Length option.

‡ When using an HA or HB manifold base with the "P" Enclosure / Lead Length option:
- Outputs 1 – 24 can be single or double address bases. Use a base with "J" or "M" Enclosure / Lead Length option.
- Outputs 25 – 28 are a double address base. Use a base with "P" Enclosure / Lead Length option (this is a double address board with a ribbon connection from the valve driver module, PSSV32A).
- Outputs 29 – 32 can be single or double. Use a base with "J" or "M" Enclosure / Lead Length option.



Option "N"



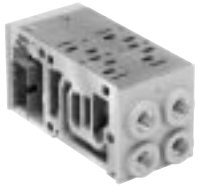
Option "P"

Subbase Kits

HA Series Subbase

Manifold Kits

HB Series 2-Station Manifold



HA Series 2-Station Manifold

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Plug-in, 5599-2, Size 1, 2 & 3 Manifold / Subbase Kits

BOLD OPTIONS ARE MOST POPULAR.

PS4011 55 A [ ] C P

Basic Series	
H1	**PS4011**
H2	**PS4111**
H3	**PS4211**

	Wiring Options
Blank	**None**
C	Chrysler
F	**SAE / Ford**
G	General Motors

	Enclosures / Lead Length
7†	3-Pin Mini Connector in Base
8†	4-Pin M12 Micro Connector in Base
9†	5-Pin Mini Connector in Base
A	**6" Leads**
C	Terminal Block
J*	Circuit Board, Single Address
M*	**Circuit Board, Double Address**

Note:
When using the Enclosure / Lead Length "J" or "M" option:
12VDC - Maximum number of coils is 13
24VDC - Maximum number of coils is 21
120VAC - Coils limited by the number of pins available in the connector (25-Pin D-Sub = 24 coils, 19-Pin Brad Harrison = 16, 12-Pin M23 = 8)
240VAC - Must use "A" or "C" Option, Lead Wires or Terminal Blocks

* Not Available with Subbase Kits.

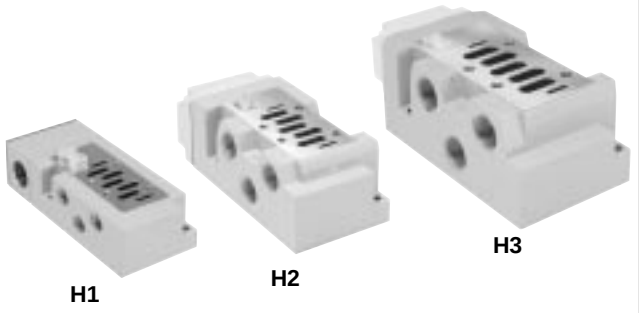
† Must Specify Valve Auto Wiring Option "C", "F", or "G".

K

Mounting Base Style / Port Size					
H1 Series		**H2 Series**		**H3 Series**	
Subbase: 3/8 NPT Side Ports	**15**	**Subbase: 1/2 NPT Side Ports**	**17**	**Subbase: 3/4 NPT Side Ports**	**19**
Subbase: 3/8 BSPP Side Ports	16	Subbase: 1/2 BSPP Side Ports	18*	Subbase: 3/4 BSPP Side Port	10*
Manifold: 1/4 NPT End Ports	53	Subbase: 1/2 NPT Bottom / End Port	27	Subbase: 3/4 NPT Bottom / End Port	29
Manifold: 1/4 BSPP End Ports	54*	Subbase: 1/2 BSPP Bottom / End Port	28*	Subbase: 3/4 BSPP Bottom / End Port	20*
Manifold: 3/8 NPT End Ports	**55**	Manifold: 3/8 NPT End Ports	55	Manifold: 1/2 NPT End Port	57
Manifold: 3/8 BSPP End Ports	56*	Manifold: 3/8 BSPP End Ports	56*	Manifold: 1/2 BSPP End Ports	58*
Manifold: 3/8 NPT Bottom / End Port	65†	**Manifold: 1/2 NPT End Port**	**57**	**Manifold: 3/4 NPT End Port**	**59**
Manifold: 3/8 BSPP Bottom / End Port	66*†	Manifold: 1/2 BSPP End Ports	58*	Manifold: 3/4 BSPP End Port	50
		Manifold: 1/2 NPT Bottom / End Port	67	Manifold: 3/4 NPT Bottom / End Port	69
		Manifold: 1/2 BSPP Bottom / End Port	68*	Manifold: 3/4 NPT Bottom / End Port	60*

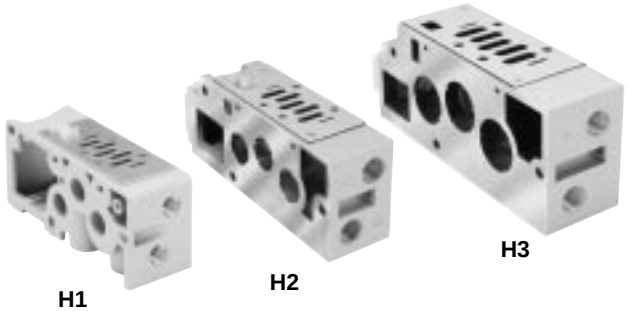
* BSPP Conforms to ISO 1179-1 w 228-1 Theads.
† #1 Bottom Port - 1/4".

Subbase Kits



Automotive Connectors
Mounted in 1/2" Conduit Port
- *3-Pin - Wired for Single Solenoid*
- *4-Pin / 5-Pin - Wired for Double Solenoid*

Manifold Kits



Automotive Connectors
Mounted in Individual Manifold Conduit Cover
- *3-Pin - Wired for Single Solenoid*
- *4-Pin / 5-Pin - Wired for Double Solenoid*

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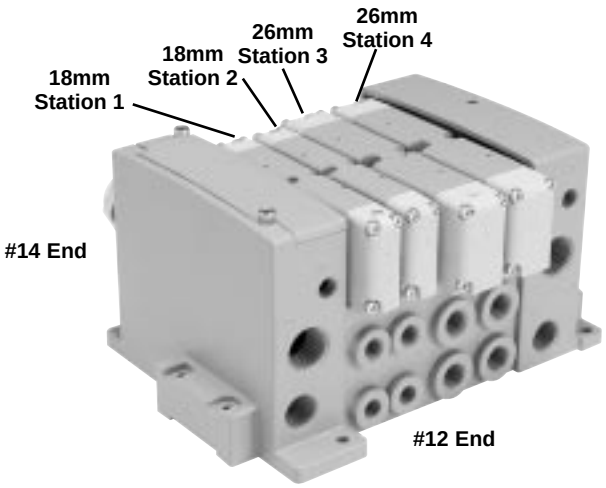
How To Order Plug-In Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold.
   The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)



Example:
4-Station Manifold with (2) 18mm and (2) 26mm Valves On Manifold Bases

Maximum Solenoids Energized Simultaneously (Interconnect Circuit Boards)

HA / HB	Voltage Code	25-Pin D-Sub	19-Pin Round	Single 12-Pin M23	isysnet
24VDC	G9	24	16	8	32
120VAC*	23	24	16	8	N/A

* Not CSA certified for 25-Pin, D-Sub option.

K

Add-A-Fold Assembly Model Number

AA HB D 0 04 –

Valve Series
Right & Left End Plate 15407-2 (Plug-In, HB 18mm HB* & HA 26mm)
* Common End Plates for HA & HB.

End Plate Type

25-Pin	**D**
19-Pin	**E**
16 Point Terminal Strip	F
M23, 12-Pin	G
isysnet	**Y***

* Valve Driver Module included. Must order communication modules separately.

Thread Type

0	**NPT**
1*	BSPP "G"

* BSPP Conforms to ISO 1179-1 w 228-1 Theads.

Number of Stations*

02
04
•
24
•
32†

* Must be ordered in multiples of (2).
† Maximum Number

Transition Plate

Blank	**No Transition Plate**
B	**HB / HA to H2**

Example

Application requires a 4-Station manifold with a regulator on Station 2. (Two 18mm + Two 26mm Stations)

Item	Qty.	Part No.	Location
01	1	AAHBD004	
02	1	HB1VXBG0G9A	Station 1
03	1	HB2VXLG0G9A	Station 2
04	1	PS5638166P	Station 2
05	1	PS561151MP	Station 1 & 2
06	2	HA1VXBG0G9A	Station 3 & 4
07	1	PS551151MP	Station 3 & 4

NOTE: Construct manifold assemblies from left to right while looking at the ports. Valves must be ordered as External Pilot when using Sandwich Regulator.

When using an HA or HB manifold base with the "N" Enclosure / Lead Length option:
- Outputs 1 – 24 can be single or double address bases. Use a base with "J" or "M" Enclosure / Lead Length option.
- Outputs 25 – 26 are a single address base. Use a base with "N" Enclosure / Lead Length option (this is a single address board with a ribbon connection from the valve driver module, PSSV32A).
- Outputs 27 – 32 can be single or double. Use a base with "J" or "M" Enclosure / Lead Length option.

When using an HA or HB manifold base with the "P" Enclosure / Lead Length option:
- Outputs 1 – 24 can be single or double address bases. Use a base with "J" or "M" Enclosure / Lead Length option.
- Outputs 25 – 28 are a double address base. Use a base with "P" Enclosure / Lead Length option (this is a double address board with a ribbon connection from the valve driver module, PSSV32A).
- Outputs 29 – 32 can be single or double. Use a base with "J" or "M" Enclosure / Lead Length option.

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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 complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

Example:
3-Station Manifold with (3) H1 Valves On Manifold Bases and Regulator at Station 3

Maximum Solenoids Energized Simultaneously (Interconnect Circuit Boards)

H1 Voltage Code	25-Pin D-Sub	19-Pin Round	Single 12-Pin M23	isysnet
12VDC 45	13	13	8	N/A
24VAC* 42	24	16	8	N/A
24VDC B9	20	16	8	21
120VAC* 23	24	16	8	N/A

* Not CSA certified for 25-Pin, D-Sub option.

K

Add-A-Fold Assembly Model Number

AA H1 D 0 03 –

Valve Series	
Right & Left End Plate	H1

End Plate Type	
25-Pin	D†
19-Pin	E†
M23, 12-Pin	G†
isysnet	X*

* Valve Driver Module included. Must order Communication Modules Separately.
† Multi Connector Included.

Transition Plate	
Blank	No Transition Plate
C	H1 to H2
D	H1 to H3

Number of Stations*
01
02
03
04
•
•
21

Thread Type	
0	NPT
1*	BSPP "G"

* BSPP Conforms to ISO 1179-1 w 228-1 Theads.

Example

Application requires a 3-Station manifold with a valve, regulator on Station 3.

Item	Qty.	Part No.	Location
01	1	AAH1E003	
02	1	H11VXBG0B9C	Station 1
03	1	PS401155MCP	Station 1
04	1	H12VXBG0B9C	Station 2
05	1	PS401155MCP	Station 2
06	1	H12VXXG0B9C	Station 3
07	1	PS4038166CP	Station 3
08	1	PS401155MCP	Station 3

NOTE:
Construct manifold assemblies from left to right while looking at the cylinder ports.

Valves must be ordered as External Pilot when using Sandwich Regulator.

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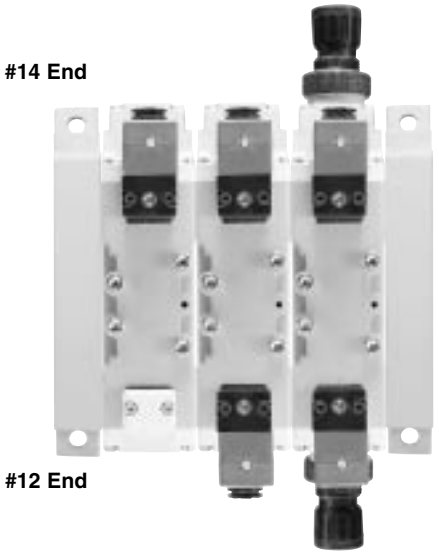
How To Order Plug-In Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

Maximum Solenoids Energized Simultaneously (Interconnect Circuit Boards)

H2 / H3	Voltage Code	25-Pin D-Sub	19-Pin Round	Single 12-Pin M23	isysnet
12VDC	45	13	13	8	N/A
24VAC*	42	24	16	8	N/A
24VDC	B9	20	16	8	21
120VAC*	23	24	16	8	N/A

* Not CSA certified for 25-Pin, D-Sub option.



Example:
3-Station Manifold with (3) H2 Valves On Manifold Bases and Regulator at Station 3

Add-A-Fold Assembly Model Number

AA	H2	D	0	03	–

Valve Series

Right & Left End Plate	H2
Right & Left End Plate	H3

End Plate Type

25-Pin	D†
19-Pin	E†
M23, 12-Pin	G†
isysnet	Y*

* Valve Driver Module included. Must order Communication Modules Separately.
† Collective Wiring Module Included.

Transition Plate

Blank	No Transition Plate
E*	H2 to H3

* Use Largest Size (H3) Number. Not Available with Type "V".

Number of Stations*

01
02
03
04
•
•
21

Thread Type

0	NPT
1*	BSPP "G"

* BSPP Conforms to ISO 1179-1 w 228-1 Theads.

Example

Application requires a 3-Station manifold with a valve and regulator on Station 2.

Item	Qty.	Part No.	Location
01	1	AAH2D003	
02	1	H21VXBG0B9C	Station 1
03	1	PS411157MCP	Station 1
04	1	H22VXBG0B9C	Station 2
05	1	PS401157MCP	Station 2
06	1	H22VXXG0B9C	Station 3
07	1	PS4138166CP	Station 3
08	1	PS401157MCP	Station 3

NOTE: Construct manifold assemblies from left to right while looking at the cylinder ports.
Valves must be ordered as External Pilot when using Sandwich Regulator.

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15407-2 Plug-in End Plate Kits

BOLD OPTIONS ARE MOST POPULAR.

HB HA

PS56 20 01 0 P

Basic Series	
ISO 15407, Size HB, 18mm & HA, 26mm	PS56

End Plate Kit Type	
End Plate, Collective Wiring	20*

* Must Order Bases with Circuit Boards.

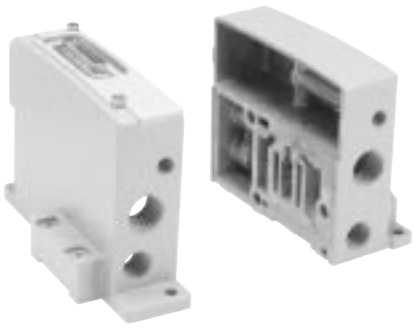
Options	
L2*	25-Pin, D-Sub
L3	19-Pin, Round, Brad Harrison
L4	12-Pin, M23
L5	16-Point Terminal Strip
L6**	isysnet

* 120VAC is not CSA rated.
** Valve Driver Module and 24 Output Cable Installed. Must order communication modules separately.

Thread Type	
0	NPT
1*	BSPP "G"

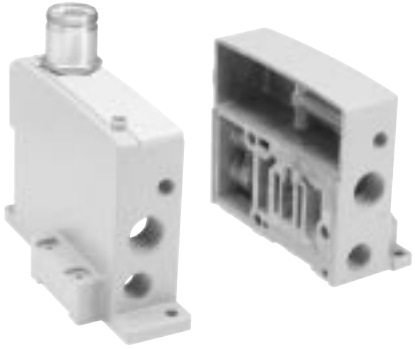
* BSPP Conforms to ISO 1179-1 w 228-1 Theads.

K



HB - HA 25-Pin End Plates

HB - HA 16-Point Terminal Strip End Plates



HB - HA 19-Pin End Plates

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

5599-2 Plug-in End Plate Kits

BOLD OPTIONS ARE MOST POPULAR.

H1 H2 H3

PS40 20 L2 0 C P

Basic Series	
ISO 5599, Size 1	PS40
ISO 5599, Size 2	PS41
ISO 5599, Size 3	PS42

End Plate Kit Type	
End Plate, Collective Wiring	20*

* Must Order Bases with Circuit Boards.

Engineering Level	
C	Current

Thread Type	
0	NPT
1*	BSPP "G"

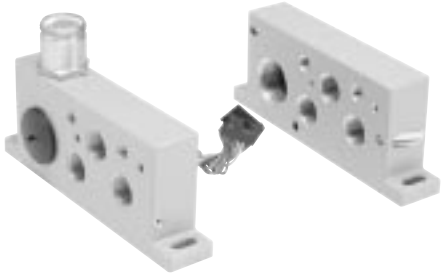
* BSPP Conforms to ISO 1179-1 w 228-1 Theads.

Options	
L1*†	Collective Wiring End Plate, Top Ported
L2‡	25-Pin, D-Sub
L3	19-Pin, Round, Brad Harrison
L4	12-Pin, M23
L6§	isysnet

* For PS41 and PS42 Kits Only.
† Must Order Collective Wiring Module Separately.
‡ 120VAC is Not CSA Rated.
§ Valve Driver Module and 24 Output Cable Installed. Must order communication modules separately.

K

H1 25-Pin D-Sub End Plates



H1 19-Pin Round End Plates

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

15407-2 & 5599-2 Plug-in Transition Plate Kits

BOLD OPTIONS ARE MOST POPULAR.

HA H1 H2 H3

PS40 26 L2 0 C P

Basic Series
PS40
PS56

Transition Plate Type	
HA / HB to H2	**24***
H1 to H2 to H3	**25**
H1 to H3	**26**
H1 to H2	**27**
H2 to H3	**28**

* Used Only with Basic Series PS56.

Thread Type	
0	**NPT**
1*	BSPP "G"

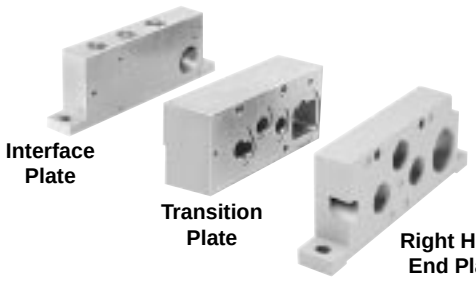
* BSPP Conforms to ISO 1179-1 w 228-1 Theads.

Options	
L1*	**Collective Wiring End Plate, Top Ported**
L2	**25-Pin, D-Sub**
L3	**19-Pin, Round, Brad Harrison**
L4	12-Pin, M23
L5**	16-Pt. Terminal Strip
L6	**isysnet**

* Used Only with Transition Plate Type "28". Must order Collective Wiring Modules Separately.

** Only Available with Transition Plate Type "24".

Engineering Level	
Blank	**Basic Series PS56**
C	**Basic Series PS40**



H1 to H2 Shown

K

Collective Wiring Module Kits Size 2 & 3

Size	Kit Number
25-Pin, D-Sub Module*†	**SCD251MC**
M23, 12-Pin*†	**SCM231MC**
19-Pin Heavy Duty Round*†	**SCC191MC**
D-Sub Cable, Non-IP, 3 Meters	**P8LMH25M3A**

*** Kit includes:** Wiring Module with Circuit Board Connection, Gasket, Tie Rods and Bolts.

† Available with isys, ISO 5599-2, Sizes 2 & 3.

H2 H3

25-Pin, D-Sub Collective Wiring Module

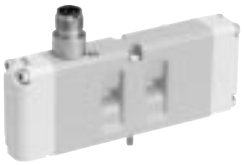
19-Pin Heavy Duty Wiring Module

HB, HA, H1, H2, H3 25-Pin, D-Sub Cable

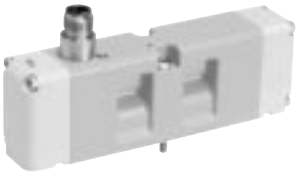
Parker Hannifin Corporation
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics

Non Plug-in, 15407-1, Size 18mm (HB) & 26mm (HA)

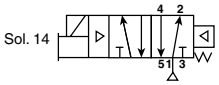
Single Solenoid
2-Position



HB: 18mm



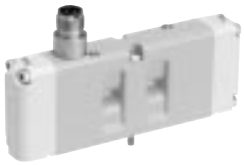
HA: 26mm



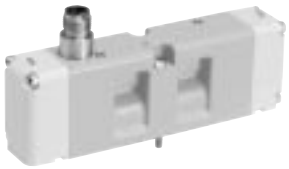
HB	**HBEWXBG2G9000FA**	24VDC	0.55 Cv
HA	**HAEWXBG2G9000FA**	24VDC	1.1 Cv

H##WXBG2G9000FA = 4-Pin M12 Micro Straight Connector

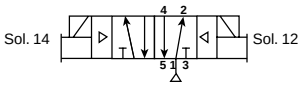
Double Solenoid
2-Position



HB: 18mm



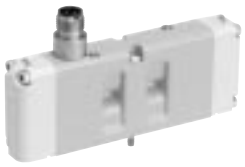
HA: 26mm



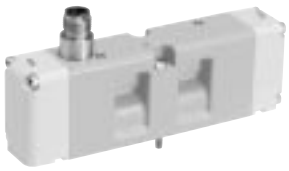
HB	**HB2WXBG2G9000FA**	24VDC	0.55 Cv
HA	**HA2WXBG2G9000FA**	24VDC	1.1 Cv

H##WXBG2G9000FA = 4-Pin M12 Micro Straight Connector

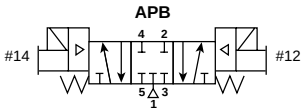
Double Solenoid
3-Position APB
3-Position CE
3-Position PC

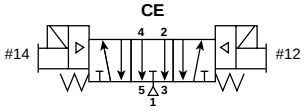


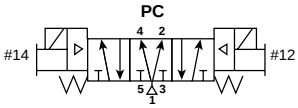
HB: 18mm



HA: 26mm







APB			
HB	**HB5WXBG2G9000FA**	24VDC	0.50 Cv
HA	**HA5WXBG2G9000FA**	24VDC	1.0 Cv
CE			
HB	**HB6WXBG2G9000FA**	24VDC	0.50 Cv
HA	**HA6WXBG2G9000FA**	24VDC	1.0 Cv

PC			
HB	**HB7WXBG2G9000FA**	24VDC	0.50 Cv
HA	**HA7WXBG2G9000FA**	24VDC	1.0 Cv

H##WXBG2G9000FA = 4-Pin M12 Micro Straight Connector

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

Non Plug-in, 15407-1, Size 18mm (HB) & 26mm (HA)

BOLD OPTIONS ARE MOST POPULAR.

HB	E	WX	B	G	2	G9	000F	A

Basic Series 15407-1	
ISO 15407-1 18mm	HB
ISO 15407-1 26mm	HA

15407-1 Operator / Function	
Single Solenoid, 2-Position - Air Return	**1**
Double Solenoid, 2-Position	**2**
Single Remote Pilot, 2-Position - Air Return	3*§
Double Remote Pilot, 2-Position	4*§
Double Solenoid, 3-Position - APB	**5**
Double Solenoid, 3-Position - CE	**6**
Double Solenoid, 3-Position - PC	7
Double Remote Pilot, 3-Position - APB	8*§
Double Remote Pilot, 3-Position - CE	9*§
Double Remote Pilot, 3-Position - PC	0*§
Single Solenoid, 2-Position - Air Return, Spring Assist	**E**
Single Remote Pilot, 2-Position - Air Return, Spring Assist	F*§
Double Solenoid, Dual 3/2, NC/NC	**N†**
Double Solenoid, Dual 3/2, NO/NO	**P†**
Double Solenoid, Dual 3/2, 14 End NC – 12 End NO	**Q†**

* Only Available with Pilot Source / Pilot Exhaust "0".
† Available on HB Only.
§ Must Order Remote Pilot Access Plates for Manifolds.

15407-1 Mounting	
Valve Less Base	**WX**

15407-1 Pilot Source / Pilot Exhaust	
None, Remote Pilot Valve	0
Internal Pilot, Port #1 / Vented	**B**
External Pilot #14 Port / Vented	L*

* Must be specified when using Sandwich Regulators.

15407-1 Overrides / Lights	
0	None, Remote Pilot Valve
G	**Non-Locking, Flush, Push - w/ Light**
H	Locking, Flush, Push / Turn - w/ Light

15407-1 Enclosure / Lead Length	
0	None, Remote Pilot Valve
2	**4-Pin, M12 Micro, Straight Connector**

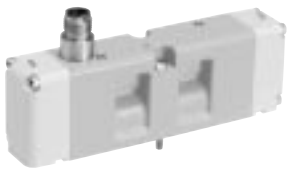
15407-1 Voltage & Frequency		
	DC	**Light & Surge Suppression**
G9	**24**	**LED & Suppression**
XX	Remote Pilot	

15407-1 Central Connector Wiring Options	
Blank	Remote Pilot
000F	**SAE / Ford, ISO 20401**

15407-1 Engineering Level	
A	**Current**

K

Note: HB 18mm Valve Remote Pilot Option only available with PL02 Individual Subbase Kits



Parker Hannifin Corporation
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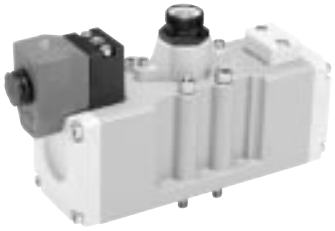
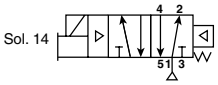
Non Plug-in, 5599-1, Central Connector - Size 1, 2, & 3

Single Solenoid
2-Position, Spring / Air Return
(H2 Series Shown)

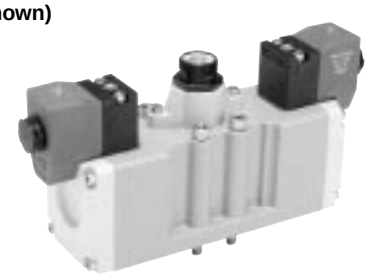


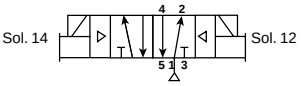


H1	**H1EWXBG323000*C**	120VAC	1.5 Cv
	H1EWXBG2B9000*C	24VDC	
H2	**H2EWXBG323000*C**	120VAC	3.0 Cv
	H2EWXBG2B9000*C	24VDC	
H3	**H3EWXBG323000*C**	120VAC	6.0 Cv
	H3EWXBG2B9000*C	24VDC	

H##WXBG3̲23000*C = 5-Pin Mini Automotive Straight Connector
H##WXBG2̲B9000*C = 4-Pin M12 Micro Straight Connector

Double Solenoid
2-Position
(H2 Series Shown)

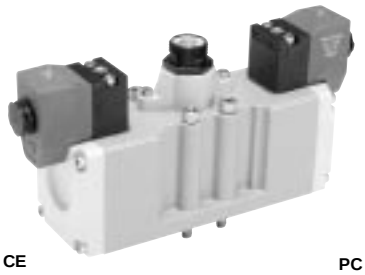




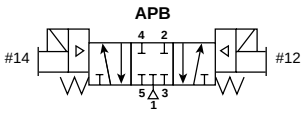
H1	**H12WXBG323000*C**	120VAC	1.5 Cv
	H12WXBG2B9000*C	24VDC	
H2	**H22WXBG323000*C**	120VAC	3.0 Cv
	H22WXBG2B9000*C	24VDC	
H3	**H32WXBG323000*C**	120VAC	6.0 Cv
	H32WXBG2B9000*C	24VDC	

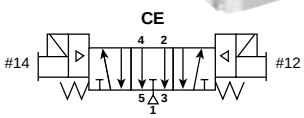
H##WXBG3̲23000*C = 5-Pin Mini Automotive Straight Connector
H##WXBG2̲B9000*C = 4-Pin M12 Micro Straight Connector

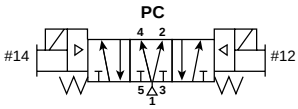
Double Solenoid
3-Position APB
3-Position CE
3-Position PC
(H2 Series Shown)



*** Specify Automotive Wiring Code**
C - Chrysler
F - SAE / Ford
G - GM







APB			
H1	**H15WXBG323000*C**	120VAC	1.2 Cv
	H15WXBG2B9000*C	24VDC	
H2	**H25WXBG323000*C**	120VAC	2.8 Cv
	H25WXBG2B9000*C	24VDC	
H3	**H35WXBG323000*C**	120VAC	5.0 Cv
	H35WXBG2B9000*C	24VDC	
CE			
H1	**H16WXBG323000*C**	120VAC	1.2 Cv
	H16WXBG2B9000*C	24VDC	
H2	**H26WXBG323000*C**	120VAC	2.8 Cv
	H26WXBG2B9000*C	24VDC	
H3	**H36WXBG323000*C**	120VAC	5.0 Cv
	H36WXBG2B9000*C	24VDC	

PC			
H1	**H17WXBG323000*C**	120VAC	1.2 Cv
	H17WXBG2B9000*C	24VDC	
H2	**H27WXBG323000*C**	120VAC	2.8 Cv
	H27WXBG2B9000*C	24VDC	
H3	**H37WXBG323000*C**	120VAC	5.0 Cv
	H37WXBG2B9000*C	24VDC	

H##WXBG3̲23000*C = 5-Pin Mini Automotive Straight Connector
H##WXBG2̲B9000*C = 4-Pin M12 Micro Straight Connector

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

Non Plug-in, 5599-1, Central Connector - Size 1, 2, & 3

BOLD OPTIONS ARE MOST POPULAR

H1	E	WX	B	G	2	B9	000	F	C

Basic Series 5599-1	
ISO 5599-1 Size 1	**H1**
ISO 5599-1 Size 2	**H2**
ISO 5599-1 Size 3	**H3**

5599 -1 Engineering Level	
C	**Current**

5599-1 Central Connector Wiring Options	
C	**Chrysler**
F*	**SAE / Ford, ISO 20401**
G	General Motors

* Complies to ISO 20401 with Enclosure Lead Length "2".

5599-1 Operator / Function	
Single Solenoid, 2-Position - Air Return	**1**
Double Solenoid, 2-Position	**2**
Double Solenoid, 3-Position - APB	**5**
Double Solenoid, 3-Position - CE	**6**
Double Solenoid, 3-Position - PC	7
Single Solenoid, 2-Position - Air Return, Spring Assist	**E**

5599-1 Mounting	
Valve Less Base	**WX**

5599-1 Pilot Source / Pilot Exhaust	
Internal Pilot, Port #1 / Vented	**B**
External Pilot #12 or #14 Port / Vented	X*

* Must be specified when using Sandwich Regulators.

5599-1 Overrides / Lights	
Non-Locking, Flush, Push - w/ Light	**G**
Locking, Flush, Push / Turn - w/ Light	H

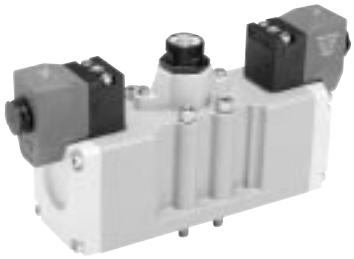
5599-1 Voltage & Frequency				
	AC		DC	Light & Surge Suppression
	60Hz	50Hz		
B9*			**24**	**LED & Suppression**
23	**120**	**115**		**LED & Suppression**

* Solenoid is Blue color.

5599-1 Enclosure / Lead Length	
1*	3-Pin, Mini Straight Connector
2†	**4-Pin, M12 Micro Straight Connector**
3	5-Pin, Mini Automotive Straight Connector

* Operator Function "1" or "E"

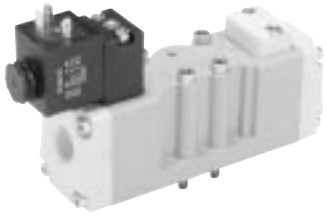
† Voltage Code "B9" Only.

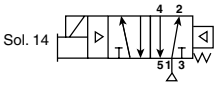


Parker Hannifin Corporation
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics

Non Plug-in, 5599-1, CNOMO - Size 1, 2, & 3

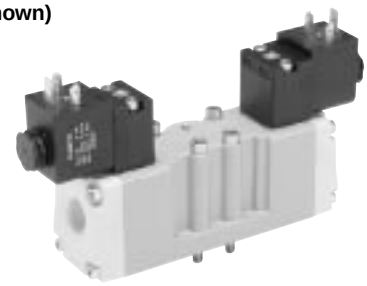
Single Solenoid
2-Position, Spring / Air Return
(H1 Series Shown)

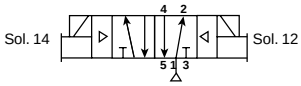




H1	**H1EWXBBL53C**	120VAC	1.5 Cv
	H1EWXBBL49C	24VDC	
H2	**H2EWXBBL53C**	120VAC	3.0 Cv
	H2EWXBBL49C	24VDC	
H3	**H3EWXBBL53C**	120VAC	6.0 Cv
	H3EWXBBL49C	24VDC	

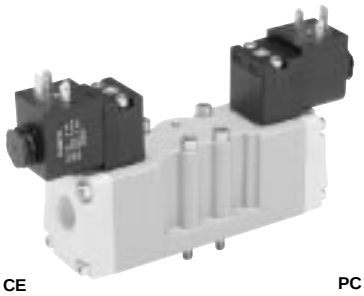
Double Solenoid
2-Position
(H1 Series Shown)

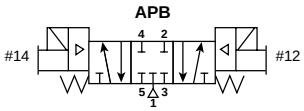


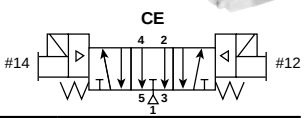


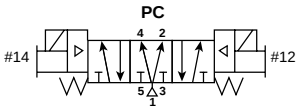
H1	**H12WXBBL53C**	120VAC	1.5 Cv
	H12WXBBL49C	24VDC	
H2	**H22WXBBL53C**	120VAC	3.0 Cv
	H22WXBBL49C	24VDC	
H3	**H32WXBBL53C**	120VAC	6.0 Cv
	H32WXBBL49C	24VDC	

Double Solenoid
3-Position APB
3-Position CE
3-Position PC
(H1 Series Shown)









APB			
H1	**H15WXBBL53C**	120VAC	1.2 Cv
	H15WXBBL49C	24VDC	
H2	**H25WXBBL53C**	120VAC	2.8 Cv
	H25WXBBL49C	24VDC	
H3	**H35WXBBL53C**	120VAC	5.0 Cv
	H35WXBBL49C	24VDC	
CE			
H1	**H16WXBBL53C**	120VAC	1.2 Cv
	H16WXBBL49C	24VDC	
H2	**H26WXBBL53C**	120VAC	2.8 Cv
	H26WXBBL49C	24VDC	
H3	**H36WXBBL53C**	120VAC	5.0 Cv
	H36WXBBL49C	24VDC	

PC			
H1	**H17WXBBL53C**	120VAC	1.2 Cv
	H17WXBBL49C	24VDC	
H2	**H27WXBBL53C**	120VAC	2.8 Cv
	H27WXBBL49C	24VDC	
H3	**H37WXBBL53C**	120VAC	5.0 Cv
	H37WXBBL49C	24VDC	

Non Plug-in, 5599-1, CNOMO - Size 1, 2, & 3

BOLD OPTIONS ARE MOST POPULAR.

H1	E	WX	B	B	L	53	–	C

Basic Series 5599-1	
ISO 5599-1 Size 1	**H1**
ISO 5599-1 Size 2	**H2**
ISO 5599-1 Size 3	**H3**

5599-1 Engineering Level	
C	**Current**

5599-1 Automotive Wiring Options	
Blank	**None**
000F*	SAE / Ford

* Required with Enclosure "6" Only.

5599-1 Operator / Function	
Single Solenoid, 2-Position - Air Return	**1**
Double Solenoid, 2-Position	**2**
Single Remote Pilot, 2-Position - Air Return	3*§
Double Remote Pilot, 2-Position	4*§
Double Solenoid, 3-Position - APB	**5**
Double Solenoid, 3-Position - CE	**6**
Double Solenoid, 3-Position - PC	7
Double Remote Pilot, 3-Position - APB	8*§
Double Remote Pilot, 3-Position - CE	9*§
Double Remote Pilot, 3-Position - PC	0*§
Single Solenoid, 2-Position - Air Return, Spring Assist	**E**
Single Remote Pilot, 2-Position - Air Return, Spring Assist	F*§

* Only Available with Pilot Source / Pilot Exhaust "0".
§ Must Order Remote Pilot Access Plates for Manifolds.

5599-1 Voltage & Frequency			
	AC		DC
	60Hz	50Hz	
19*			24
42	24		
45			12
49			**24**
53	**120**	**115**	
57	240		
XX	Remote Pilot		

* LED & Surge Suppression.
Only Available with Enclosure "6".

5599-1 Mounting	
Valve Less Base	**WX**

5599-1 Pilot Source / Pilot Exhaust	
None, Remote Pilot Valve	0*
Internal Pilot, Port #1 / Vented	**B**
External Pilot #12 or #14 Port / Vented	X*

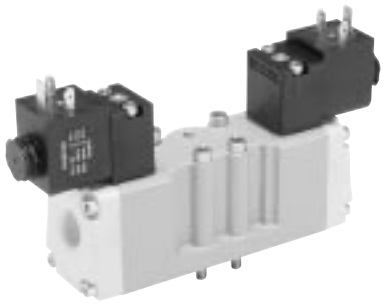
* Must be specified when using Sandwich Regulators.

5599-1 Enclosure / Lead Length	
0	None, Remote Pilot Valve
6*	2-Pin, M12 EURO Connector with CNOMO Operator
L	**3-Pin, 30mm DIN 43650A with CNOMO Connector**
N†	None, Valve Less Coil

* Only available with Voltage / Wiring "19000FC".
† Must use Override / Light Option "B" or "C".

5599-1 Overrides / Lights	
None, Remote Pilot Valve	0
Non-Locking, Flush, Push - w/o Light	**B**
Locking, Flush, Push / Turn - w/o Light	C
Non-Locking, Flush, Push - w/ Light	**G***
Locking, Flush, Push / Turn - w/ Light	H*

* Apply to Voltage Code "19" & Enclosure / Lead Length "6".



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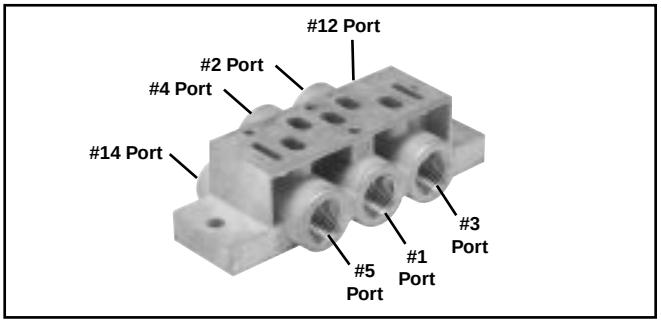
Non Plug-in, 15407-1, Size 18mm & 26mm Manifold / Subbase Kits

Individual Subbase Kit
with Side Ports

Size	Port Size	Kit Number	
		NPT	BSPP "G"
HB	1/8"	**PL02-01-80**	PL02-01-70
HA	1/4"	**PL01-02-80**	PL01-02-70

Note: Can be used for external, single, or double remote pilot.



Two Station Manifold Base
with Side Ports

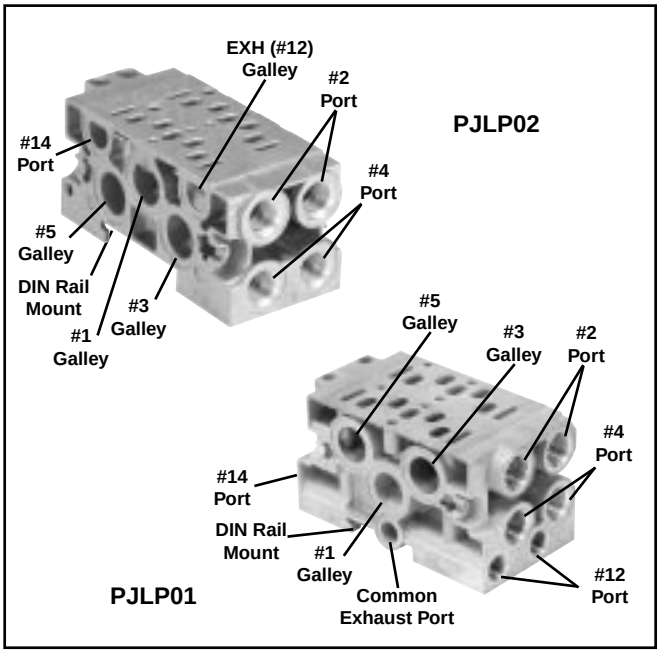
Size	Port Size	Kit Number	
		NPT	BSPP "G"
HB	1/8"	**PJLP02-201-80***	PJLP02-201-70*
HA	1/4"	**PJLP01-202-80***	PJLP01-202-70*

***** Can be used for external pilot, not remote pilot.
Note: Gaskets and assembly hardware included.

Two Station Manifold Base
with Side Ports

Size	Port Size	Kit Number	
		NPT	BSPP "G"
HA	1/4"	**PJL01-202-80***	PJL01-202-70*

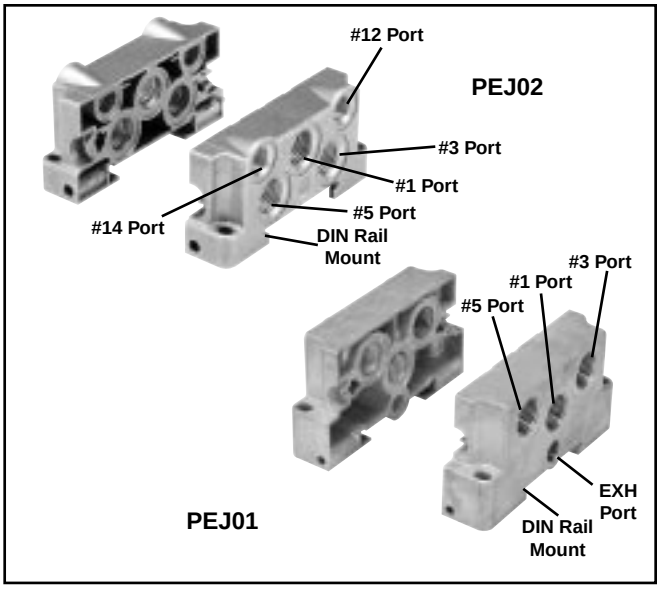
***** Can be used for single and double remote pilot and external pilot using the #14 Port.
Note: Gaskets and assembly hardware included.



End Plate Kit
for Side Ported Two Station Manifold Base

Size	Port Size	Kit Number	
		NPT	BSPP "G"
HB	1/4"	**PEJ02-02-80***	PEJ02-02-70*
HA	3/8"	**PEJ01-03-80†**	PEJ01-03-70†

***** Use with PJLP02.....
† Use with PJLP01 or PJL01.....



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Non Plug-in, 15407-1 & 5599-1 Manifold / Subbase Kits

BOLD OPTIONS ARE MOST POPULAR.

PS5511 13 0 P

Basic Series	
ISO 15407-1 18mm, HB	**PS5611**
ISO 15407-1 26mm, HA	**PS5511**

Enclosures / Lead Length	
0	None, No Electrical Plug - 15407-1

Mounting Style / Port Size			
HB		**HA**	
Manifold with 1/8 NPT End Ports	**51**	**Subbase with 1/4 NPT Side Ports**	**13**
Manifold with 1/8 BSPP End Port	52*	Subbase with 1/4 BSPP Side Ports	14*
Manifold with 1/8 NPT Bottom / End Port	61	Subbase with 1/4 NPT Bottom / Side Port	23
Manifold with 1/8 BSPP Bottom / End Port	62*	Subbase with 1/4 BSPP Bottom / Side Port	24*
		Manifold with 1/4 NPT End Port	**53**
		Manifold with 1/4 BSPP End Port	54*
		Manifold with 1/4 NPT Bottom / End Port	63
		Manifold with 1/4 BSPP Bottom / End Port	64*

* BSPP Conforms to ISO 1179-1 w 228-1 Theads.

PS4011 55 0 C P

Basic Series	
H1	**PS4011**
H2	**PS4111**
H3	**PS4211**

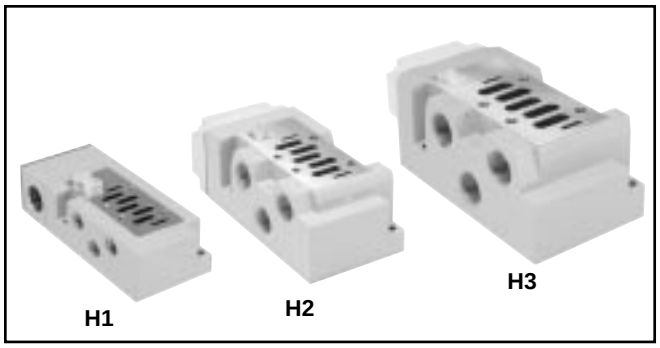
Enclosures / Lead Length	
0	**None, No Electrical Plug - 5599-1**

Mounting Base Style / Port Size					
H1 Series		**H2 Series**		**H3 Series**	
Subbase: 3/8 NPT Side Ports	**15**	**Subbase: 1/2 NPT Side Ports**	**17**	**Subbase: 3/4 NPT Side Ports**	**19**
Subbase: 3/8 BSPP Side Ports	16	Subbase: 1/2 BSPP Side Ports	18*	Subbase: 3/4 BSPP Side Port	10*
Manifold: 1/4 NPT End Ports	53	Subbase: 1/2 NPT Bottom / End Port	27	Subbase: 3/4 NPT Bottom / End Port	29
Manifold: 1/4 BSPP End Ports	54*	Subbase: 1/2 BSPP Bottom / End Port	28*	Subbase: 3/4 BSPP Bottom / End Port	20*
Manifold: 3/8 NPT End Ports	**55**	Manifold: 3/8 NPT End Ports	55	Manifold: 1/2 NPT End Port	57
Manifold: 3/8 BSPP End Ports	56*	Manifold: 3/8 BSPP End Ports	56*	Manifold: 1/2 BSPP End Ports	58*
Manifold: 3/8 NPT Bottom / End Port	65†	**Manifold: 1/2 NPT End Port**	**57**	**Manifold: 3/4 NPT End Port**	**59**
Manifold: 3/8 BSPP Bottom / End Port	66*†	Manifold: 1/2 BSPP End Ports	58*	Manifold: 3/4 BSPP End Port	50
		Manifold: 1/2 NPT Bottom / End Port	67	Manifold: 3/4 NPT Bottom / End Port	69
		Manifold: 1/2 BSPP Bottom / End Port	68*	Manifold: 3/4 NPT Bottom / End Port	60*

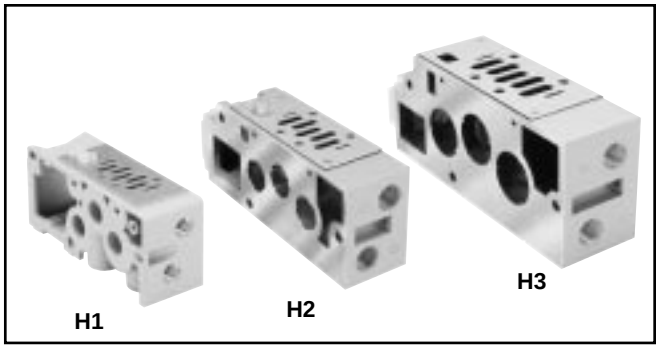
* * BSPP Conforms to ISO 1179-1 w 228-1 Theads.

† #1 Bottom Port - 1/4".

Subbase Kits



Manifold Kits



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Non Plug-in, 5599-1, VDMA - Size 1, 2, & 3 Manifold / Subbase Kits

Manifold VDMA – Form C Bottom Port

Size	Port Size	Kit Number
		BSPP "G"
H1	1/4"	P2N-VM512MB
H2	3/8"	P2N-WM513MB
H3	1/2"	P2N-YM514MB

VDMA End Plates – Form D

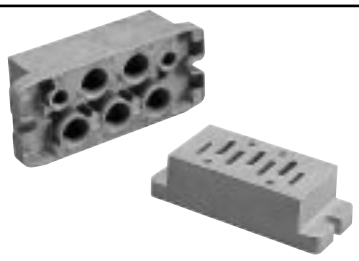
Size	Port Size	Kit Number
		BSPP "G"
H1	3/8"	P2N-VM513ES
H2	1/2"	P2N-WM514ES
H3	1"	P2N-YM518ES

Subbase – Side Ports (5599-1 & VDMA)

Size	Port Size	5599-1 Kit Number		VDMA Kit
		NPT	BSPP "G"	BSPP "G"
H1	1/4"	**PL1-1/4-80**	PL1-1/4-70	P2N-VS512SD
H2	3/8"	**PL2-3/8-80**	PL2-3/8-70	P2N-WS513SD
H3	1/2"	PL3-1/2-80	PL3-1/2-70	P2N-YS514SD

Subbase – Bottom Ports

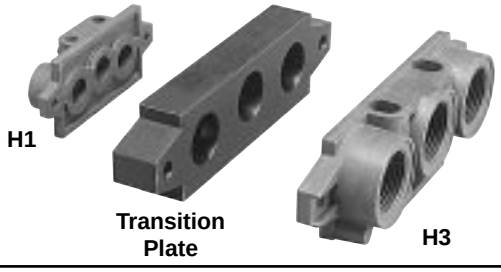
Size	Port Size	5599-1 Kit Number	
		NPT	BSPP "G"
H1	1/4"	PD1-1/4-80	PD1-1/4-70
H2	3/8"	PD2-3/8-80	PD2-3/8-70



VDMA Transition Plate

Kit Number
P2N-VM500AK

Kit includes: Transition Plate Only. Order P2N-VM513ES and P2N-YM518ES Separately to Assemble Add-A-Fold



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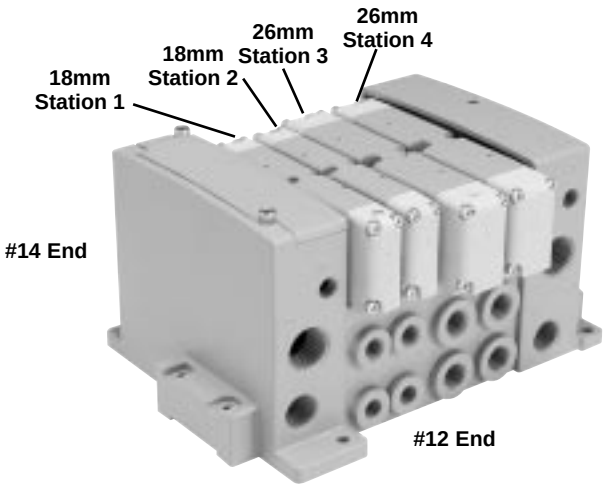
How To Order Non-Plug-In Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold.
   The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)



Example:
4-Station Manifold with (2) 18mm and (2) 26mm Valves On Manifold Bases

K

Add-A-Fold Assembly Model Number

AA HB S 0 04 –

Valve Series	
Right & Left End Plate 15407-1 (Non Plug-In, HA 26mm)	01†
Right & Left End Plate 15407-1 (Non Plug-In, HB 18mm)	02†
Right & Left End Plate 15407-1 (HB 18mm & HA 26mm)	HB*

* Common End Plates for HA & HB.
† Must be used with End Plate Type "U".

End Plate Type	
HB - Non-Collective Wiring	S
01 & 02 Non-Collective Wiring	U*

* Must be used with Valve Series 02 & 01.

Thread Type	
0	NPT
1*	BSPP "G"

* BSPP Conforms to ISO 1179-1 w 228-1 Theads for End Plate Type "S".

Number of Stations*
02
04
•
24
•
32†

* Must be ordered in multiples of (2).
† Maximum Number

Transition Plate	
Blank	No Transition Plate
B*	HB / HA to H2

* Not Available with End Plate Type "U".

Example

Application requires a 4-Station manifold with a regulator on Station 2. (Two 18mm + Two 26mm Stations)

Item	Qty.	Part No.	Location
01	1	AAHBS004	
02	1	HB1VXBG0G9A	Station 1
03	1	HB2VXLG0G9A	Station 2
04	1	PS5638166P	Station 2
05	1	PS561151MP	Station 1 & 2
06	2	HA1VXBG0G9A	Station 3 & 4
07	1	PS551151MP	Station 3 & 4

NOTE: Construct manifold assemblies from left to right while looking at the ports. Valves must be ordered as External Pilot when using Sandwich Regulator.

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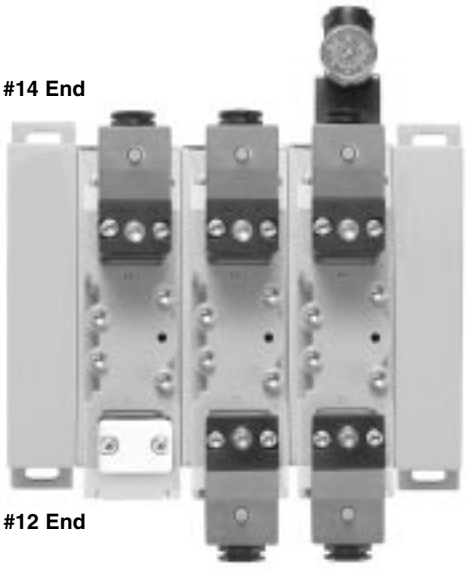
How To Order Non-Plug-In Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)



Example:
3-Station Manifold with (3) H1 Valves On Manifold Bases and Regulator at Station 3

K

Add-A-Fold Assembly Model Number

AA	H1	S	0	03	–

Valve Series

Right & Left End Plate	H1

End Plate Type

Standard - Non-Collective Wiring	S
VDMA 5599-1	V

Transition Plate

Blank	No Transition Plate
C*	H1 to H2
D	H1 to H3

* Not Available with Type "V".

Number of Stations*

01
02
03
04
•
•
21

Thread Type

0	NPT
1*	BSPP "G"

* BSPP Conforms to ISO 1179-1 w 228-1 Theads.

Example

Application requires a 3-Station manifold with a valve, regulator on Station 3.

Item	Qty.	Part No.	Location
01	1	AAH1S003	
02	1	H11VXBG0B9C	Station 1
03	1	PS401155MCP	Station 1
04	1	H12VXBG0B9C	Station 2
05	1	PS401155MCP	Station 2
06	1	H12VXXG0B9C	Station 3
07	1	PS4038166CP	Station 3
08	1	PS401155MCP	Station 3

NOTE:
Construct manifold assemblies from left to right while looking at the cylinder ports.

Valves must be ordered as External Pilot when using Sandwich Regulator.

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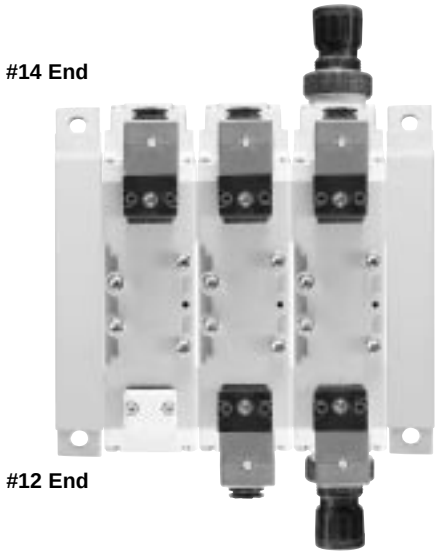
How To Order Non-Plug-In Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)



Example:
3-Station Manifold with (3) H2 Valves
On Manifold Bases
and Regulator at Station 3

K

Add-A-Fold Assembly Model Number

AA	H2	S	0	03	–

Valve Series

Right & Left End Plate	H2
Right & Left End Plate	H3

End Plate Type

Standard - Non-Collective Wiring	S
VDMA 5599-1	V

Thread Type

0	NPT
1*	BSPP "G"

* BSPP Conforms to ISO 1179-1 w 228-1 Theads.

Number of Stations*

01
02
03
04
•
•
21

Transition Plate

Blank	No Transition Plate
E*	H2 to H3

* Use Largest Size (H3) Number. Not Available with Type "V".

Example

Application requires a 3-Station manifold with a valve and regulator on Station 2.

Item	Qty.	Part No.	Location
01	1	AAH2S003	
02	1	H21VXBG0B9C	Station 1
03	1	PS411157MCP	Station 1
04	1	H22VXBG0B9C	Station 2
05	1	PS401157MCP	Station 2
06	1	H22VXXG0B9C	Station 3
07	1	PS4138166CP	Station 3
08	1	PS401157MCP	Station 3

NOTE: Construct manifold assemblies from left to right while looking at the cylinder ports.
Valves must be ordered as External Pilot when using Sandwich Regulator.

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15407-1, Non-Plug-in End Plate Kits

BOLD OPTIONS ARE MOST POPULAR.

HB HA

PS56 31 01 0 P

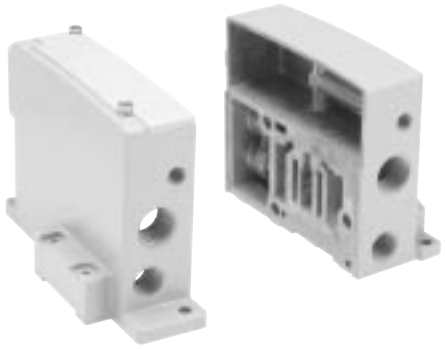
Basic Series	
ISO 15407, Size HB, 18mm & HA, 26mm	PS56

End Plate Kit Type	
End Plate, Non-Collective Wiring	31

Thread Type	
0	NPT
1*	BSPP "G"

* BSPP Conforms to ISO 1179-1 w 228-1 Theads.

Options	
01	Non-Collective Wiring



HB - HA Non-Collective Wiring End Plates

K

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5599-1 Non-Plug-in End Plate Kits

BOLD OPTIONS ARE MOST POPULAR.

H1 H2 H3

PS40	31	01	0	C	P

Basic Series	
ISO 5599, Size 1	PS40
ISO 5599, Size 2	PS41
ISO 5599, Size 3	PS42

End Plate Kit Type	
End Plate, Non-Collective Wiring	31

Options	
01	Non-Collective Wiring

Thread Type	
0	NPT
1*	BSPP "G"

* BSPP Conforms to ISO 1179-1 w 228-1 Theads.

Engineering Level	
C	Current

K

H1 Non-Collective Wiring End Plates

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15407-1 & 5599-1 Plug-in Transition Plate Kits

BOLD OPTIONS ARE MOST POPULAR.

HA H1 H2 H3

PS40 26 01 0 C P

Basic Series
PS40
PS56

Transition Plate Type	
HA / HB to H2	24*
H1 to H2 to H3	25
H1 to H3	26
H1 to H2	27
H2 to H3	28

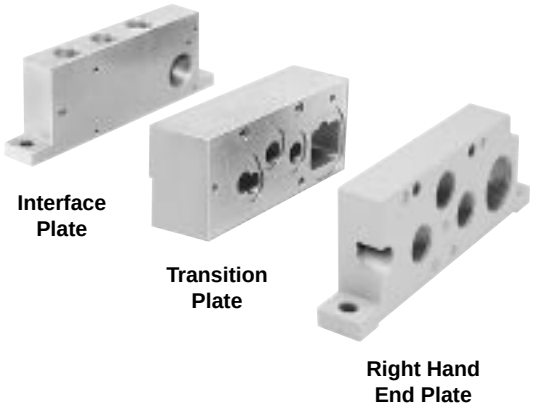
* Used Only with Basic Series PS56.

Options	
01	Non-Collective Wiring

Thread Type	
0	NPT
1*	BSPP "G"

* BSPP Conforms to ISO 1179-1 w 228-1 Theads.

Engineering Level	
Blank	Basic Series PS56
C	Basic Series PS40



H1 to H2 Shown

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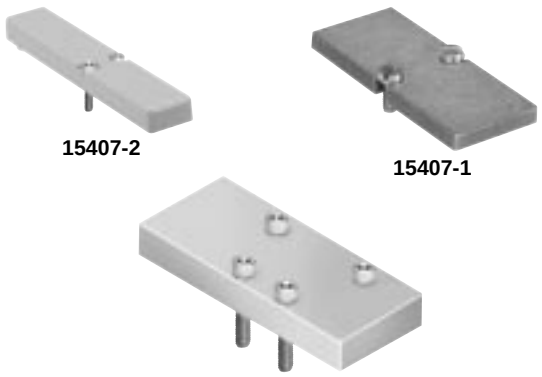
Blanking Plate Kits

Size	Kit Number			
	15407-2	15407-1	5599-2 / 5599-1	VDMA
HB	PS5634P	DX02BLK	—	—
HA	PS5534P	DX01BLK	—	—
H1	—	—	PS4034CP	P2N-AA5B
H2	—	—	PS4134CP	P2N-BA5B
H3	—	—	PS4234CP	P2N-CA5B

Kit includes: Blanking Plate, Gasket, and Mounting Bolts.



Manifold Port Isolation Kits

Main Galley (1, 3, 5)

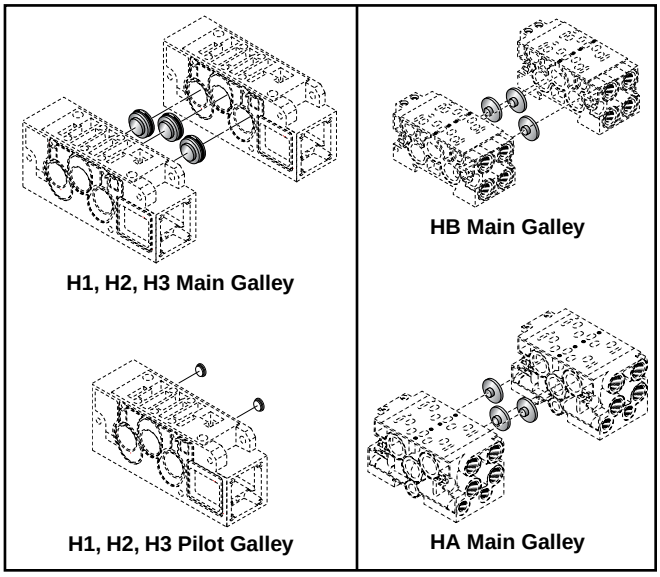
Size	Kit Number	VDMA
HB	D02BD0	—
HA	D01BD0	—
H1	PS4032CP	P2N-VK0P
H2	PS4132CP	P2N-WK0P
H3	PS4232CP	—

Kit includes: Plugs with O-rings.

Pilot Galley

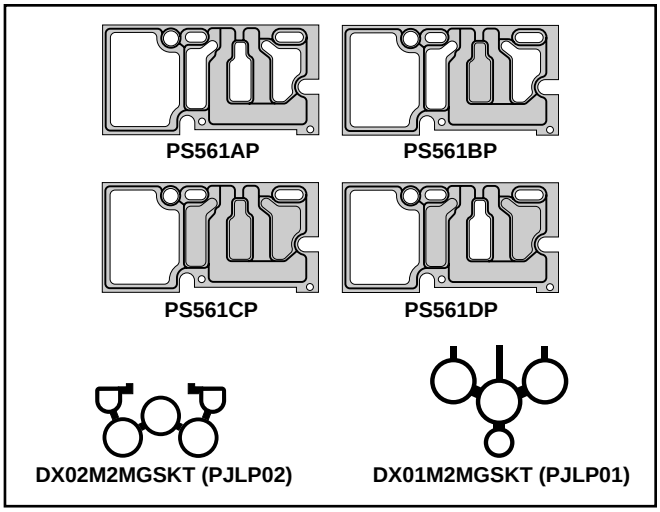
Size	Kit Number
H1 H2 H3	PS4033CP

Kit includes: Plugs with O-rings.



Manifold to Manifold Gasket Kits

15407-2				
Size	Standard	Blocked #1 Port	Blocked #1, 3, 5 Ports	Blocked #3, 5 Ports
HB HA	PS561AP	PS561BP	PS561CP	PS561DP
15407-1				
HB	DX02M2MGSKT (PJLP02)			
HA	DX01M2MGSKT (PJLP01)			
H1	PS4013P	—	—	—
H2	PS4113P	—	—	—
H3	PS4213P	—	—	—



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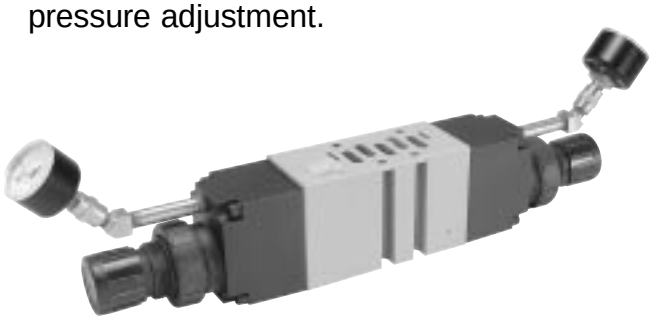
Sandwich Regulators Features

- Remote Air Pilot Operated for hard-to-reach pressure control.
- Unregulated Pilot Pressure to valve for consistent valve shifting regardless of pressure adjustment.

H1 - Size 1
(Independent Dual Port Regulator Shown)



H2 - Size 2
(Independent Dual Port Regulator Shown)

HB - 18mm
(Independent Dual Port Regulator Shown)

HA - 26mm
(Common Port Regulator Shown)

K

Gauge Adapter Kit

Included with all HB Regulators. Both kits are required on all HA & HB Regulators when the Regulator is on the last Station on the Right (14) End.

Description	Part Number
Gauge Kit	PS5651160P
1/8" Female to 1/8" Female Coupling	207P-2*
1/8" Male to 1/8" Male Long Nipple	VS215PNL-2-15*

* Included in Gauge Kit PS5651160P

Sandwich Regulator Cv Flow Chart*

	Common Pressure Code 166				Single Pressure 2 Code 266				Single Pressure 4 Code 260				Dual Pressure Code 266			
	1-2	1-4	2-3	4-5	1-2	1-4	2-3	4-5*	1-2	1-4	2-3	4-5*	1-2	1-4	2-3	4-5*
HB	0.20	0.20	0.41	0.34	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.23	0.19	0.28	0.27
HA	0.41	0.43	0.87	0.89	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.42	0.45	0.68	0.66
H1	0.62	0.61	1.28	1.18	0.73	0.96	0.96	0.93	0.34	0.70	0.94	0.98	0.52	0.48	0.86	0.88
H2	1.47	1.60	2.41	2.33	1.71	1.90	1.52	1.75	1.74	1.67	1.73	1.79	1.61	1.62	1.50	1.67
H3	2.37	2.39	4.30	4.47	2.37	2.81	2.75	3.01	2.65	2.59	2.68	2.74	2.43	2.41	3.16	3.04

* Regulator Port exhaust through Base Port 3.
Note: All Cv's calculated with regulator adjusted full open.

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BOLD OPTIONS ARE MOST POPULAR

PS5637 1 6 6 P

Basic Series	
HB	
15407-1, 18mm	**PS5637**
15407-2, 18mm	**PS5638**
HA	
15407-1, 26mm	**PS5537**
15407-2, 26mm	**PS5538**

Regulator Function	
Common Pressure Regulator	**1**
Independent Pressure Regulator	**2**

	#2 Port Regulator / Gauge*
2	2-60 PSIG w/o Gauge
3	5-125 PSIG w/o Gauge
5	2-60 PSIG w/Gauge
6	**5-125 PSIG w/Gauge**

* For Common Pressure Regulator Option, Regulator Gauge callout must be the same number for both Port #4 and Port #2. (Example: 166)

	#4 Port Regulator / Gauge*
2	2-60 PSIG w/o Gauge
3	5-125 PSIG w/o Gauge
5	2-60 PSIG w/Gauge
6	**5-125 PSIG w/Gauge**

* For Common Pressure Regulator Option, Regulator Gauge callout must be the same number for both Port #4 and Port #2. (Example: 166)

PS4037 1 6 6 C P

Basic Series	
H1	
5599-1	**PS4037**
5599-2	**PS4038**
H2	
5599-1	**PS4137**
5599-2	**PS4138**
H3	
5599-1	**PS4237**
5599-2	**PS4238**

Regulator Function	
Common Pressure Regulator	**1**
Independent Pressure Regulator	**2**
Selector Regulator	3

	#2 Port Regulator / Gauge*
0**	**Line By-Pass Plate**
1	1-30 PSIG w/o Gauge
2	2-60 PSIG w/o Gauge
3	5-125 PSIG w/o Gauge
4	1-30 PSIG w/Gauge
5	2-60 PSIG w/Gauge
6	**5-125 PSIG w/Gauge**
C	Air Pilot w/60 PSIG Gauge
D	Air Pilot w/160 PSIG Gauge

* For Common Pressure Regulator Option, Regulator Gauge callout must be the same number for both Port #4 and Port #2. (Example: 166)

** Pressure Line By-Pass Option can only be used with Independent and Selector Regulators (Option 2 & 3 in Sandwich Block Function).

	#4 Port Regulator / Gauge*
0**	**Line By-Pass Plate**
1	1-30 PSIG w/o Gauge
2	2-60 PSIG w/o Gauge
3	5-125 PSIG w/o Gauge
4	1-30 PSIG w/Gauge
5	2-60 PSIG w/Gauge
6	**5-125 PSIG w/Gauge**
C	Air Pilot w/60 PSIG Gauge
D	Air Pilot w/160 PSIG Gauge

* For Common Pressure Regulator Option, Regulator Gauge callout must be the same number for both Port #4 and Port #2. (Example: 166)

** Pressure Line By-Pass Option can only be used with Independent and Selector Regulators (Option 2 & 3 in Sandwich Block Function).

Ordering Components
- *Manifold or Subbase Kit required.*
- *Sandwich Regulator Kit configured for Internal Pilot as standard.*
- *Order valve as External Pilot.*

How to Configure Sandwich Regulator / Valve Combinations

Internal Pilot Configuration -
Pressure in Base Port 1 feeds regulator configured for Internal Pilot which feeds valve configured for External Pilot.

External Pilot Configuration - H1, H2, H3
An External Pilot pressure in Port 12 or 14 of the base feeds thru the Sandwich Regulator 12 or 14 galley directly to the 12/14 pilot of the valve. This configuration takes an External Pilot from the 12 port of the base and passes it thru the regulator to feed the 12 galley of the valve.

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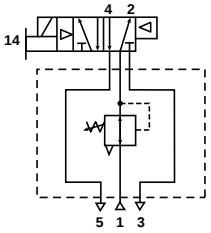
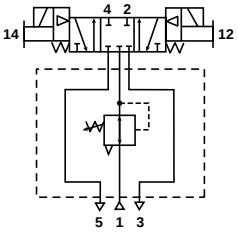
HB & HA Common Port Regulation

Provides adjustable regulated air pressure to the valve's #1 port which gives the same pressure to both the #2 and #4 port of the manifold or subbase. The regulator is always on the 14 end of the valve.

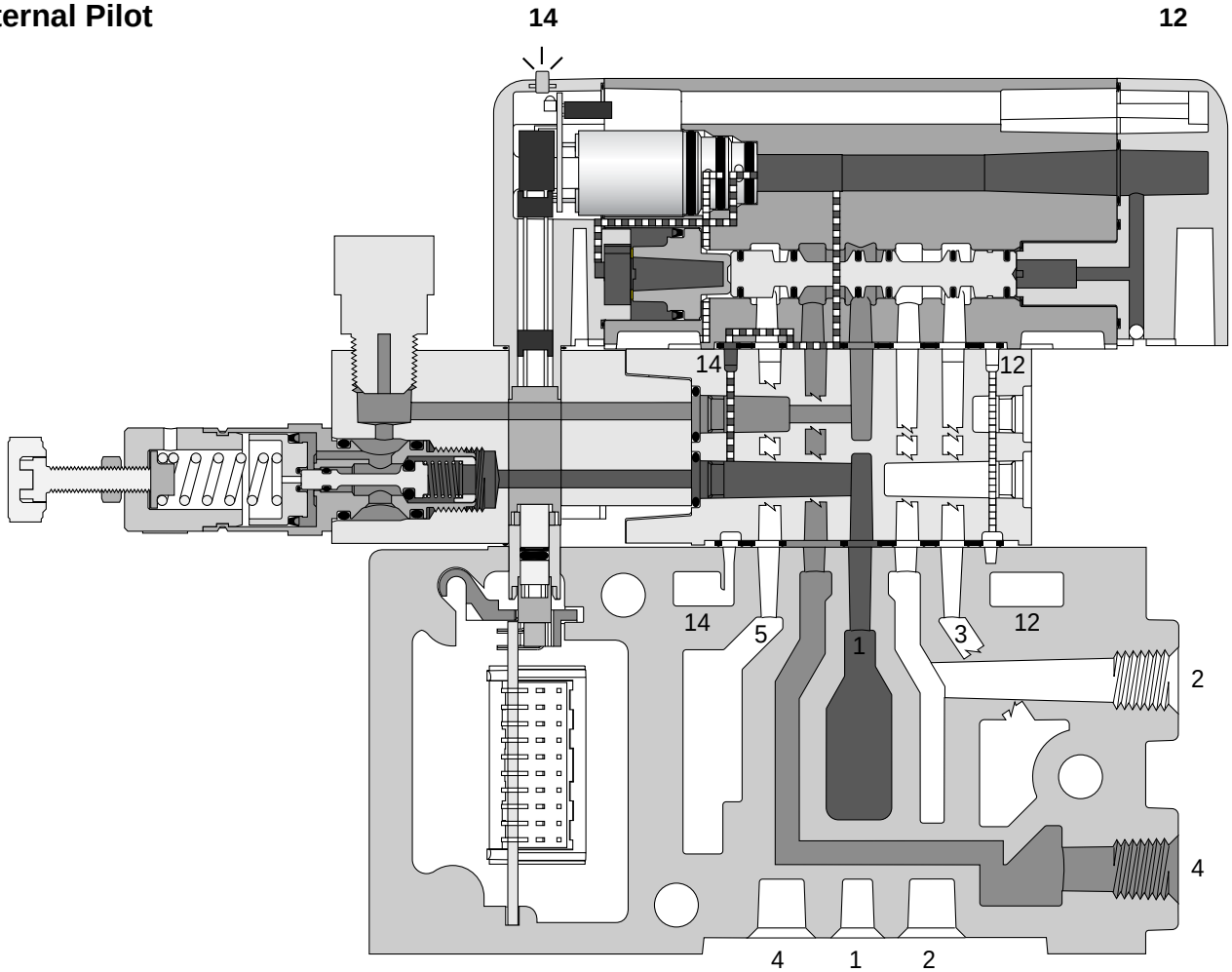
Common Port Regulator with 4-Way, 2-Position Single Solenoid Valve



Common Port Regulator with 4-Way, 3-Position APB Valve



HB Common Port Regulator Shown - Single Solenoid, 14 Energized, Internal Pilot



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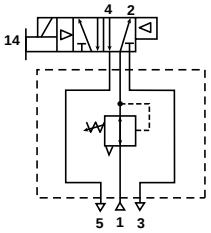
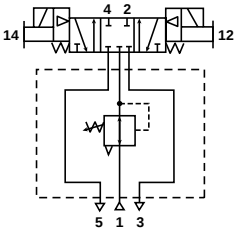
H1, H2, H3 Common Port Regulation

Provides adjustable regulated air pressure to the valve's #1 port which gives the same regulated pressure to both the #2 and #4 port of the manifold or subbase. The regulator is always on the 14 end of the valve.

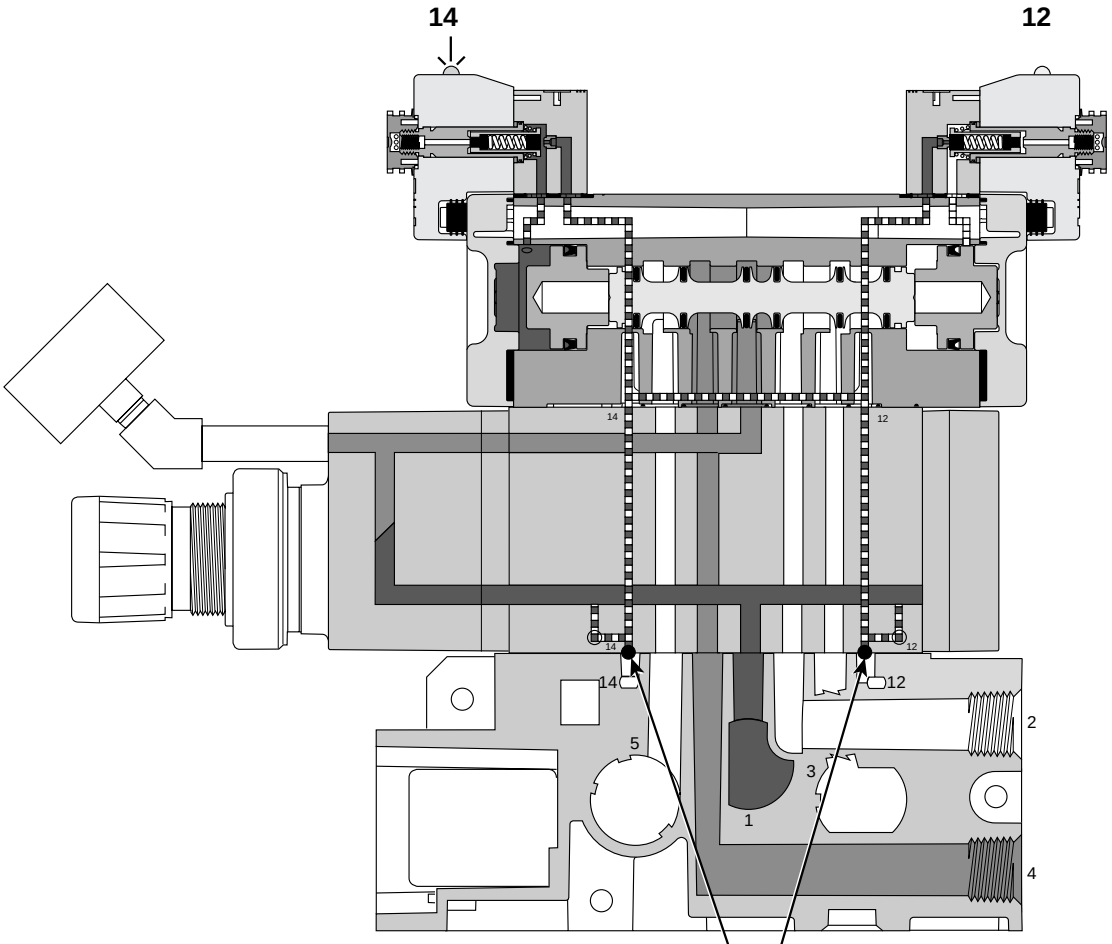
Common Port Regulator with 4-Way, 2-Position Single Solenoid Valve



Common Port Regulator with 4-Way, 3-Position APB Valve



H2 Common Port Regulator Shown - Double Solenoid, 14 Energized, Internal Pilot



Sandwich Regulator has standard configuration of Internal Pilot with the Pilot Plug in the bottom of the I & E Pilot Holes which prevents line pressure from escaping through the manifold.

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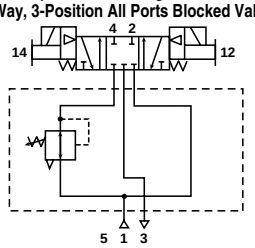
H1, H2, H3 Independent Port Regulation

Single Port Regulator

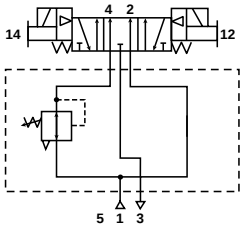
Provides regulated pressure to one of the ports and full line pressure to the other by use of the Line Pressure By-Pass Plate. Pressure regulation can occur out of the #4 port of the valve.

When using an Independent Pressure Sandwich Regulator, the cylinder outlet ports are reversed. The 12 end energizes the #4 port and the 14 end energizes the #2 port. The 3-Position CE and PC functions are also reversed. (See schematics on right.)

Independent Port Regulator with 4-Way, 3-Position All Ports Blocked Valve

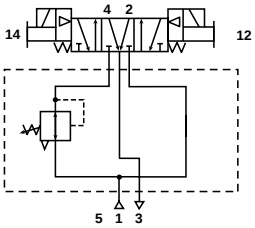


Independent Port Regulator with 4-Way, 3-Position, Inlet to Cylinder Function



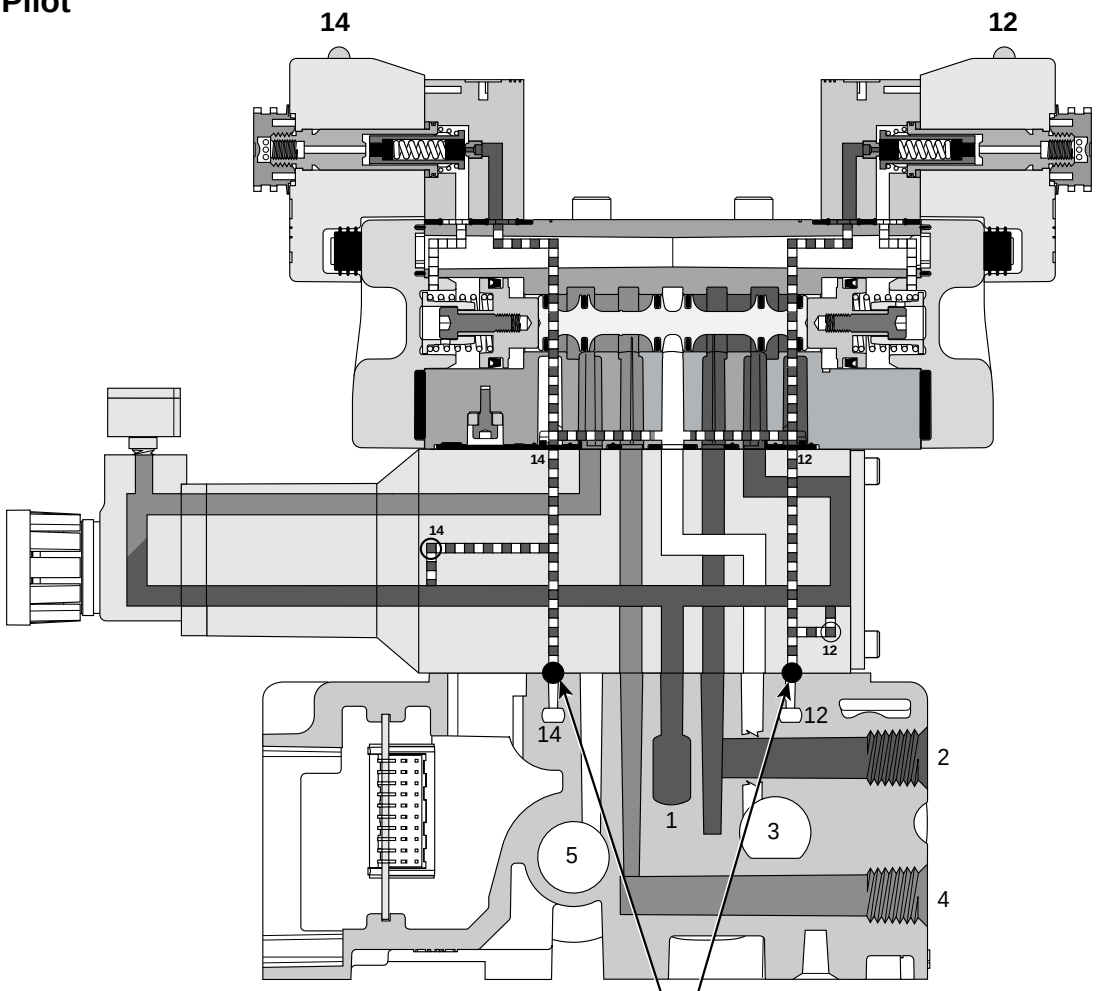
⚠CAUTION: Requires 4-Way, 3-Position, Cylinder to Exhaust Valve

Independent Port Regulator with 4-Way, 3-Position, Cylinder to Exhaust Function



⚠CAUTION: Requires 4-Way, 3-Position, Inlet to Cylinder Valve

H1 Independent Port Regulator Shown - Double Solenoid, De-energized, Internal Pilot



Sandwich Regulator has standard configuration of Internal Pilot with the Pilot Plug in the bottom #12 and #14 Pilot Hole which prevents line pressure from escaping through the manifold.

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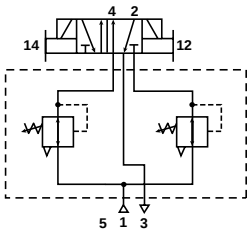
HB & HA Independent Dual Port Regulation

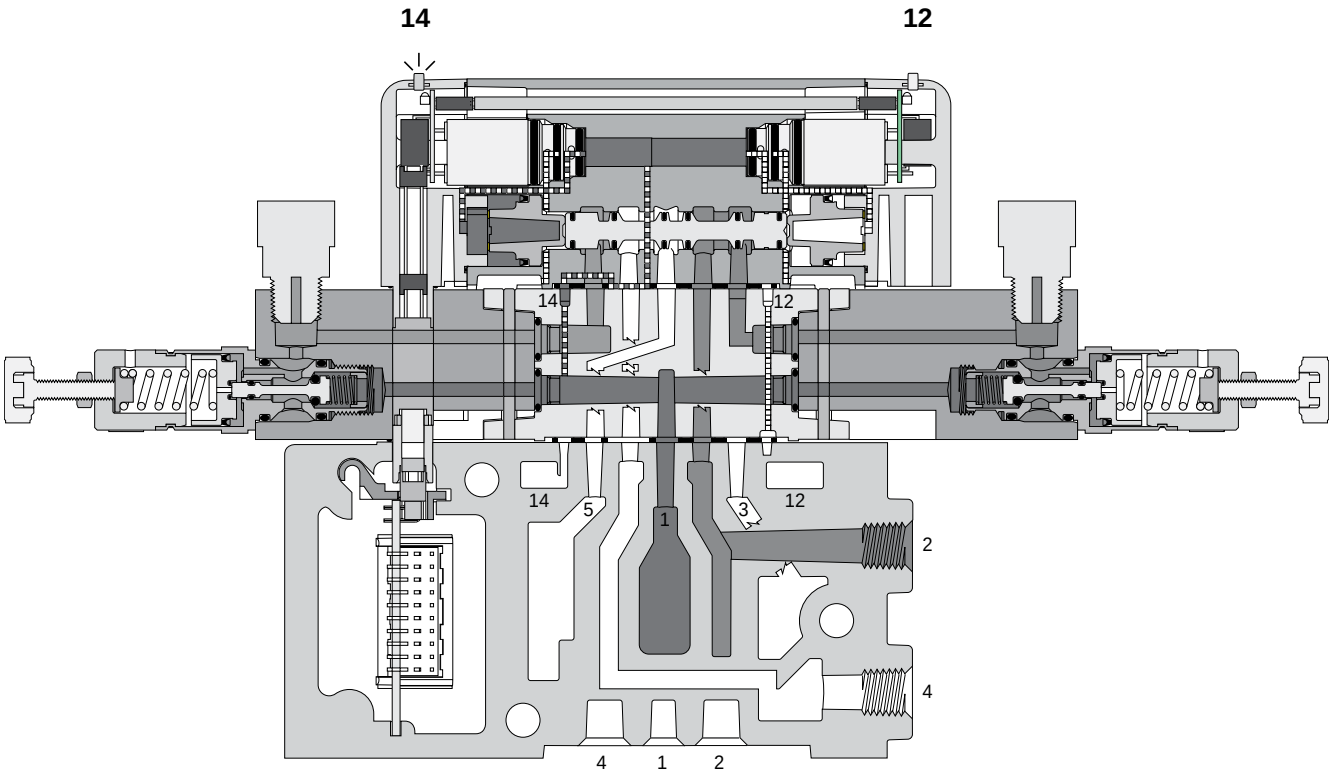
Dual Port Regulator

Provides regulated pressure to both ports. Pressure regulation can occur out of the #2 or #4 port of the valve.

Independent Dual Port Regulator with 4-Way, 2-Position Double Solenoid Valve



HB Independent Dual Port Regulator Shown - Double Solenoid, 14 Energized, Internal Pilot



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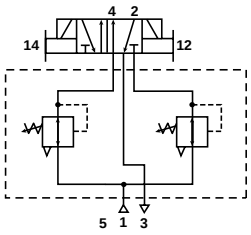
H1, H2, H3 Independent Dual Port Regulation

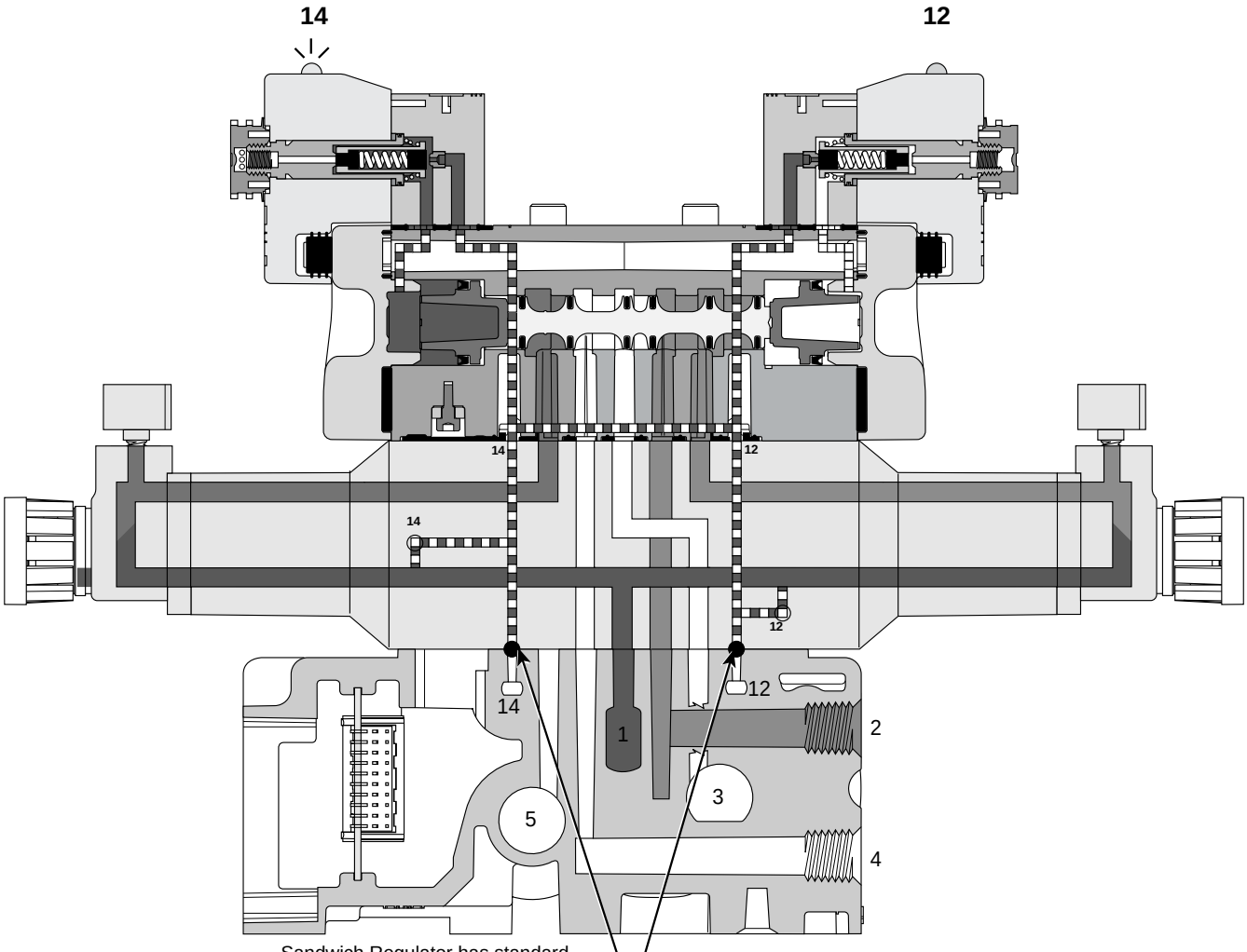
Dual Port Regulator

Provides regulated pressure to both ports. Pressure regulation can occur out of the #2 or #4 port of the valve.

Independent Dual Port Regulator with 4-Way, 2-Position Double Solenoid Valve



H1 Independent Dual Port Regulator Shown - Double Solenoid, 14 Energized, Internal Pilot



Sandwich Regulator has standard configuration of Internal Pilot with the Pilot Plug in the bottom #12 and #14 Pilot Hole which prevents line pressure from escaping through the manifold.

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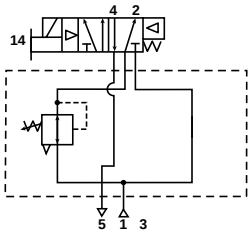
H1, H2, H3 Selector Regulation

Supplies two different pressures to the valve's #1 and #3 flow paths. Shifting the valve "selects" one or the other of these two pressures to flow out port #2. A Selector Regulator can: 1) Provide regulated pressure to one flow path and full line pressure to the other by use of the Line Pressure By-Pass Plate or 2) Provide regulated pressure to each of the flow paths. (Note: Port #4 is pressurized with air from #1 flow path when 14 end is energized. In many applications, port #4 in the manifold or subbase needs to be plugged.)

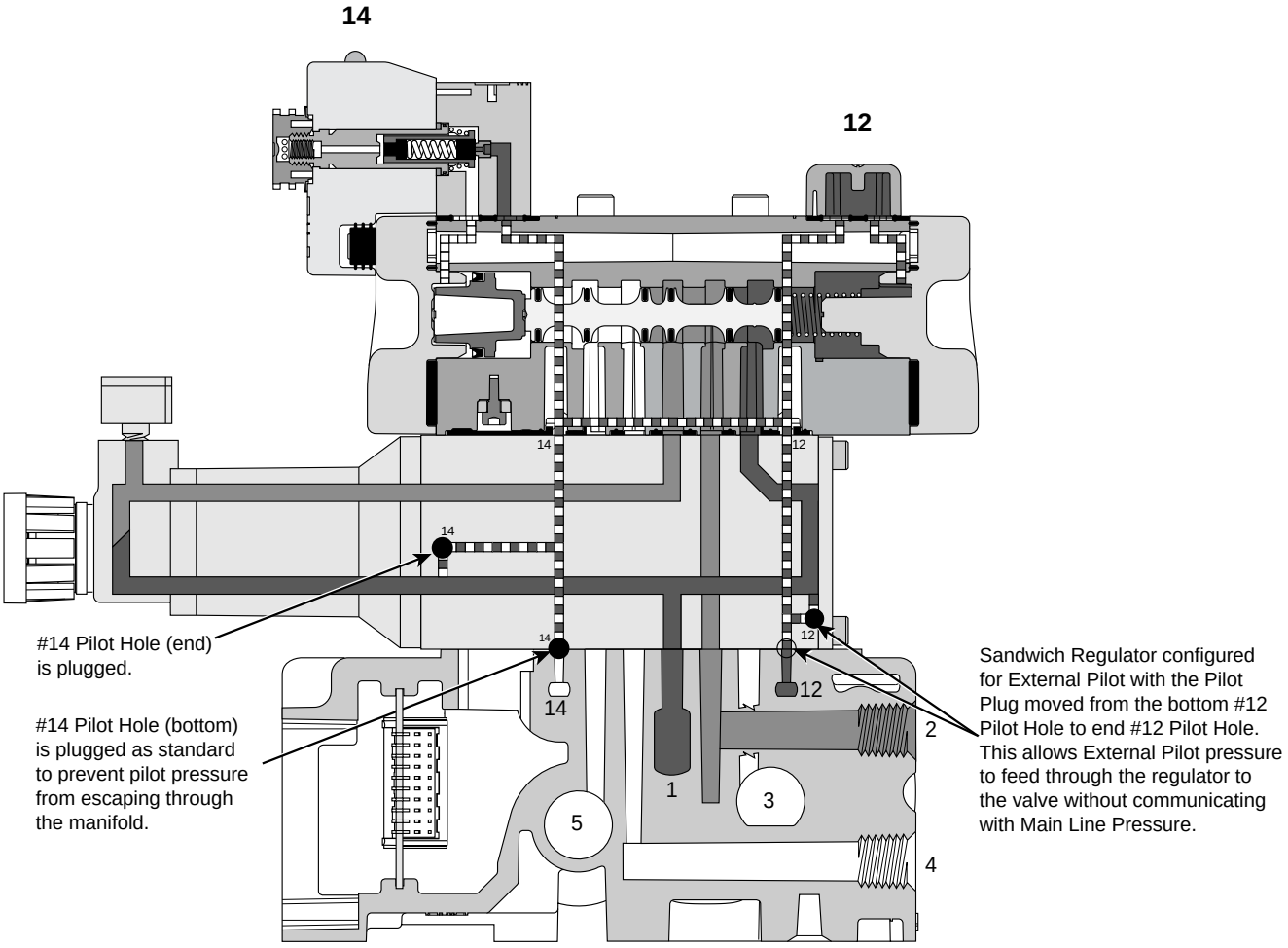
Selector Regulator with 4-Way, 2-Position Single Solenoid Valve



H1 H2 H3

H1, H2 & H3 with Selector Regulator utilizes Bottom / End Port Manifolds and requires external plumbing to accomplish the same function as the H1.

H1 Selector Regulator Shown - Single Solenoid, 14 De-energized, External Pilot



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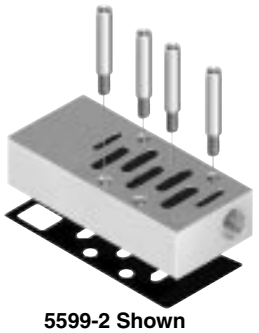
Remote Pilot Access Plate Kits

Size	Port Size	Kit Number	
		NPT	BSPP "G"
H1	1/8"	PS401500CP	PS401501CP
H2	1/8"	PS411500CP	PS411501CP
H3	1/8"	PS421500CP	PS421501CP

Kit includes: Pilot Port Access Plate, Gasket and Mounting Studs.



5599-2 Shown

H1 Auxiliary Access Plate Kits

Size	Port Size	Kit Number	
		NPT	BSPP "G"
H1	1/4" & 3/8"	PS403000CP	PS403001CP

Kit includes: Pilot Port Access Plate, Gasket and Mounting Screws.
- Used on H1 Manifolds to provide auxiliary access to Ports 1, 3 & 5.
- Port 1: 1/4", Ports 3 & 5: 3/8". Height: .72 Inch

K

Sandwich Supply & Exhaust Modules

Valve Size		NPT	BSPP "G"
HB	Supply	PS562600P	PS562601P
15407-1	Exhaust	PS562700P	PS562701P
HA	Supply	PS552600P	PS552601P
15407-1	Exhaust	PS552700P	PS552701P
HB	Supply	PS561600P	PS561601P
15407-2	Exhaust	PS561700P	PS561701P
HA	Supply	PS551600P	PS551601P
15407-2	Exhaust	PS551700P	PS551701P

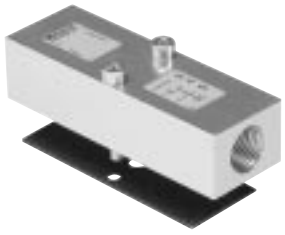
Quantity 1
- Used on HB & HA valves to provide a pressure or exhaust path to individual valves.

15407-2 Shown

Intermediate Air Supply Base 15407-1

Size	Port Size	Kit Number
		NPT
HB	1/8"	D02P-01-80
HA	1/4"	D01P-02-80

Kit includes: Gasket and Mounting Bolts.



D01P-02-80 Shown

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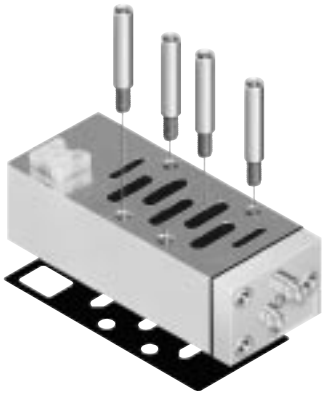
Features

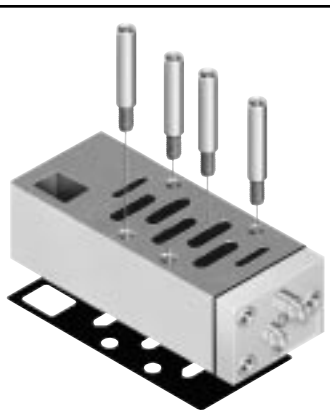
- Both adjustment screws are located on the 12 end of the unit.
- Sandwich Flow Control mounts with its own studs, which means the valve uses standard bolts for mounting.
- Sandwich Flow Control is not to be used as a shut off device and is not bubble tight when needles are fully turned down.

Plug-In
15407-2
18mm Shown

Valve Size	Plug-In 15407-2	Non Plug-In 15407-1
HB	PS5635P	PS5642P
HA	PS5535P	PS5542P
Valve Size	**Plug-In 5599-2**	**Non Plug-In 5599-1**
H1	PS4035CP	PS4042CP
H2	PS4135CP	PS4142CP
H3	PS4235CP	PS4242CP



Plug-In
5599-2
Size 2 Shown



Non Plug-In
5599-1
Size 2 Shown

A Sandwich Flow Control and Common Port Sandwich Regulator may be sandwiched together on a manifold or subbase. The Sandwich Flow Control MUST be located between the manifold/subbase and the Common Port Sandwich Regulator.

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Temperature Rating

HB	HA	H1	H2	H3
-15°C to 49°C (5°F to 120°F) Ambient.				

CSA / C-US

HB	HA	H1	H2	H3
Standard at - 1000kPa (145 PSIG)				

Response Time** (ms)

Valve Size	Port Size	0 Cu. In. Chamber		## Cu. In. Chamber	
		Fill	Exhaust	Fill	Exhaust
Single Solenoid 2-Position - Air Return / Spring Assist					
HB	1/8"	28	30	141	154
HA	1/4"	24	26	77	124
H1	3/8"	39	41	159	210
H2	1/2"	78	81	219	310
H3	3/4"	90	93	244	320

HB (12), HA (25), H1 (50), H2 (100), H3 (200)

** With 100 PSIG supply, time (ms) required to fill from 0 to 90 PSIG and Exhaust from 100 PSIG to 10 PSIG measured from the instant of energizing or de-energizing 24VDC solenoid.

Tested per ANSI / (NFPA) T3.21.8

Flow Rating (Cv)

Valve Size	Port Size	2-Position	3-Position
HB	1/8"	0.55	0.50
HA	1/4"	1.1	1.0
H1	3/8"	1.5	1.2
H2	1/2"	3.0	2.8
H3	3/4"	6.0	5.0

Cv tested per ANSI / (NFPA) T3.21.3

Minimum Operating Voltage

	HB	HA	H1	H2	H3
MOV (24VDC)	20.4	20.4	20.4	20.4	20.4
MOV (120VAC)	102	102	102	102	102

Operating Pressure

HB HA H1 H2 H3

Maximum: 145 PSIG (1000 kPa)
Minimum:

Operator / Function	Internal Pilot	PSIG (Min. kPa) HB	PSIG (Min. kPa) HA	PSIG (Min. kPa) H1	PSIG (Min. kPa) H2	PSIG (Min. kPa) H3
1	Single Solenoid - 2-Position	30 (207)	25 (173)	25 (173)	25 (173)	35 (241)
2	Double Solenoid- 2-Position					
3	Single Remote Pilot - 2-Position **	Vacuum	Vacuum	Vacuum	Vacuum	Vacuum
4	Double Remote Pilot - 2-Position**	Vacuum	Vacuum	Vacuum	Vacuum	Vacuum
5, 6, 7	Double Solenoid - 3-Position APB, CE, PC	35 (241)	35 (241)	35 (241)	50 (345)	50 (345)
8, 9, 0	Double Remote Pilot - 3-Position** APB, CE, PC	Vacuum	Vacuum	Vacuum	Vacuum	Vacuum
E	Single Solenoid Pilot - 2-Position Air Return / Spring Assist	30 (207)	30 (207)	35 (241)	45 (310)	45 (310)
F	Single Remote Pilot - 2-Position** Air Return / Spring Assist					
	External Pilot*	*	*	*	*	*
All	isys	Vacuum	Vacuum	Vacuum	Vacuum	Vacuum

* External Pilot Pressure / Remote Pilot Supply - 45-145 PSIG (310-1000 kPa).
** Must be equal to or greater than operating pressure.

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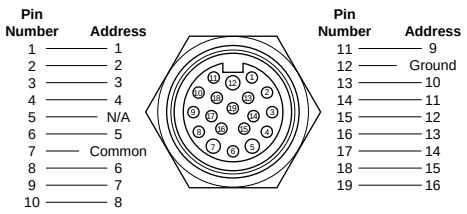
Maximum Solenoids Energized Simultaneously (Interconnect Circuit Boards)

HA / HB	Voltage Code	25-Pin D-Sub	19-Pin Round	Single 12-Pin M23	isysnet
24VDC	G9	24	16	8	32
120VAC*	23	24	16	8	32
H1 / H2 / H3	**Voltage Code**	**25-Pin D-Sub**	**19-Pin Round**	**Single 12-Pin M23**	**isysnet**
12VDC	45	13	13	8	N/A
24VAC*	42	24	16	8	21
24VDC	B9	20	16	8	N/A
120VAC*	23	24	16	8	N/A

* Not CSA certified for 25-Pin, D-Sub option.

19-Pin Round Brad Harrison



Face View - Male 19-Pin Connector

19-Pin Round Cable Specifications

Common Pin “7” is rated for 8 amps. Cable common wire must be greater than total amperage of solenoids on Add-A-Fold assembly.

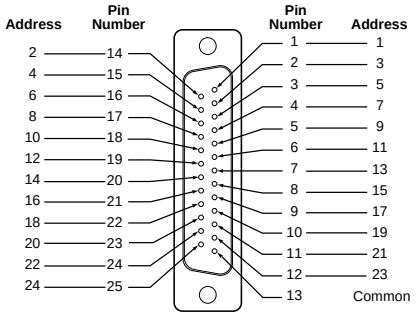
Example: 8 station manifold, 16 solenoids,
120VAC - 16 x .039 amps = .63 total amp rating.

NEMA 4 rated with properly assembled NEMA 4 rated cable.

Cable Assemblies

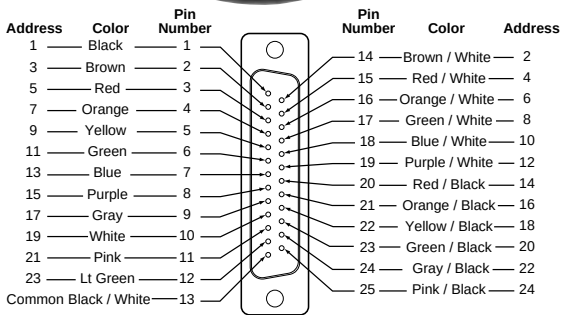
Part Number	Description	Length
333030P80M050	Brad Harrison Female to Male Cable	16.40 ft.
333030P80M0100	Brad Harrison Female to Male Cable	32.80 ft.

25-Pin, D-Sub Connector (Male)



Face View - Male D-Sub, 25-Pin Connector

25-Pin, D-Sub Cable (Female)

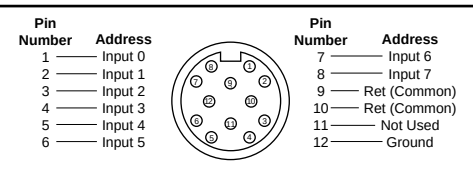


25-Pin, D-Sub Cable Specifications

Common Pin “13” is rated for 3 amps. Common wire rating must be greater than total amperage of all solenoids on a Add-A-Fold assembly.

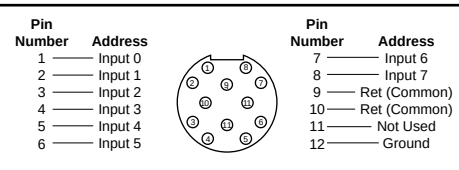
IP65 rated with properly assembled IP65 rated cable.

M23, 12-Pin Round Connector (Male)



Face View - Male M23, 12-Pin Connector

M23,12-Pin Round Connector (Female)



Face View - Female M23, 12-Pin Connector

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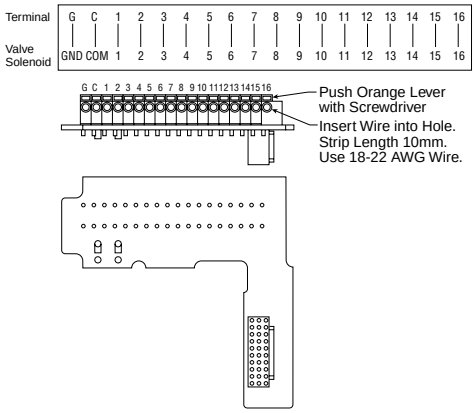
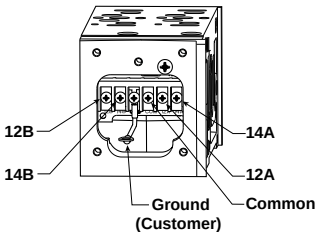
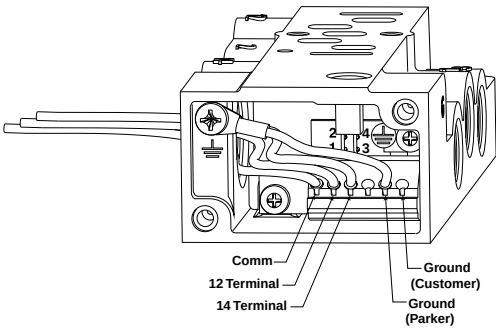
16-Point Terminal Strip



Manifold Wiring

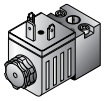


Subbase Wiring

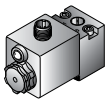


Electrical Connectors - Size 1, 2 & 3

5599-1 CNOMO



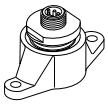
30mm 3-Pin ISO 4400 (DIN 43650A)



2-Pin M12 Euro

5599-1 AUTO

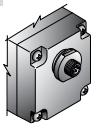
3-Pin Mini



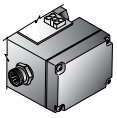
4-Pin Micro

5-Pin Mini

5599-2



Manifold Auto Connector



Subbase Auto Connector

Connections

	14 Solenoid	12 Solenoid
Valves with Wires	Black Wires	Red Wires
Valves with Terminal Block (Will accept 18 to 24 Gauge Wires)	14 and Com Terminals	12 and Com Terminals

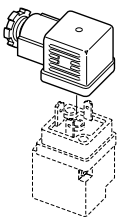
90° Cord Sets

Part Number	Description	Length
884031A09M030	4-Pin (Micro): Brad Harrison	3 Meters
115021A01F010	5-Pin (Mini): Brad Harrison	1 Foot

Female Electrical Connectors (IP65 Rated)

30mm 3-Pin ISO 4400 (DIN 43650A)

Connector	Connector with 6' (2m) Cord	Description
PS2028BP	PS2028JBP	Unlighted
PS203279BP	PS2032J79BP*	Light – 6-48V, 50/60Hz; 6-48VDC
PS203283BP	PS2032J83BP*	Light – 120V/60Hz
PS203283BP	N/A	Light – 240V/60Hz



* With surge suppression.

Engineering Data:
Conductors: 2 Poles Plus Ground; Cable Range (Connector Only): 8 to 10mm (0.31 to 0.39 Inch);
Contact Spacing: 18mm

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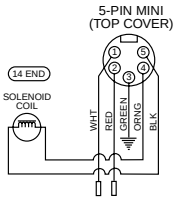
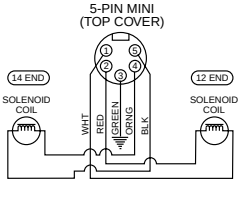
Automotive Connection – Wiring Options

'C' Chrysler Connection

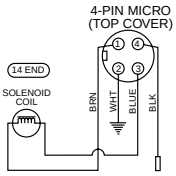
5-Pin Male / Single Solenoid
(Encl. Option 3, Auto Option C)



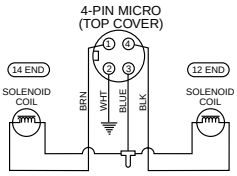
5-Pin Male / Double Solenoid
(Encl. Option 3, Auto Option C)



4-Pin Male / Single Solenoid
(Encl. Option 2, Auto Option C)

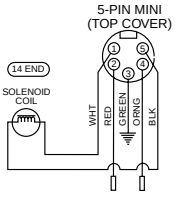


4-Pin Male / Double Solenoid
(Encl. Option 2, Auto Option C)

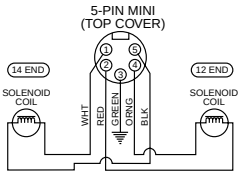


'F' SAE / Ford Wiring

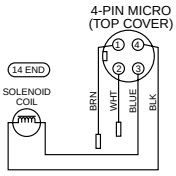
5-Pin Male / Single Solenoid
(Encl. Option 3, Auto Option F)



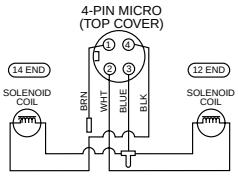
5-Pin Male / Double Solenoid
(Encl. Option 3, Auto Option F)



ISO 20401
4-Pin Male / Single Solenoid
(Encl. Option 2, Auto Option F)

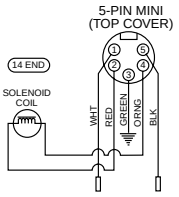


ISO 20401
4-Pin Male / Double Solenoid
(Encl. Option 2, Auto Option F)

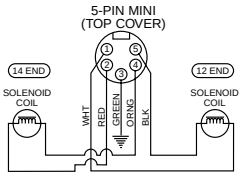


'G' GM Wiring

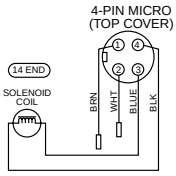
5-Pin Male / Single Solenoid
(Encl. Option 3, Auto Option G)



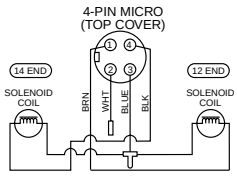
5-Pin Male / Double Solenoid
(Encl. Option 3, Auto Option G)



4-Pin Male / Single Solenoid
(Encl. Option 2, Auto Option G)

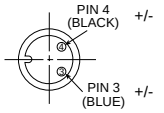


4-Pin Male / Double Solenoid
(Encl. Option 2, Auto Option G)

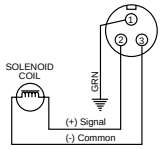


CNOMO Connection - Wiring Options

2-Pin Male / Single Solenoid
(Encl. Option 6, Auto Option F)

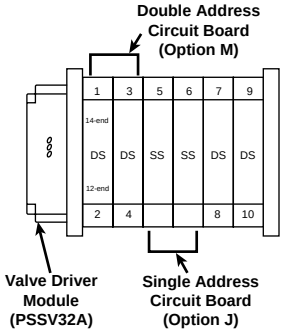


3-Pin Male / Single Solenoid
(Encl. Option 1, Auto Options C, F & G)

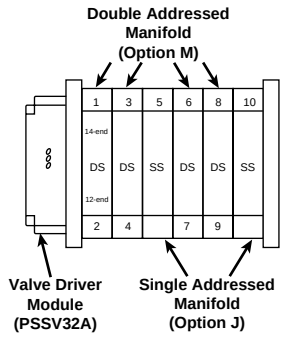


I/O Addressing Examples

HB & HA Example
Two Station Manifold Bases



H1, H2 & H3 Example:
Single Station Manifold Bases



Notes: SS = Single Solenoid Valve
DS = Double Solenoid Valve
First output address the #14 end of the valve closest to the valve driver module.

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5599-2 & 5599-1 AUTO Solenoid Kits

H1 H2 H3	
Voltage Code	**Coil Kit Number**
42 (24VAC)	PS404142P
45 (12VDC)	PS404145P
B9 (24VDC)	PS4041B9P
23 (120VAC)	PS404123P
57 (240VAC)	PS404157P

Quantity 1

5599-1 CNOMO Solenoid Kits

H1 H2 H3		
Voltage Code	**3-Pin 30mm 'L' Coil Kit**	**2-Pin M12 Euro '6' Coil Kit**
19	—	PS2828619P
42	PS2828A42P	—
45	PS2828A45P	—
49	PS2828A49P	—
53	PS2828A53P	—
57	PS2828A57P	—

Quantity 1

Manifold Hardware Kits

Valve Size	Kit Number
HB (15407-2)	PS5612P
HA (15407-2)	PS5512P
H1	PS4012P
H2	PS4112P
H3	PS4212P

Quantity 12

Valve Bolt Kits – 15407-2, 5599-1 & 5599-2

Valve Size	Kit Number
HB	PS5687P
HA	PS5587P
H1	PS4087CP
H2	PS4187CP
H3	PS4287CP

Quantity 12

Regulator Kits

Valve Size	Kit Number
H1	PS4039P
H2 H3	PS4139P

Pilot Operator - LMOR

Valve Size	Kit Number
H1 H2 H3	PS4052CP

Quantity 10

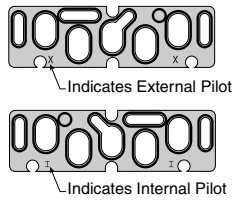
Pilot Operator - NLMOR

Valve Size	Kit Number
H1 H2 H3	PS4053CP

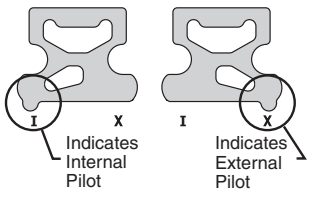
Pilot Select Gasket Kits

Valve Size	Kit Number
HB	PS5605P
HA	PS5505P
H1 H2 H3	PS4007P

Quantity 10



HB Shown



H1, H2, H3

Valve to Base Gasket Kits

Valve Size	Standard	Remote Pilot	Dual Pressure #3	Dual Pressure #5
HB	PS5605P*	—	—	—
HA	PS5505P*	—	—	—
H1	PS4005CP	PS4006CP	PS40D3CP	—
H2	PS4105CP	PS4106CP	PS41D3CP	PS41D5CP
H3	PS4205CP	PS4206CP	PS42D3CP	PS42D5CP

Quantity 1
* Quantity 10

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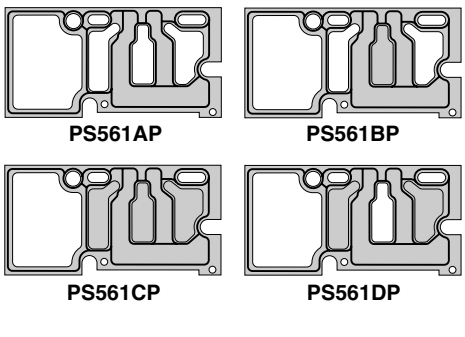
Richland, Michigan
www.parker.com/pneumatics

Manifold to Manifold Gasket Kits

	15407-2			
Size	**Standard**	**Blocked #1 Port**	**Blocked #1, 3, 5 Ports**	**Blocked #3, 5 Ports**
HB / HA	PS561AP	PS561BP	PS561CP	PS561DP
	15407-1			
HB	DX02M2MGSKT (PJLP02)			
HA	DX01M2MGSKT (PJLP01)			
H1	PS4013P	—	—	—
H2	PS4113P	—	—	—
H3	PS4213P	—	—	—



PS561AP **PS561BP**

PS561CP **PS561DP**

DX02M2MGSKT (PJLP02) **DX01M2MGSKT (PJLP01)**

Regulator Gauge Kits – Size 1, 2 & 3

Gauge Type	Kit Number
1" Face Air - Standard	
0-60 PSIG	PS4051060BP
0-160 PSIG	**PS4051160BP**
1-1/2" Face Air - Large*	
0-60 PSIG	PS4053060BP
0-160 PSIG	PS4053160BP
1-1/2" Face Liquid*	
0-160 PSIG	PS4052160BP

* Includes brass pipe fitting extensions
Quantity 1

Regulator Spring Range Kits

Spring Range	H1	H2 / H3
0 to 30 PSIG	PS4050030P	PS4150030BP
2 to 60 PSIG	PS4050060P	PS4150060BP
5 to125 PSIG	PS4050125P	PS4150125BP

Quantity 1

Regulator Conversion Kits

Valve Size	Manual Bonnet Assembly (w/o Spring)	Air Pilot Bonnet Assembly	Independent By-Pass Plate
H1	PS4045BP	PS4047BP	PS4048BP
H2 / H3	PS4145BP	PS4147BP	PS4148BP

Quantity 1

Regulator & Flow Control Mounting Studs

Type	HB	HA
Flow Control	PS5636P	PS5536P
Regulator	PS5636P	PS5536P

Type	H1	H2	H3
Flow Control	PS4036P	PS4136P	PS4236P
Regulator	PS4040P	PS4140P	PS4240P

Quantity 12

Body Service Kits

Valve Size	2-Position	3-Position		
		APB	CE	PC
HB	PS5601P	PS5602P	PS5603P	PS5604P
HA	PS5501P	PS5502P	PS5503P	PS5504P
H1	PS4001CP	PS4002CP	PS4003CP	PS4004CP
H2	PS4101CP	PS4102CP	PS4103CP	PS4104CP
H3	PS4201CP	PS4202CP	PS4203CP	PS4204CP

Kit Includes: Spool assembly with seals, all piston seals, return spring, pilot selector gasket, coil to end cap gasket.

Quantity 1

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Pilot By-Pass Plate

Valve Size			Kit Number
H1	H2	H3	PS4051P

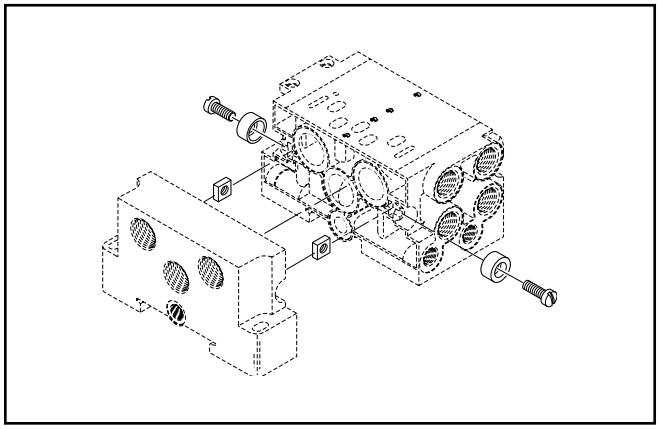
Quantity 10

Manifold Bolt Kit – (15407-1 HB & HA Manifolds)

Part Number	Items
DX02M2MB*	Bolt, Washer & Nut*

* Includes 10 Bolts, 10 Washers, 10 Nuts

** Use this number for both sizes, PJLP02 & PJLP01.



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Subbases

Size	Port Numbers	Port Size	Acceptable Fittings	Notes
H1	#1 to #3 or #5	1/4" BSPP	EO Fittings; Prestolok; P6M Mufflers; EO Plugs	1, 2, 3, 4, 5
		3/8" BSPP	Prestolok; EO Plugs	1, 2, 3, 4, 5
	#2 to #4	1/4" BSPP	EO Fittings; Prestolok; EO Plugs	1, 2, 3, 4, 5
		3/8" BSPP	Prestolok; EO Plugs; EO Fittings	1, 3, 4, 5, 6
	#12 to #2 and #14 to #4	1/8" & 1/4" BSPP	EO Fittings; EO Plugs; Prestolok	1, 2, 3, 4, 5
		1/8" & 3/8" BSPP	Prestolok; EO Plugs	1, 2, 3, 4, 5
	#1 to #2 to #3 to #4 to #5 All Inclusive Bottom Ports	1/4" BSPP	EO Fittings; EO Plugs; Prestolok; P6M Mufflers	1, 2, 3, 4, 5
H2	#1 to #3 or #5	3/8" BSPP	EO Fittings; Prestolok; ES, ASN, P6M Mufflers	1, 2, 3, 4, 5
		1/2" BSPP	EO Fittings; Prestolok; EO Plugs; ASN, P6M Mufflers	1, 2, 3, 4, 5
	#2 to #4	3/8" BSPP	EO Fittings; Prestolok; EO Plugs	1, 2, 3, 4, 5
		1/2" BSPP	EO Fittings; Prestolok; EO Plugs	1, 2, 3, 4, 5
	#12 to #2 and #14 to #4	1/8" & 3/8" BSPP	EO Fittings; EO Plugs; Prestolok	1, 2, 3, 4, 5
		1/8" & 1/2" BSPP	EO Fittings; EO Plugs; Prestolok	1, 2, 3, 4, 5
	#1 to #2 to #3 to #4 to #5 All Inclusive Bottom Ports Also Includes #12 & #14	3/8" & 1/2" BSPP	EO Fittings; Prestolok; EO Plugs	1, 2, 3, 4, 5
H3	#1 to #3 or #5	1/2" BSPP	EO Fittings; EO Plugs; Prestolok; ES, ASN, P6M Mufflers	1, 2, 3, 4, 5
		3/4" BSPP	EO Fittings; EO Plugs; ES & P6M Mufflers	1, 3, 4, 5
	#2 to #4	1/2" BSPP	EO Fittings; EO Plugs; Prestolok	1, 2, 3, 4, 5
		3/4" BSPP	EO Fittings; EO Plugs	1, 3, 4, 5
	#12 to #2 and #14 to #4	1/8" & 1/2" BSPP	EO Fittings; EO Plugs; Prestolok	1, 2, 3, 4, 5
		1/8" & 3/4" BSPP	EO Fittings; EO Plugs	1,3, 4, 5
	#1 to #2 to #3 to #4 to #5 All Inclusive Bottom Ports Also Includes #12 & #14	1/2" & 3/4" BSPP	EO Fittings; EO Plugs; P6M Mufflers; Prestolok	1, 3, 4, 5, 7

Manifold Bases

Size	Port Numbers	Port Size	Acceptable Fittings	Notes
H1	End Ports #2 & #4	1/4" BSPP	EO Fittings; Prestolok	1, 2, 3, 4, 5
	Bottom Ports #2 & #4	1/4" BSPP	EO Fittings; Prestolok	1, 2, 3, 4, 5
	End Ports #2 & #4	3/8" BSPP	EO Fittings; Prestolok	1, 2, 3, 4, 5
	Bottom Ports #2 & #4	3/8" BSPP	EO Fittings; Prestolok	1, 2, 3, 4, 5
H2	End Ports #2 & #4	3/8" BSPP	EO Fittings; Prestolok	1, 2, 3, 4, 5
	Bottom Ports #1, #2, & #4	3/8" BSPP	EO Fittings; Prestolok	1, 2, 3, 4, 5
	End Ports #2 & #4	1/2" BSPP	EO Fittings; Prestolok	1, 2, 3, 4, 5
	Bottom Ports #1, #2, & #4	1/2" BSPP	EO Fittings; Prestolok	1, 2, 3, 4, 5
H3	End Ports #2 & #4	1/2" BSPP	EO Fittings; Prestolok	1, 2, 3, 4, 5
	Bottom Ports #2 & #4	1/2" BSPP	EO Fittings; Prestolok	1, 2, 3, 4, 5
	End Ports #2 & #4	3/4" BSPP	EO Fittings	1, 3, 4, 5
	Bottom Ports #2 & #4	3/4" BSPP	EO Fittings	1, 3, 4, 5

End Plates

Size	Port Numbers	Port Size	Acceptable Fittings	Notes
H1	#1 to #3 & #5	1/2" BSPP	EO Fittings; Prestolok	1, 2, 3, 4, 5
	#12 to #3	1/8" to 1/2" BSPP	EO Fittings; Prestolok; P6M Muffler	1, 2, 3, 4, 5
	#14 to #5	1/8" to 1/2" BSPP	EO Fittings; Prestolok; P6M Muffler	1, 2, 3, 4, 5
H2	#1 to #3 & #5	3/4" BSPP	EO Fittings	1, 3, 4, 5
	#12 to #3	1/8" to 3/4" BSPP	EO Fittings; EO Plugs; P6M Muffler	1, 3, 4, 5
	#14 to #5	1/8" to 3/4" BSPP	EO Fittings; EO Plugs; P6M Muffler	1, 3, 4, 5
H3	#1 to #3 & #5	1" BSPP	EO Fittings	1, 3, 4, 5
	#12 to #3	1/8" to 1" BSPP	EO Fittings; EO Plugs; P6M & ES Muffler	1, 3, 4, 5
	#14 to #5	1/8" to 1" BSPP	EO Fittings; EO Plugs; P6M & ES Muffler	1, 3, 4, 5

Collective Wiring Interface Plates

Size	Port Numbers	Port Size	Acceptable Fittings	Notes
H1	TOP #1 to #3 & #5	1/2" BSPP	Prestolok; P6M Muffler; EO Fittings	1, 2, 3, 4, 5
H2	TOP #1 to #3 & #5	3/4" BSPP	EO Fittings; P6M & ES Mufflers	1, 3, 4, 5
H3	TOP #1 to #3 & #5	1" BSPP	EO Fittings; P6M & ES Mufflers	1, 3, 4, 5

General Notes Applicable to Applications

1) **EO and EO2 Fittings** are metric tube ends and male BSPP threads to valve components – Light Duty Series – spot faces for B & E and G & H types of flat face sealing. Straights are the **BE-R-ED** Series and elbows are **WEE-R** Adjustable Lock Nut Series.
2) **Prestolok Fittings** are metric push-in fittings with tube ends and BSPP threads to valve components. Straights are the **F4PB** Series and elbows are **C64PB** Adjustable Series.
3) In most applications, there is not enough swing clearance to install elbows in adjacent ports.
4) In a few applications, it may be necessary to remove the tube nut during installation.
5) In specifically identified installations, assembly with specific fittings is made provided that the hex points are not aligned along the port center to center line.
6) 3/8" EO fittings with 12 mm tubing only.
7) Prestolok available in 1/2" size only.

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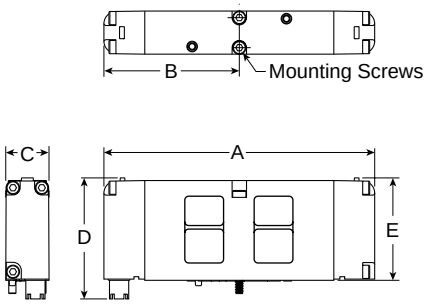
HB

15407-2



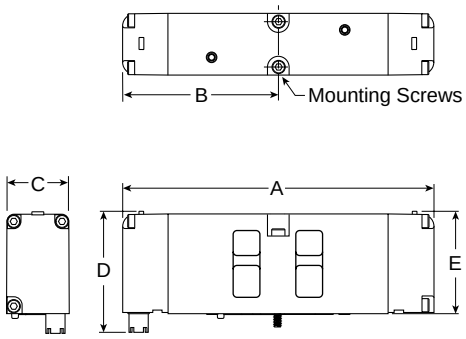
18mm Dimensions

A	B	C	D
4.43 (113)	2.22 (56)	.72 (18)	1.98 (50)
E			
1.68 (43)			

Inches (mm)

HA

15407-2



26mm Dimensions

A	B	C	D
5.10 (130)	2.55 (65)	1.02 (26)	1.98 (50)
E			
1.66 (42)			

Inches (mm)

K

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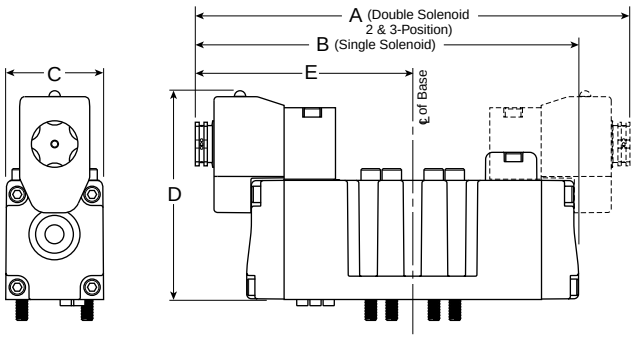
H1

H2

H3

5599-2

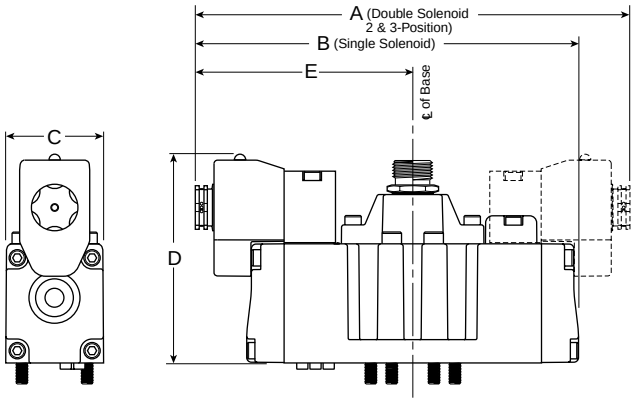


H1 Dimensions

A	A1	B	C
7.32 (186)	5.59 (142)	6.46 (164)	1.65 (42)
D	**D1**	**D2**	**D3**
3.54 (90)	4.29 (109)	4.29 (109)	2.50 (63.5)
D4	**E**	**E1**	
2.48 (63)	3.66 (93)	2.80 (71)	

Inches (mm)

5599-1 Auto



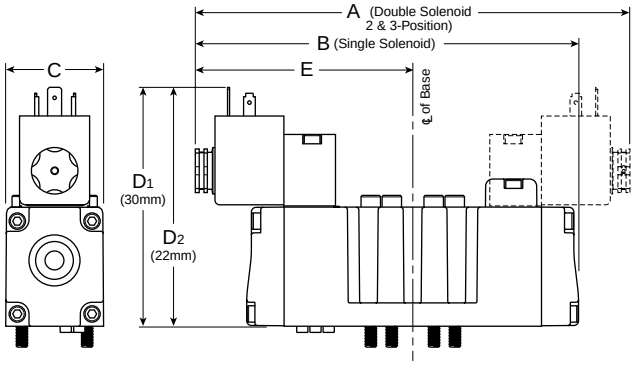
H1 Valve Dimensions Shown

H2 Dimensions

A	A1	B	C
8.35 (212)	6.62 (168)	7.48 (190)	2.17 (55)
D	**D1**	**D2**	**D3**
4.05 (103)	4.80 (122)	4.57 (116)	2.99 (76)
E	**E1**		
4.17 (106)	3.31 (84)		

Inches (mm)

5599-1 CNOMO

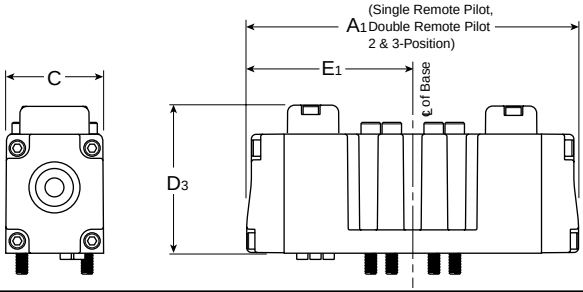


H3 Dimensions

A	A1	B	C
9.49 (241)	6.98 (177)	8.23 (209)	2.17 (55)
D	**D1**	**D2**	**D3**
4.05 (103)	4.80 (122)	4.57 (116)	2.99 (76)
E	**E1**		
4.74 (121)	3.491 (89)		

Inches (mm)

5599-2 / 5599-1 Remote Pilot



K

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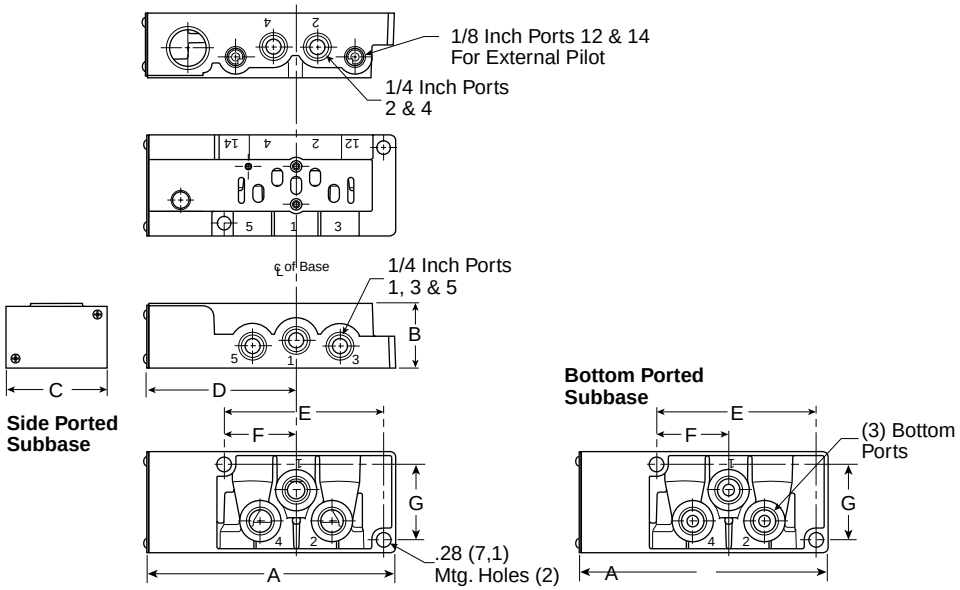
HA

HA 15407-2 & 15407-1, PS5511 Subbases



HA Dimensions

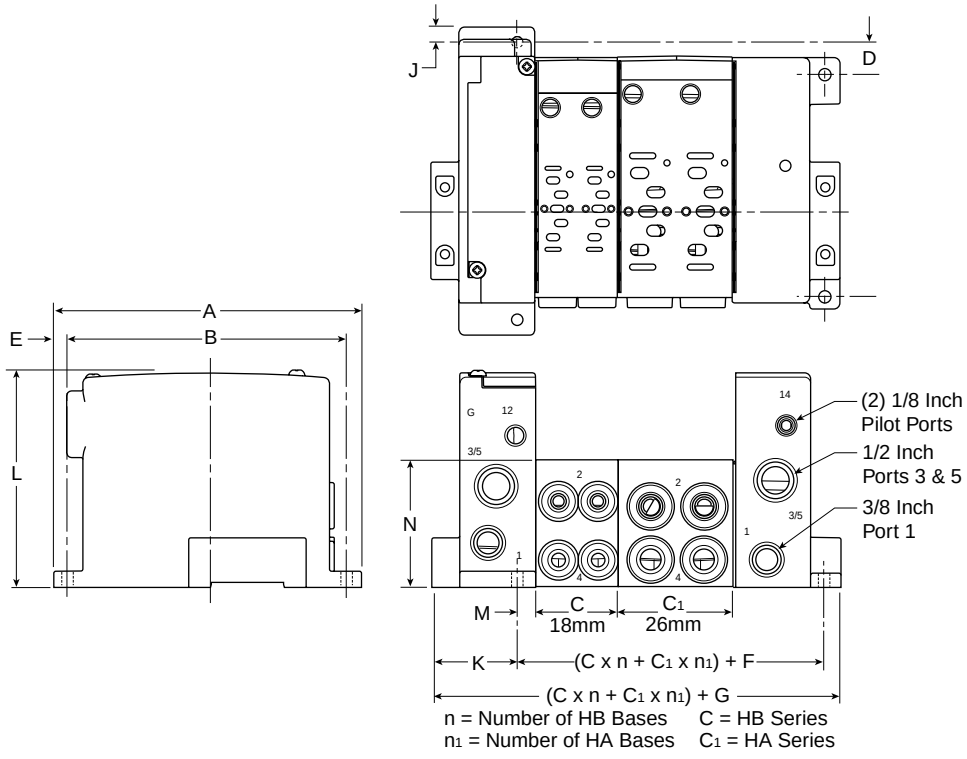
A	B	C	D
4.88 (124)	1.28 (32.5)	2.00 (50.8)	2.91 (74)
E	**F**	**G**	
1.43 (36.2)	3.16 (80.2)	1.49 (37.9)	

Inches (mm)

K

HB HA

HB & HA 15407-2 & 15407-1, PS5611 & PS5511 Manifolds



HB & HA Dimensions

A	B	C	C_1
5.98 (152)	5.39 (137)	1.61 (40.8)	2.24 (56.8)
D	**E**	**F**	**G**
.63 (16)	.30 (7.5)	2.14 (54.4)	4.12 (104.6)
H	**J**	**K**	**L**
4.32 (109.8)	.15 (4)	1.68 (42.7)	4.17 (106)
M	**N**		
.33 (8.4)	2.48 (63)		

Inches (mm)

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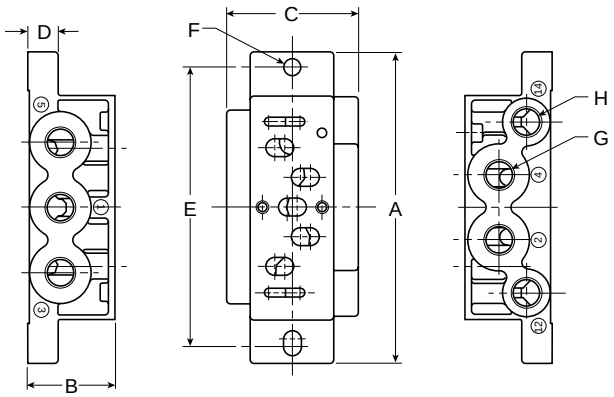
HB HA

Individual Subbase

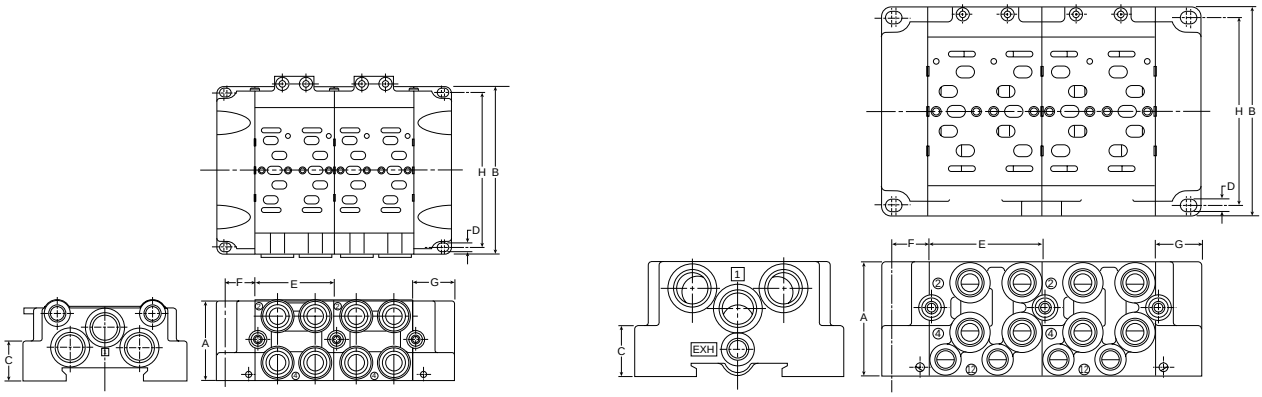


Series	Part Number	A	B	C	D	E	F	G	H
HB	PL02	3.15 (80)	.87 (22)	1.06 (27)	.31 (8)	2.76 (70)	.216 Dia. (Ø 5.5)	1/8	M5
HA	PL01	3.94 (100)	1.10 (28)	1.65 (42)	.39 (10)	3.54 (90)	.216 Dia. (Ø 5.5)	1/4	1/8

Inches (mm)

HB HA

2-Station Manifold Bases



Series	Part Number	A	B	C	D	E	F	G	H
HB	PJLP02 / PEJ02	1.52 (38.5)	3.15 (80)	.47 (12)	.165 Dia. (Ø 4.2)	1.50 (38)	.55 (14)	.71 (18)	2.83 (72)
HA	PJL01 / PJLP01 / PEJ01	2.17 (55)	3.94 (100)	.94 (24)	.216 Dia. (Ø 5.5)	2.13 (54)	.67 (17)	.87 (22)	3.54 (90)

Inches (mm)

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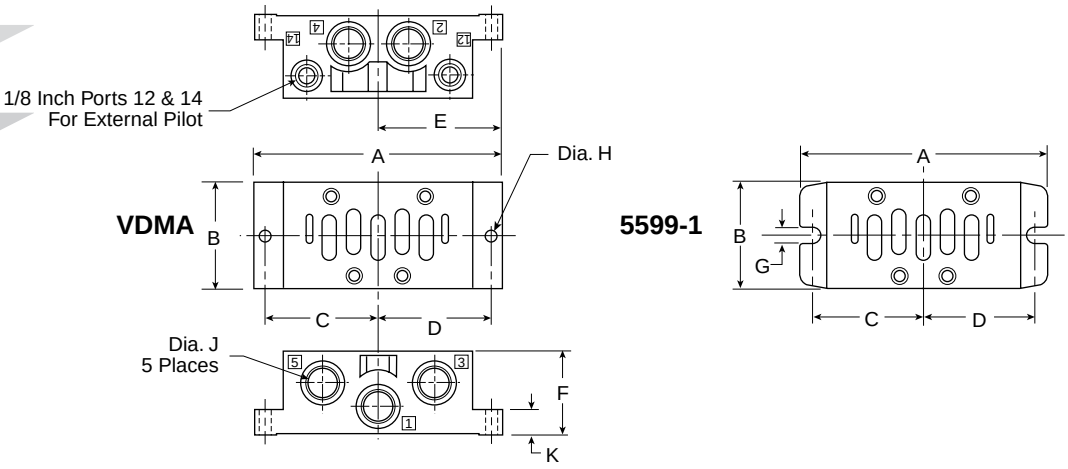
H1

H2

H3

VDMA & 5599-1 Side Ported Subbase



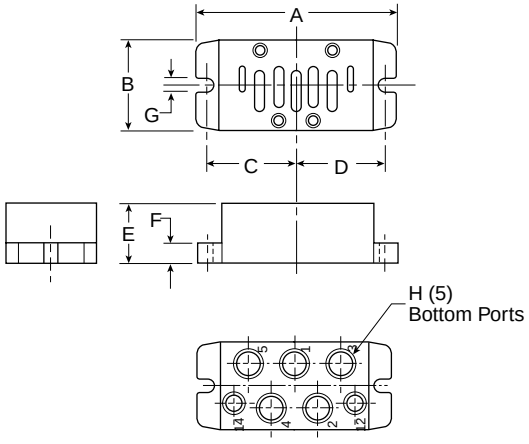
	Series	Part Number	J	A	B	C	D	E	F	G	H	K
VDMA	DX1	P2N-VS512SD	BSPP G1/4	4.33 (110)	1.89 (48)	1.93 (49)	1.93 (49)	2.17 (55)	1.26 (32)	—	.22 (5.6)	.39 (9.9)
	DX2	P2N-WS513SD	BSPP G3/8	4.88 (124)	2.20 (56)	2.21 (56)	2.21 (56)	2.44 (62)	1.57 (40)	—	.22 (5.5)	.51 (13)
	DX3	P2N-YS514SD	BSPP G1/2	5.87 (149)	2.80 (71)	2.68 (68)	2.68 (68)	2.93 (74.5)	2.05 (52)	—	0.26 (6.6)	0.71 (18)
5599-1	DX1	PL1-1/4-70	BSPP G1/4	4.33 (110)	1.81 (46)	1.93 (49)	1.93 (49)	2.17 (55)	1.14 (29)	0.22 (5.5)	—	0.24 (6)
		PL1-1/4-80	NPT 1/4									
	DX2	PL2-3/8-70	BSPP G3/8	4.88 (124)	2.21 (56)	2.17 (55)	2.17 (55)	2.44 (62)	1.46 (37)	0.22 (5.5)	—	0.24 (6)
		PL2-3/8-80	NPT 3/8									
	DX3	PL3-1/2-70	BSPP G1/2	5.87 (149)	2.80 (71)	2.68 (68)	2.68 (68)	2.93 (74.5)	2.36 (60)	0.26 (6.6)	—	0.71 (18)
		PL3-1/2-80	NPT 1/2									

Inches (mm)

H1

H2

5599-1 Bottom Ported Subbase



Bottom Ported Subbase

Series	Part Number	H	A	B	C	D	E	F	G
H1	PD1-1/4-70	BSPP G1/4	4.33 (110)	1.81 (46)	1.93 (49)	1.93 (49)	1.14 (29)	.24 (6)	0.22 (5.5)
	PD1-1/4-80	NPT1/4							
H2	PD2-3/8-70	BSPP G3/8	4.88 (124)	2.20 (56)	2.17 (55)	2.17 (55)	1.46 (37)	.24 (6)	.0.22 (5.5)
	PD2-3/8-80	NPT3/8							

Inches (mm)

K

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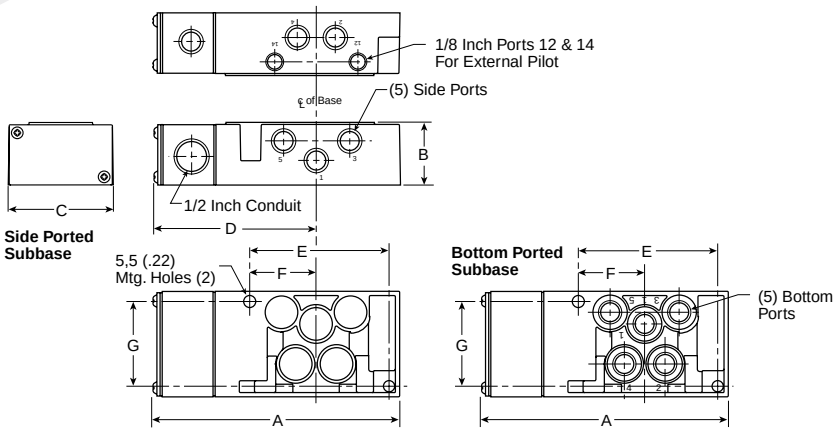
H1

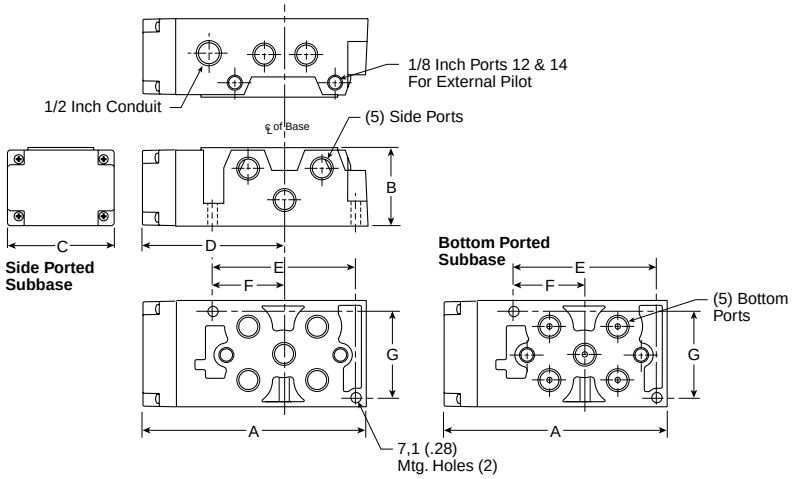


PS4011 Subbase

A	B	C	D
5.83 (148)	1.48 (38)	2.50 (64)	3.86 (98)
E	**F**	**G**	
3.29 (84)	1.57 (40)	2.00 (51)	

Inches (mm)

H2

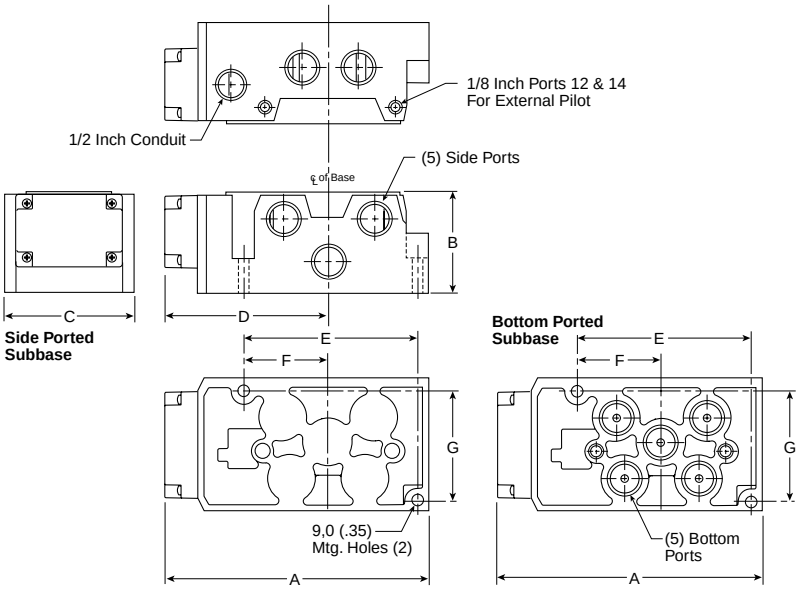


PS4111 Subbase

A	B	C	D
6.69 (170)	2.33 (59)	3.15 (80)	4.25 (108)
E	**F**	**G**	
4.21 (107)	2.07 (52)	2.56 (65)	

Inches (mm)

H3



PS4211 Subbase

A	B	C	D
7.90 (201)	2.96 (75)	3.90 (990)	4.92 (125)
E	**F**	**G**	
5.14 (131)	2.50 (64)	3.24 (82)	

Inches (mm)

K

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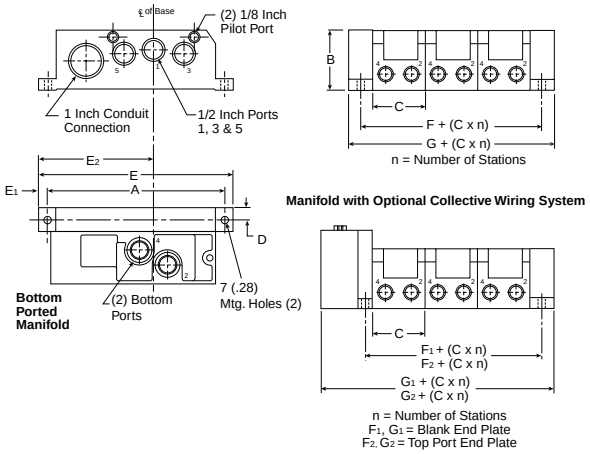
H1

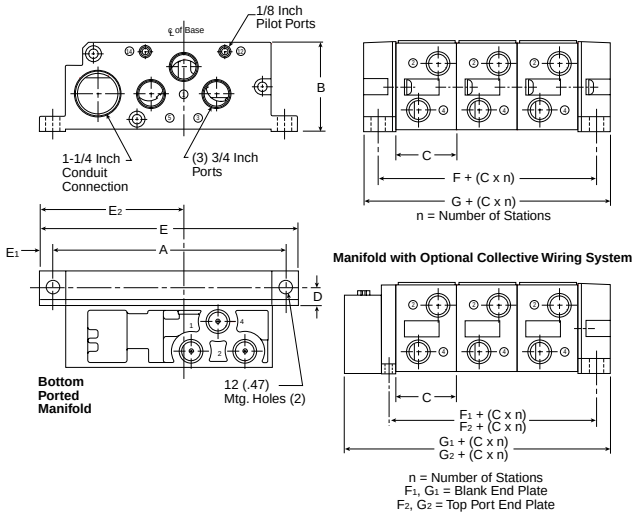


PS4011 Manifold

A	B	C	D	E
6.50 (165)	2.20 (56)	1.93 (49)	.44 (11)	7.15 (182)
E1	**E2**	**F**	**F1**	**F2**
.33 (8)	4.25 (108)	.87 (22)	.64 (16)	.90 (23)
G	**G1***	**G2***		
1.80 (46)	2.56 (65)	3.26 (83)		

Inches (mm)
* For 19-Pin Round Connector Module, add 1.08" (27.5mm) to the G1 & G2 dimensions.

H2

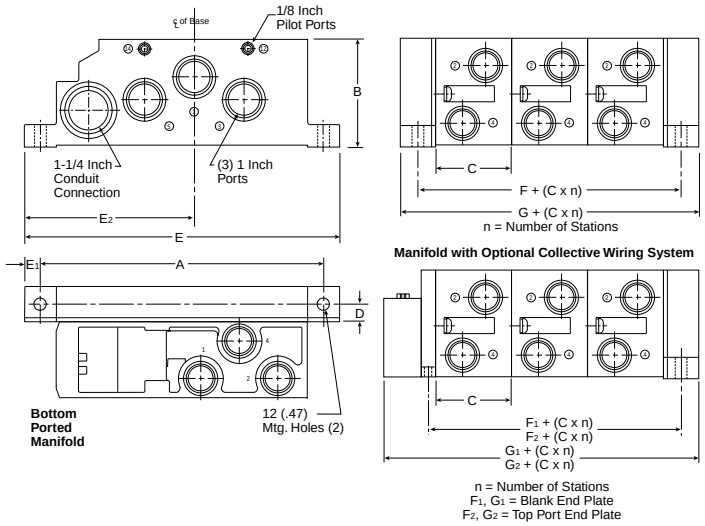


PS4111 Manifold

A	B	C	D	E
8.46 (215)	3.35 (85)	2.20 (56)	.59 (15)	9.41 (239)
E1	**E2**	**F**	**F1**	**F2**
.47 (12)	5.28 (134)	1.18 (30)	1.06 (27)	1.30 (33)
G	**G1***	**G2***		
2.36 (60)	3.41 (87)	3.88 (99)		

Inches (mm)
* For 19-Pin Round Connector Module, add 1.08" (27.5mm) to the G1 & G2 dimensions.

H3



PS4211 Manifold

A	B	C	D	E
10.41 (265)	4.13 (105)	2.80 (71)	.65 (175)	11.61 (295)
E1	**E2**	**F**	**F1**	**F2**
.59 (15)	6.26 (159)	1.30 (33)	1.12 (29)	1.59 (41)
G	**G1***	**G2***		
2.60 (63)	3.54 (90)	4.49 (114)		

Inches (mm)
* For 19-Pin Round Connector Module, add 1.08" (27.5mm) to the G1 & G2 dimensions.

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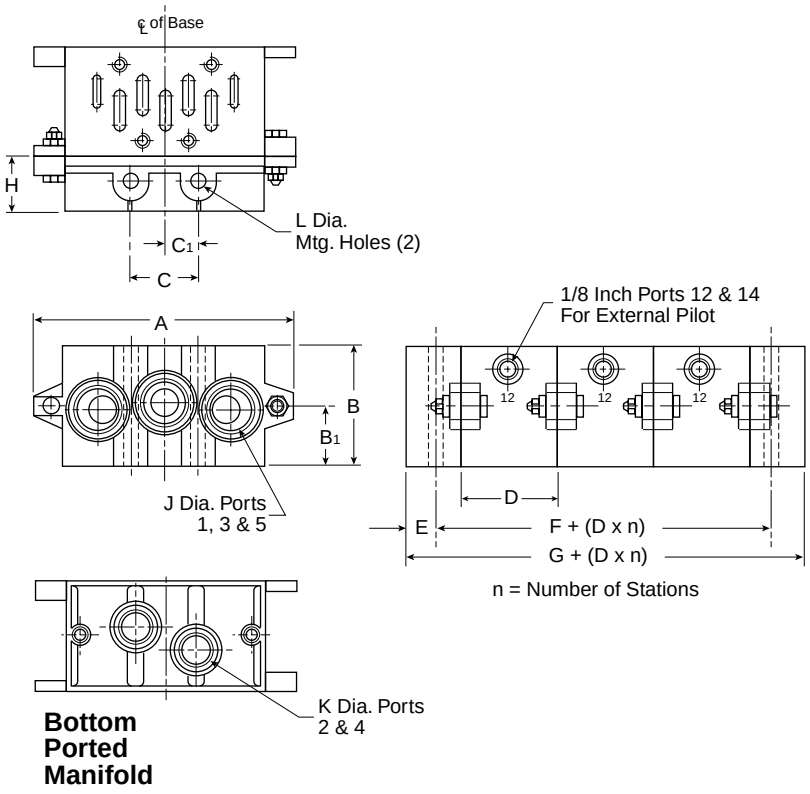
H1

H2

H3

5599-1 VDMA – Form C Manifold
&
5599-1 VDMA - Form D End Plates



K

VDMA Form C Manifold

Series	Part Number	A	B	B_1	D	E	F	G	J	K
H1	P2N-VM512MD	4.33 (110)	1.81 (46)	0.94 (24)	1.69 (55)	0.43 (22)	0.87 (22)	1.73 (44)	BSPP G3/8	BSPP G1/4
H2	P2N-WM513MD	5.31 (135)	1.85 (47)	0.94 (24)	2.20 (56)	0.51 (13)	1.02 (26)	2.05 (52)	BSPP G1/2	BSPP G3/8
H3	P2N-YM514MD	7.48 (190)	2.20 (56)	1.34 (34)	2.80 (71)	0.59 (15)	1.18 (30)	2.36 (60)	BSPP G1	BSPP G1/2

VDMA Form D End Plate

Series	Part Number	A	B	B_1	C	C_1	H	L
H1	P2N-VM513ES	4.33 (110)	1.81 (46)	0.94 (24)	1.10 (28)	0.55 (14)	0.87 (22)	0.28 (7)
H2	P2N-WM514ES	5.31 (135)	1.85 (47)	0.94 (24)	1.38 (35)	0.69 (18)	1.02 (26)	0.34 (9)
H3	P2N-YM518ES	7.48 (190)	2.20 (56)	1.34 (34)	2.05 (52)	1.03 (26)	1.18 (30)	0.47 (12)

Inches (mm)

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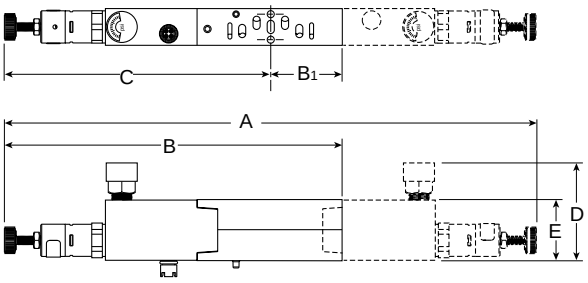
HB

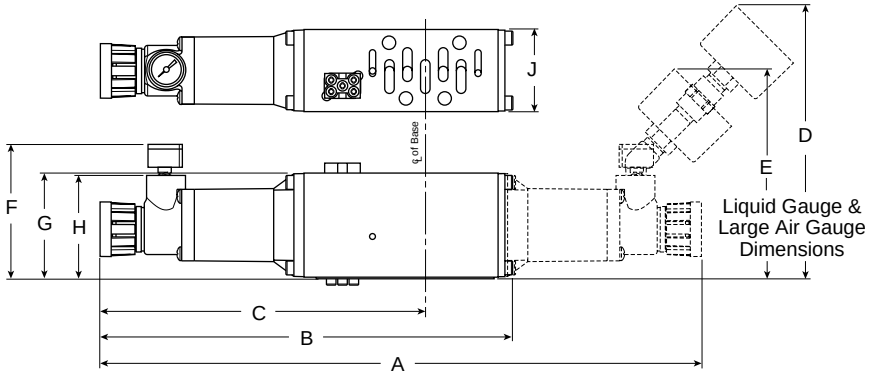
HA



Series	Part Number	A	B	B_1	C	D	E
HB	**PS5637**	10.28 (261)	6.14 (156)	1.02 (26)	5.13 (130)	2.60 (66)	1.18 (30)
HA	**PS5537**	1.61 (41)	1.41 (36)	1.06 (27)	.31 (8)	2.00 (51)	1.18 (30)

Inches
(mm)

H1



Series	Part Number	A	B	C	D	E	F	G	H	J
H1	**PS4037**	11.84 (301)	8.13 (207)	6.40 (163)	5.45 (138	4.25 (108)	2.85 (72)	2.09 (53)	2.05 (52)	1.63 (41)
	PS4038									

Inches
(mm)

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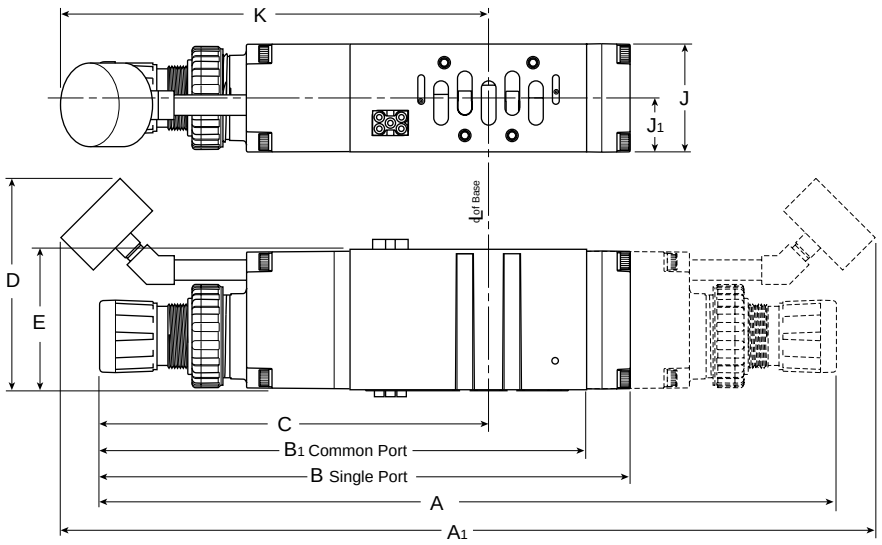
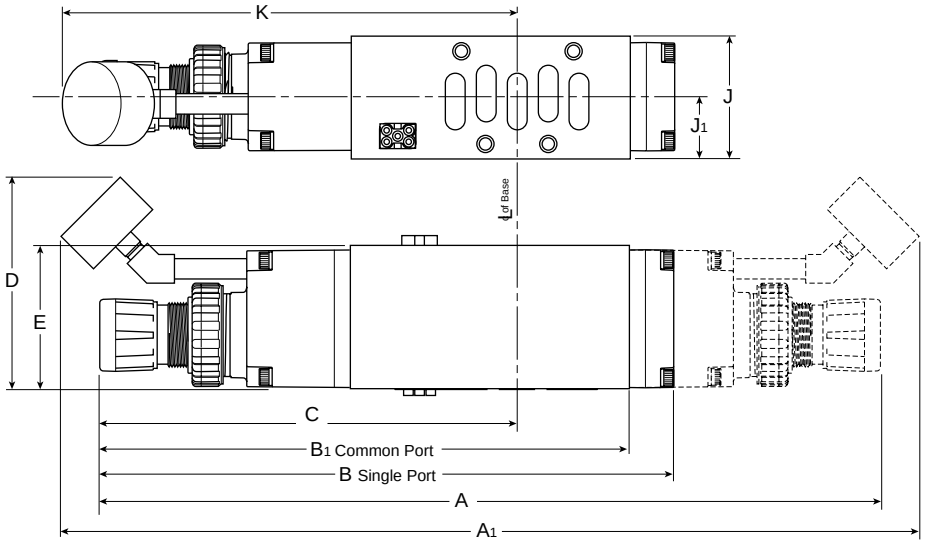
H2



Series	Part Number	A	A1	B	B1	C	D	E	J	J1	K
H2	PS4137	14.65 (372	16.18 (411)	10.56 (268)	9.84 (250	7.71 (196)	4.20 (107)	2.80 (71)	2.15 (55)	1.07 (27)	8.50 (216)
	PS4138										

Inches
(mm)

H3



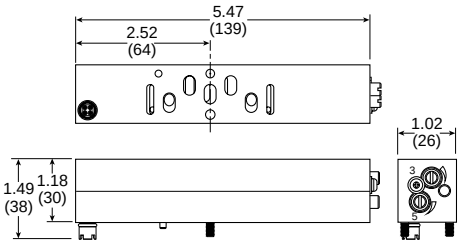
Series	Part Number	A	A1	B	B1	C	D	E	J	J1	K
H3	PS4237	15.67 (398)	17.15 (436)	11.53 (293)	10.67 (271)	8.37 (213)	4.20 (107)	2.93 (75)	2.50 (64)	1.25 (32)	9.10 (231)
	PS4238										

Inches
(mm)

K

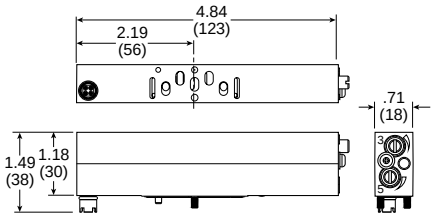
HA

HA Flow Control



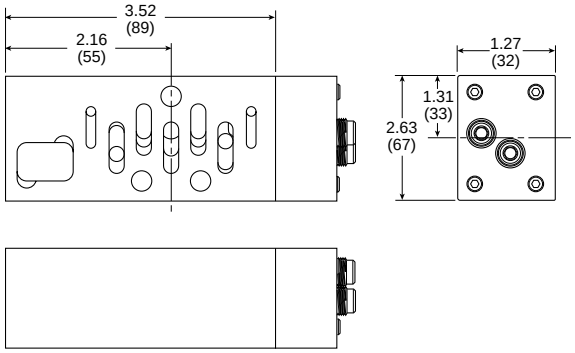
HB

HB Flow Control



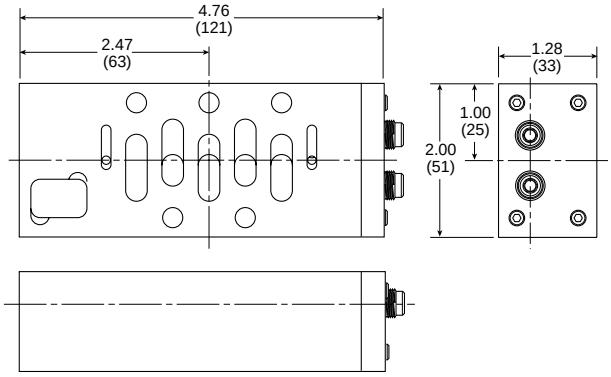
H1

H1 Flow Control



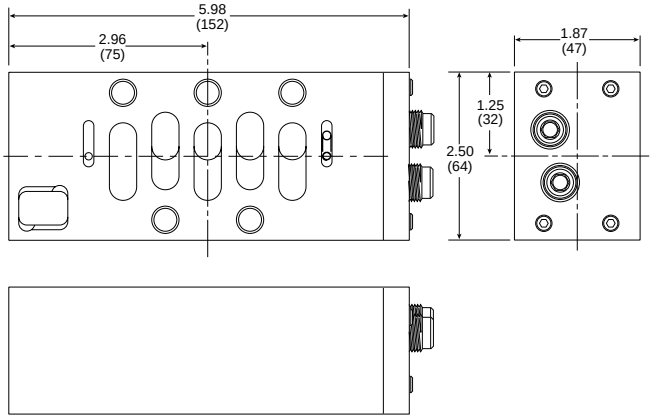
H2

H2 Flow Control



H3

H3 Flow Control



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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.

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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.

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1. Terms and Conditions of Sale: All descriptions, quotations, proposals, offers, acknowledgments, acceptances and sales of Seller's products are subject to and shall be governed exclusively by the terms and conditions stated herein. Buyer's acceptance of any offer to sell is limited to these terms and conditions. Any terms or conditions in addition to, or inconsistent with those stated herein, proposed by Buyer in any acceptance of an offer by Seller, are hereby objected to. No such additional, different or inconsistent terms and conditions shall become part of the contract between Buyer and Seller unless expressly accepted in writing by Seller. Seller's acceptance of any offer to purchase by Buyer is expressly conditional upon Buyer's assent to all the terms and conditions stated herein, including any terms in addition to, or inconsistent with those contained in Buyer's offer. Acceptance of Seller's products shall in all events constitute such assent.

2. Payment: Payment shall be made by Buyer net 30 days from the date of delivery of the items purchased hereunder. Amounts not timely paid shall bear interest at the maximum rate permitted by law for each month or portion thereof that the Buyer is late in making payment. Any claims by Buyer for omissions or shortages in a shipment shall be waived unless Seller receives notice thereof within 30 days after Buyer's receipt of the shipment.

3. Delivery: Unless otherwise provided on the face hereof, delivery shall be made F.O.B. Seller's plant. Regardless of the method of delivery, however, risk of loss shall pass to Buyer upon Seller's delivery to a carrier. Any delivery dates shown are approximate only and Seller shall have no liability for any delays in delivery.

4. Warranty: Seller warrants that the items sold hereunder shall be free from defects in material or workmanship for a period of 18 months from date of shipment from Parker Hannifin Corporation. THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO ITEMS PROVIDED HEREUNDER. SELLER MAKES NO OTHER WARRANTY, GUARANTEE, OR REPRESENTATION OF ANY KIND WHATSOEVER. ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO, MERCHANTABILITY AND FITNESS FOR PURPOSE, WHETHER EXPRESS, IMPLIED, OR ARISING BY OPERATION OF LAW, TRADE USAGE, OR COURSE OF DEALING ARE HEREBY DISCLAIMED.

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5. Limitation of Remedy: SELLER'S LIABILITY ARISING FROM OR IN ANY WAY CONNECTED WITH THE ITEMS SOLD OR THIS CONTRACT SHALL BE LIMITED EXCLUSIVELY TO REPAIR OR REPLACEMENT OF THE ITEMS SOLD OR REFUND OF THE PURCHASE PRICE PAID BY BUYER, AT SELLER'S SOLE OPTION. IN NO EVENT SHALL SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES OF ANY KIND OR NATURE WHATSOEVER, INCLUDING BUT NOT LIMITED TO LOST PROFITS ARISING FROM OR IN ANY WAY CONNECTED WITH THIS AGREEMENT OR ITEMS SOLD HEREUNDER, WHETHER ALLEGED TO ARISE FROM BREACH OF CONTRACT, EXPRESS OR IMPLIED WARRANTY, OR IN TORT, INCLUDING WITHOUT LIMITATION, NEGLIGENCE, FAILURE TO WARN OR STRICT LIABILITY.

6. Changes, Reschedules and Cancellations: Buyer may request to modify the designs or specifications for the items sold hereunder as well as the quantities and delivery dates thereof, or may request to cancel all or part of this order, however, no such requested modification or cancellation shall become part of the contract between Buyer and Seller unless accepted by Seller in a written amendment to this Agreement. Acceptance of any such requested modification or cancellation shall be at Seller's discretion, and shall be upon such terms and conditions as Seller may require.

7. Special Tooling: A tooling charge may be imposed for any special tooling, including without limitations, dies, fixtures, molds and patterns, acquired to manufacture items sold pursuant to this contract. 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 items sold hereunder, 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.

8. 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 (2) 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.

9. Taxes: Unless otherwise indicated on the face hereof, 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 the items sold hereunder. If any such taxes must be paid by Seller or if Seller is liable for the collection of such tax, the amount thereof shall be in addition to the amounts for the items sold. Buyer agrees to pay all such taxes or to reimburse Seller therefore upon receipt of its invoice. If Buyer claims exemption from any sales, use or other tax imposed by any taxing authority, Buyer shall save Seller harmless from and against any such tax, together with any interest or penalties thereon which may be assessed if the items are held to be taxable.

10. 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 Part 10. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets (hereinafter "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 an item sold pursuant to this contract 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 an item sold hereunder 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 said item, replace or modify said item so as to make it noninfringing, or offer to accept return of said item 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 items 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 item sold hereunder. The foregoing provisions of this Part 10 shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

If a claim is based on information provided by Buyer or if the design for an item delivered hereunder is specified in whole or in part by Buyer, Buyer shall defend and indemnify Seller for all costs, expenses or judgements resulting from any claim that such item infringes any patent, trademark, copyright, trade dress, trade secret or any similar right.

11. Force Majeure: Seller does not assume the risk of and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter "Events of Force Majeure"). Events of Force Majeure shall include without limitation, accidents, acts of God, strikes or labor disputes, acts, laws, rules or regulations of any government or government agency, fires, floods, delays or failures in delivery of carriers or suppliers, shortages of materials and any other cause beyond Seller's control.

12. Entire Agreement/Governing Law: The terms and conditions set forth herein, together with any amendments, modifications and any different terms or conditions expressly accepted by Seller in writing, shall constitute the entire Agreement concerning the items sold, and there are no oral or other representations or agreements which pertain thereto. This Agreement shall be governed in all respects by the law of the State of Ohio. No actions arising out of sale of the items sold hereunder or this Agreement may be brought by either party more than two (2) years after the cause of action accrues.

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