

Catalog 0617-2/USA



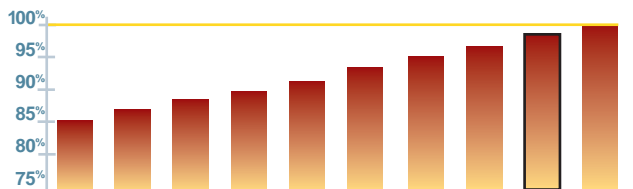
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Excellence is imprinted on our corporate DNA. We are the only manufacturer offering customers a choice of hydraulic, pneumatic, electromechanical, or computer motion control.

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- Downloadable catalogs
- 3D design files
- Training materials
- Product configuration software
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Offer of Sale

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

Notes

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“Moduflex” Series	www.parker.com/pneu/moduflex	A Moduflex
“ADEX” Series	www.parker.com/pneu/adex	B ADEX
15mm Solenoid Valve	www.parker.com/pneu/15mm	C 15mm Solenoid Valve
“PS1E” Series		D PS1E
“PVL” Series	www.parker.com/pneu/pvl	E PVL
Flow Controls & Accessories		F Flow Controls & Accessories
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Notes



Moduflex Valve System

*Instant Control For All
Pneumatic Actuators*

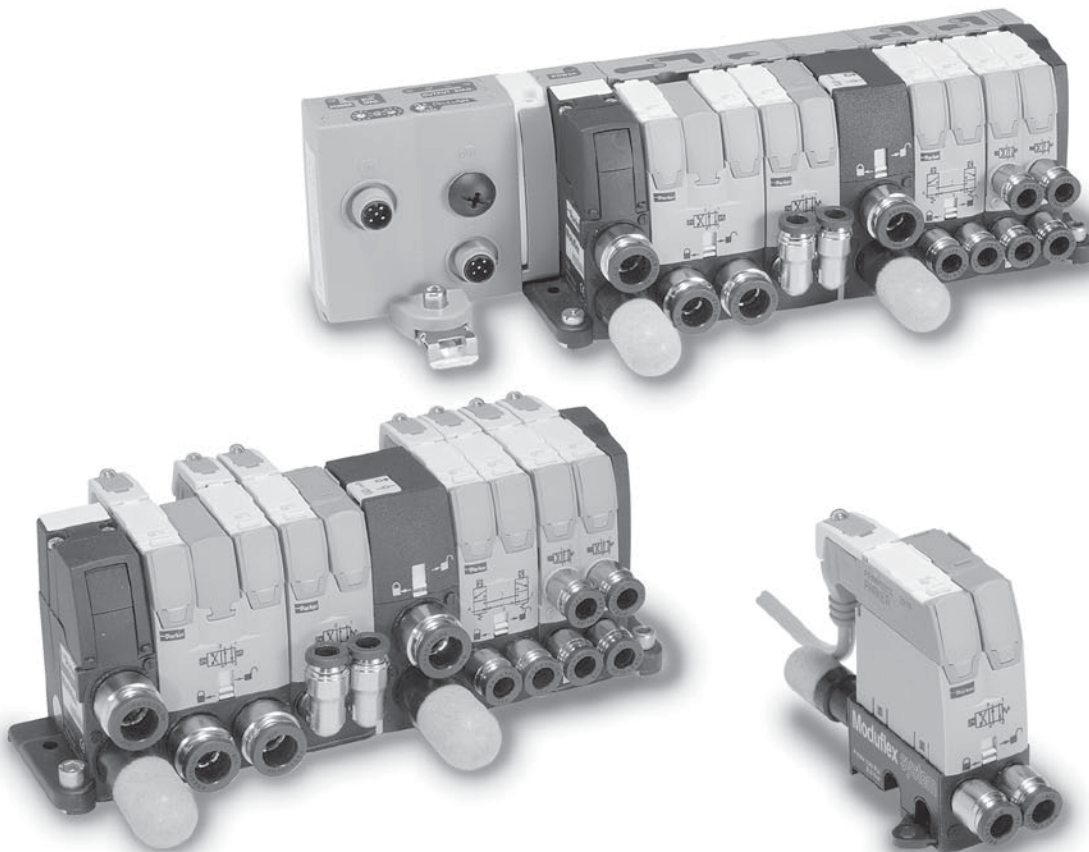
*Modular Valve Islands or
Stand-Alone Valves*

Section A

www.parker.com/pneu/moduflex



A



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Bold Options Standard.

Regular text part numbers may have longer lead times.





A

Module Series Selection and Assembly Procedures

Modulflex system provides a complete choice of either stand-alone valves, short-build valve islands, or large valve island configurations. Electrical control connections may be individual or island integrated. Peripheral modules add complementary functions — flow control, pressure regulation, P.O. check valves and vacuum generators can be added directly to the valve or used as a stand alone product.

Modulflex gives machine builders maximum flexibility to assemble each automation system step by step using basic modules.

Valve islands can be easily assembled using the following procedure.

1. Assemble the required valve island with the basic modules.
2. Mount the valve island on the machine together with any stand-alone valves and peripheral modules.
3. Select and install the required clip-on pneumatic and electrical connectors.

“S” Series Stand Alone Valves

For isolated cylinders on a machine, it is preferable to locate the valve close by. Therefore a stand-alone module is ideal. Response time and air consumption are then reduced to a minimum. Peripheral modules can be installed directly into the valve.



“S” Series Size 1
Single Solenoid



“S” Series Size 1
Single Air Pilot

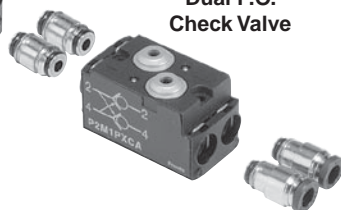


Straight or
Elbow
Pneumatic
Connectors



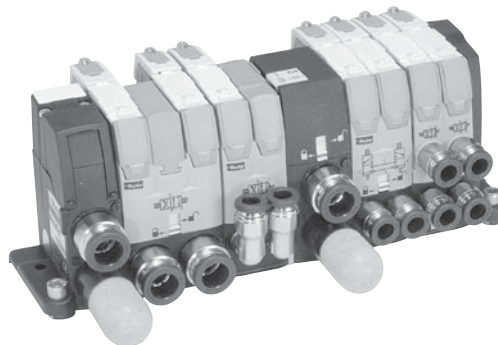
Union
Pneumatic
Connectors

Dual P.O.
Check Valve



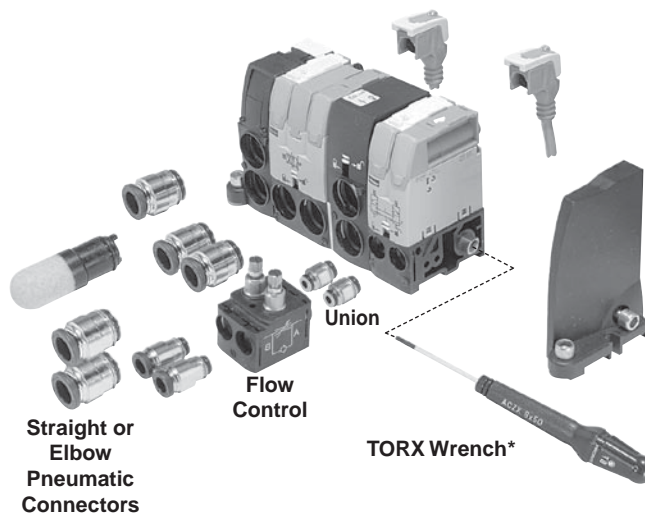
“T” Series Valve Island Modules with Individual Connectors

For small groups of cylinders requiring short localized valve islands, it is convenient to use individual electrical connector islands.



“T” Series Island Modules

“T” Series modules are easily assembled to form a complete manifold. All electrical connectors are individual and pneumatic connectors are of the push-in tube type. Modules with different functions and flow passages may be combined in the same island manifold, giving total flexibility to adapt to all machine requirements.

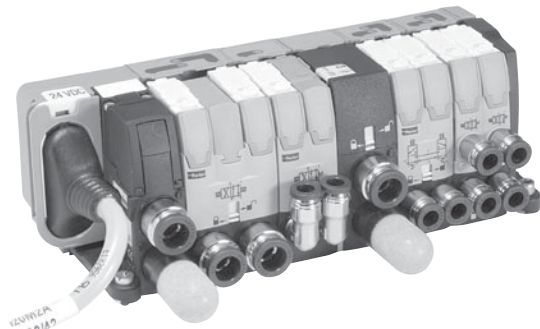


* Maximum torque rating 10.6 in. lbs. (1.2 Nm).



"V" Series Valve Island Modules with Integrated Connections

When the number of valves is larger, modular islands are easily assembled using the integrated electrical connection series. These islands are then connected to the control PLC, with a multi-connector cable or with a field bus connection.

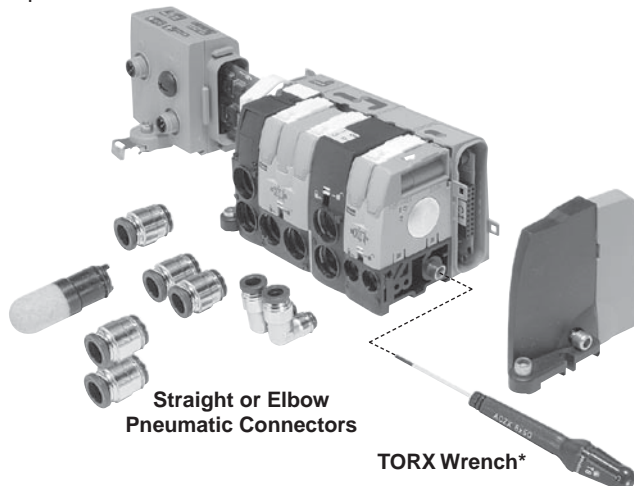


"V" Series with 20-Pin Connector



"V" Series with Field Bus Connection

"V" Series modules are easily assembled to form a complete manifold. All pneumatic connectors are of the push-in tube type. When the valve island has been installed, it is a simple operation to separate the field bus module from the valve island using the quick release lever. Modules with different functions and flow passages may be combined in the same island manifold, giving total flexibility to adapt to all machine requirements.



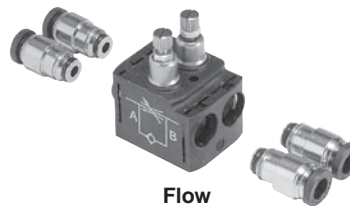
Straight or Elbow
Pneumatic Connectors

TORX Wrench*

* Maximum torque rating 10.6 in. lbs. (1.2 Nm).

"P" Series Peripheral Modules

Peripheral Modules are available and can be mounted directly to valves or used as a stand alone product. These modules answer the complementary needs of the cylinders, flow controls, pressure regulation or positioning.



Flow
Control



Pressure
Regulator



Dual P.O.
Check Valve



Pressure
Sensor

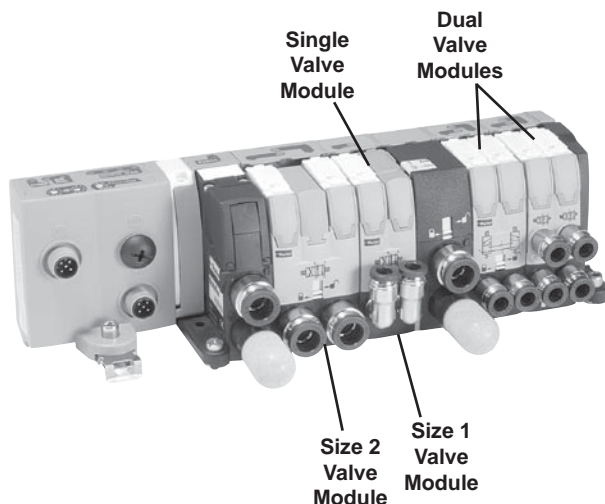


Vacuum Generator



Valve Function

A



Moduflex Valve Islands offer the greatest flexibility for your design requirements.

Valve Modules are available as 4-Way or 3-Way valves and can be ordered as single or dual valves. A Single Valve Module has one valve in one valve body. A Dual Valve Module will have 2 valves in one valve body. Each Valve in the Dual Valve Body is controlled by a solenoid or air pilot and can be operated independently from the other valve in the same body. There are no dimensional difference between a single and a dual valve. Flow Rates are reduced on the dual valves.

Single valve modules offer Ceramic Slide Valve Technology while dual valve modules offer WCS – Wear Compensation System Technology. Both offer low friction shift forces, fast response and less spool wear.



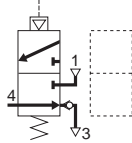




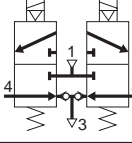


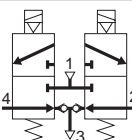
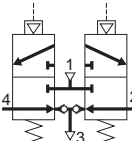
Valve Modules are available in two different valve body sizes. Size 1 and Size 2 Valve Modules can be combined in both “T” and “V” Series Valve Islands without transition kits.

4/2 , 4-Way, 2-Position Valves

Single Valves	ANSI Symbol	Description	Size 1 Body	Size 2 Body
		Single Solenoid, Spring Return Valve	Cv = .32	Cv = .80
		Single Air Pilot, Spring Return Valve		
		Double Solenoid Valve	Cv = .32	Cv = .80
		Double Air Pilot Valve		
Dual Valves	ANSI Symbol	Description	Size 1 Body	Size 2 Body
		(2) Single Solenoid, Spring Return Valve with Exhaust Check. Double Solenoid Valve Body	Cv = .18	N/A
		(2) Single Air Pilot, Spring Return Valve with Exhaust Check. Double Air Pilot Valve Body		

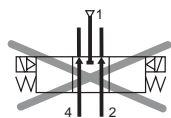


3/2 , 3-Way, 2-Position Valves

Single Valves	ANSI Symbol	Description	Size 1 Body	Size 2 Body
 		Single Solenoid, NC, Spring Return Valve with Exhaust Check.	Cv = .22	Cv = .44
		Single Air Pilot, NC, Spring Return Valve with Exhaust Check.		
Dual Valves	ANSI Symbol	Description	Size 1 Body	Size 2 Body
 		(2) Single Solenoid, NO, Spring Return Valve with Exhaust Check. Double Solenoid Valve Body	Cv = .22	Cv = .44
		(2) Single Air Pilot, NO, Spring Return Valve with Exhaust Check. Double Air Pilot Valve Body		
 		(2) Single Solenoid, NC, Spring Return Valve with Exhaust Check. Double Solenoid Valve Body	Cv = .22	Cv = .44
		(2) Single Air Pilot, NC, Spring Return Valve with Exhaust Check. Double Air Pilot Valve Body		

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

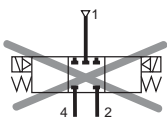
3-Position Center Exhaust



A traditional 5/3 center exhaust valve is now replaced by a double 3/2 NC+NC valve module (version with no exhaust check valves). Both cylinder chambers are exhausted and rod and piston are free to move.



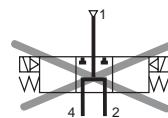
3-Position All Ports Blocked



A traditional 5/3 all ports blocked valve is now replaced by a double 3/2 NC+NC valve module and a dual P.O. check module that will block the flow to and from the cylinder. Cylinder positioning is more precise.



3-Position Pressure Center



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





A

"S" Series Basic Modules Size 1 (Without Pneumatic Connectors)



Single Solenoid



Double Solenoid



Single Air Pilot



Double Air Pilot

Size 1 Electro-Pneumatic Stand Alone Valve Modules, 24VDC

4-Way / 2-Position / Single Valve

	Solenoid	Weight	Part Number
	Single Solenoid (Monostable)	2.54 oz	P2M1S4ES2C
	Double Solenoid (Bistable)	3.07 oz	P2M1S4EE2C

Size 1 Air Pilot Stand Alone Valve Modules

4-Way / 2-Position / Single Valve

	Solenoid	Weight	Part Number
	Single Air Pilot (Monostable)	2.54 oz	P2M1S4PS
	Double Air Pilot (Bistable)	3.07 oz	P2M1S4PP

3-Way / 2-Position / Dual Valve

	Solenoid	Weight	Part Number
	Double Solenoid NC + NC with Exhaust Check	3.00 oz	P2M1SDEE2C
	Double Solenoid NO + NO with Exhaust Check	3.00 oz	P2M1SCEE2C
	Double Solenoid NC + NO with Exhaust Check	3.00 oz	P2M1SEEE2C
	Single Solenoid NC with Exhaust Check	2.82 oz	P2M1S3ES2C
	Center Exhaust = dual 3/2 NC + NC without Exhaust Check	3.00 oz	P2M1SGEE2C

3-Way / 2-Position / Dual Valve

	Solenoid	Weight	Part Number
	Double Air Pilot NC + NC with Exhaust Check	2.82 oz	P2M1TDPP
	Double Air Pilot NO + NO with Exhaust Check	2.82 oz	P2M1TCPP
	Single Air Pilot NC	2.68 oz	P2M1T3PS

Note: Includes 5/32" (4mm) Air Pilot Connectors.

Note: Bold Options Standard





M8 Female Individual Connectors with Flying Lead Cable (For Solenoid Pilots)



With LED Voltage Surge Protection and Flying Lead Cable IP67 Protected		Weight (oz)	Order Code
	2 m Cable	2.19	P8LS08L226C
	5 m Cable	5.47	P8LS08L526C
	9 m Cable	9.88	P8LS08L926C

Pneumatic Connectors for Size 1 Modules



		Elbow Version		Straight Version	
		Weight (oz)	Order Code	Weight (oz)	Order Code
Tube Push-in Connector	5/32" = 4mm OD	0.18	CMD04-1	0.07	FMD04-1
	6mm OD	0.18	CMD06-1	0.11	FMD06-1
	1/4" OD	0.18	CMD07-1B	0.11	FMD07-1B
Muffler for Exhaust Port	—	—	—	0.11	MMDVA1
Plug	—	—	—	0.18	PMDYY1
Double Male Union (For Peripheral Valve Modules)	—	—	—	0.21	HMDXX1

Note: 85 Durometer minimum for pneumatic connectors.

A



A

"S" Series Basic Modules Size 2 (Without Pneumatic Connectors)



Single Solenoid



Double Solenoid



Single Air Pilot



Double Air Pilot

Size 2 Electro-Pneumatic Stand Alone Valve Modules, 24VDC

4-Way / 2-Position / Single Valve

	Solenoid	Weight	Part Number
	Single Solenoid (Monostable)	2.75 oz	P2M2S4ES2C
	Double Solenoid (Bistable)	3.28 oz	P2M2S4EE2C

Size 2 Air Pilot Stand Alone Valve Modules

4-Way / 2-Position / Single Valve

	Solenoid	Weight	Part Number
	Single Air Pilot (Monostable)	2.75 oz	P2M2S4PS
	Double Air Pilot (Bistable)	3.28 oz	P2M2S4PP

3-Way / 2-Position / Dual Valve

	Solenoid	Weight	Part Number
	Double Solenoid NC + NC with Exhaust Check	3.53 oz	P2M2SDEE2C
	Double Solenoid NO + NO with Exhaust Check	3.53 oz	P2M2SC EE2C
	Double Solenoid NC + NO with Exhaust Check	3.53 oz	P2M2SE EE2C
	Single Solenoid NC with Exhaust Check	3.35 oz	P2M2S3ES2C
	Center Exhaust = dual 3/2 NC + NC without Exhaust Check	3.53 oz	P2M2SG EE2C

3-Way / 2-Position / Dual Valve

	Solenoid	Weight	Part Number
	Double Air Pilot NC + NC with Exhaust Check	3.53 oz	P2M2SDPP
	Double Air Pilot NO + NO with Exhaust Check	3.53 oz	P2M2SCPP
	Single Air Pilot NC with Exhaust Check	3.35 oz	P2M2S3PS

Note: Includes 5/32" (4mm) Air Pilot Connectors.

Note: Bold Options Standard



M8 Female Individual Connectors with Flying Lead Cable (For Solenoid Pilots)



With LED Voltage Surge Protection and Flying Lead Cable IP67 Protected		Weight (oz)	Order Code
	2 m Cable	2.19	P8LS08L226C
	5 m Cable	5.47	P8LS08L526C
	9 m Cable	9.88	P8LS08L926C

Pneumatic Connectors for Size 2 Modules



PMDYY2



MMDVA2



HMDXX2



FMD09-2B



CMD09-2B

		Elbow Version		Straight Version	
		Weight (oz)	Order Code	Weight (oz)	Order Code
Tube Push-in Connector	6mm OD	0.18	CMD06-2	0.11	FMD06-2
	1/4" OD	0.18	CMD07-2B	0.11	FMD07-2B
	8mm OD	0.21	CMD08-2	0.14	FMD08-2
	3/8" OD	0.21	CMD09-2B	0.14	FMD09-2B
	10mm OD	0.25	CMD10-2	0.18	FMD10-2
	12mm OD	0.28	CMD12-2	0.21	FMD12-2
	1/2" OD	—	—	0.21	FMD13-2B
Muffler for Exhaust Port	—	—	—	0.11	MMDVA2
Plug	—	—	—	0.18	PMDYY2
Double Male Union (For Peripheral Valve Modules)	—	—	—	0.28	HMDXX2

Note: 85 Durometer minimum for pneumatic connectors.



A

"S" Series Stand-alone Valve Modules Model Number Index

Complete Modules (Complete with Pneumatic and Electrical Connectors)

BOLD OPTIONS ARE STANDARD

P2M **1** **S** **4ES** **2C** **00** **A** **F4**

Basic Series	
Moduflex	P2M

Size	
Size 1	1
Size 2	2

Valve Series	
Stand Alone	S

Valve Type / Function	
3-Way / 2-Position	
Single Solenoid, NC Spring Return	3ES
Single Air Pilot, NC Spring Return	3PS
4-Way / 2-Position	
Single Solenoid, Spring Return	4ES
Single Air Pilot, Spring Return	4PS
Double Solenoid	4EE
Double Air Pilot	4PP
Dual 3-Way, 2-Position, Spring Return	
Solenoid, NC / NC + PO Check (4/3 APB)	BEE*
Air Pilot, NC / NC + PO Check (4/3 APB)	BPP*
Solenoid, NO / NO (4/3 Pressure Ctr.)	CEE
Air Pilot NO / NO (4/3 Pressure Ctr.)	CPP
Solenoid, NC / NC with Exhaust Check	DEE
Air Pilot, NC / NC with Exhaust Check	DPP
Solenoid, NO / NC with Exhaust Check	EEE
Solenoid, NC / NC without Check (4/3 Exh. Ctr.)	GEE

*Valve includes peripheral P. O. Check Valve and union fittings.

Operator Voltage	
24VDC	2C
Remote Pilot - 5/32" (4mm) Tube	00

Ports (All Ports)	
C0*	10mm Elbow Fitting
C2*	12mm Elbow Fitting
C4	5/32" (4mm) Elbow Fitting
C6	6mm Elbow Fitting
C7	1/4" Elbow Fitting
C8*	8mm Elbow Fitting
C9*	3/8" Elbow Fitting
F0*	10mm Elbow Fitting
F2*	12mm Elbow Fitting
F3*	1/2" Straight Fitting
F4	5/32" (4mm) Straight Fitting
F6	6mm Straight Fitting
F7	1/4" Straight Fitting
F8*	8mm Straight Fitting
F9*	3/8" Straight Fitting

* Only Available with Size 2 Valves.

Fitting Configuration	
A*	Straight Fittings
B*	Elbow Fittings
C**	Straight Fitting & Muffler
D**	Elbow Fitting & Muffler

* Ports 1 & 3 fittings sizes are same as Ports 2 & 4 (See example at left.)

† Fitting in Port 1, Muffler in Port 3

LED / Cable	
00	No Cable, No LED, No Surge Suppression
V2	2 Meter Cable with LED and Surge Suppression
V5	5 Meter Cable with LED and Surge Suppression
V9	9 Meter Cable with LED and Surge Suppression

EXAMPLE for Fitting Configuration:
Size 1

CF7 Ports 1 & 3
1/4" Straight Fitting & Muffler
Ports 2 & 4
1/4" Straight Fittings

Size 2

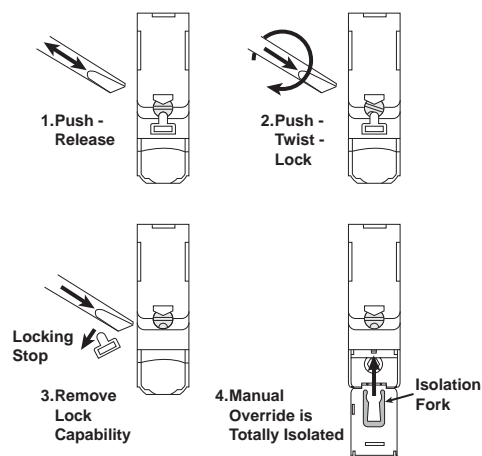
AC0 Ports 1 & 3
10mm Elbow Fittings
Ports 2 & 4
10mm Elbow Fittings

With Only One Universal Solenoid Pilot for all Configurations

24VDC is now a global standard for all machines.

The Moduflex 24VDC unique solenoid pilot is supplied with the multi-function manual override that can be adapted to all requirements, as explained by the drawings.

Multi-Function Adaptable Manual Override





“S” Series Single Solenoid

Example:

Size 1, 4-Way Single Solenoid valve with 1/4" Straight Connectors in Ports 1, 2 and 4. Exhaust Muffler in Port 3. Valve to include 2m cable with LED and surge suppression.

A

How to Order Complete Valve Assembly

Line Item	Quantity	Part Number	Description
1	1	P2M1S4ES2CV2CF7	Size 1, Stand Alone Valve Module, 4 Way, Single Solenoid, 2m Cable with LED / Surge Suppression, Exhaust Muffler with 1/4" OD Straight Port Fittings

Notes:

1. Cables supplied loose with valve.
2. For LED and Surge Suppressor, cable must be supplied with valve.

How to Order Components

Line Item	Quantity	Part Number	Description
1	1	P2M1S4ES2C	Size 1, Stand Alone Valve Module, Single Solenoid, 4 Way
2	1	P8LS08L226C	2m Cable with LED / Surge Suppression
3	3	FMD07-1B	Size 1, 1/4" OD Tube Push In Connector
4	1	MMDVA1	Size 1, Muffler for Exhaust Port



A

"T" Series Basic Modules Size 1 (Without Pneumatic Connectors)



Single Solenoid



Double Solenoid



Single Air Pilot



Double Air Pilot

Size 1 Electro-Pneumatic Island Valve Modules, 24VDC

4-Way / 2-Position / Single Valve

	Solenoid	Weight	Part Number
	Single Solenoid (Monostable)	2.40 oz	P2M1T4ES2C
	Double Solenoid (Bistable)	2.72 oz	P2M1T4EE2C

4-Way / 2-Position / Dual Valve

	Solenoid	Weight	Part Number
	Solenoid Spring with Exhaust Check	2.72 oz	P2M1TJEE2C

3-Way / 2-Position / Dual Valve

	Solenoid	Weight	Part Number
	Double Solenoid NC + NC with Exhaust Check	2.82 oz	P2M1TDEE2C
	Double Solenoid NO + NO with Exhaust Check	2.82 oz	P2M1TCEE2C
	Double Solenoid NC + NO with Exhaust Check	2.82 oz	P2M1TEEE2C
	Single Solenoid NC with Exhaust Check	2.68 oz	P2M1T3ES2C
	Center Exhaust = dual 3/2 NC + NC without Exhaust Check	2.84 oz	P2M1TGEE2C

Size 1 Air Pilot Island Valve Modules

4-Way / 2-Position / Single Valve

	Solenoid	Weight	Part Number
	Single Air Pilot (Monostable)	2.40 oz	P2M1T4PS
	Double Air Pilot (Bistable)	2.72 oz	P2M1T4PP

4-Way / 2-Position / Dual Valve

	Solenoid	Weight	Part Number
	Air Pilot Spring with Exhaust Check	2.72 oz	P2M1TJPP

3-Way / 2-Position / Dual Valve

	Solenoid	Weight	Part Number
	Double Air Pilot NC + NC with Exhaust Check	2.82 oz	P2M1TDPP
	Double Air Pilot NO + NO with Exhaust Check	2.82 oz	P2M1TCPP
	Single Air Pilot NC with Exhaust Check	2.68 oz	P2M1T3PS

Note: Includes 5/32" (4mm) Air Pilot Connectors.

Note: Bold Options Standard



M8 Female Individual Connectors with Flying Lead Cable (For Solenoid Pilots)



With LED Voltage Surge Protection and Flying Lead Cable IP67 Protected		Weight (oz)	Order Code
	2 m Cable	2.19	P8LS08L226C
	5 m Cable	5.47	P8LS08L526C
	9 m Cable	9.88	P8LS08L926C

Pneumatic Connectors for Size 1 Modules



		Elbow Version		Straight Version	
		Weight (oz)	Order Code	Weight (oz)	Order Code
Tube Push-in Connector	5/32" = 4mm OD	0.18	CMD04-1	0.07	FMD04-1
	6mm OD	0.18	CMD06-1	0.11	FMD06-1
	1/4" OD	0.18	CMD07-1B	0.11	FMD07-1B
Muffler for Exhaust Port	—	—	—	0.11	MMDVA1
Plug	—	—	—	0.18	PMDYY1
Double Male Union (For Peripheral Valve Modules)	—	—	—	0.21	HMDXX1

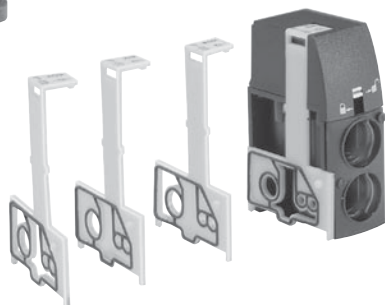
Note: 85 Durometer minimum for pneumatic connectors.



P2M1K0TASD



P2M2HXT01



P2M2BXT0A

Island Modules

Module	Weight (oz)	Order Code
Pneumatic Head and Tail Set	2.26	P2M2HXT01*
Pneumatic Head and Tail Set with TORX Screwdriver	2.50	P2M2HXT0T*
TORX Screwdriver Only	.24	P2M1K0TASD
Intermediate Supply Module (With a set of 4 Configuration Plates)	1.48	P2M2BXT0A*

* Use Fittings for Size 2 Modules Only.



A

"T" Series Basic Modules Size 2 (Without Pneumatic Connectors)



Single Solenoid



Double Solenoid



Single Air Pilot



Double Air Pilot

Size 2 Electro-Pneumatic Island Valve Modules, 24VDC

4-Way / 2-Position / Single Valve

	Solenoid	Weight	Part Number
	Single Solenoid (Monostable)	2.61 oz	P2M2T4ES2C
	Double Solenoid (Bistable)	2.93 oz	P2M2T4EE2C

Size 2 Air Pilot Island Valve Modules

4-Way / 2-Position / Single Valve

	Solenoid	Weight	Part Number
	Single Air Pilot (Monostable)	2.61 oz	P2M2T4PS
	Double Air Pilot (Bistable)	2.93 oz	P2M2T4PP

3-Way / 2-Position / Dual Valve

	Solenoid	Weight	Part Number
	Double Solenoid NC + NC with Exhaust Check	3.32 oz	P2M2TDEE2C
	Double Solenoid NO + NO with Exhaust Check	3.32 oz	P2M2TCEE2C
	Double Solenoid NC + NO with Exhaust Check	3.32 oz	P2M2TEEE2C
	Single Solenoid NC with Exhaust Check	3.17 oz	P2M2T3ES2C
	Center Exhaust = dual 3/2 NC + NC without Exhaust Check	3.32 oz	P2M2TGEE2C

3-Way / 2-Position / Dual Valve

	Solenoid	Weight	Part Number
	Double Air Pilot NC + NC with Exhaust Check	3.32 oz	P2M2TDPP
	Double Air Pilot NO + NO with Exhaust Check	3.32 oz	P2M2TCPP
	Single Air Pilot NC with Exhaust Check	2.61 oz	P2M2T3PS

Note: Includes 5/32" (4mm) Air Pilot Connectors.

Note: Bold Options Standard



M8 Female Individual Connectors with Flying Lead Cable (For Solenoid Pilots)



With LED Voltage Surge Protection and Flying Lead Cable IP67 Protected		Weight (oz)	Order Code
	2 m Cable	2.19	P8LS08L226C
	5 m Cable	5.47	P8LS08L526C
	9 m Cable	9.88	P8LS08L926C

Pneumatic Connectors for Size 2 Modules



PMDYY2



MMDVA2



HMDXX2



FMD09-2B



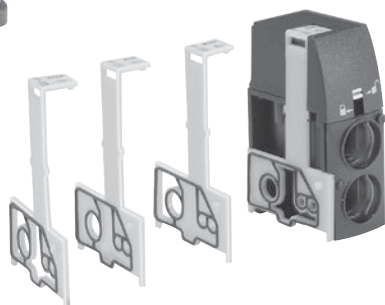
CMD09-2B



P2M1K0TASD



P2M2HXT01



P2M2BXT0A

		Elbow Version		Straight Version	
		Weight (oz)	Order Code	Weight (oz)	Order Code
Tube Push-in Connector	6mm OD	0.18	CMD06-2	0.11	FMD06-2
	1/4" OD	0.18	CMD07-2B	0.11	FMD07-2B
	8mm OD	0.21	CMD08-2	0.14	FMD08-2
	3/8" OD	0.21	CMD09-2B	0.14	FMD09-2B
	10mm OD	0.25	CMD10-2	0.18	FMD10-2
	12mm OD	0.28	CMD12-2	0.21	FMD12-2
	1/2" OD	—	—	0.21	FMD13-2B
Muffler for Exhaust Port	—	—	—	0.11	MMDVA2
Plug	—	—	—	0.18	PMDYY2
Double Male Union (For Peripheral Valve Modules)	—	—	—	0.28	HMDXX2

Note: 85 Durometer minimum for pneumatic connectors.

Island Modules

Module	Weight (oz)	Order Code
Pneumatic Head and Tail Set	2.26	P2M2HXT01*
Pneumatic Head and Tail Set with TORX Screwdriver	2.50	P2M2HXT0T*
TORX Screwdriver Only	.24	P2M1K0TASD
Intermediate Supply Module (With a set of 4 Configuration Plates)	1.48	P2M2BXT0A*

* Use Fittings for Size 2 Modules Only.



A

"T" Series Island Valve Modules Model Number Index

Complete Modules (Complete with Pneumatic and Electrical Connectors)

**BOLD OPTIONS
ARE STANDARD**

P2M		1	T	4ES	2C	00	0	F4
Basic Series								
Valvetronic Modules		P2M						
Size								
Size 1		1						
Size 2		2						
Valve Series								
Individual Wire		T						
Valve Type / Function								
3-Way / 2-Position								
Single Solenoid, NC Spring Return		3ES						
Single Air Pilot, NC Spring Return		3PS						
4-Way / 2-Position								
Single Solenoid, Spring Return		4ES						
Single Air Pilot, Spring Return		4PS						
Double Solenoid		4EE						
Double Air Pilot		4PP						
Dual 3-Way, 2-Position, Spring Return								
Solenoid, NC / NC + PO Check (4/3 APB)		BEE*						
Air Pilot, NC / NC + PO Check (4/3 APB)		BPP*						
Solenoid, NO / NO (4/3 Pressure Ctr.)		CEE						
Air Pilot NO / NO (4/3 Pressure Ctr.)		CPP						
Solenoid, NC / NC with Exhaust Check		DEE						
Air Pilot, NC / NC with Exhaust Check		DPP						
Solenoid, NO / NC with Exhaust Check		EEE						
Solenoid, NC / NC without Check (4/3 Exh. Ctr.)		GEE						
Dual 4-Way, 2-Position, Spring Return								
Solenoid		JEE**						
Air Pilot		JPP**						
Ports 2 & 4								
C0*		10mm Elbow Fitting						
C2*		12mm Elbow Fitting						
C4		5/32" (4mm) Elbow Fitting						
C6		6mm Elbow Fitting						
C7		1/4" Elbow Fitting						
C8*		8mm Elbow Fitting						
C9*		3/8" Elbow Fitting						
F0*		10mm Straight Fitting						
F2*		12mm Straight Fitting						
F3*		1/2" Straight Fitting						
F4		5/32" (4mm) Straight Fitting						
F6		6mm Straight Fitting						
F7		1/4" Straight Fitting						
F8*		8mm Straight Fitting						
F9*		3/8" Straight Fitting						
<small>* Only Available with Size 2 Valves.</small>								
Ports 1 & 3								
0		None						
LED / Cable								
00		No Cable, No LED, No Surge Suppression						
V2		2 Meter Cable with LED and Surge Suppression						
V5		5 Meter Cable with LED and Surge Suppression						
V9		9 Meter Cable with LED and Surge Suppression						
Operator Voltage								
2C		24VDC						
00		Remote Pilot - 5/32" (4mm) Tube						

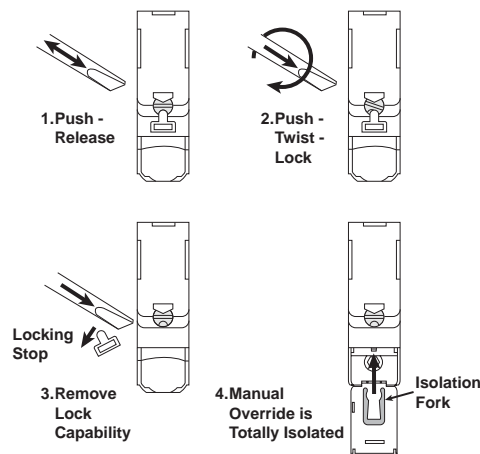
*Valve includes peripheral P. O. Check Valve and union fittings.
** Size 1 Only.

With Only One Universal Solenoid Pilot for all Configurations

24VDC is now a global standard for all machines.

The Moduflex 24VDC unique solenoid pilot is supplied with the multi-function manual override that can be adapted to all requirements, as explained by the drawings.

Multi-Function Adaptable Manual Override





“T” Series Single Solenoid

Example:

Size 1, 4-Way Single Solenoid valve with 1/4" Straight Connectors in Ports 2 and 4. Valve to include 2m cable with LED and surge suppression.

A

How to Order Complete Valve Assembly

Line Item	Quantity	Part Number	Description
1	1	P2M1T4ES2CV20F7	Size 1, T Series Island Valve Module, 4 Way, Single Solenoid, 2m Cable with LED / Surge Suppression, 1/4" OD Straight Port Fittings

Notes:

1. Cables supplied loose with valve.
2. For LED and Surge Suppressor, cable must be supplied with valve.
3. To assemble into a manifold, Pneumatic Head and Tail Set must be ordered separately.

How to Order Components

Line Item	Quantity	Part Number	Description
1	1	P2M1T4ES2C	Size 1, T Series Island Valve Module, Single Solenoid, 4 Way
2	1	P8LS08L226C	2m Cable with LED / Surge Suppression
3	2	FMD07-1B	Size 1, 1/4" OD Tube Push In Connector



A

“V” Series Basic Modules Size 1 (Without Pneumatic Connectors)



Single Solenoid



Double Solenoid

Size 1 Electro-Pneumatic Island Valve Modules, 24VDC

4-Way / 2-Position / Single Valve

	Solenoid	Weight	Part Number
	Single Solenoid (Monostable)	3.32 oz	P2M1V4ES2CV
	Double Solenoid (Bistable)	3.63 oz	P2M1V4EE2CV

4-Way / 2-Position / Dual Valve

	Solenoid	Weight	Part Number
	Solenoid Spring with Exhaust Check	3.63 oz	P2M1VJEE2CV

3-Way / 2-Position / Dual Valve

	Solenoid	Weight	Part Number
	Double Solenoid NC + NC with Exhaust Check	3.74 oz	P2M1VDEE2CV
	Double Solenoid NO + NO with Exhaust Check	3.74 oz	P2M1VCEE2CV
	Double Solenoid NC + NO with Exhaust Check	3.74 oz	P2M1VEEE2CV
	Single Solenoid NC with Exhaust Check	3.60 oz	P2M1V3ES2CV
	Center Exhaust = dual 3/2 NC + NC without Exhaust Check	3.74 oz	P2M1VGEE2CV

Pneumatic Connectors for Size 1 Modules



PMDYY1

HMDXX1

MMDVA1



FMD04-1

CMD04-1



FMD07-1B

CMD07-1B

		Elbow Version		Straight Version	
		Weight (oz)	Order Code	Weight (oz)	Order Code
Tube Push-in Connector	5/32" = 4mm OD	0.18	CMD04-1	0.07	FMD04-1
	6mm OD	0.18	CMD06-1	0.11	FMD06-1
	1/4" OD	0.18	CMD07-1B	0.11	FMD07-1B
Muffler for Exhaust Port	—	—	—	0.11	MMDVA1
Plug	—	—	—	0.18	PMDYY1
Double Male Union (For Peripheral Valve Modules)	—	—	—	0.21	HMDXX1

Note: 85 Durometer minimum for pneumatic connectors.

Note: Bold Options Standard



A



P2M2HEV0A



P2M2HEV0D



Electrical Connector

Module	Weight (oz)	Order Code
20-Pin, Multi-Connector Electrical Head Module	1.34	P2M2HEV0A
25-Pin, D-Sub, Electrical Head Module	1.34	P2M2HEV0D

Electrical 20-Pin Multi-Connector with Flying Lead Cable

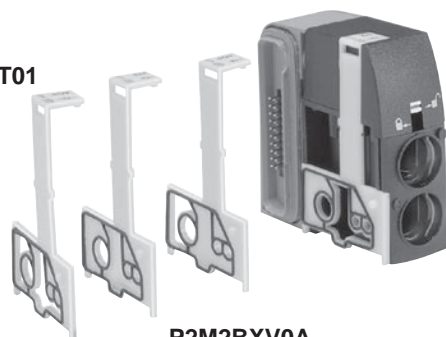
Cable Length	Weight (oz)	Order Code
2 m	10.97	P8LMH20M2A
5 m	27.41	P8LMH20M5A
9 m	49.38	P8LMH20M9A



P2M1K0TASD



P2M2HXT01



P2M2BXV0A



Electrical 25-Pin D-Sub Cable (IP40)

Cable Length	Weight (oz)	Order Code
3 m	14.3	P8LMH25M3A

Island Modules

Module	Weight (oz)	Order Code
Pneumatic Head and Tail Set	2.26	P2M2HXT01*
Pneumatic Head and Tail Set with TORX Screwdriver	2.50	P2M2HXT0T*
TORX Screwdriver Only	.24	P2M1K0TASD
Intermediate Supply Module (With a set of 4 Configuration Plates)	1.48	P2M2BXV0A*

* Use Fittings for Size 2 Modules Only.



A

“V” Series Basic Modules Size 2 (Without Pneumatic Connectors)



Single Solenoid



Double Solenoid

Size 2 Electro-Pneumatic Island Valve Modules, 24VDC

4-Way / 2-Position / Single Valve

	Solenoid	Weight	Part Number
	Single Solenoid (Monostable)	3.53 oz	P2M2V4ES2CV
	Double Solenoid (Bistable)	3.88 oz	P2M2V4EE2CV

3-Way / 2-Position / Dual Valve

	Solenoid	Weight	Part Number
	Double Solenoid NC + NC with Exhaust Check	4.06 oz	P2M2VDEE2CV
	Double Solenoid NO + NO with Exhaust Check	4.06 oz	P2M2VCEE2CV
	Double Solenoid NC + NO with Exhaust Check	4.06 oz	P2M2VEEE2CV
	Single Solenoid NC with Exhaust Check	3.88 oz	P2M2V3ES2CV
	Center Exhaust = dual 3/2 NC + NC without Exhaust Check	4.06 oz	P2M2VGEE2CV

Pneumatic Connectors for Size 2 Modules



PMDYY2



MMDVA2



HMDXX2



FMD09-2B



CMD09-2B

		Elbow Version		Straight Version	
		Weight (oz)	Order Code	Weight (oz)	Order Code
Tube Push-in Connector	6mm OD	0.18	CMD06-2	0.11	FMD06-2
	1/4" OD	0.18	CMD07-2B	0.11	FMD07-2B
	8mm OD	0.21	CMD08-2	0.14	FMD08-2
	3/8" OD	0.21	CMD09-2B	0.14	FMD09-2B
	10mm OD	0.25	CMD10-2	0.18	FMD10-2
	12mm OD	0.28	CMD12-2	0.21	FMD12-2
	1/2" OD	—	—	0.21	FMD13-2B
Muffler for Exhaust Port	—	—	—	0.11	MMDVA2
Plug	—	—	—	0.18	PMDYY2
Double Male Union (For Peripheral Valve Modules)	—	—	—	0.28	HMDXX2

Note: 85 Durometer minimum for pneumatic connectors.

Note: Bold Options Standard



A



P2M2HEV0A



P2M2HEV0D



Electrical Connector

Module	Weight (oz)	Order Code
20-Pin, Multi-Connector Electrical Head Module	1.34	P2M2HEV0A
25-Pin, D-Sub, Electrical Head Module	1.34	P2M2HEV0D

Electrical 20-Pin Multi-Connector with Flying Lead Cable

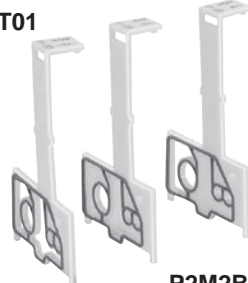
Cable Length	Weight (oz)	Order Code
2 m	10.97	P8LMH20M2A
5 m	27.41	P8LMH20M5A
9 m	49.38	P8LMH20M9A



P2M1K0TASD



P2M2HXT01



P2M2BXV0A



Electrical 25-Pin D-Sub Cable (IP40)

Cable Length	Weight (oz)	Order Code
3 m	14.3	P8LMH25M3A

Island Modules

Module	Weight (oz)	Order Code
Pneumatic Head and Tail Set	2.26	P2M2HXT01*
Pneumatic Head and Tail Set with TORX Screwdriver	2.50	P2M2HXT0T*
TORX Screwdriver Only	.24	P2M1K0TASD
Intermediate Supply Module (With a set of 4 Configuration Plates)	1.48	P2M2BXV0A*

* Use Fittings for Size 2 Modules Only.



A

"V" Series Island Valve Modules Model Number Index

Complete Modules (Complete with Pneumatic and Electrical Connectors)

**BOLD OPTIONS
ARE STANDARD**

P2M	1	V	4ES	2C	00	0	F4
------------	----------	----------	------------	-----------	-----------	----------	-----------

Basic Series	
Valvetronic Modules	P2M

Size	
Size 1	1
Size 2	2

Valve Series	
Valvetronic	V

Valve Type / Function	
3-Way / 2-Position	
Single Solenoid, NC Spring Return	3ES
4-Way / 2-Position	
Single Solenoid, Spring Return	4ES
Double Solenoid	4EE
Dual 3-Way, 2-Position, Spring Return	
Solenoid, NC / NC + PO Check (4/3 APB)	BEE*
Solenoid, NO / NO (4/3 Pressure Ctr.)	CEE
Solenoid, NC / NC with Exhaust Check	DEE
Solenoid, NO / NC with Exhaust Check	EEE
Solenoid, NC / NC without Check (4/3 Exh. Ctr.)	GEE
Dual 4-Way, 2-Position, Spring Return	
Solenoid	JEE**

*Valve includes peripheral P. O. Check Valve and union fittings.
** Size 1 Only.

Ports 2 & 4	
C0*	10mm Elbow Fitting
C2*	12mm Elbow Fitting
C4	5/32" (4mm) Elbow Fitting
C6	6mm Elbow Fitting
C7	1/4" Elbow Fitting
C8*	8mm Elbow Fitting
C9*	3/8" Elbow Fitting
F0*	10mm Elbow Fitting
F2*	12mm Elbow Fitting
F3*	1/2" Straight Fitting
F4	5/32" (4mm) Straight Fitting
F6	6mm Straight Fitting
F7	1/4" Straight Fitting
F8*	8mm Straight Fitting
F9*	3/8" Straight Fitting

* Only Available with Size 2 Valves.

Ports 1 & 3	
0	None

LED / Cable	
V0	No Cable with LED and Surge Suppression

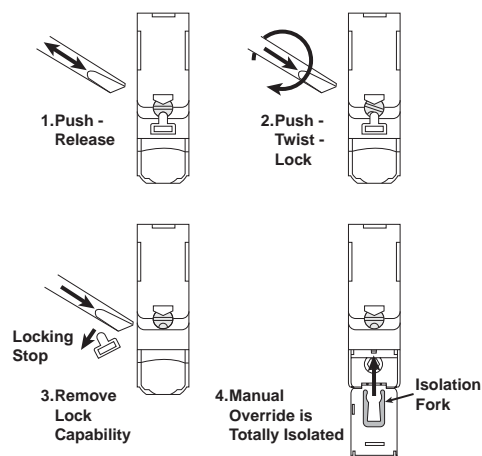
Operator Voltage	
2C	24VDC

With Only One Universal Solenoid Pilot for all Configurations

24VDC is now a global standard for all machines.

The Moduflex 24VDC unique solenoid pilot is supplied with the multi-function manual override that can be adapted to all requirements, as explained by the drawings.

Multi-Function Adaptable Manual Override





“V” Series Single Solenoid

Example:

Size 1, 4-Way Single Solenoid valve with 1/4" Straight Connectors in Ports 2 and 4. Valve to include LED and surge suppression.

A

How to Order Complete Valve Assembly

Line Item	Quantity	Part Number	Description
1	1	P2M2V4ES2CV00F7	Size 1, V Series Island Valve Module, 4 Way, Single Solenoid, LED / Surge Suppression, 1/4" OD Straight Port Fittings

Notes:

1. LED and Surge Suppressor included with valve.
2. To assemble into a manifold, Pneumatic Head and Tail Set and Electrical Connector must be ordered separately.

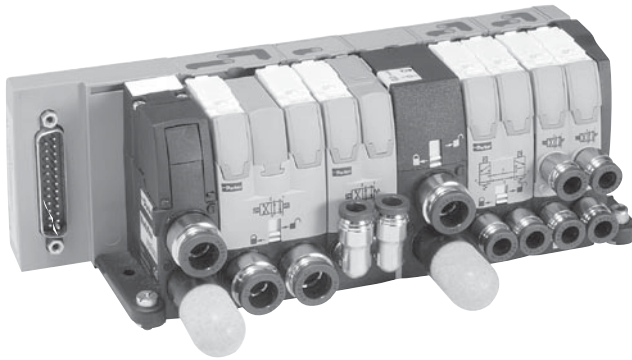
How to Order Components

Line Item	Quantity	Part Number	Description
1	1	P2M1V4ES2CV	Size 1, V Series Island Valve Module, Single Solenoid, 4 Way
2	2	FMD07-1B	Size 1, 1/4" OD Tube Push In Connector



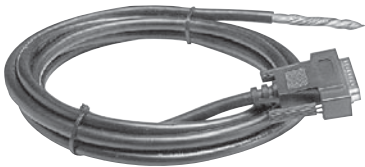
A

“V” Series 25-Pin, D-Sub Addressing



Electrical 25-Pin D-Sub Cable (IP40)

Cable Length	Weight (oz)	Order Code
3 m	14.3	P8LMH25M3A



P8LMH253A - Cable

Address	Color	Pin Number	Pin Number	Color	Address
0	Black	1	14	Brown / White	1
2	Brown	2	15	Red / White	3
4	Red	3	16	Orange / White	5
6	Orange	4	17	Green / White	7
8	Yellow	5	18	Blue / White	9
10	Green	6	19	Purple / White	11
12	Blue	7	20	Red / Black	13
14	Purple	8	21	Orange / Black	15
16	Gray	9	22	Yellow / Black	17
18	White	10	23		Not Used
Not Used		11	24		Not Used
Not Used		12	25		Not Used
Common		13			

Face View - Female D-Sub, 25-Pin Cable Connector

Valve Island Head 25-Pin, Multi-Connector

On the island head module, the multi-connector integrates the HE10 connector standard in its 25-Pin version.

Its plug-in function is secured in position with a guillotine lock with easy access from the front of the island.

The 25-Pin, D-Sub multi-connector is rated for IP40.

25-Pin, Multi-Connector Addressing

When assembling a **V Series** island, modules are automatically connected to the head module through the modular principle of the integrated electrical connections.

Each wire color code corresponds a solenoid pilot position in the island.

Address	Color	Pin Number	Pin Number	Color	Address
1	Brown / White	14	1	Black	0
3	Red / White	15	2	Brown	2
5	Orange / White	16	3	Red	4
7	Green / White	17	4	Orange	6
9	Blue / White	18	5	Yellow	8
11	Purple / White	19	6	Green	10
13	Red / Black	20	7	Blue	12
15	Orange / Black	21	8	Purple	14
17	Yellow / Black	22	9	Gray	16
Not Used		23	10	White	18
Not Used		24	11		Not Used
Not Used		25	12		Not Used
			13		Common

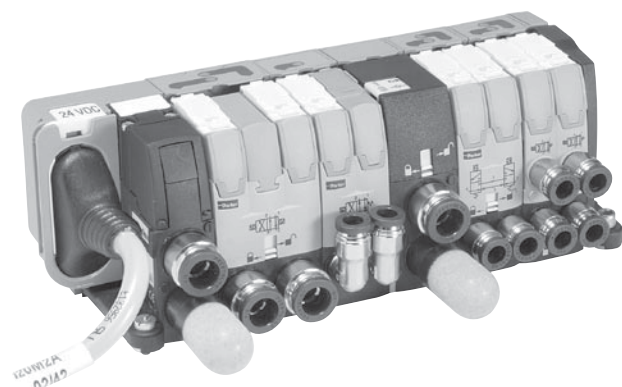
Face View - Male D-Sub, 25-Pin Head Module Connector

Electrical Specifications

Rated Voltage	24 VDC
Maximum Addresses	19
Maximum Energized Simultaneously	19
Electrical Connection	25-Pin, D-Sub DIN41652, MIL-C-24308, NFC93425 Type HE5
Polarity	Insensitive: PNP and NPN compatible
Dust and Water Protection	IP40



“V” Series 20-Pin, Multi-Connector and Addressing



Valve Island Head 20-Pin, Multi-Connector

On the island head module, the multi-connector integrates the HE10 connector standard in its 20-Pin version.

Its plug-in function is secured in position with a guillotine lock with easy access from the front of the island.

Just like the whole island, the multi-connector follows the IP65 protection standard.

Cable Specification:

8.6 mm dia., UL, 20 wires, 0.22mm², AWG 24

Minimum Static Radius: 6.5 mm (.255")

Available with 6.56 ft. (2 m), 16.4 ft. (5 m) and 29.5 ft. (9 m) lengths.

20-Pin, Multi-Connector Addressing

When assembling a **V Series** island, modules are automatically connected to the head module through the modular principle of the integrated electrical connections.

The color code addressing given below conforms to the DIN 47100 standard.

Each wire color code corresponds a solenoid pilot position in the island.

Electrical 20-Pin Multi-Connector with Flying Lead Cable (IP65)

Cable Length	Weight (oz)	Order Code
2 m	10.97	P8LMH20M2A
5 m	27.41	P8LMH20M5A
9 m	49.38	P8LMH20M9A



P8LMH20M2A - Cable

Address	Color	Pin Number	Pin Number	Color	Address
1 —	White / Pink	10 —	0 —	Pink / Brown	0
3 —	White / Grey	11 —	1 —	Grey / Brown	2
5 —	White / Yellow	12 —	2 —	Yellow / Brown	4
7 —	White / Green	13 —	3 —	Brown / Green	6
9 —	Grey / Pink	14 —	4 —	Red / Blue	8
11 —	Red	15 —	5 —	Violet	10
13 —	Pink	16 —	6 —	Blue	12
15 —	Yellow	17 —	7 —	Grey	14
17 —	Brown	18 —	8 —	Green	16
	Black (Common)	19 —	9 —	White	18

Face View - Female 20-Pin Cable Connector

Address	Color	Pin Number	Pin Number	Color	Address
0 —	Pink / Brown	0 —	10 —	White / Pink	1
2 —	Grey / Brown	1 —	11 —	White / Grey	3
4 —	Yellow / Brown	2 —	12 —	White / Yellow	5
6 —	Brown / Green	3 —	13 —	White / Green	7
8 —	Red / Blue	4 —	14 —	Grey / Pink	9
10 —	Violet	5 —	15 —	Red	11
12 —	Blue	6 —	16 —	Pink	13
14 —	Grey	7 —	17 —	Yellow	15
16 —	Green	8 —	18 —	Brown	17
18 —	White	9 —	19 —	Black (Common)	19

Face View - Male 20-Pin Head Module Connector

Electrical Specifications

Rated Voltage	24 VDC
Maximum Addresses	19
Maximum Energized Simultaneously	19
Electrical Connection	Type HE10
Polarity	Insensitive: PNP and NPN compatible
Dust and Water Protection	IP65



A

“V” Series Bus Connections

Valve Island Electrical Head Modules for Bus Connections and Control



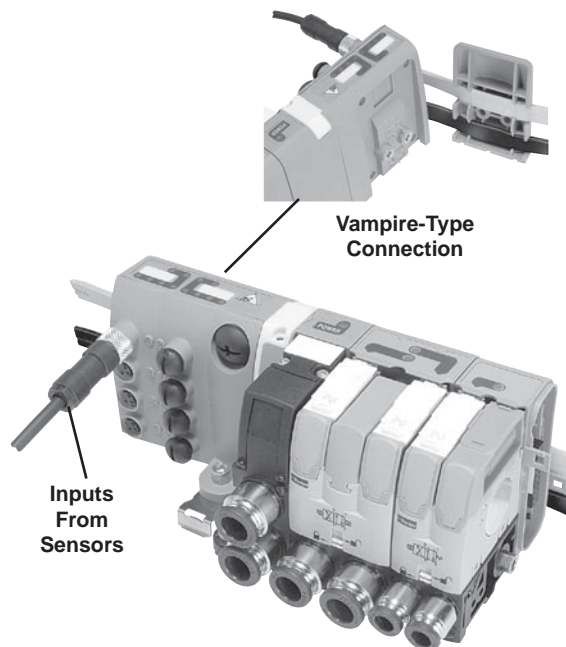
P2M2HBVA10808A



P2M2HBVA10808B



P2M2HBVA10800



Vampire-Type Connection

Inputs From Sensors

Standard ASi Protocol (up to 31 nodes) Electrical Head Modules

Electrical Module for 8 Solenoids Max.
(V Series islands may have up to 8 solenoids)
(2 nodes per module, 4 inputs, 4 solenoids per node)

Input / Output Capability	Weight (oz)	Order Code
0 inputs and 8 solenoid outputs	5.29	P2M2HBVA10800
8 (PNP) inputs on eight (M8) connectors and 8 solenoid outputs	7.05	P2M2HBVA10808A
8 (PNP) inputs on four (M12) connectors and 8 solenoid outputs	7.05	P2M2HBVA10808B

ASi Version 2.1 Protocol (up to 62 nodes) Electrical Head Modules

Electrical Module for 6 Solenoids Max.
(V Series islands may have up to 6 solenoids)
(2 nodes per module, 4 inputs, 4 solenoids per node)

Input / Output Capability	Weight (oz)	Order Code
0 inputs and 6 solenoid outputs	5.29	P2M2HBVA20600
8 (PNP) inputs on eight (M8) connectors and 6 solenoid outputs	7.05	P2M2HBVA20608A
8 (PNP) inputs on four (M12) connectors and 6 solenoid outputs	7.05	P2M2HBVA20608B

ASi Bus Accessories

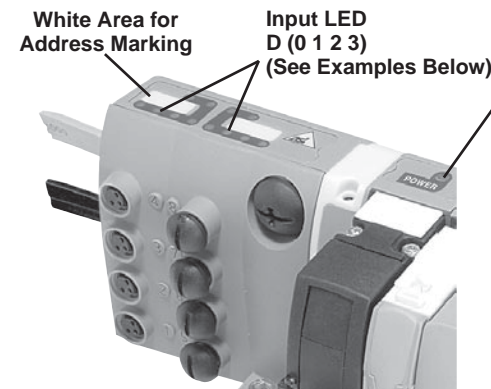
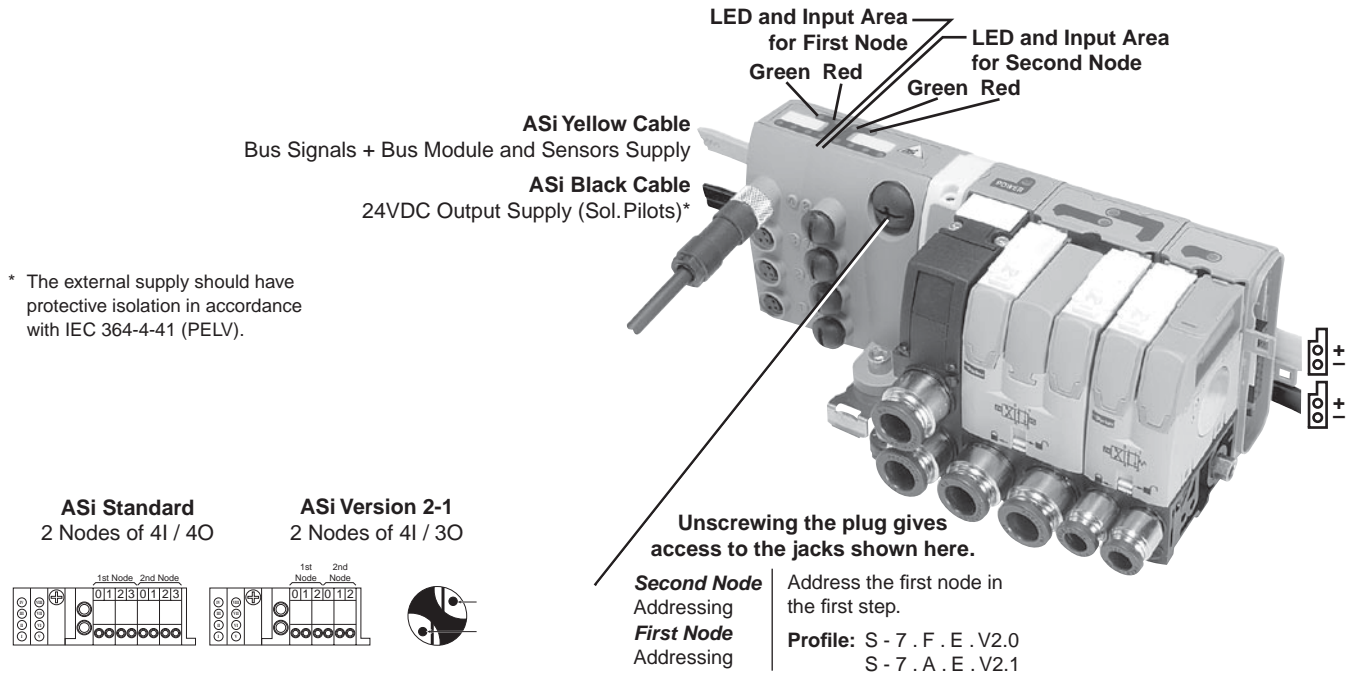
M12 Cable with Jack for Addressing

Length	Weight (oz)	Order Code
1 m	3.53	P8LS12JACK



“V” Series ASi Bus Module: Addressing, Diagnostic, Input Wiring **Bus Addressing, First and Second Node**

A



Bus Diagnostic

“Power” LED State		Off	Green	Red
Power Supply		Sol. Pilot Supply	Normal Operation	Solenoid Overload

First Node LEDs State		Second Node LEDs State		System Condition
Green LED	Red LED	Green LED	Red LED	
*	○	*	○	Normal Operation
○	○	○	○	No Module + Sensor Supply
○	*	○	*	Input Overload
○	*	○	*	No ASi Communication
*	*	○	*	Address First Node = 0
*	○	*	*	Address Second Node = 0

* ON ○ OFF * BLINK

Input Wiring

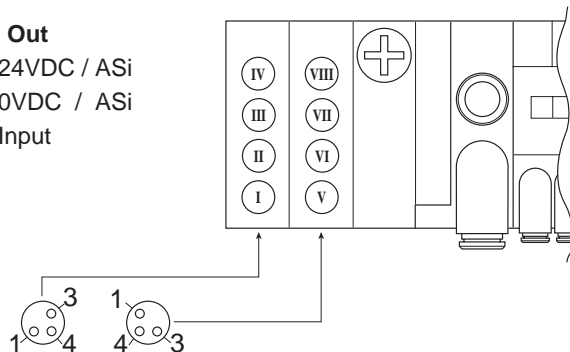
Physical Input (I, II, III, IV) = D (0 1 2 3) First Node,
 Physical Input (V, VI, VII, VIII) = D (0 1 2 3) Second Node.

Examples: Physical Input III = Logical Input 6.2,
 Physical Input V = Logical Input 7.0.

M8 Female Connectors

Pin Out

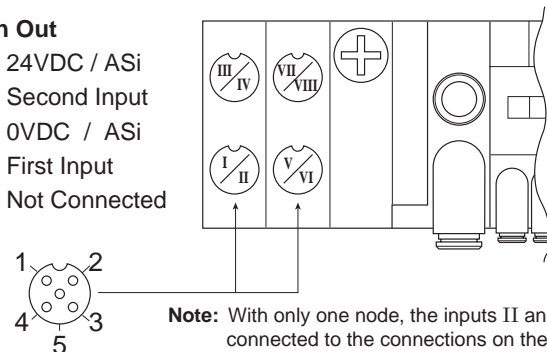
- 1 - 24VDC / ASi
- 3 - 0VDC / ASi
- 4 - Input



M12 Female Connectors

Pin Out

- 1 - 24VDC / ASi
- 2 - Second Input
- 3 - 0VDC / ASi
- 4 - First Input
- 5 - Not Connected





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“V” Series Bus Connections

Valve Island Electrical Head Modules for Bus Connections and Control



CANopen



INTERBUS-S

Device Bus Electrical Head Modules

Electrical Module for 16 Outputs Max.
(V Series islands may have up to 16 solenoids)



P2M2HBVP11600

Bus Protocol	Weight (oz)	Order Code
Profibus DP	8.82	P2M2HBVP11600
DeviceNet	8.82	P2M2HBVD11600
CANopen	8.82	P2M2HBVC11600
Interbus S	10.58	P2M2HBVS11600

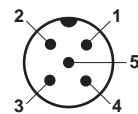
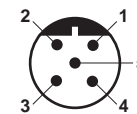
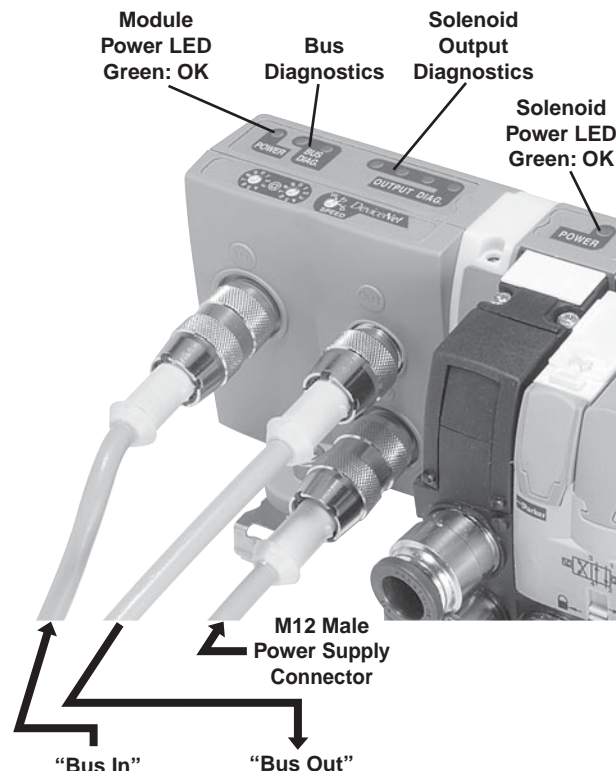
Device Bus Accessories

	Bus Protocol	Connector Type	Weight (oz)	Order Code
Power Supply Female Straight Connector	Profibus DP or Interbus S	M12 type A	0.88	P8CS1205AA
	DeviceNet	M12 type B	0.88	P8CS1205AB
Line Termination Resistor	Profibus DP	M12 type B	0.88	P8BPA00MB
	DeviceNet / CANopen	M12 type A	0.88	P8BPA00MA

Note: Use standard cables and connectors for bus communications from your electrical supplier.

M12 (Male) Power Supply Connector

- 1 - 24VDC Module (Not Connected for DeviceNet)
- 2 - Not Connected
- 3 - 0VDC Module and Solenoid
- 4 - 24VDC Solenoid
- 5 - Protected Earth (PE)

DeviceNet/
CANopenBus In
(As Seen
On Module)M12 Male
Type AProfibus DP/
Interbus SBus In
(As Seen
On Module)M12 Male
Type B

Connection

All bus modules have an M12 male connector for power supply.

Type A or B have been chosen to make them non compatible with M12 bus connectors, thereby avoiding any connection mistake.

Diagnostic

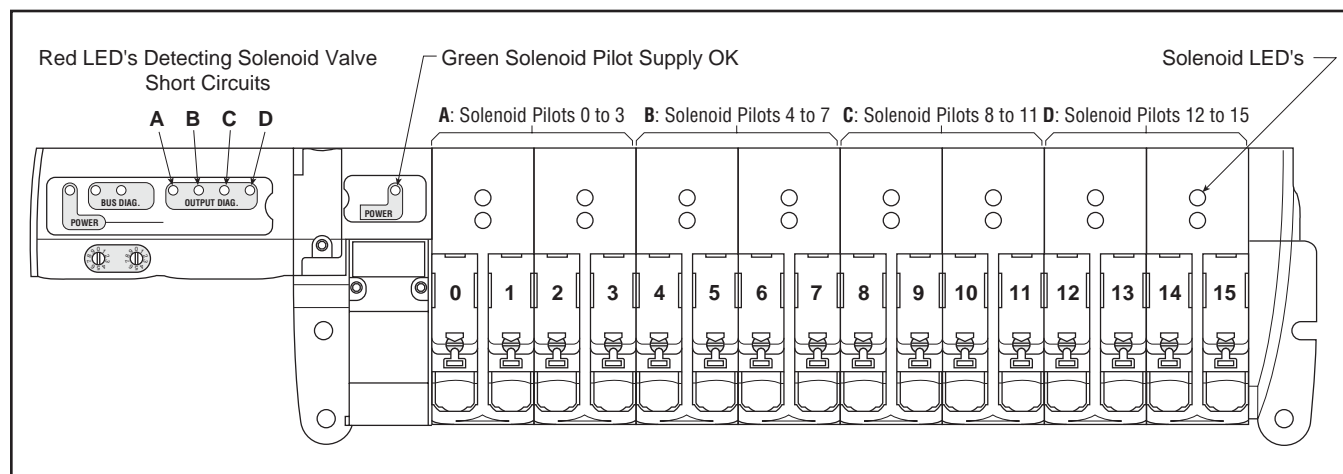
The two “power” indicators shown on the illustrations provide visual indication of the module and solenoid supply status.

Note: Output power to the solenoids can be wired to allow the user to turn the outputs off while allowing communications to remain on. This can be done by placing the user's Emergency Stop switch or other hard-wired control contact between Pin 1 and Pin 4. If this feature is not required, Pin 1 and Pin 4 should be wired together.



Solenoid Pilot Diagnostic Common to All Device Bus Modules

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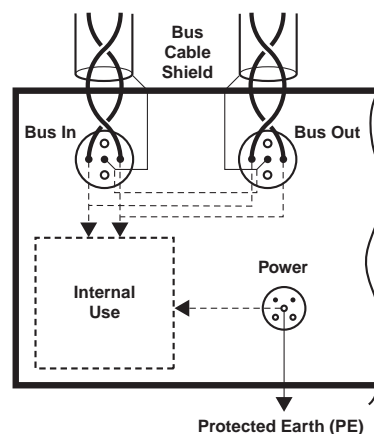
Inside the bus module, solenoid valve control is protected against short-circuits with the following visual indication provided:

- The red LEDs with code, shown above, detect solenoid valve short-circuits.
- Supply is OK when the solenoid pilot power supply indicator is green.

Bus Cable Protection Shield Connections for Profibus DP, DeviceNet and CANopen

To provide protection against electro-magnetic interferences, the bus cables are shielded. The module "bus in" and "bus out" connectors each includes a pin for connecting the cable shield (see next pages). It is safer to connect the shield to the protected earth (PE) at both ends of the bus. Within the bus module, provision is made to enable shield continuity by connection between the two shield pins.

The protected earth have to be connected locally on each module for CE accordance.





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“V” Series Valvetronic™

Device Bus Module: Connections, Addressing, Diagnostic



Bus Cable Connections

Profibus DP standard male and female type B M12 connectors.

Use of prefabricated cables available from your local electrical supplier is recommended.

Line termination P8BPA00MB, is necessary on the “bus out” connector of the last station.

This module incorporates an Autobaud detect feature, eliminating the need to set switches.

Addressing

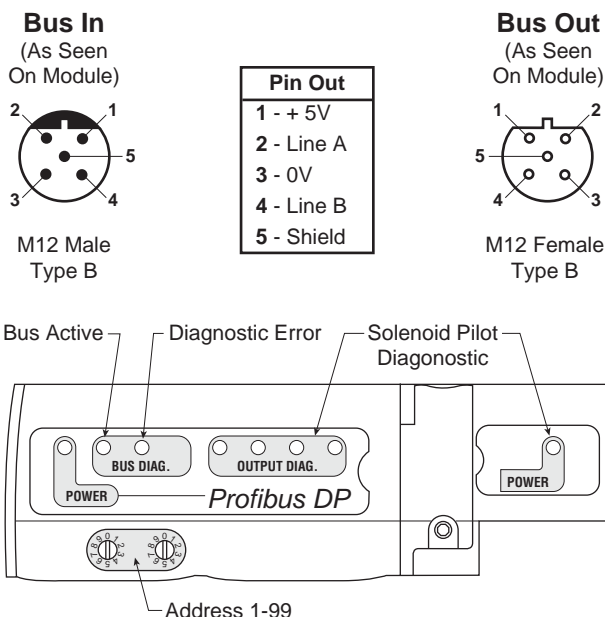
Use the GSD file on website .

The rotary switches enable configuration of the decimal address.

- www.parker.com/moduflex

Diagnostic

Diagnostic according to the module dialog shown on the illustration.



Bus Cable Connections

DeviceNet standard male and female type A M12 connectors.

Use of prefabricated cables available from your local electrical supplier is recommended.

Line termination P8BPA00MA, is necessary on the “bus out” connector of the last station.

Addressing

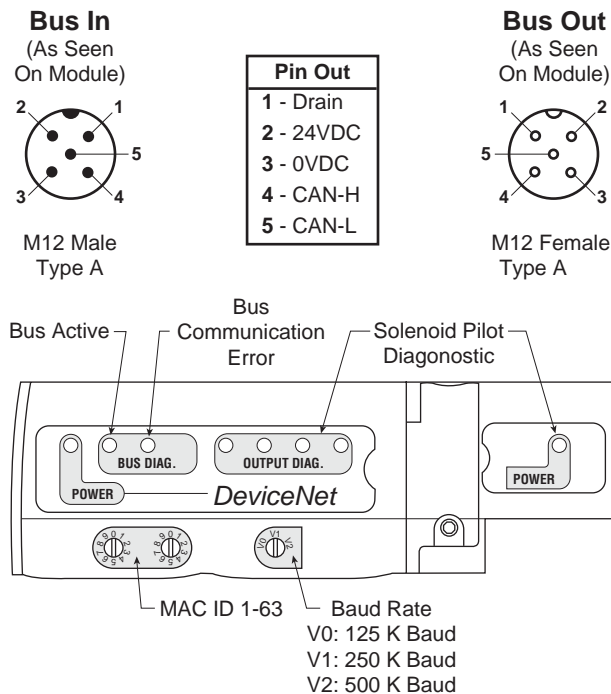
Use the EDS file on website .

The rotary switches enable configuration of the node address (MAC ID) and the baud rate.

- www.parker.com/moduflex

Diagnostic

Diagnostic according to the module dialog shown on the illustration.





CANopen

Bus Cable Connections

CANopen standard male and female type A M12 connectors.

Use of prefabricated cables available from your local electrical supplier is recommended.

Line termination P8BPA00MA, is necessary on the "bus out" connector of the last station.

Addressing

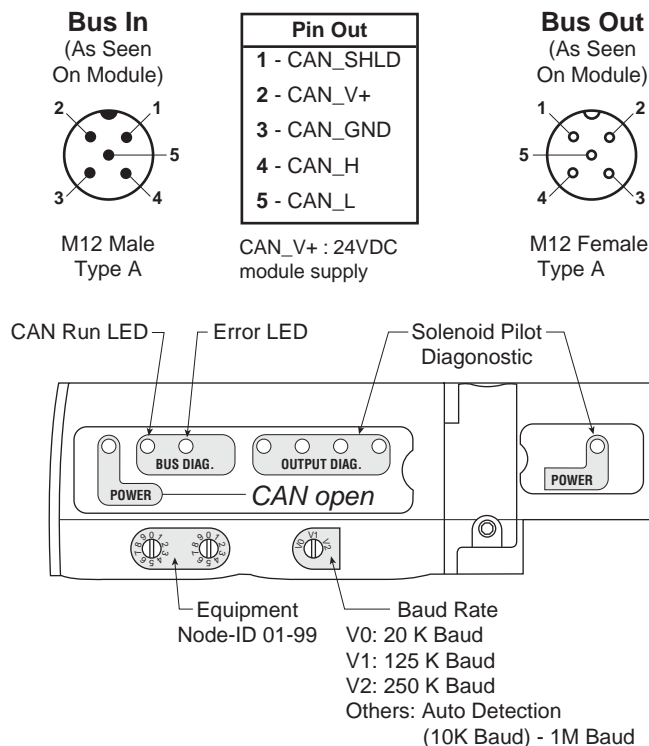
Use the EDS file on website.

The rotary switches enable configuration of the decimal address.

- www.parker.com/moduflex

Diagnostic

Diagnostic according to the module dialog shown on the illustration.



INTERBUS-S

Bus Cable Connections

The M23 connectors conform to "Interbus remote bus".

Use of prefabricated cables available from your usual electrical supplier is recommended.

This module operates at 500 kbps.

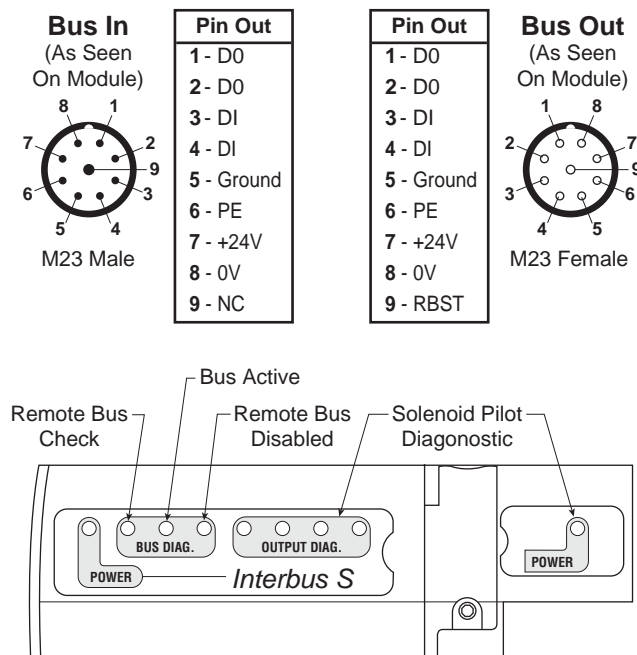
Addressing

Interbus S is self addressing; therefore, it does not need any software or hardware configuration.

Diagnostic

Diagnostic according to the module dialog shown on the illustration.

This diagnostic conforms to the Interbus S standard.



Note: For more details, please consult "Interbus remote bus" documentation.



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Serial Bus Specifications

All Buses	EMC / CE Mark	According to EN 61 000-6-2	EN 50081-2
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ASi Bus	ASi Line	According to EN 50295		
	Solenoid Pilot Voltage	24VDC		
	Module Consumption	max. 70 mA (2 nodes)		
	Max. Supply for All Inputs	240 mA (including internal input consumption)		
	Internal Input Consump.	9 mA for each active input		
	Inputs	According to IEC 1131-2 class 2		
	Certification	These products have been developed according to the association complete specification (v.2.11) and to the slave profiles S-7.F.E or S-B.F.E		

Device Bus	Bus Line	According to each bus specification		
	Module Voltage	20 to 30VDC		
	Solenoid Pilot Voltage	24VDC		
	Module Consumption	Profibus DP max. 1.5W	DeviceNet / CANopen max. 1.5W	Interbus S max. 2W
	Outputs	Overload protection		
	Certification	<u>DeviceNet</u> : Compliant to Composite Test Revision 17, Test Suite: M002		
		<u>Profibus-DP</u> : Compliant to Test Specifications for Profibus DP Slaves, Version 2.0, February 2000, based on EN 50170-2 at Siemens AG in Furth.		
		<u>Interbus-S</u> : This product has passed the relevant tests in accordance with the Interbus conformance requirements Certified No. 385.		



I/O Tables Common to All Device Bus Modules

Input Data Table								
Byte	Bit 0	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7
0	Discrete Input 0 (Diagnostic LED 0-3)	Discrete Input 1 (Diagnostic LED 4-7)	Discrete Input 2 (Diagnostic LED 8-11)	Discrete Input 3 (Diagnostic LED 12-15)	—	—	—	—
Output Data Table								
Byte	Bit 0	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7
0	Discrete Output 0	Discrete Output 1	Discrete Output 2	Discrete Output 3	Discrete Output 4	Discrete Output 5	Discrete Output 6	Discrete Output 7
1	Discrete Output 8	Discrete Output 9	Discrete Output 10	Discrete Output 11	Discrete Output 12	Discrete Output 13	Discrete Output 14	Discrete Output 15

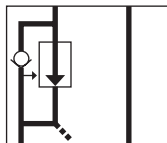
A



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Size 1 Pressure Regulation Modules

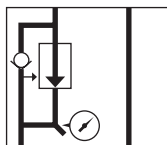
The thrust developed by a cylinder often requires adjustment by controlling pressure to the front or back of the piston. The pressure regulation module enables manual adjustment of pressure with visual indication provided by the pressure gauge.



P2M1PXSN

Pressure Regulation Module Without Gauge Size 1

Pressure Range	Size 1
0 to 30 PSI	P2M1PXST Weight 4.06 oz
0 to 60 PSI	P2M1PXSL Weight 4.06 oz
0 to 120 PSI	P2M1PXSN Weight 4.06 oz



P2M1PXSG



P2M1K0GN

Pressure Regulation Module With Gauge Size 1

Pressure Range	Size 1	Replacement Gauge
0 to 30 PSI	P2M1PXSR Weight 5.12 oz	P2M1K0GT Weight 1.06 oz
0 to 60 PSI	P2M1PXSM Weight 5.12 oz	P2M1K0GL Weight 1.06 oz
0 to 120 PSI	P2M1PXSG Weight 5.12 oz	P2M1K0GN Weight 1.06 oz



Pneumatic Connectors for Size 1 Regulators

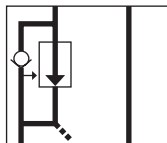
		Elbow Version		Straight Version	
		Weight (oz)	Order Code	Weight (oz)	Order Code
Tube Push-in Connector	5/32" = 4mm OD	0.18	CMD04-1	0.07	FMD04-1
	6mm OD	0.18	CMD06-1	0.11	FMD06-1
	1/4" OD	0.18	CMD07-1B	0.11	FMD07-1B
Plug	—	—	—	0.18	PMDYY1
Double Male Union (For Peripheral Valve Modules)	—	—	—	0.21	HMDXX1

Note: 85 Durometer minimum for pneumatic connectors.



Size 2 Regulation Modules

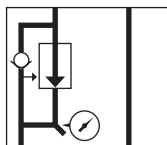
The thrust developed by a cylinder often requires adjustment by controlling pressure to the front or back of the piston. The pressure regulation module enables manual adjustment of pressure with visual indication provided by the pressure gauge.



P2M2PXSN

Pressure Regulation Module Without Gauge Size 2

Pressure Range	Size 2
0 to 30 PSI	P2M2PXST Weight 6.00 oz
0 to 60 PSI	P2M2PXSL Weight 6.00 oz
0 to 120 PSI	P2M2PXSN Weight 6.00 oz



P2M2PXSR



P2M1K0GN

Pressure Regulation Module With Gauge Size 2

Pressure Range	Size 2	Replacement Gauge
0 to 30 PSI	P2M2PXSR Weight 4.94 oz	P2M1K0GT Weight 1.06 oz
0 to 60 PSI	P2M2PXSM Weight 4.94 oz	P2M1K0GL Weight 1.06 oz
0 to 120 PSI	P2M2PXSG Weight 4.94 oz	P2M1K0GN Weight 1.06 oz



PMDYY2



HMDXX2



FMD09-2B



CMD09-2B

Pneumatic Connectors for Size 2 Regulators

		Elbow Version		Straight Version	
		Weight (oz)	Order Code	Weight (oz)	Order Code
Tube Push-in Connector	6mm OD	0.18	CMD06-2	0.11	FMD06-2
	1/4" OD	0.18	CMD07-2B	0.11	FMD07-2B
	8mm OD	0.21	CMD08-2	0.14	FMD08-2
	3/8" OD	0.21	CMD09-2B	0.14	FMD09-2B
	10mm OD	0.25	CMD10-2	0.18	FMD10-2
	12mm OD	0.28	CMD12-2	0.21	FMD12-2
	1/2" OD	—	—	0.21	FMD13-2B
Plug	—	—	—	0.18	PMDYY2
Double Male Union (For Peripheral Valve Modules)	—	—	—	0.28	HMDXX2

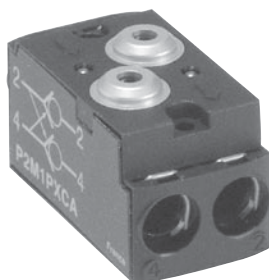
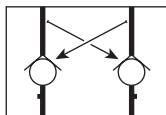
Note: 85 Durometer minimum for pneumatic connectors.



A

Dual P.O. Check Valve

Combined with a double 3/2 NC + NC valve, this module will block both flows and stop cylinder movement as soon as the valve's outputs are both exhausted. Better than a 3-Position valve, it provides more precise positioning when fitted close to the cylinder. Standard with manual release buttons.



P2M1PXCA

Dual P.O. Check Valve Size 1

Description	Size 1
Dual Pilot Operated	P2M1PXCA Weight .88 oz



Pneumatic Connectors for Size 1 Dual P.O. Check Valves

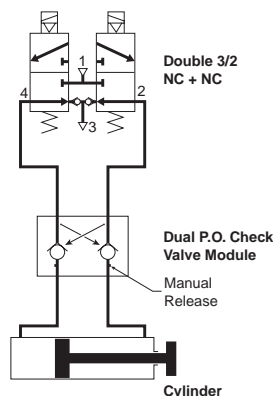
		Elbow Version		Straight Version	
		Weight (oz)	Order Code	Weight (oz)	Order Code
Tube Push-in Connector	5/32" = 4mm OD	0.18	CMD04-1	0.07	FMD04-1
	6mm OD	0.18	CMD06-1	0.11	FMD06-1
	1/4" OD	0.18	CMD07-1B	0.11	FMD07-1B
Double Male Union (For Peripheral Valve Modules)	—	—	—	0.21	HMDXX1

Note: 85 Durometer minimum for pneumatic connectors.

Application

At the outputs of a double 3/2 NC + NC valve, the dual P.O. check valve module achieves efficient and stable cylinder positioning. As soon as both lines are exhausted by the main control valve, the two internally piloted check valves close tight. The cylinder is then stabilized.

The manual pressure releases may then eventually be used for an adequate machine positioning.



Dual P.O. Check Valve Size 2

Description	Size 2
Dual Pilot Operated	P2M2PXCA Weight .88 oz



Pneumatic Connectors for Size 2 Dual P.O. Check Valves

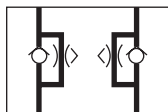
		Elbow Version		Straight Version	
		Weight (oz)	Order Code	Weight (oz)	Order Code
Tube Push-in Connector	6mm OD	0.18	CMD06-2	0.11	FMD06-2
	1/4" OD	0.18	CMD07-2B	0.11	FMD07-2B
	8mm OD	0.21	CMD08-2	0.14	FMD08-2
	3/8" OD	0.21	CMD09-2B	0.14	FMD09-2B
	10mm OD	0.25	CMD10-2	0.18	FMD10-2
	12mm OD	0.28	CMD12-2	0.21	FMD12-2
	1/2" OD	—	—	0.21	FMD13-2B
Double Male Union (For Peripheral Valve Modules)	—	—	—	0.28	HMDXX2

Note: 85 Durometer minimum for pneumatic connectors.



Dual Flow Control

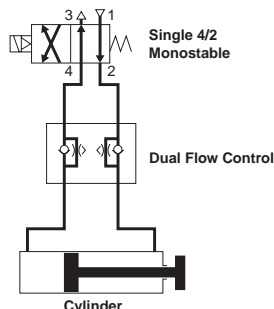
By controlling the exhaust flows of a double-acting cylinder, this module can adjust both speeds — extend and retract. It may be plugged into the valve module output ports or mounted close to the cylinder in its in-line version.



P2M1PXFA

Application

On a double-acting cylinder, extend and retract speeds are adjusted separately by control of air flow exhaust. The control becomes more precise when the flow adjustment is close to the cylinder. The examples show different solutions which are dependent upon the valve-to-cylinder distance and accessibility to the cylinder



Dual Flow Control Size 1

Description	Size 1
Dual Flow Control Module	P2M1PXFA Weight 1.06 oz

Dual Flow Control Size 2

Description	Size 2
Dual Flow Control Module	P2M2PXFA Weight 1.59 oz



Pneumatic Connectors for Size 1 Dual P.O. Check Valves

		Elbow Version		Straight Version	
		Weight (oz)	Order Code	Weight (oz)	Order Code
Tube Push-in Connector	5/32" = 4mm OD	0.18	CMD04-1	0.07	FMD04-1
	6mm OD	0.18	CMD06-1	0.11	FMD06-1
	1/4" OD	0.18	CMD07-1B	0.11	FMD07-1B
Double Male Union (For Peripheral Valve Modules)	—	—	—	0.21	HMDXX1

Note: 85 Durometer minimum for pneumatic connectors.



Pneumatic Connectors for Size 2 Dual P.O. Check Valves

		Elbow Version		Straight Version	
		Weight (oz)	Order Code	Weight (oz)	Order Code
Tube Push-in Connector	6mm OD	0.18	CMD06-2	0.11	FMD06-2
	1/4" OD	0.18	CMD07-2B	0.11	FMD07-2B
	8mm OD	0.21	CMD08-2	0.14	FMD08-2
	3/8" OD	0.21	CMD09-2B	0.14	FMD09-2B
	10mm OD	0.25	CMD10-2	0.18	FMD10-2
	12mm OD	0.28	CMD12-2	0.21	FMD12-2
	1/2" OD	—	—	0.21	FMD13-2B
Double Male Union (For Peripheral Valve Modules)	—	—	—	0.28	HMDXX2

Note: 85 Durometer minimum for pneumatic connectors.



A

"P" Series Peripheral Modules Model Number Index

Complete Modules (Complete with Pneumatic Connectors)

**BOLD OPTIONS
 ARE STANDARD**

P2M 1 PX S L F4 F4

Basic Series	
Electro-Pneumatic Valve Modules	P2M

Size	
Size 1	1
Size 2	2

Style / Function	
Peripheral	PX

Accessory Type	
Dual Pilot Operated Check	C
Dual Flow Control	F
Single Pressure Regulator	S

Accessory Option	
Flow Control or Pilot Operated Check	A*
0 - 120 PSI - Gauge	G
0 - 60 PSI - No Gauge	L
0 - 60 PSI - Gauge	M
0 - 120 PSI - No Gauge	N
0 - 30 PSI - Gauge	R
0 - 30 PSI - No Gauge	T

* Must be used with Accessory Type "C" or "F".

Ports 2 & 4 (S, T & V Series)	
C0*	10mm Elbow Fitting
C2*	12mm Elbow Fitting
C4	5/32" (4mm) Elbow Fitting
C6	6mm Elbow Fitting
C7	1/4" Elbow Fitting
C8*	8mm Elbow Fitting
C9*	3/8" Elbow Fitting
F0*	10mm Elbow Fitting
F2*	12mm Elbow Fitting
F3*	1/2" Straight Fitting
F4	5/32" (4mm) Straight Fitting
F6	6mm Straight Fitting
F7	1/4" Straight Fitting
F8*	8mm Straight Fitting
F9*	3/8" Straight Fitting
JJ	Double Male Union
PP	Clip-In Plug

* Only Available with Size 2 Valves.

Ports 1 & 3 (Supply / Exhaust)	
C0*	10mm Elbow Fitting
C2*	12mm Elbow Fitting
C4	5/32" (4mm) Elbow Fitting
C6	6mm Elbow Fitting
C7	1/4" Elbow Fitting
C8*	8mm Elbow Fitting
C9*	3/8" Elbow Fitting
F0*	10mm Elbow Fitting
F2*	12mm Elbow Fitting
F3*	1/2" Straight Fitting
F4	5/32" (4mm) Straight Fitting
F6	6mm Straight Fitting
F7	1/4" Straight Fitting
F8*	8mm Straight Fitting
F9*	3/8" Straight Fitting
JJ	Double Male Union

* Only Available with Size 2 Valves.



Regulator with Gauge

Example:

Size 1, Regulator with gauge, 1/4" OD straight fittings.

A

How to Order Complete Peripheral Module

Line Item	Quantity	Part Number	Description
1	1	P2M1PXSGF7F7	Size 1, Regulator with 0-160 PSI Gauge, 1/4" OD Straight Port Fittings in port 1, 2, 3, 4

How to Order Components

Line Item	Quantity	Part Number	Description
1	1	P2M1PXSG	Size 1, Regulator with 0-160 PSI Gauge
2	4	FMD07-1B	Size 1-1/4" OD Tube Push-In Connector



Flow Control with Fittings

Example:

Size 1, Dual Flow Control, 1/4" OD Straight Fittings.

How to Order Complete Peripheral Module

Line Item	Quantity	Part Number	Description
1	1	P2M1PXFAF7F7	Size 1, Dual Flow Control, 1/4" OD Straight Port Fittings in Port 1, 2, 3, 4

How to Order Components

Line Item	Quantity	Part Number	Description
1	1	P2M1PXFA	Size 1, Dual Flow Control
2	4	FMD07-1B	Size 1-1/4" OD Tube Push-In Connector



A

Vacuum Generator Module



Depending on the application requirements, this vacuum generator module may be controlled by single or by a dual 3/2 Moduflex valve module. The Vacuum Module has an integrated blow-off chamber that helps destroy the degree of vacuum. Blow-off can be increased with the addition of a control air input to the blow-off port on the vacuum module. A Ø6 mm port is available for an optional plug-in vacuum sensor for delivering a vacuum feedback signal.

Vacuum Generator Module Size 1

Description	Size 1
Vacuum Generator	P2M1PXVA Weight .88 oz



Pneumatic Connectors for Size 1 Vacuum Generator Modules

		Elbow Version		Straight Version	
		Weight (oz)	Order Code	Weight (oz)	Order Code
Tube Push-in Connector	5/32" = 4mm OD	0.18	CMD04-1	0.07	FMD04-1
	6mm OD	0.18	CMD06-1	0.11	FMD06-1
	1/4" OD	0.18	CMD07-1B	0.11	FMD07-1B
Muffler for Exhaust Port	—	—	—	0.11	MMDVA-1
Double Male Union (For Peripheral Valve Modules)	—	—	—	0.21	HMDXX1

Note: 85 Durometer minimum for pneumatic connectors.

Vacuum Generator Module Model Number Index

P2M1PXVA		F7	A	F7	C	MA
Basic Configuration Basic Unit P2M1PXVA						
#1 Pressure Port 5/32" (4mm) Elbow C4 6mm Elbow C6 1/4" Elbow C7 Joint Fitting JJ 5/32" (4mm) Straight F4 6mm Straight F6 1/4" Straight F7						
Port #1 Configuration Fitting in Pressure Port and Blow-off Port A Fitting in Pressure Port and Blow-off Port Plugged* B						
					#3 Exhaust Port C4 5/32" (4mm) Elbow C6 6mm Elbow C7 1/4" Elbow F4 5/32" (4mm) Straight F6 6mm Straight F7 1/4" Straight MA Muffler	
					#2 Sensor Port A 6mm Plug B Plug C Sensor, PNP, M8 D Sensor, NPN, M8 K 1/4" Straight L 1/4" Elbow M 6mm Elbow	
					#2 Vacuum Port C4 5/32" (4mm) Elbow C6 6mm Elbow C7 1/4" Elbow F4 5/32" (4mm) Straight F6 6mm Straight F7 1/4" Straight	

* Can Not be directly mounting to valve.

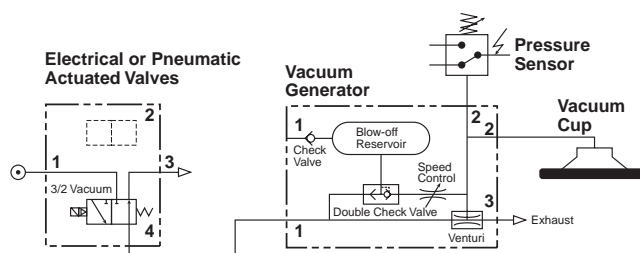


Vacuum Generator Applications



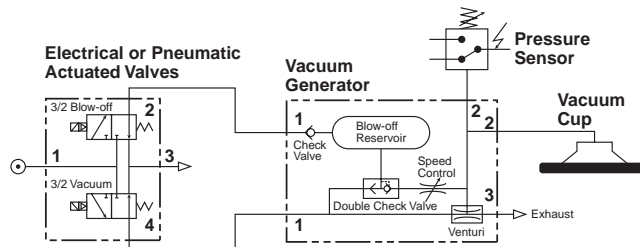
Single 3/2 NC Air Control Valve

The 3/2 valve delivers the air supply to generate vacuum through the venturi. It also pressurizes the integrated blow-off chamber. When the 3/2 valve cuts-off the air supply, this chamber is automatically exhausted into the vacuum channel in order to speed-up the part release. In this type of application, it is preferred to have the vacuum generator mounted away from the control valve.



Dual 3/2 3/2 Valve Control

One 3/2 valve controls air supply for vacuum. The other 3/2 valve will generate an additional blow-off that may prove necessary to obtain quick part release from large vacuum pads. The effect of the blow-off can be controlled with an adjustable screw. In this type of circuit, the Vacuum Generator can be mounted directly to the valve by using Double Male Unions or as a stand alone item away from the control valve.



MPS-6 Sensor Ordering Numbers

Pressure Range	Port Size	Output Circuit	Electrical Connector	Part Number
0 to -30 inHg	6mm Tube Stud	PNP Sourcing	4 Pin, M8	MPS-V6T-PC*
		NPN Sinking		MPS-V6T-NC*

* If ordering the sensor separate from the vacuum module, install a 6mm straight fitting in #2 sensor port for direct mounting.

Sensor Cable Part Numbers

Item	Connector	Contacts	Length	Cover
CB-M8-4P-2M	M8 Female	4	2m	PVC
CB-M8-4P-5M	M8 Female	4	5m	PUR

Vacuum Flow (SCFM)

Nozzle Diameter	inHg										
	0	3	6	9	12	15	18	21	24	27	30
P2M1PXVA	0.84	0.76	0.67	0.55	0.42	0.30	0.18	0.06	—	—	—

Evacuation Time

Series / Nozzle Diameter	Air Supply Pressure	Air Consumption	Evacuation Time in sec / ft ³ * to reach different Vacuum Levels (inHg)								
	PSI	SCFM	3	6	9	12	15	18	21	24	27
P2M1PXVA	70	1.60	5.6	14.2	22.0	42.4	62.3	85.0	116	198	—

* 1 ft³ = 28.31 liters





A

Intermediate Supply Module Model Number Index

BOLD OPTIONS
ARE STANDARD**P2M2BX V 0 4 F9 MM**

Intermediate Supply Module	
Basic Unit	P2M2BX

Valve Type	
Individually Wired	T
Valvetronic Interconnect	V

Wiring Style	
No Cable	0

Plate Configuration	
#1 & #3 Blocked	1
#1 Open & #3 Blocked	2
#1 Blocked & #3 Open	3
#1 & #3 Open	4

Exhaust Port Type (#3 Exhaust)*	
C0	10mm Elbow Fitting
C2	12mm Elbow Fitting
C6	6mm Elbow Fitting
C7	1/4" Elbow Fitting
C8	8mm Elbow Fitting
C9	3/8" Elbow Fitting
F0	10mm Elbow Fitting
F2	12mm Elbow Fitting
F3	1/2" Straight Fitting
F6	6mm Straight Fitting
F7	1/4" Straight Fitting
F8	8mm Straight Fitting
F9	3/8" Straight Fitting
MM	Clip-In Muffler
PP	Clip-In Plug

* Elbow Fittings Face Up.

Inlet Port Type (#1 Pressure)*	
C0	10mm Elbow Fitting
C2	12mm Elbow Fitting
C6	6mm Elbow Fitting
C7	1/4" Elbow Fitting
C8	8mm Elbow Fitting
C9	3/8" Elbow Fitting
F0	10mm Elbow Fitting
F2	12mm Elbow Fitting
F3	1/2" Straight Fitting
F6	6mm Straight Fitting
F7	1/4" Straight Fitting
F8	8mm Straight Fitting
F9	3/8" Straight Fitting
MM	Clip-In Muffler
PP	Clip-In Plug

* Elbow Fittings Face Up.

Plate Configuration

**#1 & #3 Blocked**

#1 Port connected to valves on the right only. Left is blocked.
#3 Port connected to valves on the right only. Left is blocked.

**#1 Open, #3 Blocked**

#1 Port connected to valves on the right and the left.
#3 Port connected to valves on the right only. Left is blocked.

**#1 Blocked, #3 Open**

#1 Port connected to valves on the right only. Left is blocked.
#3 Port connected to valves on the right and the left.

**#1 & #3 Open**

#1 Port connected to valves on the right and the left.
#3 Port connected to valves on the right and the left.



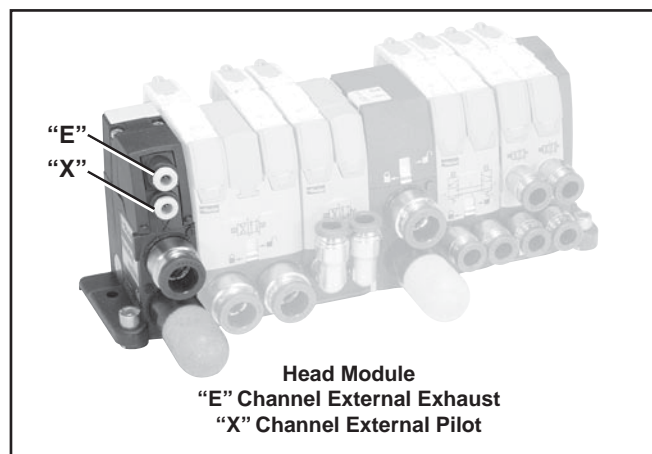
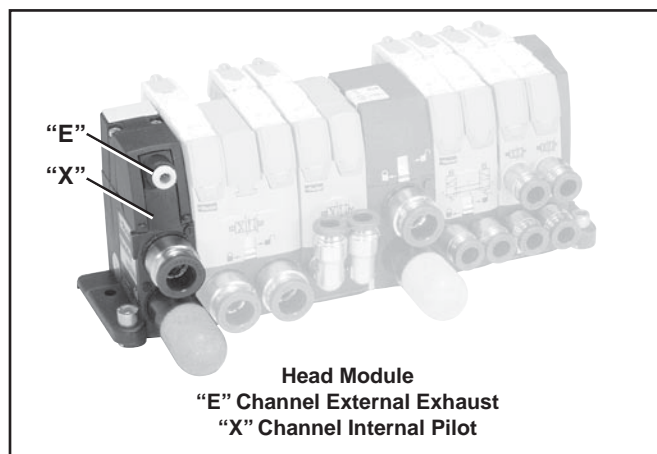
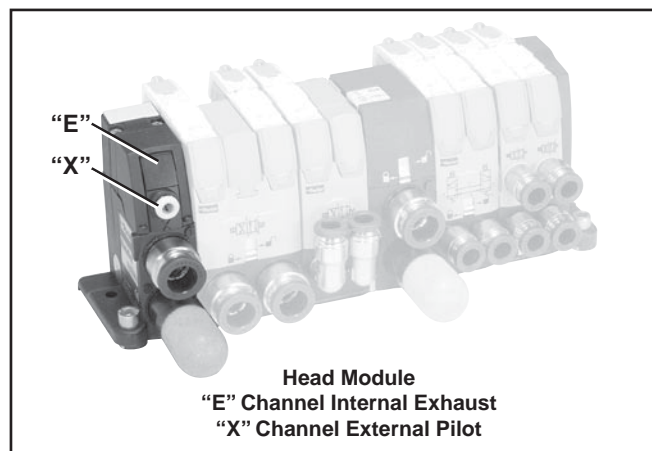
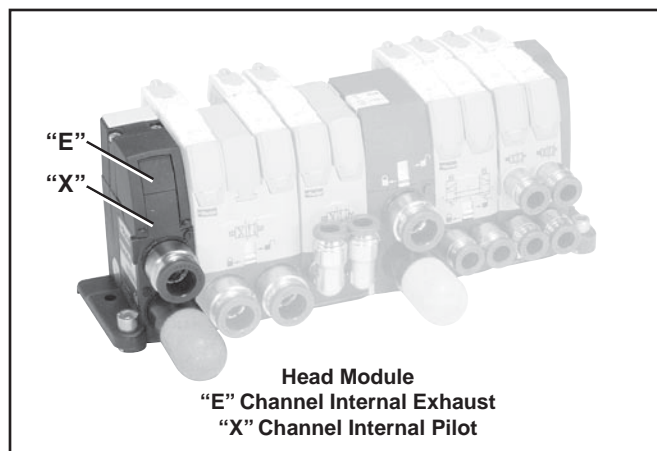
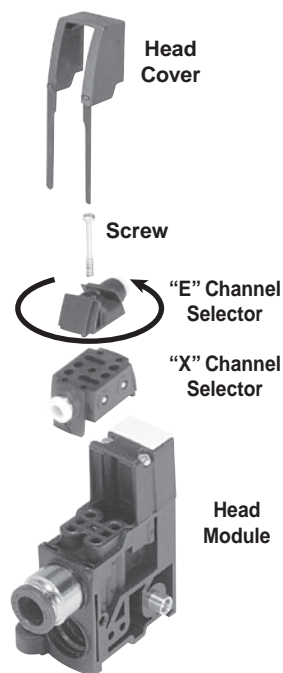
Internal and External Pilot Supply Options

All T and V Series Valves subbases incorporate an auxiliary channel “X” to supply pressure to the solenoid pilots. The “X” galley is pressurized from the head module. Depending on the configuration of the head module, this pressure is either supplied from the #1 port in the head module or supplied externally through a 4mm OD tube fitting in the head module. This fitting is supplied in all head modules and can be converted in the field.

Internal and External Solenoid Pilot Exhaust Options

All T and V Series Valves subbases incorporate an auxiliary channel “E” which is used to exhaust the solenoid pilot pressure from each solenoid valve. The “E” galley is connected to the head module. Depending on the configuration of the head module, this exhaust is either connected to the #3 exhaust port or is connected to a 4mm OD Tube fitting in the head module. This fitting is supplied in all head modules and can be converted in the field.

To configure the head module, with pressure off, remove head cover to expose the selector section. Loosen selector section and rotate “X” or “E” channel selector to desired position. Tighten selector section and assemble head cover.





A

Moduflex Island Assembly Model Number Index

Complete Modules (Complete with Pneumatic and Electrical Connectors)

**BOLD OPTIONS
 ARE STANDARD**

P2MA V 0 1 C9 C9 ##

Moduflex Island Assembly	
Island Assembly	P2MA*

* Includes pneumatic H & T module set.

Style	
Individually Wired	T
Valvetronic Interconnect	V*

* Includes 20-Pin multi-connector or 25-Pin, D-Sub electrical head module.

Wiring / Bus Protocol	
No Cable (20-Pin Multi-Connector T Series)	0
2 Meter Cable (20-Pin)	2
5 Meter Cable (20-Pin)	5
9 Meter Cable (20-Pin)	9
Bus	B*
No Cable (25-Pin, D-Sub)	D
3 Meter Cable (25-Pin, D-Sub)	F

* Order Bus module as a separate line item.

† Default to option "0" for T Series.

Pilot Source	
Internal Supply / Internal Exhaust	1
Internal Supply / External Exhaust	2
External Supply / Internal Exhaust	3
External Supply / External Exhaust	4

Number of Stations†	
01 - 19*	V-Type
01 - 30	T-Type

* Max. Number of Addresses for V type is 19. Single Solenoid Valves equal one address. Double Solenoid Valves equal two addresses. Maximum address may depend upon choice of bus protocol.

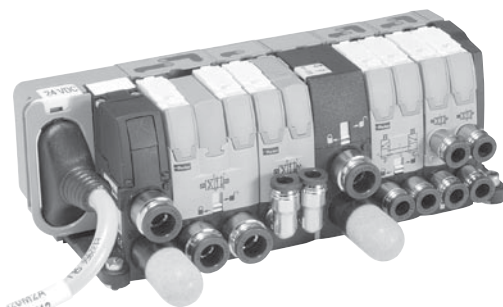
† Intermediate Modules are considered Stations, but do not count against maximum number of addresses for manifold.

Exhaust Port Type (#3 Exhaust)*	
C0	10mm Elbow Fitting
C2	12mm Elbow Fitting
C6	6mm Elbow Fitting
C7	1/4" Elbow Fitting
C8	8mm Elbow Fitting
C9	3/8" Elbow Fitting
F0	10mm Elbow Fitting
F2	12mm Elbow Fitting
F3	1/2" Straight Fitting
F6	6mm Straight Fitting
F7	1/4" Straight Fitting
F8	8mm Straight Fitting
F9	3/8" Straight Fitting
MM	Clip-In Muffler
PP	Clip-In Plug

* Elbow Fittings Face Up.

Inlet Port Type (#1 Pressure)*	
C0	10mm Elbow Fitting
C2	12mm Elbow Fitting
C6	6mm Elbow Fitting
C7	1/4" Elbow Fitting
C8	8mm Elbow Fitting
C9	3/8" Elbow Fitting
F0	10mm Elbow Fitting
F2	12mm Elbow Fitting
F3	1/2" Straight Fitting
F6	6mm Straight Fitting
F7	1/4" Straight Fitting
F8	8mm Straight Fitting
F9	3/8" Straight Fitting
MM	Clip-In Muffler
PP	Clip-In Plug

* Elbow Fittings Face Up.



"V" Series with 20-Pin Connector



"V" Series with Field Bus Connection

**Example:**

Application requires V Series valves with 20-Pin, D-Sub and 2 Meter cable. Manifold to include (1) Size 2, 4/2 Double Solenoid Valve - 3/8" OD fitting, (1) Size 1, 4/2 Single Solenoid Valve - 1/4" OD Elbow Fitting, Intermediate Module - 3/8" OD Fitting with Exhaust Muffler, Port 1 and 3 Blocked, (1) Size 1, Dual 3/2 NC Valve and (1) Size 1, 4-Way Double Solenoid Valve both with 1/4" OD Straight Fittings. Includes 3/8 OD Inlet Fitting and Exhaust Muffler.

How to Order Complete Manifold Assembly

Line Item	Quantity	Part Number	Description
1	1	P2MAV21F9MM05	Moduflex Island Assembly, Pneumatic Head and Tail Module Set, Internal Pilot Supply, Internal Pilot Exhaust, 3/8" Straight Fitting Port 1, Port 3 Muffler.
2	1	P2M2V4EE2CV00F9	Size 2, Double Solenoid, 4/2, 3/8" Straight Pneumatic Connectors.
3	1	P2M1V4ES2CV00C7	Size 1, Single Solenoid, 1/4" Elbow Pneumatic Connectors.
4	1	P2M2BXV0A1F9MM	Intermediate Module 3/8" Straight Fitting with Exhaust Muffler
5	1	P2M1DEES2CV00C7	Size 1, Dual 3/2 NC + NC, 1/4" Elbow Pneumatic Connectors.
6	2	P2M1VJEE2CV00F7	Size 1, Dual 4/2, 1/4" Straight Pneumatic Connectors.

How to Order Components

Line Item	Quantity	Part Number	Description
1	1	P2M2HXT01	Pneumatic Head and Tail Module Set
2	1	P2M2HEV0A	20-Pin, Multi-Connector Electrical Head Module
3	1	P8LMH20M2A	2 Meter, 20-Pin, D-Sub Cable
4	1	P2M2V4EE2CV	Size 2, V Series Island Valve Module, Double Solenoid, 4-Way
5	1	P2M1V4ES2CV	Size 1, V Series Island Valve Module, Single Solenoid, 4-Way
6	1	P2M2BXV0A	Intermediate Module
7	1	P2M1VGEE2CV	Size 1, V Series Island Valve Module, Dual 3/2 NC + NC
8	2	P2M1VJEE2CV	Size 1, V Series Island Valve Module, Dual 4/2
9	2	CMD07-1B	Size 1, 1/4" OD Tube Elbow Push-in Connector
10	6	FMD07-1B	Size 1, 1/4" OD Tube Straight Push-in Connector
11	4	FMD09-2B	Size 2, 3/8" OD Tube Straight Push-in Connector
12	2	MMDVA2	Clip-on Muffler

Example:

Application requires V Series valves with DeviceNet Communications Module. Manifold to include (1) Size 2, 4/2 Double Solenoid Valve - 3/8" OD fitting, (1) Size 1, 4/2 Single Solenoid Valve - 1/4" OD Elbow Fitting, Intermediate Module - 3/8" OD fitting with Exhaust Muffler, Port 1 and 3 Blocked, (1) Size 1, Dual 3/2 NC Valve and (1) Size 1, 4-Way Double Solenoid Valve both with 1/4" OD Straight Fittings. Include 3/8 OD Inlet Fitting and Exhaust Muffler.

How to Order Complete Manifold Assembly

Line Item	Quantity	Part Number	Description
1	1	P2MAVB1F9MM05	Moduflex Island Assembly, Pneumatic Head and Tail Module Set, Internal Pilot Supply, Internal Pilot Exhaust, 3/8" Straight Fitting Port 1, Port 3 Muffler.
2	1	P2M2HBVD11600	DeviceNet Module
3	1	P2M2V4EE2CV00F9	Size 2, Double Solenoid, 4/2, 3/8" Straight Pneumatic Connectors.
4	1	P2M1V4ES2CV00C7	Size 1, Single Solenoid, 1/4" Elbow Pneumatic Connectors.
5	1	P2M2BXV0A1F9MM	Intermediate Module 3/8" Straight Fitting with Exhaust Muffler
6	1	P2M1VDEE2CV00C7	Size 1, Dual 3/2 NC + NC, 1/4" Elbow Pneumatic Connectors.
7	2	P2M1VJEE2CV00F7	Size 1, Dual 4/2, 1/4" Straight Pneumatic Connectors.

How to Order Components

Line Item	Quantity	Part Number	Description
1	1	P2M2HXT01	Pneumatic Head and Tail Module Set
2	1	P2M2HBVD11600	DeviceNet Module
3	1	P2M2V4EE2CV	Size 2, V Series Island Valve Module, Double Solenoid, 4-Way
4	1	P2M1V4ES2CV	Size 1, V Series Island Valve Module, Single Solenoid, 4-Way
5	1	P2M2BXV0A	Intermediate Module
6	1	P2M1VGEE2CV	Size 1, V Series Island Valve Module, Dual 3/2 NC + NC
7	2	P2M1VJEE2CV	Size 1, V Series Island Valve Module, Dual 4/2
8	2	CMD07-1B	Size 1, 1/4" OD Tube Elbow Push-in Connector
9	6	FMD07-1B	Size 1, 1/4" OD Tube Straight Push-in Connector
10	4	FMD09-2B	Size 2, 3/8" OD Tube Straight Push-in Connector
11	2	MMDVA2	Clip-on Muffler



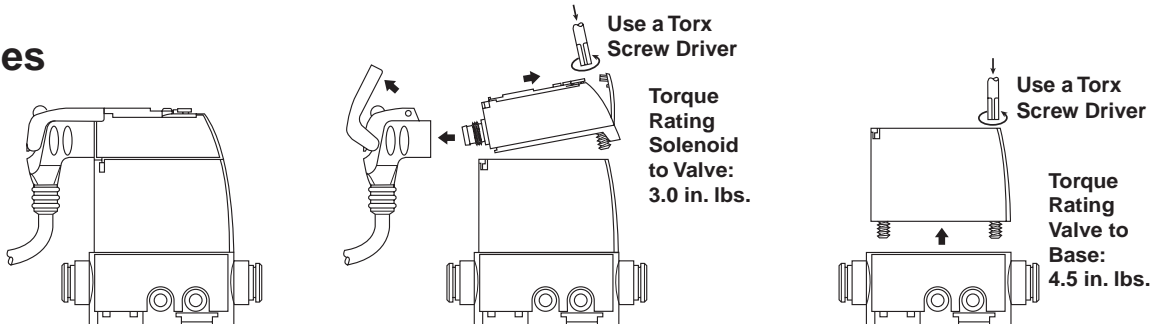
A

“V”, “T” and “S” Series Maintenance

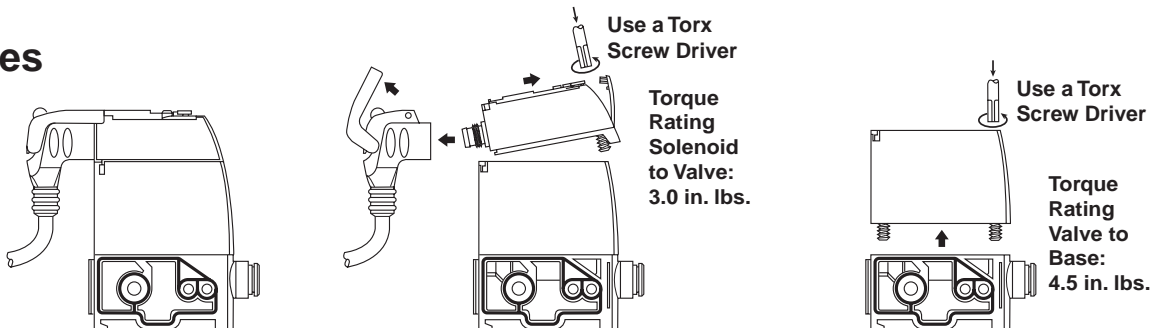
The latest generations of compact pneumatic valves have a life expectancy which generally exceeds the equipment they control. Therefore, maintenance is seldom required. When it

is necessary to change the solenoid pilot, valve or connector, they can be easily replaced without removing the island base, as shown below.

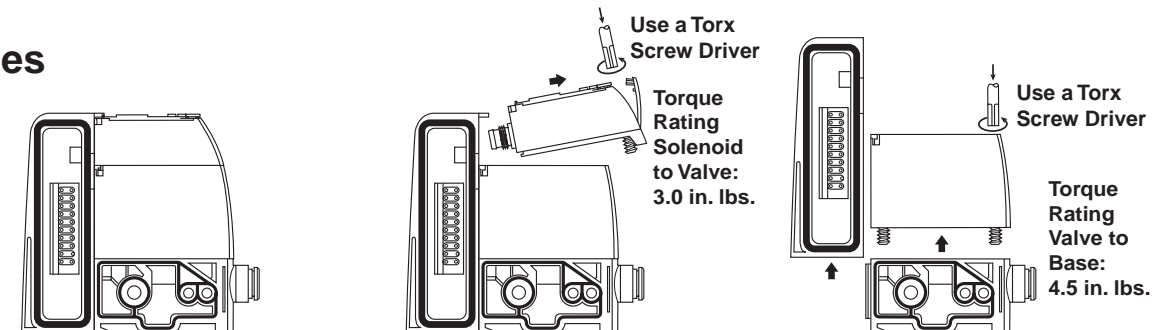
“S” Series



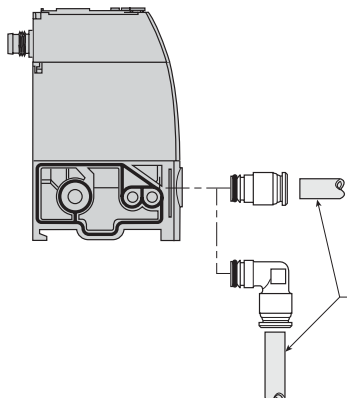
“T” Series



“V” Series



Fitting and Tubing Installation



Fitting Assembly: Pneumatic Connectors are retained by a clip in each module. Assembly is achieved by pushing the fitting into the module and sliding the clip down over the groove in the fitting. Pull fitting to check that it is secure.

Tubing Assembly: Cut tubing squarely & cleanly. Inspect the tubing to insure there are no sharp edges that may nick or cut the o-ring seal. Insert tubing into fitting until it bottoms out. A slight pull on the tube afterwards can help verify it is properly retained / inserted.

Tubing Disassembly: When it is required to remove the tubing from the fitting push the release button in towards the fitting & remove the tubing.

Tubing Reassembly: Inspect the tubing before re-inserting it for any scoring or other damage that would affect the o-ring sealing. It is recommended that for every insertion, the tubing end be trimmed, especially if it has any scoring or damage.



Valve Module Solenoid Pilot 24VDC

Description	Weight	Part Number
Solenoid Pilot (Without Plug-in Electrical Connector)	0.53 oz	P2D8V32C5
Air Pilot with 5/32" (4mm) Tube Fitting	0.30 oz	P2M2K0PA



P2D8V32C5



P2M2K0PA

A

Size 1 Valve Modules
Without Solenoid Pilot
and Without Subbase

P2M1X4EE

4-Way / 2-Position / Single Valve

	Solenoid	Weight	Part Number
	Single Solenoid (Monostable)	0.92 oz	P2M1X4ES
	Double Solenoid (Bistable)	0.88 oz	P2M1X4EE

4-Way / 2-Position / Dual Valve

	Solenoid	Weight	Part Number
	Solenoid Spring with Exhaust Check	0.99 oz	P2M1XJEE

3-Way / 2-Position / Dual Valve

	Solenoid	Weight	Part Number
	Double Solenoid NC + NC with Exhaust Check	0.99 oz	P2M1XDEE
	Double Solenoid NO + NO with Exhaust Check	0.99 oz	P2M1XCEE
	Double Solenoid NC + NO with Exhaust Check	0.99 oz	P2M1XEEE
	Single Solenoid NC with Exhaust Check	0.88 oz	P2M1X3ES

Size 2 Valve Modules
Without Solenoid Pilot
and Without Subbase

P2M2X4EE

4-Way / 2-Position / Dual Valve

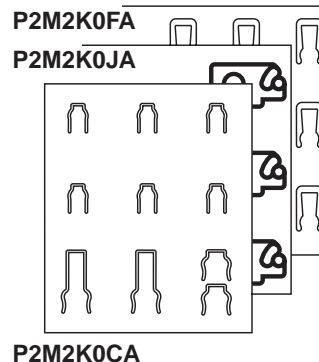
	Solenoid	Weight	Part Number
	Single Solenoid (Monostable)	0.99 oz	P2M2X4ES
	Double Solenoid (Bistable)	1.06 oz	P2M2X4EE

3-Way / 2-Position / Dual Valve

	Solenoid	Weight	Part Number
	Double Solenoid NC + NC with Exhaust Check	1.13 oz	P2M2XDEE
	Double Solenoid NO + NO with Exhaust Check	1.13 oz	P2M2XCEE
	Double Solenoid NC + NO with Exhaust Check	1.13 oz	P2M2XEEE
	Single Solenoid NC with Exhaust Check	0.99 oz	P2M2X3ES

Set of Maintenance Parts

	Description	Part Number
Clips	Set of 10 Clips: 6 for Size 1 Modules, 2 for Size 2 Modules, 2 for Island Head and Intermediate Modules	P2M2K0CA
Seals	Set of 10 Seals: 3 for Inter Island Base Seals, 3 Under Solenoid Pilot Seals, 4 Under Valve Seals (Two Size 1 Seals, Two Size 2 Seals)	P2M2K0JA
Forks	Set of 10 Isolation Forks for Solenoid Pilot Manual Override	P2M2K0FA



P2M2K0CA



Specifications

A

Pneumatic Valve Specifications

Fluid	Air, inert gas, filtered 40µ ¹ , dry ² or lubricated ³		
Operating Pressures	Vacuum to 120 PSI		
Piloting Pressure	43 to 120 PSI for operating pressures below, use external pilot supply available on all head modules ⁵		
Pilot Supply	Internal with "S" Series, mixed internal / external with "T" and "V" Series		
Exhaust Collection	All exhausts are collectable, including solenoid pilot exhaust		
Life Cycle	100 million operations ⁴ (with dry air, 3 Hz, 20°C, 6 bar)		
Operating Temperatures	5°F to 140°F (32°F to 130°F for field bus systems)		
Stocking Temperatures	-40°F to 155°F		
Vibration Resistance	According to IEC 68 - 2 - 6	2G	2 to 150 Hz
Impact Resistance	According to IEC 68 - 2 - 27	15G	11 ms

1. Class 5 according to ISO 8573-1

2. Class 4 according to ISO 8573-1

3. With main air supply lubricated, monitor lubrication rate so that valve bank is not flooded with lubricant.

4. 4/2 valve

5. Double 3/2 minimum 50 PSI

Electrical Specifications

Rated Coil Voltage	24VDC	
Allowable Voltage Fluctuation	-15% to +10 % of nominal voltage	
Electrical Connection	Polarity insensitive: PNP and NPN compatible	
Coil insulation Type	Class B	
Power Consumption	1W (42 mA)	
Manual Override	Locking or non-locking, isolated if required	
Response Time of the Complete Valve	9.6 ms ± 1.2 on 4/2 Double Solenoid Valve Size 1 12.0 ms ± 1.2 on 4/2 Single Solenoid Valve Size 1 14.8 ms ± 2 on 4/2 Double Solenoid Valve Size 2 17.0 ms ± 2 on 4/2 Single Solenoid Valve Size 2	According to ISO 12238
Type of Use	Continuous-duty Solenoid	
Dust and Water Protection	According to EN 60 529	"S" and "T" Series: IP67 "V" Series: IP65

Specifications for 1/4", 3/8" and 1/2" Fittings
Construction

Nickel Plated Brass Body; O-ring: Nitrile (Buna N) lubricated with Silicone lubricant; Grab Ring: 301 Stainless Steel;

One Piece Button Collet: Acetal – black

Recommended Parker Tubing Series:

E (Linear Low Density Polyethylene), PP (Polypropylene), N (Plasticized Polyamide, Nylon), NR (Unplasticized Polyamide, Rigid Nylon), U (Polyurethane 90 Durometer Shore A), HU (Polyurethane 95 Durometer Shore A)

Other materials: Polyurethane 85 Durometer Shore A – Applications and service conditions vary and therefore the use of a tube support may be required for any 85A PU tubing. The following commercially available O.D. – I.D. 85A tubing sizes require the use of a tube support regardless of application. (5/32" – 3/32", 3/16" – 1/8", 1/4" - .170", 1/4" – 3/16", 5/16" – 1/4", 3/8" – 5/16", 1/2" – 3/8")

Prestolok fittings should not be used for live swivel applications. Vacuum applications dependent upon temperature and type of tubing used.

Specifications for 6mm, 8mm, 10mm, 12mm Fittings
Construction

Polyamide HR Body; O-ring: Nitrile (Buna N) lubricated with Silicone lubricant; Sleeve: Nickel Plate Brass; Grab Ring: 301 Stainless Steel; One Piece Button Collet: Polyacetal – yellow

Recommended Parker Tubing Series for 6mm, 8mm, 10mm, 12mm Fittings:

E (Linear Low Density Polyethylene), N (Plasticized Polyamide, Nylon), U (Polyurethane 90 Durometer Shore A), HU (Polyurethane 95 Durometer Shore A)

Prestolok fittings should not be used for live swivel applications. Vacuum applications dependent upon temperature and type of tubing used.



"S" Series Valve Island Dimensions and Mounting

Stand-Alone Valve Size 1

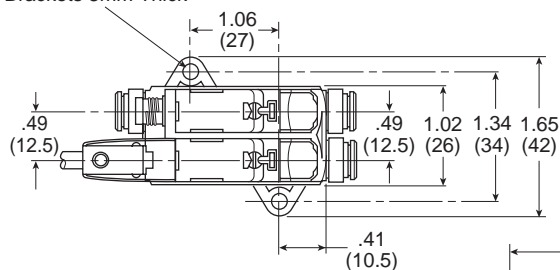


Stand-Alone Valve Size 2

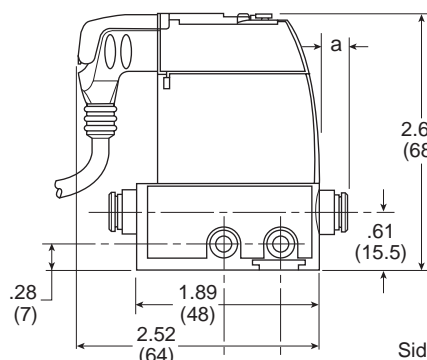
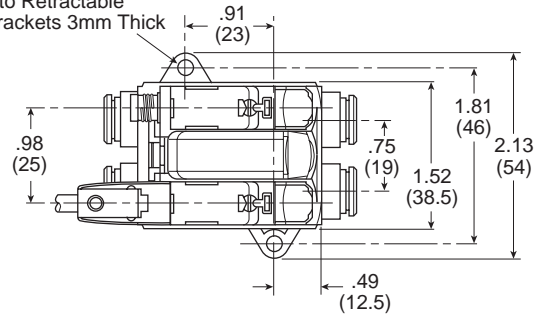


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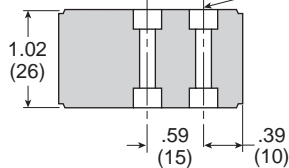
Surface Mounting
with Screws 4 mm Dia.
into Retractable
Brackets 3mm Thick



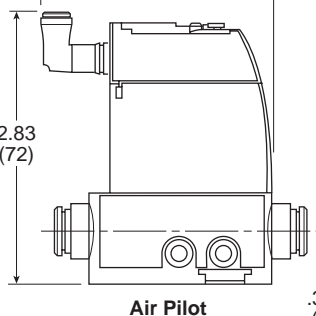
Surface Mounting
with Screws 4 mm Dia.
into Retractable
Brackets 3mm Thick



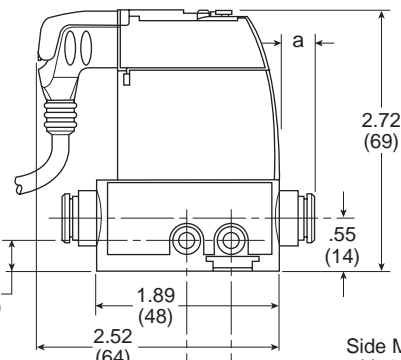
Side Mounting
with 2 Screws
4mm Dia.



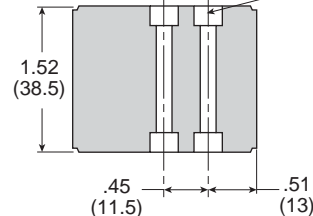
Size 1



Air Pilot



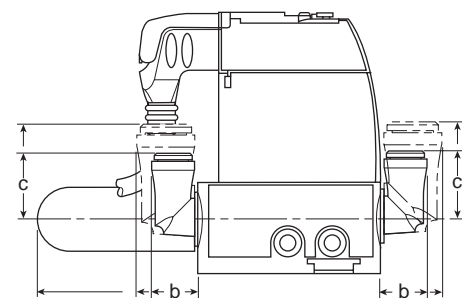
Side Mounting
with 2 Screws
4mm Dia.



Size 2

Special Case: 4/3 all ports blocked.
Add the dual P.O. check valve
module that has been plugged in
the basic valve.

OD Tube Ext.		a	b	c
Size 1 Modules	5/32" (4 mm)	8	10	12
	6 mm	8	13	16
	1/4"	15	18	22
	Muffler		31	
Size 2 Modules	1/4"	12	18	22
	8 mm	9	16	19
	3/8"	16	23	26
	10 mm	13	18	22
	Muffler		40	

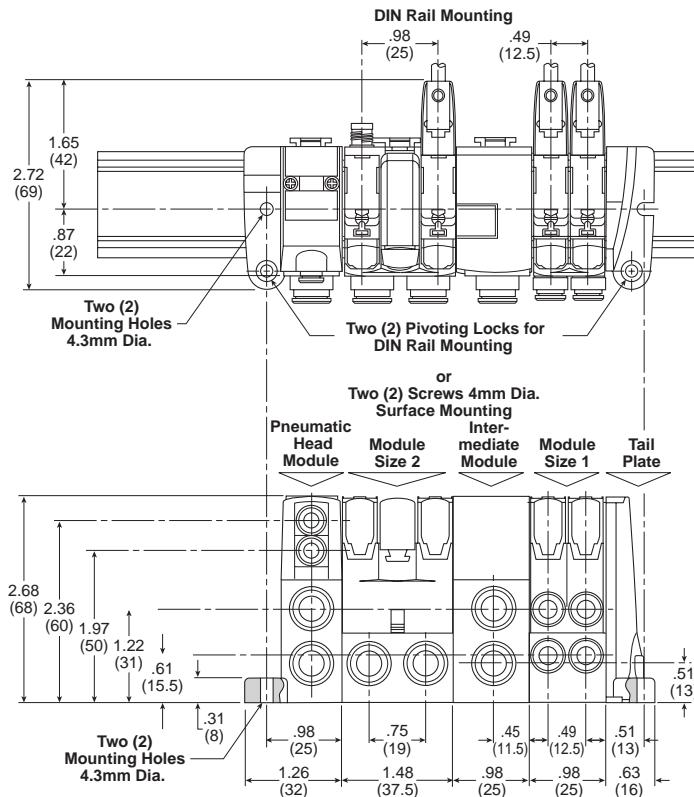
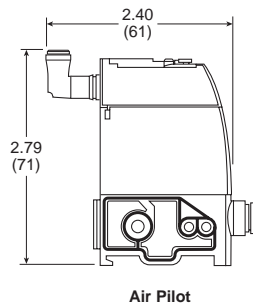
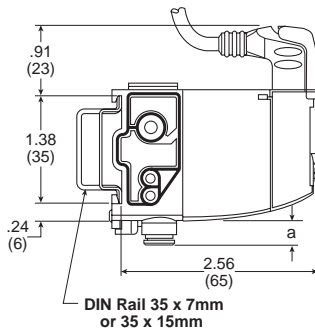




A

"T" Series Valve Island Dimensions and Mounting

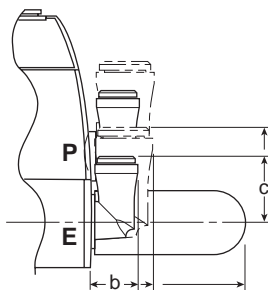
Island Total Width
 Depends on Valve
 Composition



Special Case: 4/3 all ports blocked function within island version, add the dimensions of the dual P.O. check valve module plugged into the island.

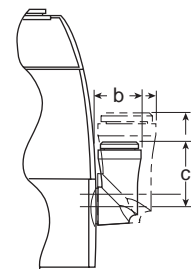
Island Head and Intermediate Modules

	a	b	c
6 mm Tube OD	8	13	16
1/4" Tube OD	12	18	22
8 mm Tube OD	9	16	19
3/8" Tube OD	16	23	26
10 mm Tube OD	13	18	25
12 mm Tube OD	13	19	25
1/2" Tube OD	13		
Muffler		40	



Island Valve Modules

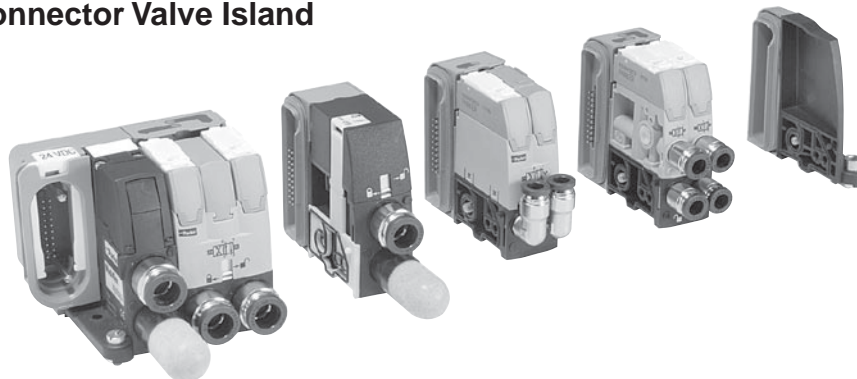
OD Tube	Ext.	a	b	c
Size 1 Modules	5/32" (4 mm)	8	10	12
	6 mm	8	13	16
	1/4"	15	18	22
Size 2 Modules	1/4"	12	18	22
	8 mm	9	16	19
	3/8"	16	23	26
	10 mm	13	18	22



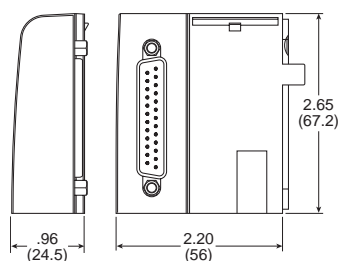
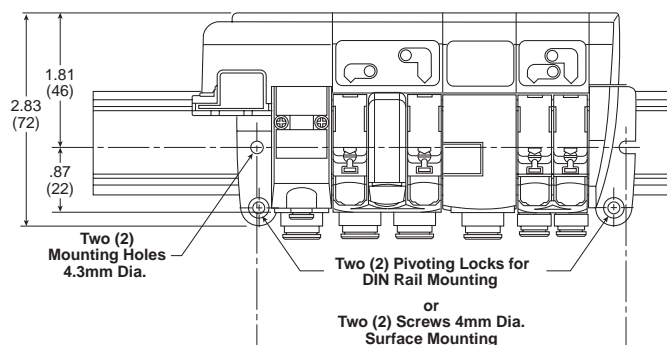
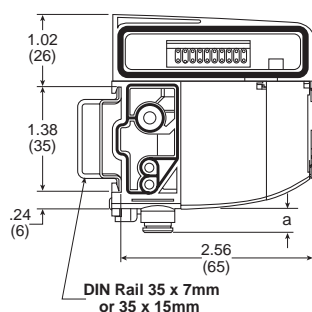


"V" Series Valve Island Dimensions and Mounting

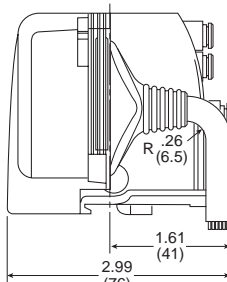
20-Pin, Multi-Connector Valve Island



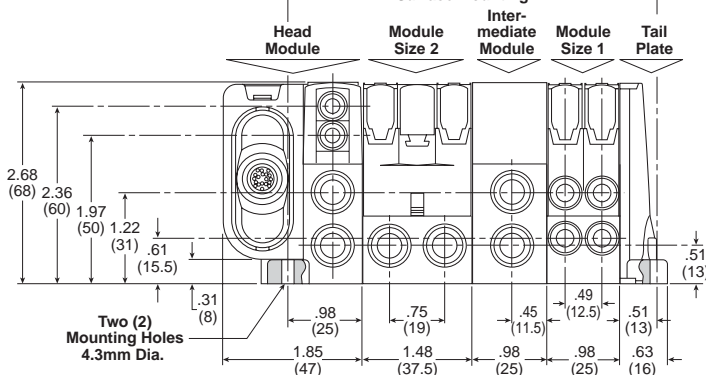
Island Total Width
 Depends on Valve
 Composition



**20-Pin,
 Multi-Connector**

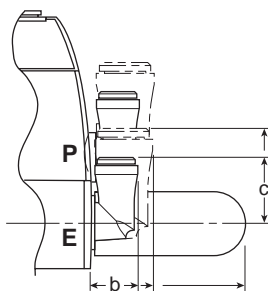


**25-Pin,
 D-Sub Module**



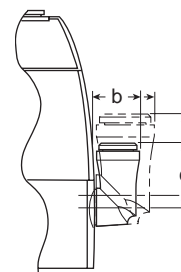
Island Head and Intermediate Modules

	a	b	c
6 mm Tube OD	8	13	16
1/4" Tube OD	12	18	22
8 mm Tube OD	9	16	19
3/8" Tube OD	16	23	26
10 mm Tube OD	13	18	25
12 mm Tube OD	13	19	25
1/2" Tube OD	13		
Muffler		40	



Island Valve Modules

OD Tube	Ext.	a	b	c
Size 1 Modules	5/32" (4 mm)	8	10	12
	6 mm	8	13	16
	1/4"	15	18	22
Size 2 Modules	1/4"	12	18	22
	8 mm	9	16	19
	3/8"	16	23	26
	10 mm	13	18	22

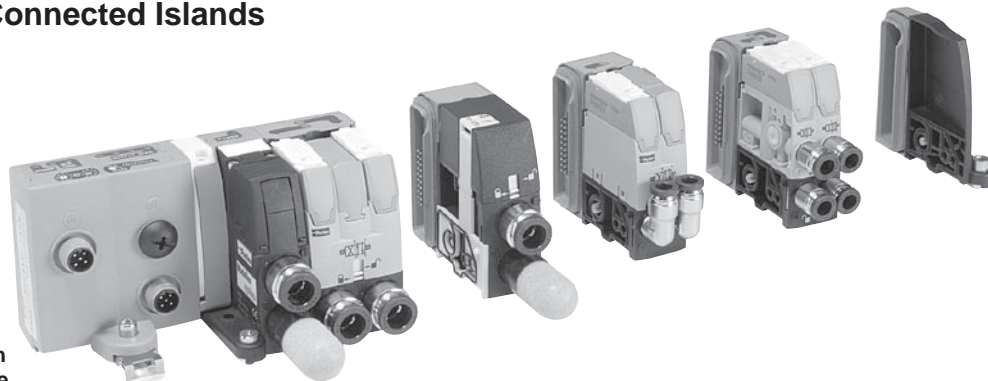




A

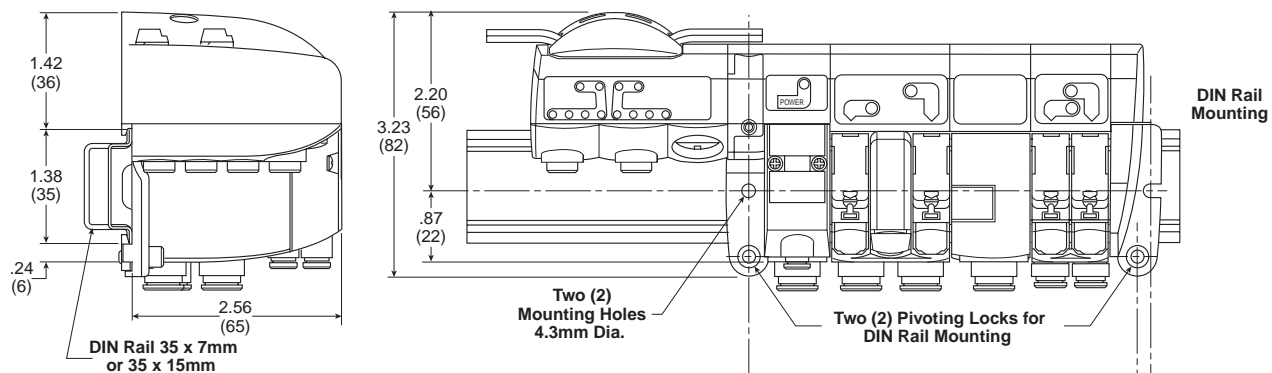
"V" Series Valve Island Dimensions and Mounting

Field Bus Connected Islands

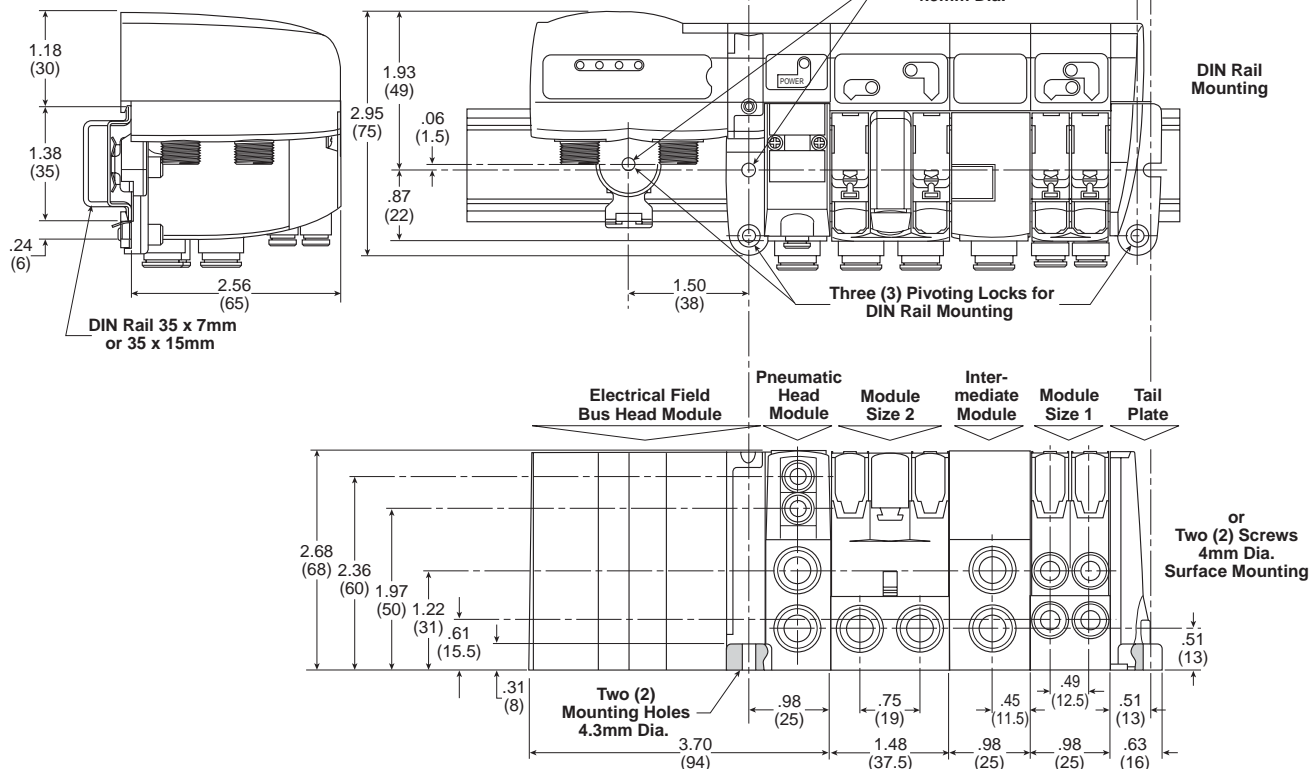


Island Total Width
Depends on Valve
Composition

ASi Bus Islands



Device Bus Islands

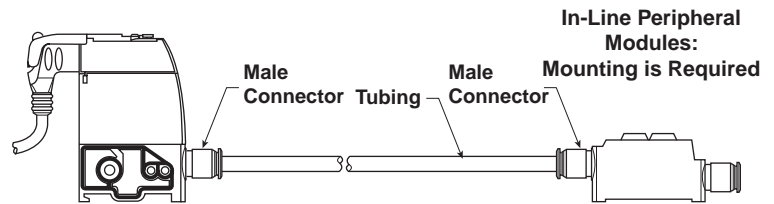
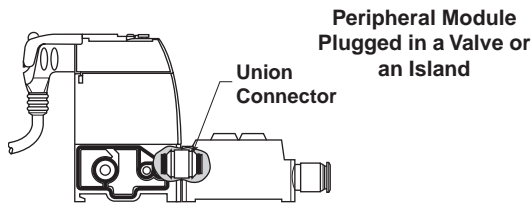




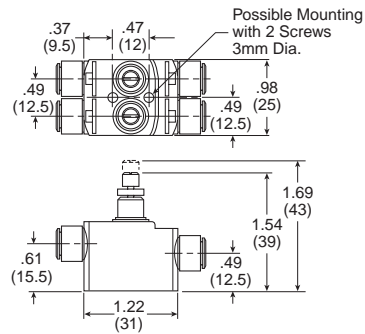
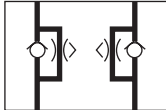
"P" Series Peripheral Modules Dimensions and Mounting

Reminder: Peripheral modules may either be plugged in the valve output ports or mounted in-line separate from the valve.

A

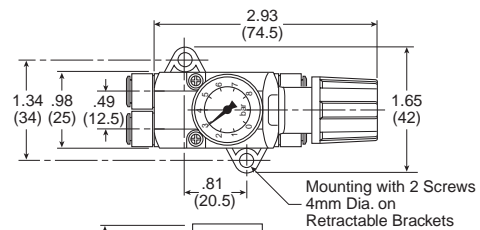
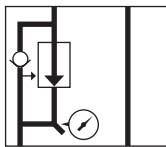


Dual Flow Control Module Size 1

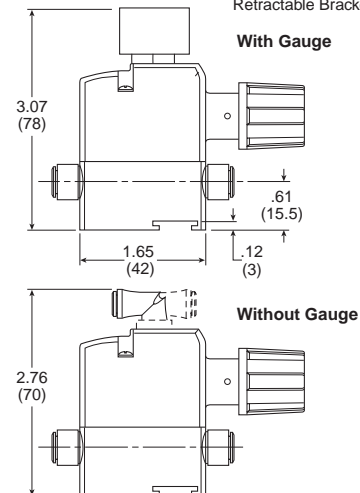
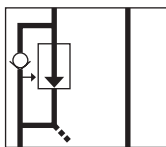


Pressure Regulation Module Size 1

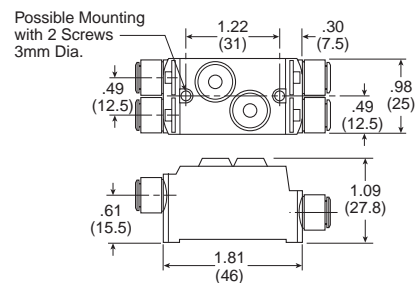
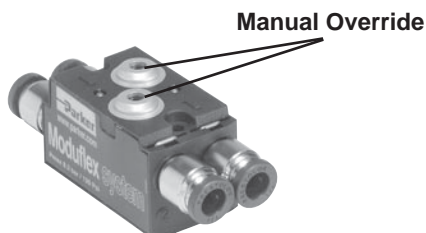
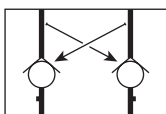
With Gauge



Without Gauge



Dual P.O. Check Valve Module Size 1



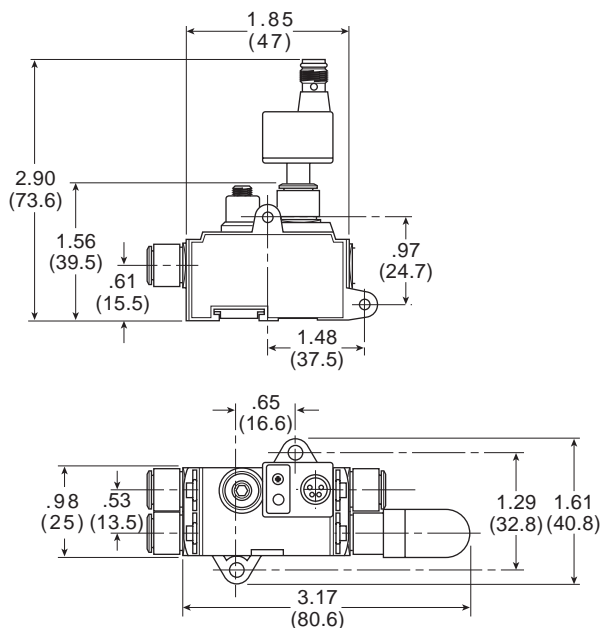
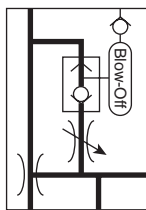


"P" Series Peripheral Modules Dimensions and Mounting

Reminder: Peripheral modules may either be plugged in the valve output ports or mounted in-line separate from the valve.

A

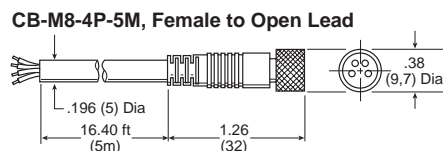
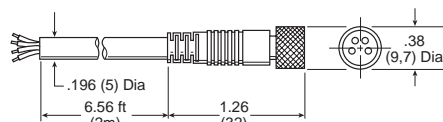
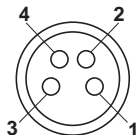
Vacuum Generator Size 1



Sensor Pin Out

Pin

- 1 Brown: 24VDC
- 2 White: NPN / PNP Open Collector Output
- 3 Blue: 0VDC
- 4 Black: NPN / PNP Open Collector Output



Sensor Specifications

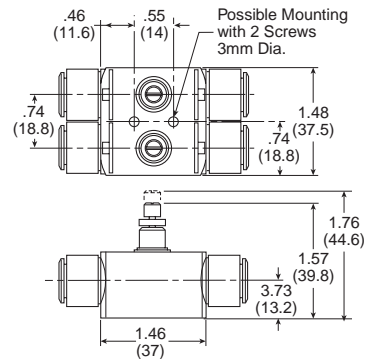
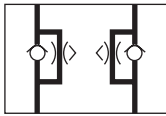
Media	Air and Non-Corrosives Gases
Proof Pressure	(V) 72.5 PSI
Operating Temperature	32 to 122°F (0 to 50°C)
Storage Temperature	14 to 140°F (-10 to 60°C)
Humidity	35 to 85% RH
Electrical Connection	(C) 4-Pin, M8 Connector
Power Supply	10.8 to 30 VDC, Ripple Vp-p 10% max., Reverse Voltage Protection
Switch Output	1 Output Signal Open and Closed, NPN or PNP, 30VDC, 125mA
Linear Output	Analog Output 1 to 5 VDC
Switch Point Setting	2/3 Turn Trimmer
Hysteresis Setting	≤ 2% of F.S.
Output Response Time	<1ms
Repeatability	≤0.2% F.S.
Shock Resistance	100 G, XYZ
Material	Housing: Polycarbonate, Pressure Port: Zinc Die-cast
Mass	T Port: 0.25 oz. (7g)



"P" Series Peripheral Modules Dimensions and Mounting

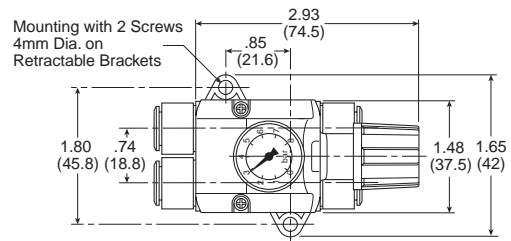
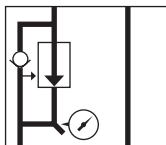
Reminder: Peripheral modules may either be plugged in the valve output ports or mounted in-line separate from the valve.

Dual Flow Control Module Size 2

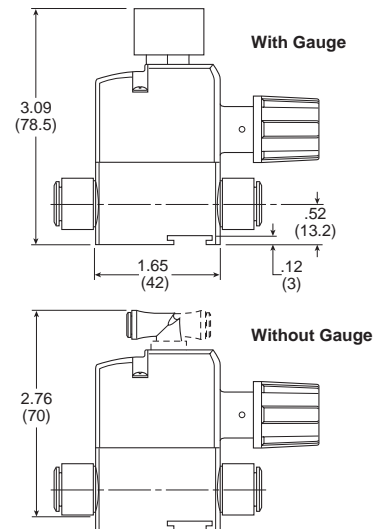
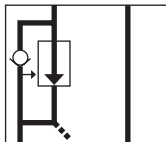


Pressure Regulation Module Size 2

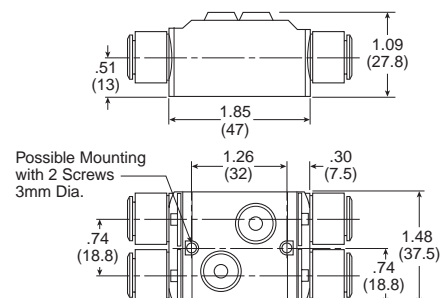
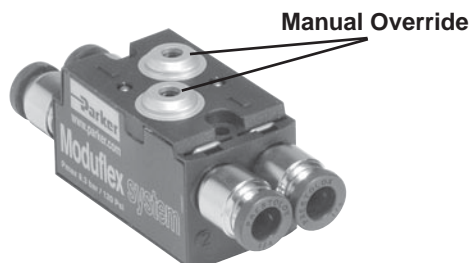
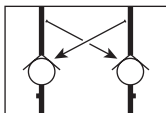
With Gauge



Without Gauge



Dual P.O. Check Valve Module Size 2





A

“V” or “T” Series Valve Island Configurator CD-ROM

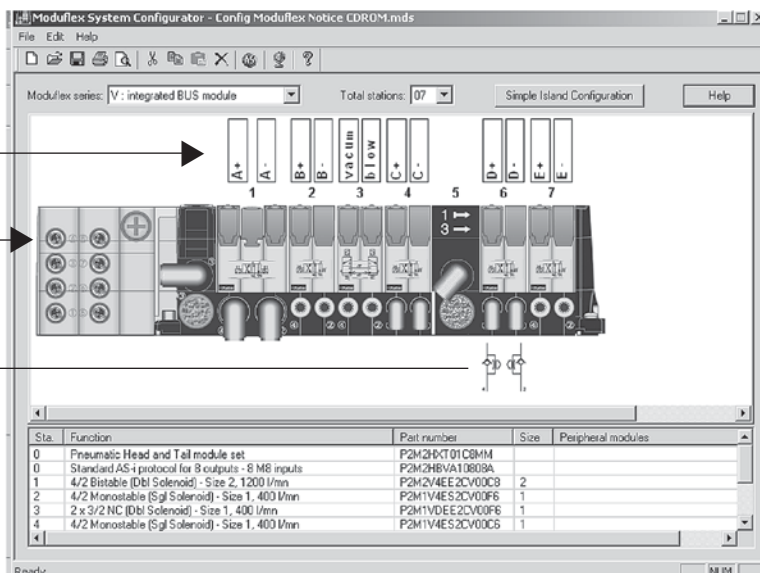
Use CD-ROM “Standard Valve Island” Configuration

Valve Island Module Identification

Valve Island Graphic Description with
 Valve Module Symbols, Output
 Connectors, Pneumatic, and Electrical
 Head Module, etc....

Peripheral Module Additions

Valve Island Composition with Each
 Module Description and Order Code



With the Moduflex Valve Island Configurator CD-ROM, you may configure the Moduflex V or T series valve islands that a given application requires.

With the CD-ROM, once the valve island is configured, the following items may be edited for the application:

1. Valve Island Print with Symbols and Marking

This graphic gathers all information required:

- For assembling, marking and connecting the valve island;
- For commissioning and maintaining the machine.

No additional valve circuit is necessary.

2. Report (4 pages) (1)

- Page 1 - Valve island complete modules part numbers
- Page 2 - Valve island basic modules and connectors listing
- Page 3 - Bill of material
- Page 4 - Warnings

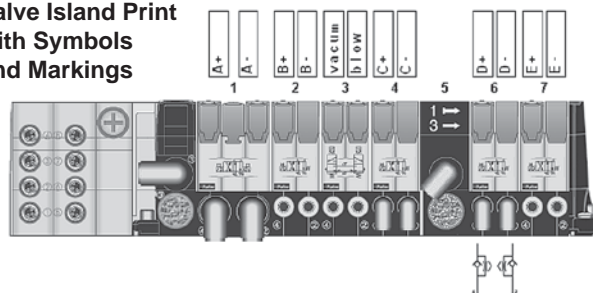
3. 2D Drawings Exported DX File

This transfer on the machine drawings enables defining the valve island mounting onto the machine.

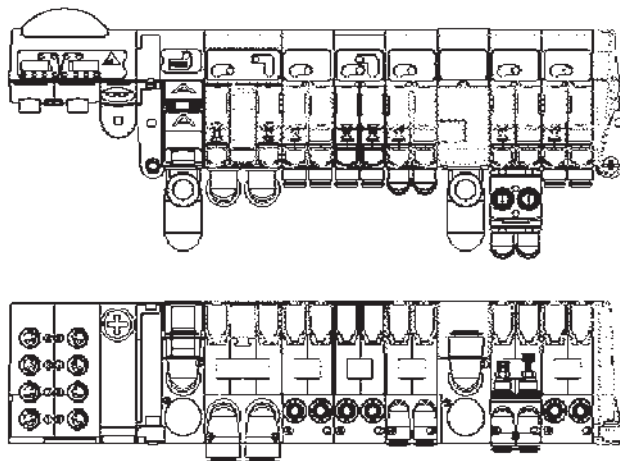
Note: 3D files (IGES, STEP and PRO-ENG) are available in the CD-ROM, for import in your CAD software of separate basic modules and connectors.

- (1) If an assembled valve island is ordered, please combine this 4-page report in order.

Valve Island Print with Symbols and Markings



Valve Island 2D Drawing Exported DX File





Ask for Your Moduflex Valve Island Configurator CD-ROM

Order Code: PDE2536CDV3.1-ev

This multi-language CD-ROM allows installation in English, French, German, Swedish, Italian and Spanish.

A





A



"ADEX" Series

Air Control Valves

A00 – .01 Cv M3 Port

A05 – .18 Cv M5 Port

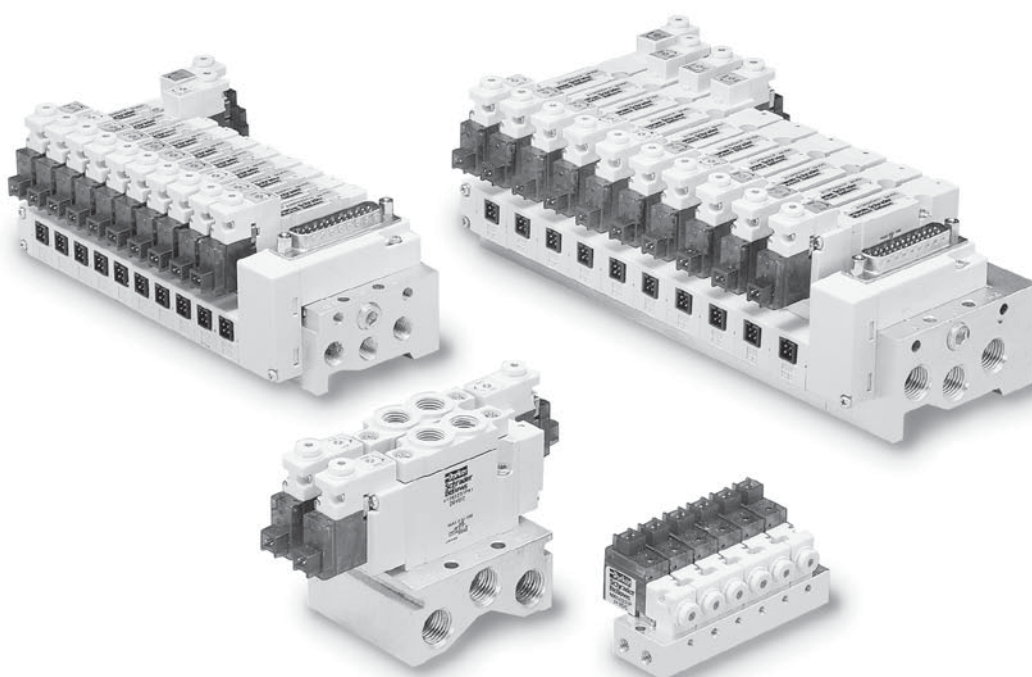
A12 – .47 Cv 1/8" Port

Section B

www.parker.com/pneu/adex



B



Basic Valve Functions	B2	Ordering Information – Collective Wiring.....	B9
Basic Valve Features	B3	Pin Mapping	B9
Common Part Numbers – P / R Type Valves	B4	Ordering Information – Kits & Accessories	B10-B14
Model Number Index – P / R Type Valves.....	B5	Technical Information.....	B15
Common Part Numbers –		Dimensions –	
A00 Subbase Valve.....	B6	A00	B16
IEM Bar Manifold.....	B7	A05 P / R and A12 P / R	B17-B20
Subbase Bar Manifold	B8		

Bold Options Standard.

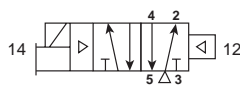
Regular text part numbers may have longer lead times.





Single Solenoid

4-Way, 2-Position



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.

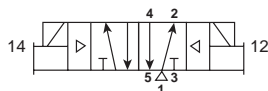
Energized position – Solenoid operator 14 energized.

Pressure at inlet port 1 connected to outlet port 4.

Outlet port 2 connected to exhaust port 3.

Double Solenoid

4-Way, 2-Position



Solenoid operator 14 energized last.

Pressure at inlet port 1 connected to outlet port 4.

Outlet port 2 connected to exhaust port 3.

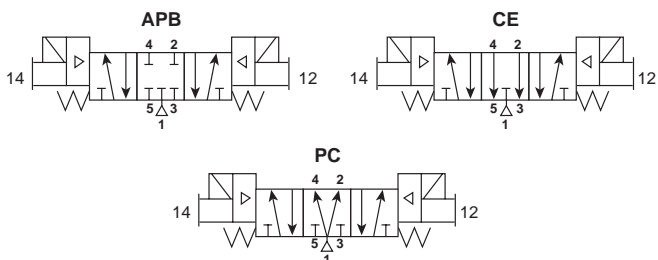
Solenoid operator 12 energized last.

Pressure at inlet port 1 connected to outlet port 2.

Outlet port 4 connected to exhaust port 5.

Double Solenoid

4-Way, 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 1: All Ports Blocked (APB)

All ports blocked in the center position.

Function 2: Center Exhaust (CE)

Cylinder ports 4 and 2 connected to exhaust ports 5 and 3 in center position. Port 1 is blocked.

Function 3: Pressure Center (PC)

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

Dual Pressure (Subbase valves only):

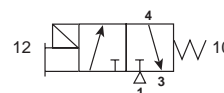
May be used for dual pressure service with pressure at ports

3 & 5. **Specify External Pilot option “X” on Valve**

AND Manifold. 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.

Single Solenoid

3-Way, 2-Position NC



Normally Closed:

De-energized position – Solenoid 12 de-energized.

Pressure at inlet port 1 blocked, outlet port 2 connected to exhaust port 3.

Energized position – Solenoid 12 energized.

Pressure at inlet port 1 connected to outlet port 2, exhaust port 3 is blocked.

Vacuum Applications (Device becomes NO):

‘1’ port is connected to atmosphere or compressed air[†] when required.

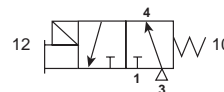
‘2’ port is outlet

‘3’ port is connected to vacuum

[†] When both vacuum and compressed air are required, maximum pressure is 85 PSIG (586 kPa).

Single Solenoid

3-Way, 2-Position NO*



Normally Open:

De-energized position – Solenoid 12 de-energized.

Pressure at inlet port 3 connected to outlet port 2, exhaust port 1 is blocked.

Energized position – Solenoid 12 energized. Pressure at inlet port 3 blocked, outlet port 2 connected to exhaust port 1.

* To obtain NO function, ports 1 & 3 are reversed (1 becomes exhaust and 3 becomes supply).

Vacuum Applications (Device becomes NC):

‘1’ port is connected to vacuum

‘2’ port is outlet

‘3’ port is connected to atmosphere or compressed air[†] when required.

[†] When both vacuum and compressed air are required, maximum pressure is 58 PSIG (400 kPa).

Caution: Normally Open and Normally Closed 3-Way valve cannot be mixed on the same manifold.



“A00” Valve

“A05” Valve

“A12” Valve

Flow Ratings*

- A00: .02 Cv
- A05: .18 Cv
- A12: .47 Cv

Operating Pressure

- Vacuum to 100 PSIG*
- A00S (NO) vacuum to 70 PSIG

Ports

- A00: M3
- A05: M5
- A12: 1/8 Inch

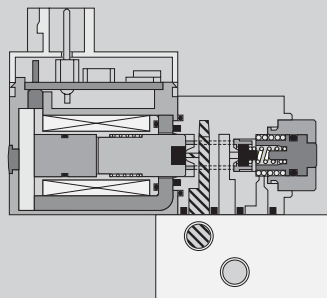
Mounting

- Inline
- Subbase Mount

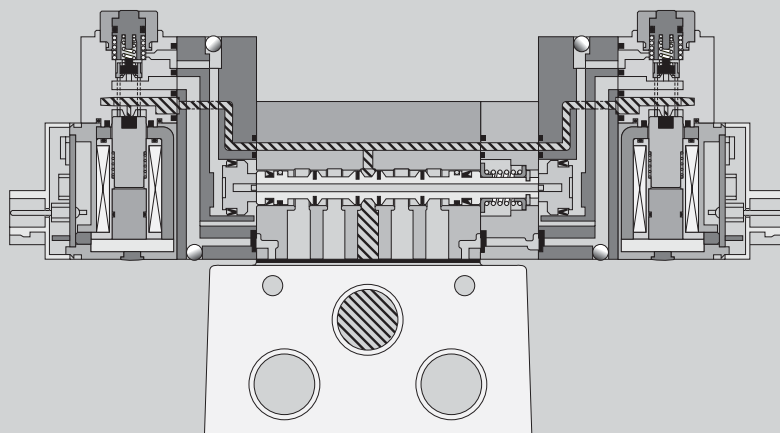
Solenoids

- 0.6 Watt
- 5VDC, 12VDC, 24VDC and 110/120VAC
- LED and Surge Suppression

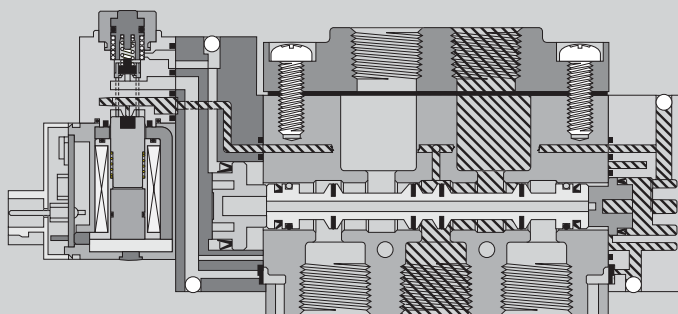
* See catalog technical section for more information.



A00S Single Solenoid Normally Closed (NC)



A05P Double Solenoid 3-Position Subbase Mounted



A12R Single Solenoid Inline



Pressure

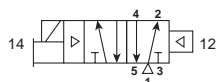
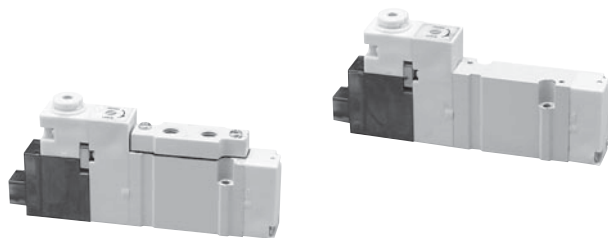


Exhaust

B



Single Solenoid 4-Way, 2-Position



Inline

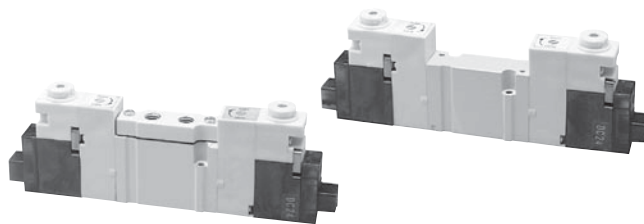
A05	A05RS251PM5MF	24VDC	M5	.17 Cv
	A05RS252PM5MF	12VDC		
A12	A12RS251PN1MF	24VDC	1/8"	.47 Cv
	A12RS252PN1MF	12VDC		

Subbase

A05	A05PS251P	24VDC	Less Base	.18 Cv
	A05PS252P	12VDC		
A12	A12PS251P	24VDC	Less Base	.44 Cv
	A12PS252P	12VDC		

Note: Wired electrical connectors sold separately.
See Accessory Section.

Double Solenoid 4-Way, 2-Position



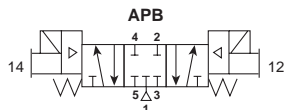
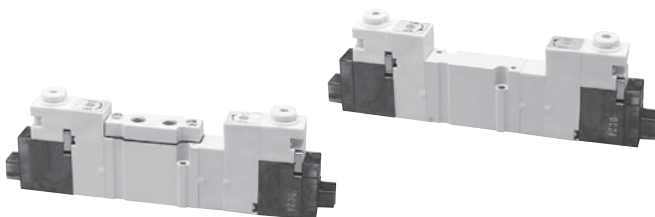
Inline

A05	A05RD251PM5MF	24VDC	M5	.17 Cv
	A05RD252PM5MF	12VDC		
A12	A12RD251PN1MF	24VDC	1/8"	.47 Cv
	A12RD252PN1MF	12VDC		

Subbase

A05	A05PD251P	24VDC	M5	.18 Cv
	A05PD252P	12VDC		
A12	A12PD251P	24VDC	1/8"	.44 Cv
	A12PD252P	12VDC		

Double Solenoid 4-Way, 3-Position, APB



Inline

A05	A05RD351PM5MF	24VDC	M5	.16 Cv
	A05RD352PM5MF	12VDC		
A12	A12RD351PN1MF	24VDC	1/8"	.43 Cv
	A12RD352PN1MF	12VDC		

Subbase

A05	A05PD351P	24VDC	Less Base	.16 Cv
	A05PD352P	12VDC		
A12	A12PD351P	24VDC	Less Base	.40 Cv
	A12PD352P	12VDC		

ANSI Cv vs. JIS Cv

For Pneumatic Valve flow, the measurement **Cv** – Coefficient of Flow – is used to convey to the user how much air can flow through a given valve. Most valve manufacturers publish this information in their catalogs to assist the user in choosing the proper valve for their application. In publishing this data however, there are discrepancies in how the **Cv** is calculated, resulting in some **Cv**'s being **OVERSTATED** by **20 to 40%**. This can adversely affect the user's application because the valve flows **LESS** than the published **Cv**.

The reason for the large discrepancy is in the method of calculation - the ANSI (NFPA) or the JIS standard.

Parker's **Cv** valve is calculated using the ANSI (NFPA) T3.21.3-1990 standard. The ANSI (NFPA) method is a structured test using very specific tube sizes and lengths, inlet pressures and pressure drops, and volume chambers.

Locking Flush Override. Mounting screws and gaskets included with valve.



“ADEX” Series

**BOLD OPTIONS
ARE STANDARD**

A05 **R** **S25** **—** **1** **P** **M5** **MF**

Basic Series	
Series	A05
Series	A12

Body Type	
Subbase	P
Inline	R

Operator / Function	
4-Way	
Single Solenoid, 2-Position, Air Return	S25
Double Solenoid, 2-Position	D25
Double Solenoid, 3-Position, APB	D35
Double Solenoid, 3-Position, CE	E35
Double Solenoid, 3Position, PC	035

Pilot Source / Exhaust	
Internal	Blank
External	X*

Voltage	
1	24VDC
2	12VDC
9	120/60 VAC

Valve Type	
Blank	None (Subbase)
MF	Inline

Port Size / Thread Type [†]	
Blank	None (Subbase)
M5	M5 (A05R Only)
N1	1/8" NPT (A12R Only)
G1	1/8" BSPP "G" (A12R Only)

[†] Required for inline models only, port size code not used for subbase versions.

Options	
P	Lights / Surge Suppression

B



Valve Only – Single Solenoid 3-Way, 2-Position*



* Screwdriver-Operated, Locking Manual Override (LMOR).

A00S **C23** **—** **1** **P**

Function

Single Solenoid Normally Open **O23**

Single Solenoid Normally Closed **C23**

Connector Position

With Indicator Light & Surge Suppression
P

Flow

Standard Type	Blank
Large Flow Type	J

Voltage

1	24VDC
2	12VDC
4*	5VDC
8*	110/50 VAC
9	120/60 VAC

* Special Order

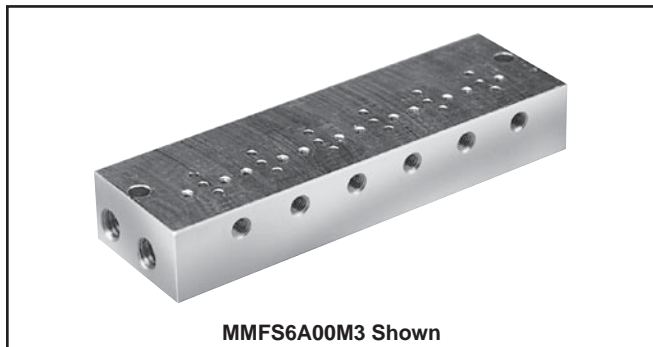
Subbase



Model Number	All Ports
A00 A00SBM3	M3

Mounting screws and gaskets included with valve.

Manifold*



* Normally Closed valves (A00SC23•P) and Normally Open valves (A00SO23•P) cannot be mounted on the same manifold simultaneously.

Mounting screws and gaskets included with valve.

MMFS **2** **A00** **M5**

Number of Stations

2 Stations	2
3 Stations	3
4 Stations	4
•	•
•	•
20 Stations	20

Port Size

M3
M5

**BOLD OPTIONS
ARE STANDARD**


“A05” Valve


MMFU10A05F Shown

4-Way, NPTF (Individual Wiring Type)	MMFU##A05F
4-Way, NPTF (Collective Wiring Type)	MMCU##A05F

– stations 2 to 20

– stations 2 to 12

(Even numbers only)

“A12” Valve


MMFU10A12F Shown

4-Way, NPTF (Individual Wiring Type)	MMFU##A12F
4-Way, NPTF (Collective Wiring Type)	MMCU##A12F

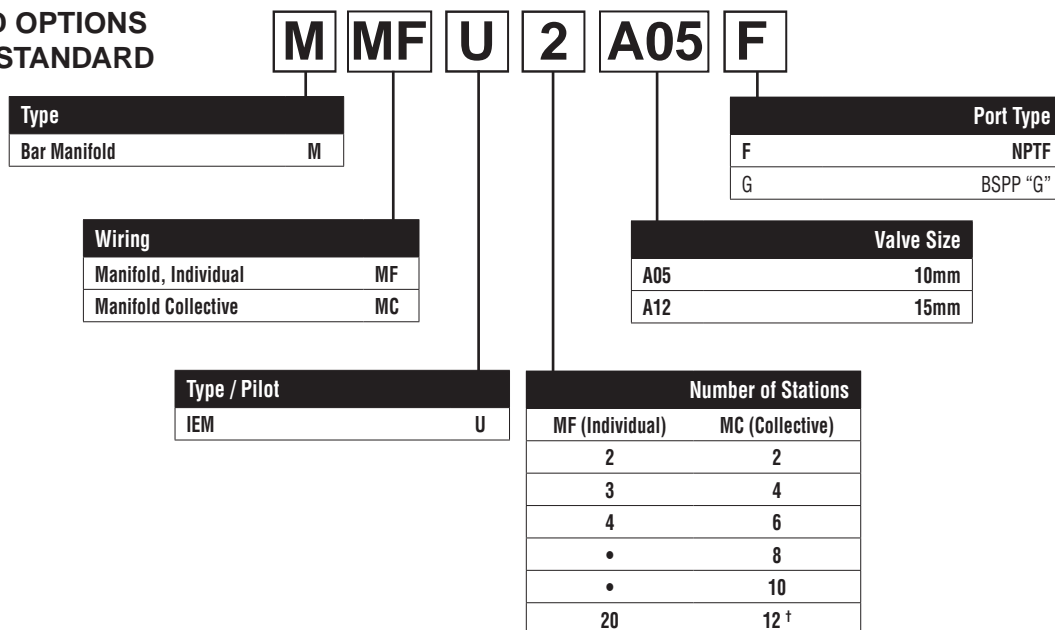
– stations 2 to 20

– stations 2 to 12

(Even numbers only)

- Utilizes Inline mount ADEX valves.
- Bolts and Gaskets are included with valve.
- A05 Collective Wiring Type Manifold Kits also include an Adapter Plate for use with the MCS Module.

Pilot Exhaust for IEM Manifold –
is captured through the “3” and “5” galley.

Model Number
**BOLD OPTIONS
 ARE STANDARD**

[†] Maximum of 12 stations available for “MC” Type. (Even # stations only.)



B

"A05" Valve



4-Way, M5 (Individual Wiring Type)	MMES##A05FM5
4-Way, M5 (Collective Wiring Type)	MMCS††A05FM5

– stations 2 to 20

†† – stations 2 to 12

(Even numbers only)

"A12" Valve



4-Way, 1/8" NPTF (Individual Wiring Type)	MMFS##A12FF1
4-Way, 1/8" NPTF (Collective Wiring Type)	MMCS††A12FF1

– stations 2 to 20

†† – stations 2 to 12

(Even numbers only)

- Utilizes Subbase mount ADEX valves.
- Bolts and Gaskets are included with valve.

Internally Piloted Manifolds –

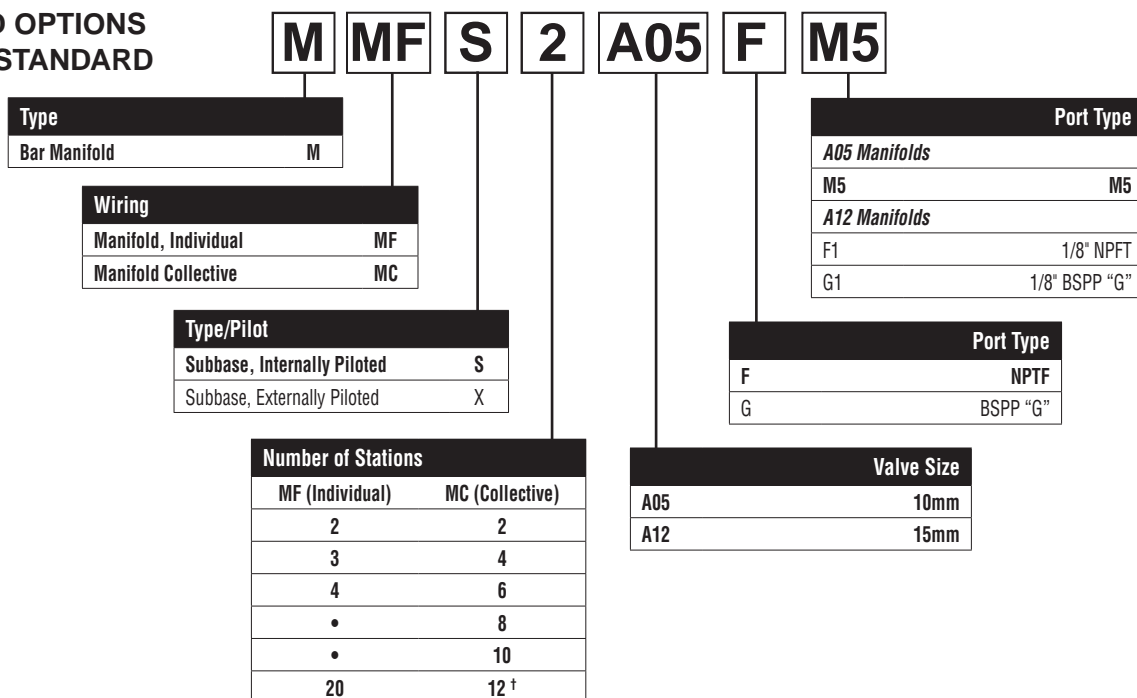
Pilot exhaust is captured through the "3" and "5" galley.

Externally Pilot Manifold –

Pilot exhaust is captured through the "Y" galley.

Model Number

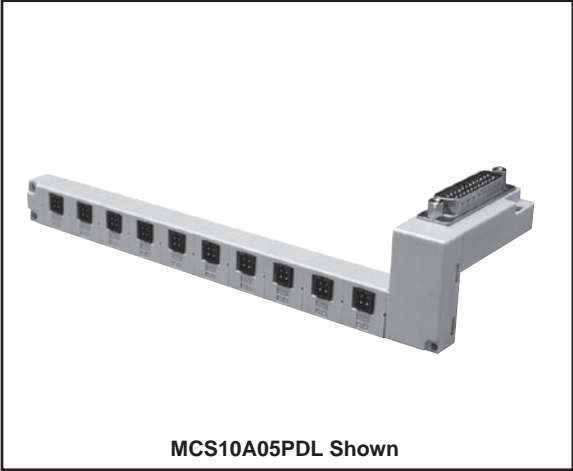
**BOLD OPTIONS
ARE STANDARD**



[†] Maximum of 12 stations available for "MC" Type. (Even # stations only.)



Collective Wiring



MCS10A05PDL Shown

MCS

Type

Manifold Collective
Wiring System

MCS

2

Number of Stations*

2 Stations2

4 Stations4

6 Stations6

8 Stations8

10 Stations10

12 Stations12

A05

Valve Size

A0510mm

A1215mm

P

Options

DL

D-Sub 25

ML

26-Pin Ribbon

DL

Options

DL

D-Sub 25

ML

26-Pin Ribbon

BOLD OPTIONS
ARE STANDARD

* Even Number of Stations Only.

B

Collective Wiring Pin Mapping (Not Available for AC Voltages)

Sequence of
Valve Numbering →

Solenoid

14 VALVE 1

12 VALVE 2

14 VALVE 3

12 VALVE 4

14 VALVE 5

12 VALVE 6

14 VALVE 7

12 VALVE 8

14 VALVE 9

12 VALVE 10

14 VALVE 11

12 VALVE 12

Common (+.-)

Valve Number

1 2 3 4

14 14 14 14

12 12

Connector

Solenoid 14

Solenoid 12

Solenoid

12 VALVE 1

14 VALVE 2

12 VALVE 3

14 VALVE 4

12 VALVE 5

14 VALVE 6

12 VALVE 7

14 VALVE 8

12 VALVE 9

14 VALVE 10

12 VALVE 11

14 VALVE 12

Common (+.-)

Pin Map for D-Sub 25 Connector

Valve and Solenoid Addresses

Pin Map for 26-Pin Ribbon Connector

Notes:

1. The MCS Collective Wiring System is “Polarity Neutral”. Polarity is addressed with the Collective Wired Connectors (page 10).
Example: When ‘positive’ common is used, an A05 single solenoid valve uses an A05PSCC. When ‘negative’ common is used, use A05PSCCM.

2. The MCS Collective Wiring System provides for both the “14” and “12” addresses at each valve location. When single solenoid valves are used, skip the “12” address for both wiring and controller programming.

3. Be sure that the leakage current of the controller outputs is less than 1.5 ma.



Individual Wired Connectors

P / R Type

Size	Voltage	Length	Part Number
A00	DC	.5 meter	A05PDCCL5
A05		1 meter	A05PDCCL10
A12		3 meter	A05PDCCL30
A12	AC	.5 meter	A05PACCL5
		1 meter	A05PACCL10

DC Voltage: Positive “+” (Red Wire)
 Negative “-” (Black Wire)
 AC Voltage: Both Wires are Blue (Polarity Neutral)



A05PDCCL##

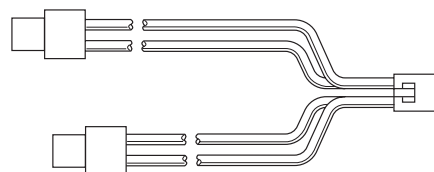
Collective Wired Connectors

P / R Type

Size		Part Number	
		PNP	NPN
A05	Single	A05PSCCM	A05PSCC
A12	Double	A05PDCCM	A05PDCC

PNP = SOURCING = “Negative Common” = Yellow Wires

NPN = SINKING = “Positive Common” = Red Wires

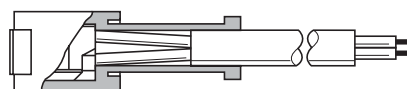
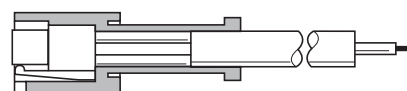
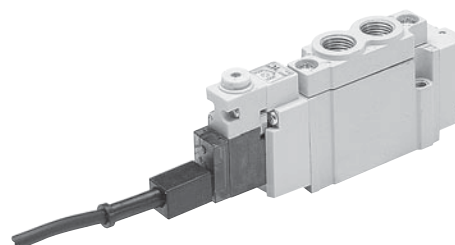


A05PDCC

Wired Connectors with Protective Cover - P / R Type

Size	Length	Part Number
A00	1 meter	A05PDCCB10
A05		
A12		

The cover is made of chloroprene rubber for electrical use, assuring excellent weather and insulation resistance. However, be careful not to place it under splash of cutting oil.



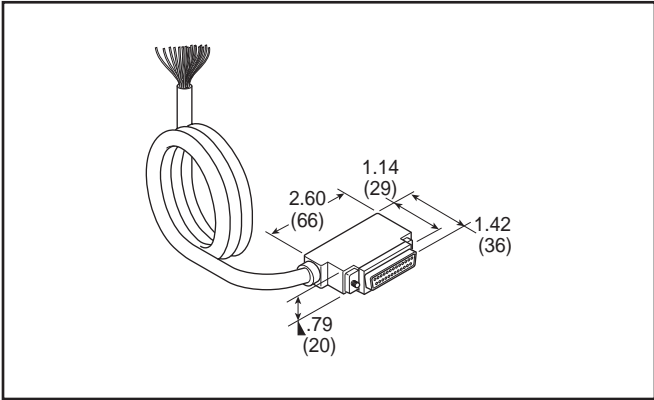
A05PDCCB10



Cable with Female D-Sub, 25-Pin Connector

Part Number	Description
DSS25FB1K	25-Pin, D-Sub Cable, 1 meter (3.3 ft.)

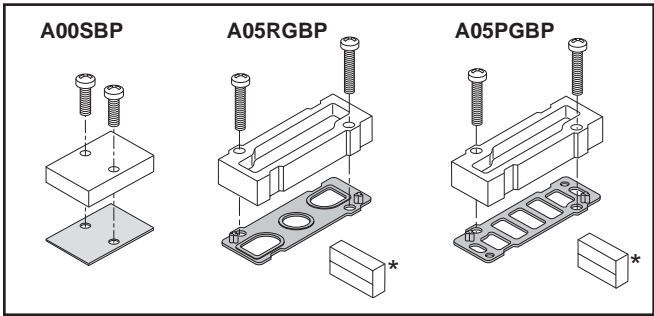
Note: For use with ADEX MCS system only.
Connection to control system is through 25 colored
wires AWG 24.



B

Blanking Plate

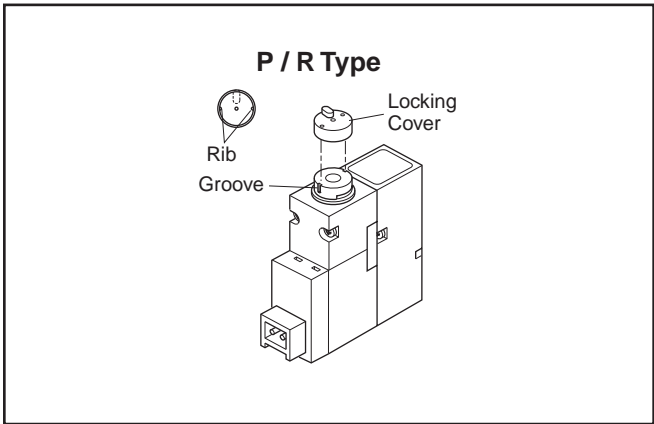
Size	Type	Part Number
A00	Subbase	A00SBP
A05	Body Ported	A05RGBP
	Subbase	A05PGBP
A12	Body Ported	A12RGBP
	Subbase	A12PGBP



* Outlet Pin Cover used with Collective Wiring System only.

Extended Override Cover

Size	Orange: For 14 Side Solenoid	Green: For 12 Side Solenoid
A00		
A05	A05PLA	A05PLB
A12		

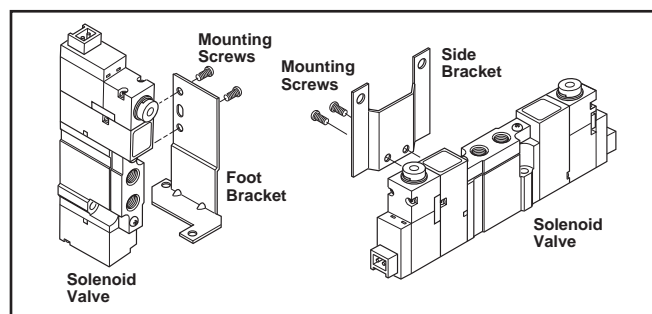




Mounting Bracket

Size	Type	Part Number
A05	Side	A05RBS
	Foot	A05RBF
A12	Side	A12RBS
	Foot	A12RBF

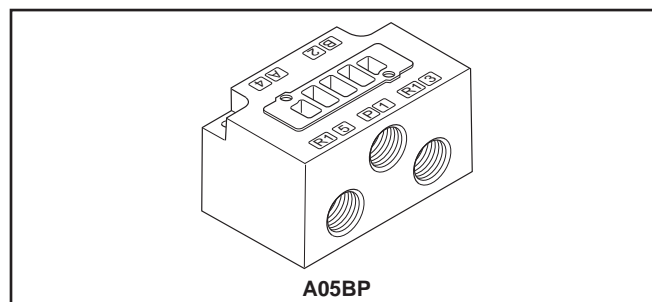
Kit Includes: (1) Bracket, (2) Screws



Subbases

Size	Port Size	Part Number
A05	1/8" NPT	A05PBN1
	1/8" BSPP "G"	A05PBG1
A12	1/4" NPT	A12PBN2
	1/4" BSPP "G"	A12PBG2

Kit Includes: (1) Subbase (Holddown Bolts and Gasket are included with valve)



Individual Air Supply Spacer

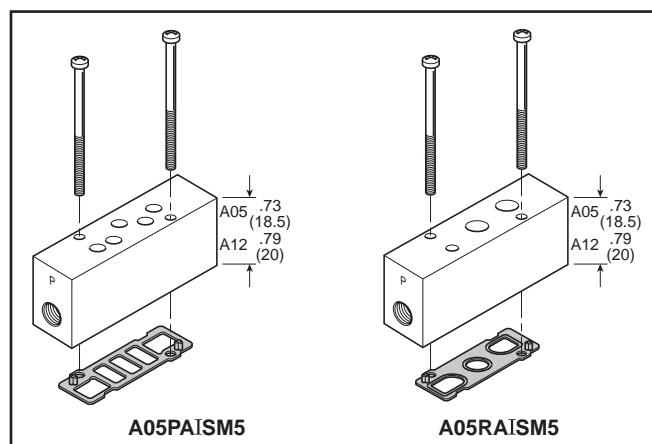
Mounts between valve and manifold. Supply from the manifold is blocked and only the valve mounted on the spacer receives the individual supply.

Size	Type	Port Size	Internal Pilot Part Number	External Pilot* Part Number
A05	Inline	M5	A05RAISM5	A05RAXISM5
	Subbase	M5	A05PAISM5	A05PAXISM5
A12	Inline	1/8" NPT	A12RAISN1	A12RAXISN1
	Subbase	1/8" NPT	A12PAISN1	A12PAXISN1

Can only be used on Collective wiring type manifolds.

* Can only be used with External Piloted valve. External pilot is located on the X Port of the manifold

Kit Includes: (1) Spacer, (2) Screws, and (1) Gasket



Individual Air Exhaust Spacer

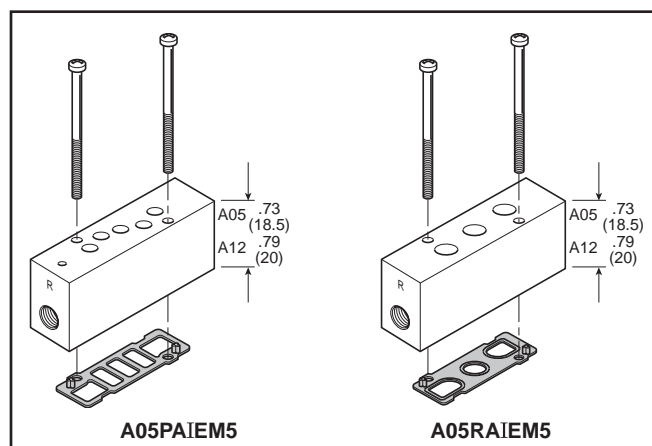
Mounts between valve and manifold. Exhaust from the manifold is blocked and only the valve mounted on the spacer has the individual exhaust.

Size	Type	Port Size	Internal Pilot Part Number	External Pilot* Part Number
A05	Inline	M5	A05RAIEM5	A05RAXIEM5
	Subbase	M5	A05PAIEM5	A05PAXIEM5
A12	Inline	1/8" NPT	A12RAIEN1	A12RAXIEN1
	Subbase	1/8" NPT	A12PAIEN1	A12PAXIEN1

Can only be used on Collective wiring type manifolds.

* Can only be used with External Piloted valve. External pilot is located on the X Port of the manifold

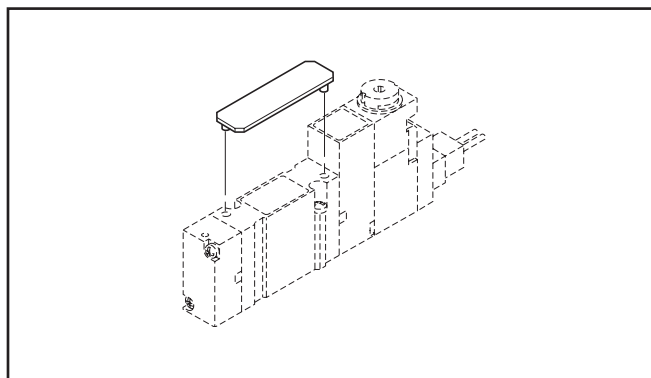
Kit Includes: (1) Spacer, (2) Screws, and (1) Gasket





Labeling Tag

Size	Description	Part Number
A05	White Label Tag	A05PN
A12		

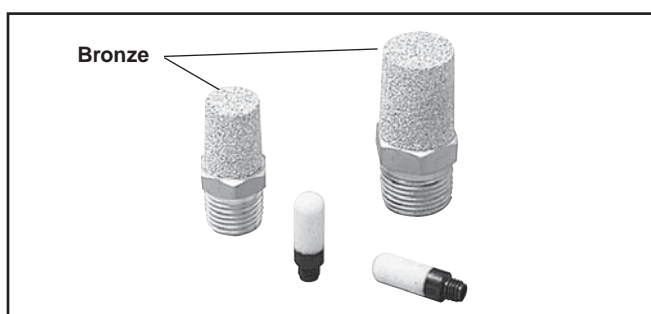


B

Exhaust Mufflers

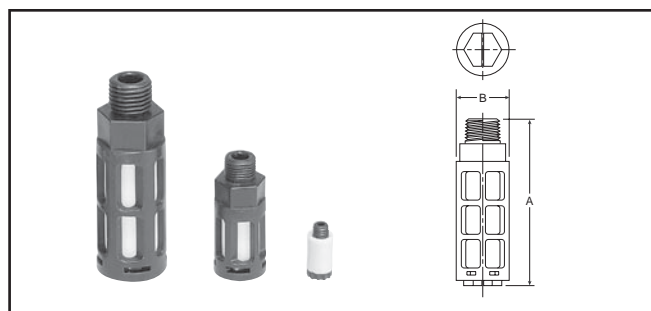
Male Thread	Model Number
M5	P6M-PAC5
1/8" NPT	EM12
1/4" NPT	EM25

P6M - Plastic; EM - Sintered Bronze



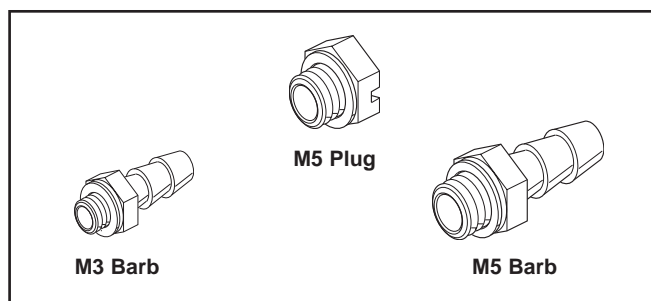
Plastic Silencers

Thread Size	Part Number		A (mm)	B (mm)
	NPT	BSPT "R"		
M5	AS-5		.43 (11)	.32 (8)
1/8"	ASN-6	AS-6	1.57 (40)	.63 (16)
1/4"	ASN-8	AS-8	2.56 (65)	.83 (21)



M3 & M5 Fittings

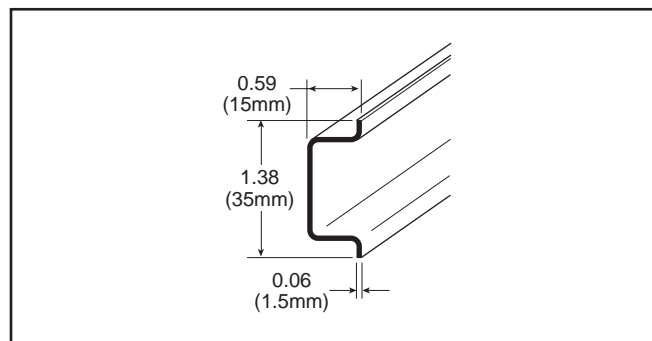
Description	Part Number
M5 Plug Fitting	N220-1900J
M3 to 3mm Barb	BC03M3
M3 to 4mm Barb	BC04M3
M5 to 3mm Barb	BC03M5





DIN Rail

Part Number	Description
AM1DE200	6 Foot Rail Length

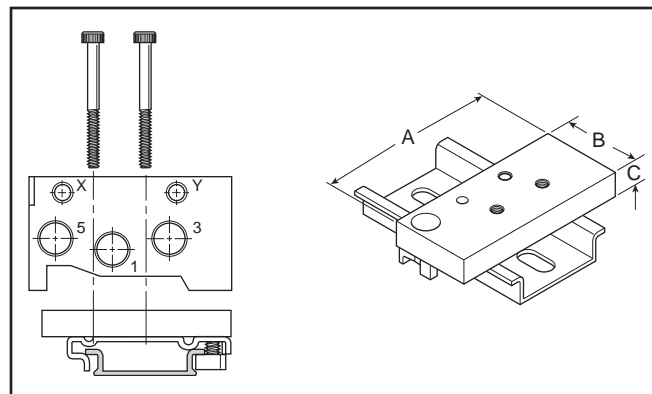


B

DIN Rail Hardware Kit

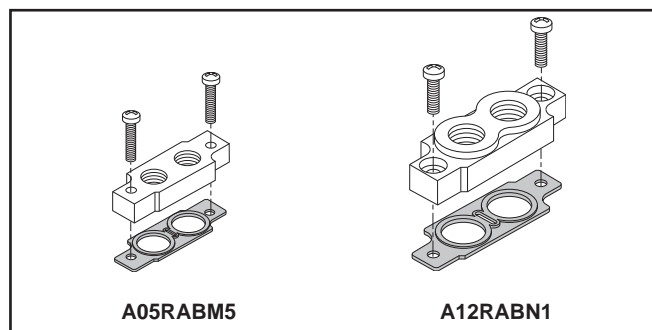
Size	Type	Part Number	Dimensions		
			A	B	C
A05	IEM	MFUA05DB	2.24	1.00	.31
	Subbase	MFSA05DB	(57)	(25)	(8)
A12	IEM	MFUA12DB	2.91	1.00	.39
	Subbase	MFSA12DB	(74)	(25)	(10)

Kit includes: (2) Screws, (2) Clamps



Replacement Kits Cylinder Port Plate Kits

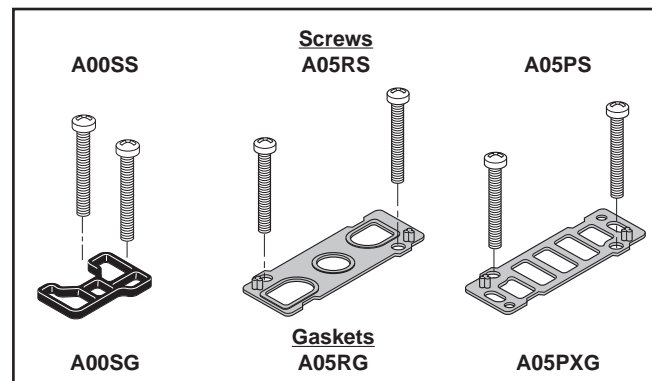
Size	Fitting	Part Number
A05	M5	A05RABM5
A12	1/8" NPT	A12RABN1
	1/8" BSPP "G"	A12RABG1



Base Gasket Kits

Size	Type	Gasket Only	Screw
A00	Subbase	A00SG	A00SS
A05	Body Ported	A05RG	A05RS
	Subbase Int.	A05PG	A05PS
	Subbase Ext.	A05PXG	A05PS
A12	Body Ported	A12RG	A12RS
	Subbase Int.	A12PG	A12PS
	Subbase Ext.	A12PXG	A12PS

These are spare parts, mounting screws and gaskets included with valves.





Flow Rating (Cv)

Size	Port Size	Mounting Style	ANSI / (NFPA)		JIS Method	
			2-Position	3-Position	2-Position	3-Position
A00	M3	Subbase	.010	—	—	—
	M5	Subbase	.017	—	—	—
	M5	Subbase	.020	—	—	—
A05	M5	Inline	.18	.16	.22	.20
	M5	Subbase	.17	.16	.32	.32
A12	1/8" Ports	Inline	.47	.43	.48	.46
	1/8" Ports	Subbase	.44	.40	.61	.42

ANSI / (NFPA) T3.21.3-1990 standard for Cv measurement.

Response Time

Valve Size	Port Size		0 Cu. In. Test Chamber	
			Fill	Exhaust
2-Position Single Solenoid / Air Return				
A00	M3		.004	.006
A05	M5		.014	.025
A12	1/8"		.016	.030
2-Position Double Solenoid				
A00	M3		—	—
A05	M5		.011	.015
A12	1/8"		.010	.012
3-Position Double Solenoid				
A00	M3		—	—
A05	M5		.013	.017
A12	1/8"		.013	.014

Average Fill Time (Seconds): With 100 PSIG supply, time required to fill from 0-90 PSIG and exhaust from 100 PSIG to 10 PSIG is measured from instant of energizing, or de-energizing 24VDC solenoid. Times shown are average.

Tested per ANSI / (NFPA) T3.21.8.

Operating Pressure

Maximum: **4-Way:** 100 PSIG (690 kPa)
3-Way: 100 PSIG (690 kPa) NC*
70 PSIG (483 kPa) NO*

Minimum:

	Description	Internal Pilot		External Pilot	
		PSIG	kPa	PSIG	kPa
4-Way	Single Solenoid	22	152	Vacuum	
				36	248
	Double Solenoid – 2-Position	15	104	Vacuum	
				36	248
4-Way	Double Solenoid – 3-Position	30	207	Vacuum	
				36	248
3-Way	A00 Series	Vacuum			

* When using vacuum and pressure on ports 1 & 3 – 85 PSIG (586 kPa) NC; 58 PSIG (400 kPa) NO (see page 2).

Temperature Rating

Intermittent Duty (AC & DC Voltage):

32°F to 122°F (0°C to 50°C)

Voltage Rated +10 / –10%

Continuous Duty (DC Voltage Only):

32°F to 104°F (0°C to 40°C)

Voltage Rated +0 / –10%

Solenoid Information

Power Consumption	Standard		
			With Indicator Light & Surge Suppressor
	DC		W
			0.6
	AC	100V	VA
		110V	VA
	High Flow		
			With Indicator Light & Surge Suppressor
	DC		W
			0.91
	AC	100V	VA
		110V	VA



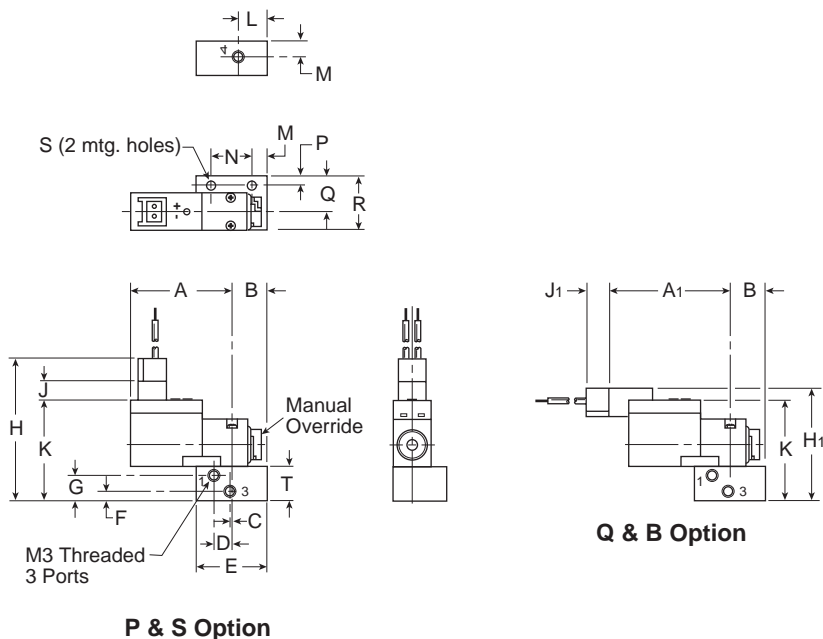
A00

Subbase

A00 - Subbase

A 1.00 (25)	A₁ 1.18 (30)	B .41 (11)	C .015 (.4)	D .17 (4)
E .79 (20)	F .12 (3)	G .28 (7)	H 1.54 (39)	H₁ 1.38 (34)
J .24 (6)	J₁ .20 (5)	K 1.11 (28)	L .32 (8)	M .18 (5)
N .47 (12)	P .10 (3)	Q .39 (10)	R .59 (15)	S .106 (2.7)
T .38 (10)				

Inches (mm)



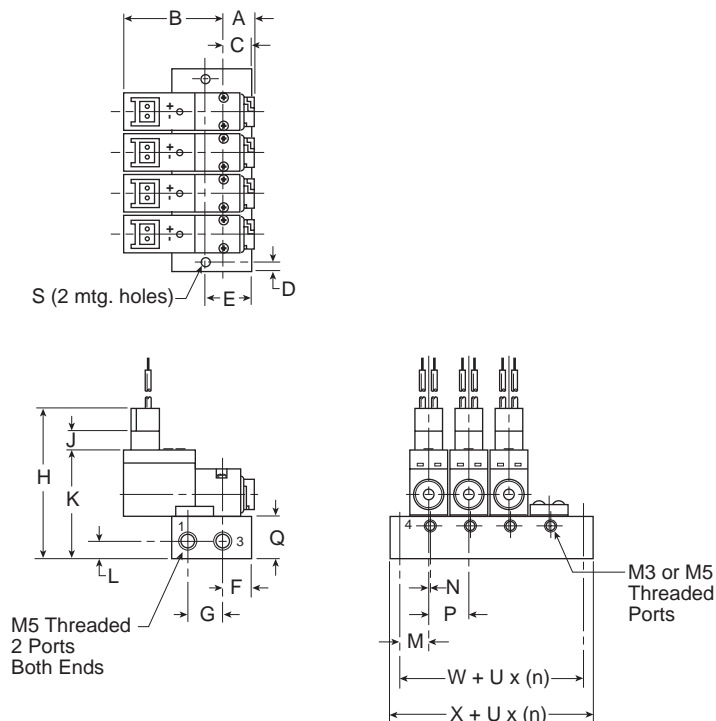
A00

Manifold

A00 - Manifold

A .36 (9)	B 1.00 (25)	C .31 (8)	D .10 (3)	E .51 (13)
F .31 (8)	G .39 (10)	H 1.63 (42)	J .20 (5)	K 1.22 (31)
L .20 (5)	M .33 (9)	N .02 (.6)	P .41 (10.5)	Q .47 (12)
S .125 (3.2)	U .41 (10.5)	X .45 (11.5)	W .26 (6.5)	

Inches (mm)

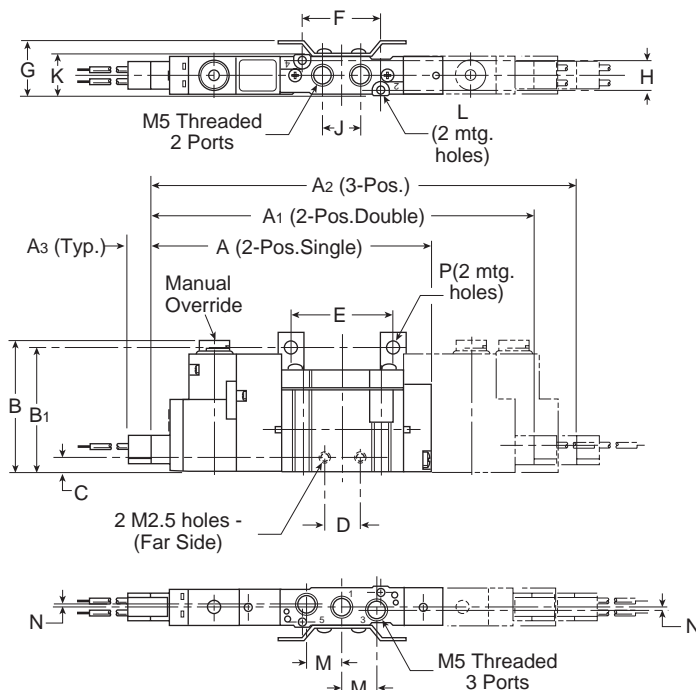


n = Number of stations.



A05

Single & Double Operators – Inline



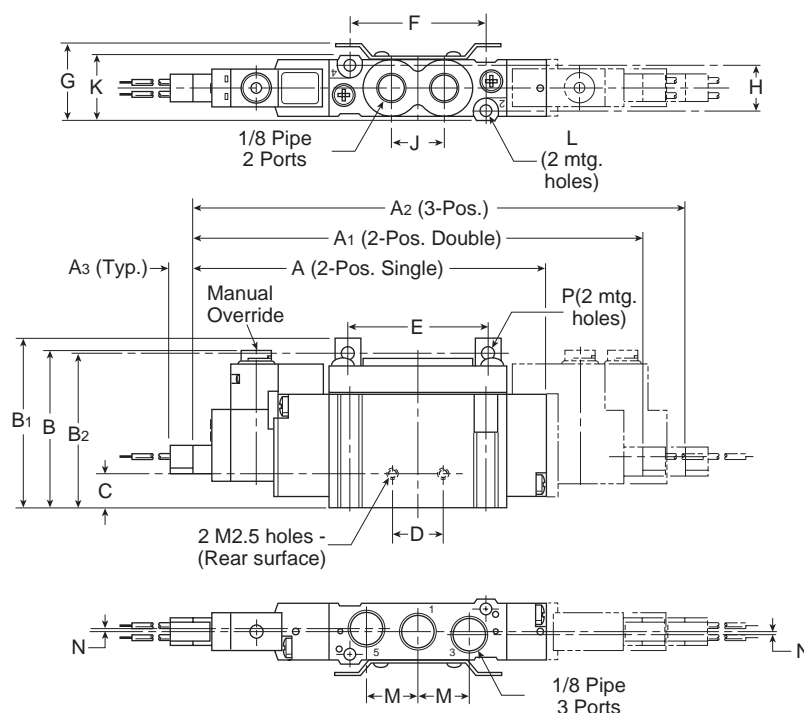
A05R – Inline

A 2.91 (74)	A₁ 3.94 (100)	A₂ 4.25 (108)	A₃ .24 (6)	B 1.38 (35)
B₁ 1.30 (33)	C .16 (4)	D .38 (10)	E 1.06 (27)	F .83 (21)
G .57 (15)	H .33 (9)	J .40 (10)	K .45 (11.4)	L Ø .08 Ø (2.1)
M .37 (10)	N .04 (1)	P Ø .14 Ø (3.5)		

Inches (mm)

A12

Single & Double Operators – Inline



A12R – Inline

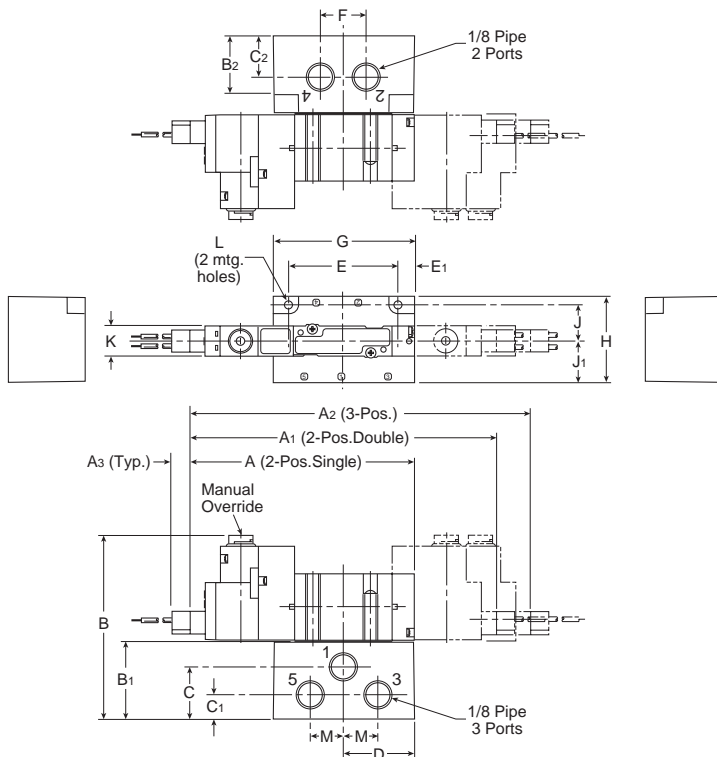
A 3.68 (94)	A₁ 4.69 (119)	A₂ 5.12 (130)	A₃ .24 (6)	B 1.64 (42)
B₁ 1.77 (45)	B₂ 1.70 (43)	C .35 (9)	D .51 (13)	E 1.46 (37)
F 1.42 (36)	G .80 (20)	H .47 (12)	J .55 (14)	K .68 (17)
L Ø .12 Ø (3.1)	M .55 (14)	N .03 (0.8)	P Ø .14 Ø (3.5)	

Inches (mm)



A05

Single & Double Operators – Subbase



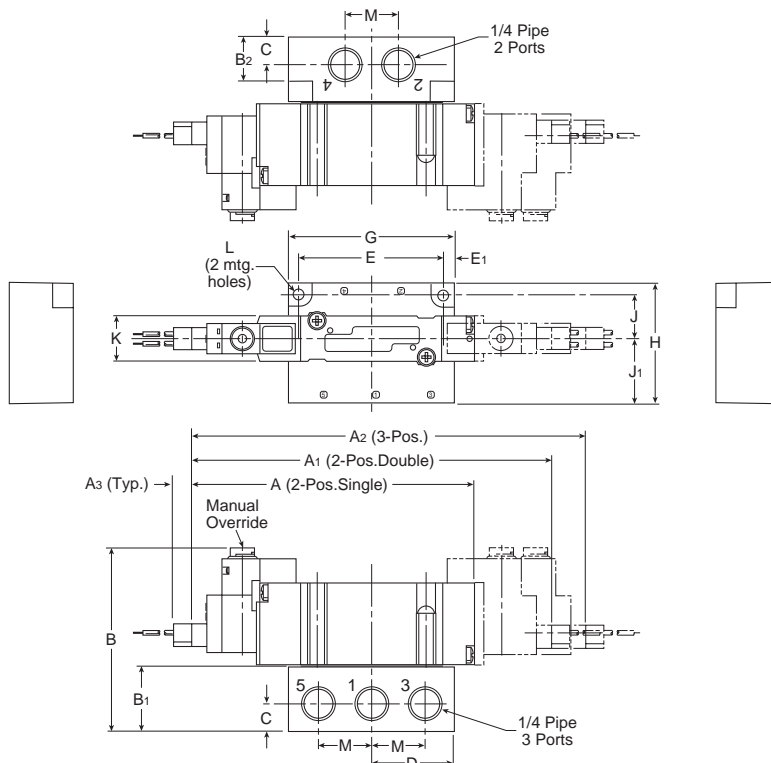
A05P – Subbase

A 2.91 (74)	A₁ 3.94 (100)	A₂ 4.25 (108)	A₃ .24 (6)	B 2.35 (60)
B₁ .96 (25)	B₂ .75 (19)	C .65 (17)	C₁ .30 (8)	C₂ .53 (14)
D .89 (23)	E 1.38 (35)	E₁ .20 (5)	F .57 (15)	G 1.77 (45)
H .08 (28)	J .45 (11.5)	J₁ .51 (13)	K .39 (10)	L Ø .13 Ø (3.2)
M .45 (12)				

Inches (mm)

A12

Single & Double Operators – Subbase



A12P – Subbase

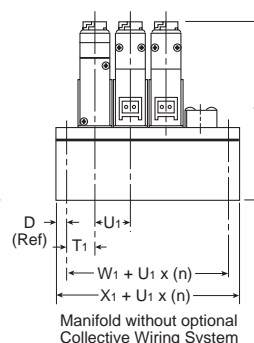
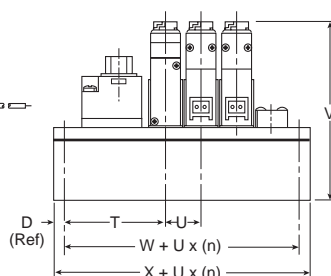
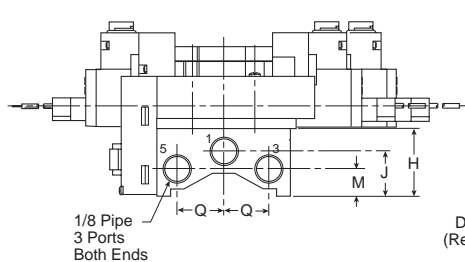
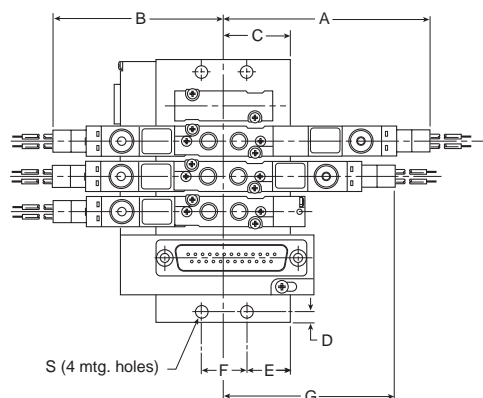
A 3.68 (94)	A₁ 4.69 (119)	A₂ 5.12 (130)	A₃ .24 (6)	B 2.41 (61)
B₁ .87 (22)	B₂ .75 (19)	C .37 (10)	D 1.10 (28)	E 1.89 (48)
E₁ .16 (4)	G 2.20 (56)	H 1.59 (41)	J .57 (14.5)	J₁ .87 (22)
K .59 (15)	L Ø .17 Ø (4.3)	M .71 (18)		

Inches (mm)



A05

Manifold – Valve Inline



A05R - Manifold, Valve Inline

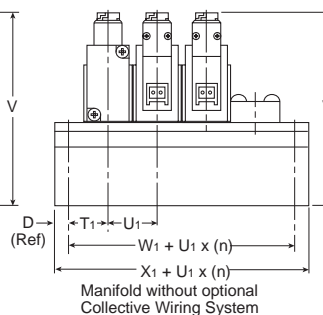
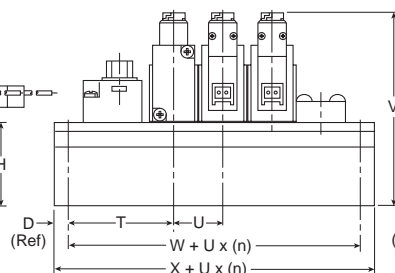
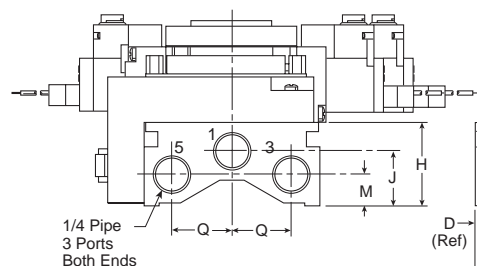
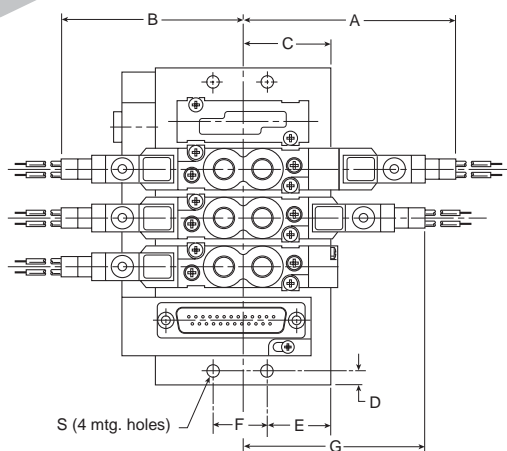
A	B	C	D	E	F
2.52 (64)	2.21 (56)	.94 (24)	.16 (4)	.61 (16)	.63 (16)
G	H	J	M	Q	S
2.21 (56)	.94 (24)	.61 (16)	.37 (10)	.63 (16)	Ø .18 Ø (4.5)
T	T ₁	U	U ₁	V	W
1.34 (34)	.51 (13)	.49 (12.5)	.41 (10.5)	2.32 (59)	1.36 (35)
W ₁	X	X ₁			
.37 (9.5)	.167 (43)	.68 (17.5)			

Inches (mm)

n = Number of stations.

A12

Manifold – Valve Inline



A12R - Manifold, Valve Inline

A	B	C	D	E	F
3.01 (77)	2.58 (66)	1.14 (29)	.20 (5)	.76 (19)	.77 (19.6)
G	H	J	M	Q	S
2.58 (66)	1.08 (28)	.71 (18)	.41 (11)	.77 (20)	Ø .18 Ø (4.5)
T	T ₁	U	U ₁	V	W
1.48 (38)	.51 (13)	.69 (17.5)	.63 (16)	2.74 (70)	1.34 (34)
W ₁	X	X ₁			
.39 (10)	1.73 (44)	.79 (20)			

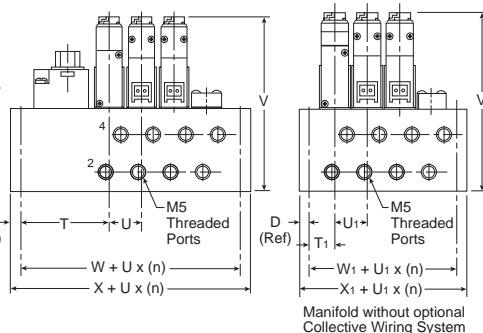
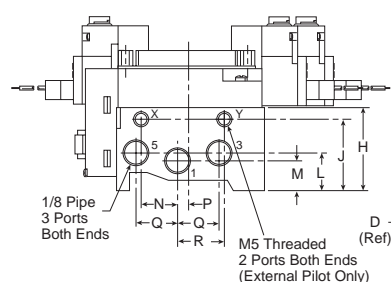
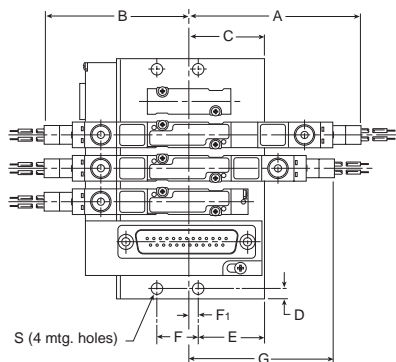
Inches (mm)

n = Number of stations.



A05

Manifold – Side Ports



A05P – Manifold, Side Ports

A	B	C	D	E	F
2.52 (64)	2.21 (56)	1.12 (29)	.16 (4)	1.00 (26)	.63 (16)
F ₁	G	H	J	L	M
.19 (5)	2.21 (56)	1.26 (32)	1.08 (28)	.59 (15)	.45 (11.5)
N	P	Q	R	S	T
.55 (14)	.13 (3)	.63 (16)	.71 (18)	Ø .18 Ø (4.5)	1.34 (34)
T ₁	U	U ₁	V	W	W ₁
.39 (10)	.49 (12.5)	.41 (10.5)	2.64 (67)	1.32 (34)	.37 (10)
X	X ₁				
1.65 (42)	.67 (18)				

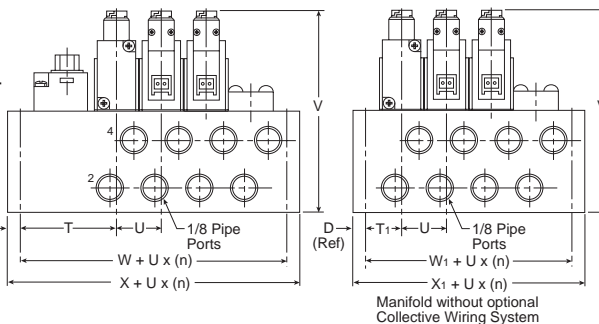
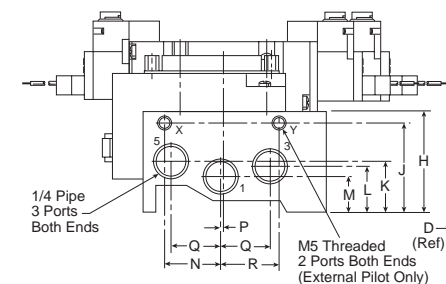
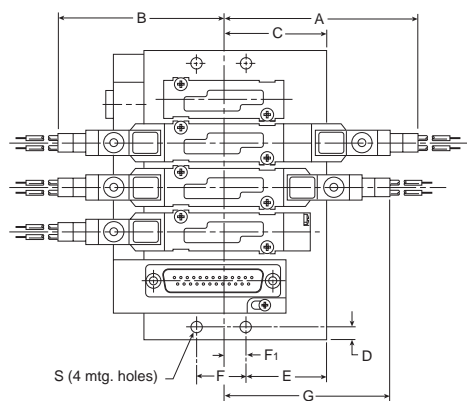
Inches (mm)

n = Number of stations.

A12

Manifold – Side Ports

A12P – Manifold, Side Ports



Inches (mm)

n = Number of stations.

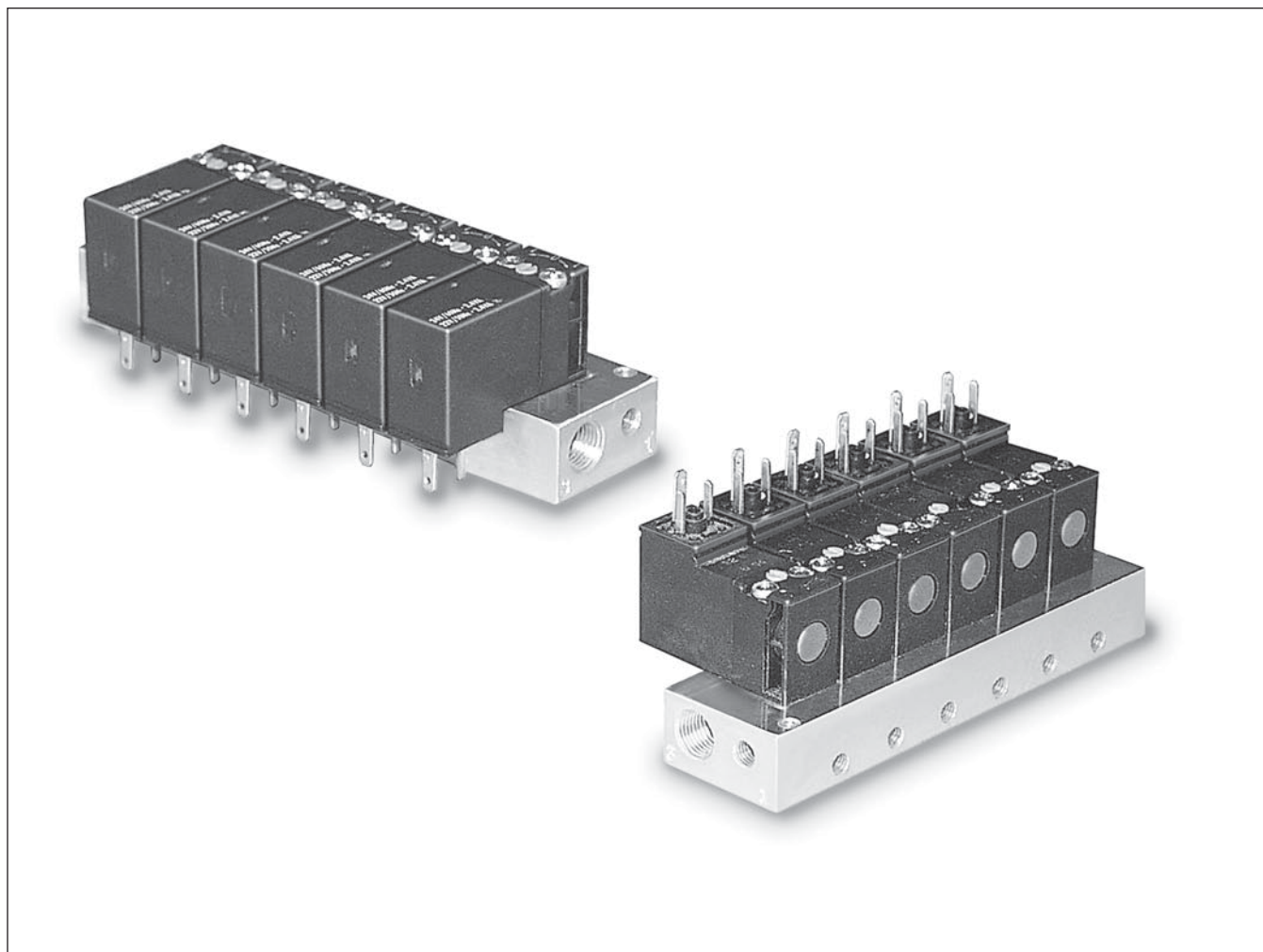


15mm Solenoid Valve

Manifold and Subbase

Section C

www.parker.com/pneu/15mm



C

Features	C2
Model Selection	
Manifolds	C3
Subbase.....	C4
Ordering Information.....	C4
Solenoid Kits	C5
Electrical Connectors	C6

Bold Options Standard.

Regular text part numbers may have longer lead times.





Features

- Compact and Simple Design
- Utilizes 15mm Solenoid Operators
- Manifold Allows Mounting of Normally Open and Normally Closed Operators Simultaneously
- Up to 20 Stations Available

Specifications

Operating Pressure:

Vacuum to 145 PSIG
(Vacuum to 10 bar)

Operating Temperature:

5° to 140°F
(-15° to 60°C)

Materials:

Aluminum

Solenoids:

- 15mm Low Watt Solenoids are UL Certified and Approved to be CE Marked
- Wide Range of Voltages Available

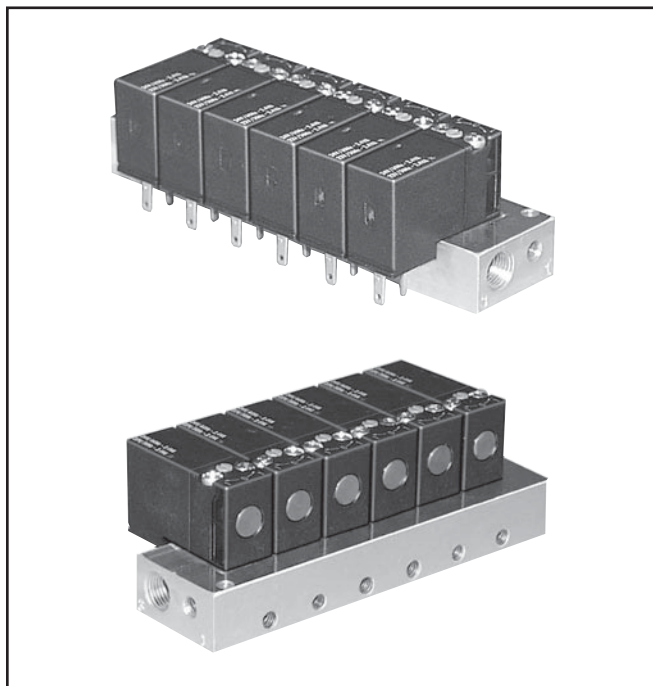
Applications

- Piloting for Process Control Valves
 - Pharmaceutical Equipment
 - Waste Water Treatment Systems
 - Food Processing
 - Chemical Batching
- Industrial Laundry Equipment
- Paint Spray & Dyeing Equipment
- Textile Winding Applications
- Vacuum and Conveyor Applications

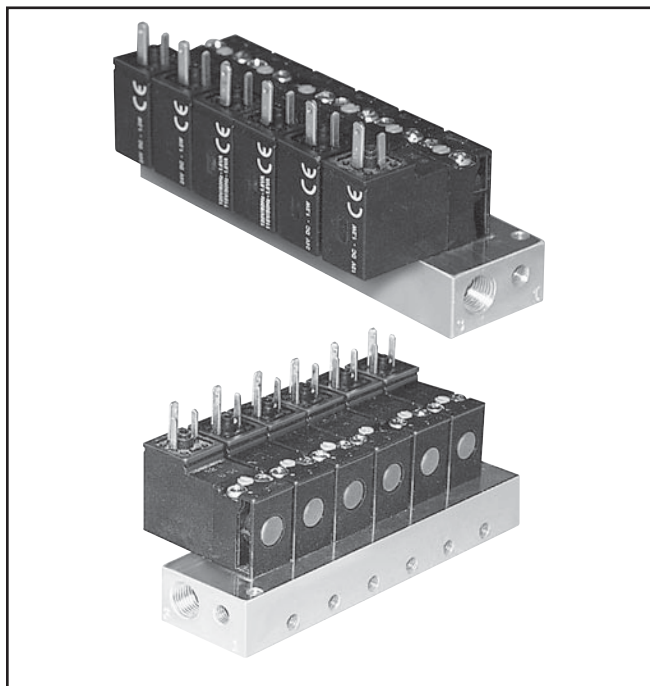
C



Manifold - Pins Down



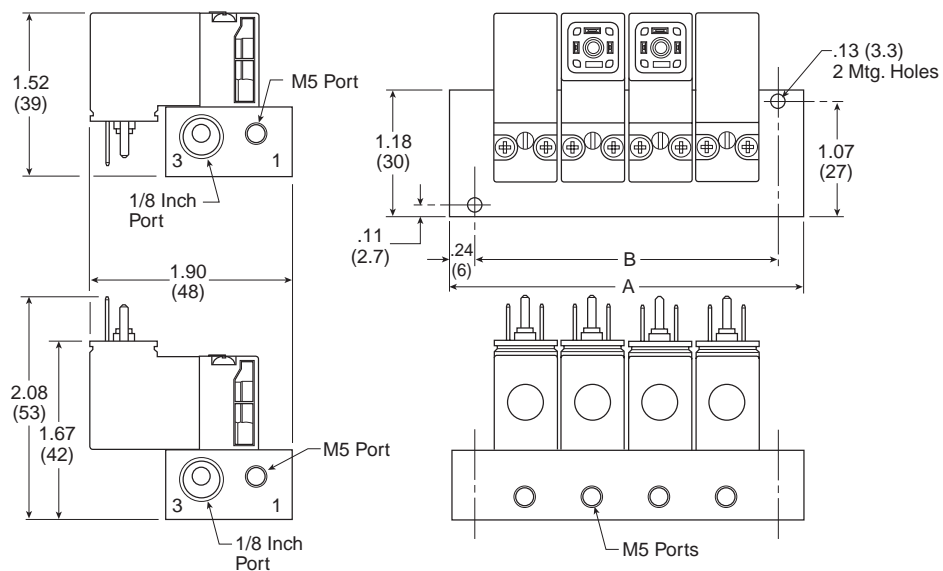
Manifold - Pins Up



C

Manifold Dimensions

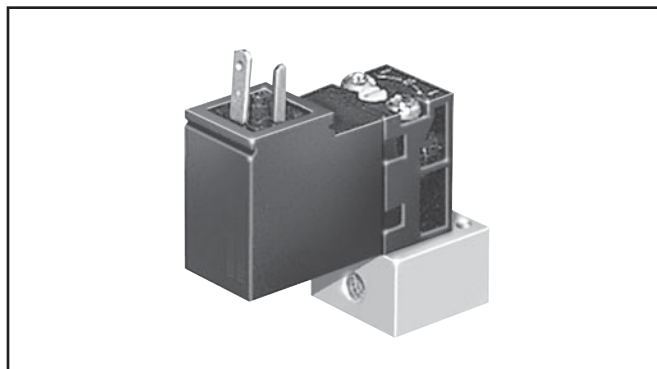
Special mounting considerations must be made for connector assembly clearance when mounting solenoid valves with pins down.



Number of Stations	Dim. A	Dim.B
2	2.04 (52)	1.57 (40)
3	2.68 (68)	2.20 (56)
4	3.31 (84)	2.83 (72)
5	3.94 (100)	3.46 (88)
6	4.57 (116)	4.09 (104)
7	5.20 (132)	4.72 (120)
8	5.83 (148)	5.35 (136)
9	6.46 (164)	5.98 (152)
10	7.09 (180)	6.61 (168)
11	7.72 (196)	7.24 (184)
12	8.35 (212)	7.87 (200)
13	8.98 (228)	8.50 (216)
14	9.61 (244)	9.13 (232)
15	10.23 (260)	9.76 (248)
16	10.87 (276)	10.39 (264)
17	11.50 (292)	11.02 (280)
18	12.13 (308)	11.65 (296)
19	12.76 (324)	12.28 (312)
20	13.39 (340)	12.91 (328)

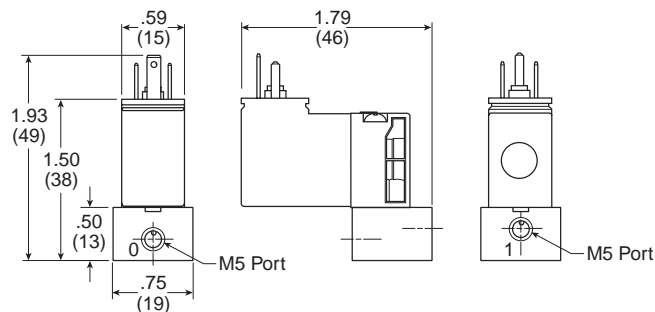


Subbase



Subbase Dimensions

Pins up only.



Model Number Index

**BOLD OPTIONS
 ARE STANDARD**

PSF		T	N	0	N	02	N	P		
Basic Series									Brand Label	
Subbase 3/2 Bottom Port									P	
Subbase 3/2 End Port									Parker	
Manifold Type									Options	
15mm Solenoid Valve Manifold (Machined to accept NC/ NO on Same Bar)									N** Standard - Cylinder Port on Non-Electrical Side (Port 1 Side)	
15mm Solenoid Valve Manifold (Machined to accept All NC or All NO)									E* Cylinder Port on Electrical Side (Port 3 Side)	
15mm Solenoid Valve Subbase									* N/A with Valve Series "S" * N/A with Manifold "PSE" ** Use for Bottom Ported Manifold Type	
* Pins Up Only. ** End Ported Only.									Number of Stations	
									02 2 Stations	
									03 3 Stations	
									20 20 Stations	
									XX Single*	
									* Use for "R" Manifold Type Only	
Pilot Source									Port Type	
Direct									0* M5	
									N** NPT	
									* Use for Valve Manifold R Only - Single Subbase ** Use for Valve Manifold S & T Only - Manifold	
Cylinder Port Size										
M5									0	

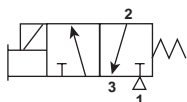
Examples:

PSFTN0N16EP - End Port Manifold - Cyl Ports and Electrical on Same Side
 PSESN0N10NP - Bottom Port Manifold - N/C and N/O can be Interchanged
 PSFTN0N10NP - End Port Manifold - Cyl Ports and Electrical are Opposite

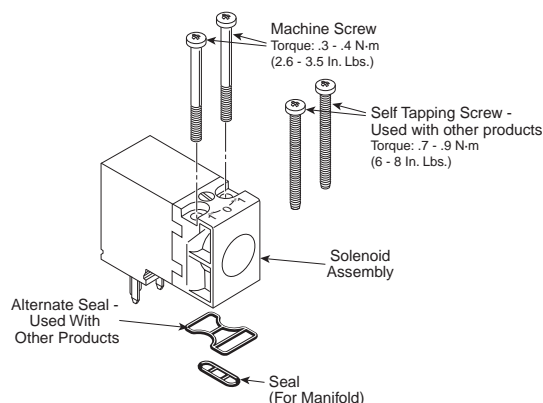
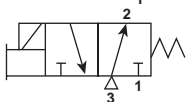


15mm Solenoid Kit Information

3/2 Normally Non-passing (NNP) /
Normally Closed (NC) Valves



3/2 Normally Passing (NP) /
Normally Open (NO) Valves



NC (NNP) Solenoids / Kits

Kit No.	* Override	## Voltage (S = Standard, O = Optional)						
		42 (24VAC)	45 (12VDC)	47 (12VDC) Mobile	48 (24VDC) Mobile	49 (24VDC)	53 (120VAC)	57 (230VAC)
PS2982*##P Pins: UP NC / NNP 1.2W / 1.6VA	B (Non-lock, Flush)	O	O	—	—	S	S	O
	C (Lock, Flush)	O	O	—	—	S	S	O
	D (Non-lock, Ext)	—	—	O	O	O	O	—
PS3541*##P Pins: DOWN NC / NNP 1.8W / 2.4VA	B (Non-lock, Flush)	O	O	—	—	S	S	—
	C (Lock, Flush)	O	O	—	—	S	S	—
	D (Non-lock, Ext)	—	—	—	—	O	O	—
	E (Lock, Ext)	—	—	—	—	O	O	—
PS3441*##P Pins: DOWN NC / NNP 1.2W / 1.6VA	B (Non-lock, Flush)	O	O	—	—	O	O	O
	C (Lock, Flush)	O	O	—	—	O	O	O
PS3202*##P Pins: UP NO / NP 1.2W / 1.6VA	B (Non-lock, Flush)	O	O	—	—	S	S	—

* Override

Voltage

Bold items are standard.

Technical Data

Electrical Interface Per:

Din 43650 Form C

Pneumatic Interface Per:

Afnor E 0652 110 N

Protection:

IP65 (Washdown)

Air Flow:

Standard Flow 0.033 Cv (33 Lpm) (1.2W) (1.6VA)

High Flow 0.05 Cv (50 Lpm) (1.8W) (2.4VA)

Operating Temperature:

Standard Flow: 5°F to 140°F (-15°C to 60°C)

High Flow: 5°F to 122°F (-15°C to 50°C)

Mobile Applications (47 & 48 Voltage Options):

-40°F to 158°F (-40°C to 70°C)

Operating Pressure:

Vacuum to 145 PSIG (Vacuum to 10 bar)

Storage Temperature:

All Applications: -40°F to 158°F (-40°C to 70°C)

Voltage Tolerance:

All Voltages Except 47 & 48: Rated Voltage +10% / -15%

Options 47 & 48: Rated Voltage +25% / -30%

Materials

Valve:

Body: Glass Filled Polyamide

Internal Metal Parts: Steel

Screws: Steel

Bottom Plug: Thermoplastic

Poppet Seals: Nitrile for Standard, Fluorocarbon for Mobile



Female Electrical Connectors

15mm 3-Pin DIN 43650C (Use with Enclosure “5”)

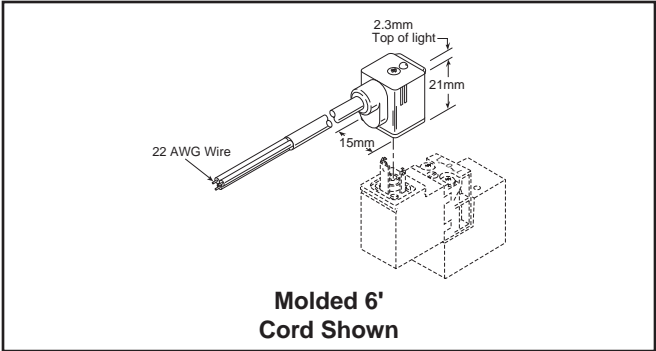
Connector	Connector with Cord	Description
PS2932BP	PS2932HBP 18 Inches	Unlighted
PS2932BP	PS2932JBP 6 Feet	Unlighted
PS294675BP	PS2946J75BP* 6 Feet	Light – 12VAC or DC
PS294679BP	PS2946J79BP* 6 Feet	Light – 24VAC or DC
PS294683BP	PS2946J83BP* 6 Feet	Light – 110/120VAC
PS294687BP	N/A	Light – 240/230VAC

* LED with surge suppression.

Note: Max ø6.5mm cable size required for connector w/o 6' (2m) cord.
IP65 rated when properly installed.

Engineering Data:

Conductors: 2 Poles Plus Ground
Cable Range (Connector Only): 4 to 6mm (0.16 to 0.24 Inch)
Contact Spacing: 8mm

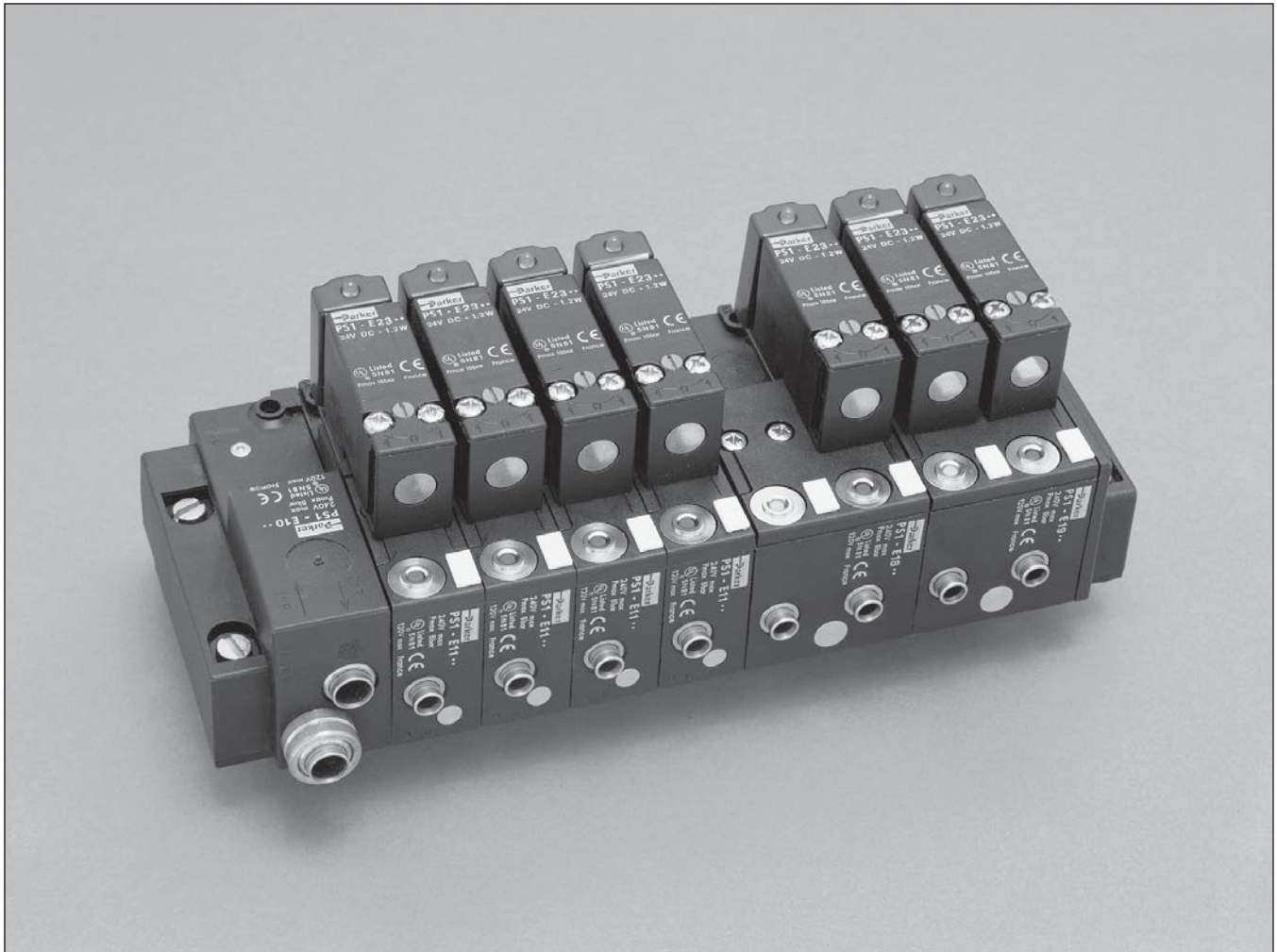


C



PS1E Series Electro-pneumatic Interface Valves

Section D



D

FeaturesD2-D3

3/2 and 4/2 Electro-Pneumatic Interface Modules

Complete Units, Head / Tail Sets, Intermediate Pressure
SupplyD4

Modules without Solenoid, Solenoids,
Pressure SwitchD5

Technical Data, DimensionsD6

Suppressor and LED Indicators, Spare Parts,
Marking Accessories.....D7



Compact, easy to install, reliable...

Easy To Meet System Design Needs

- Full flow capacity allows direct operation of small cylinders (single or double acting) or pneumatic piloting of larger control valves (pneumatic or hydraulic).
- Valve configurations in 3/2 or 4/2 (single or double acting).
- Outlet fittings (push-in) for 5/32" or 1/4" tubing.
- System modification or expansion simplified by easily adding modules to stack.
- Wide range of voltages available.
- Multiple pressures possible in one assembly.

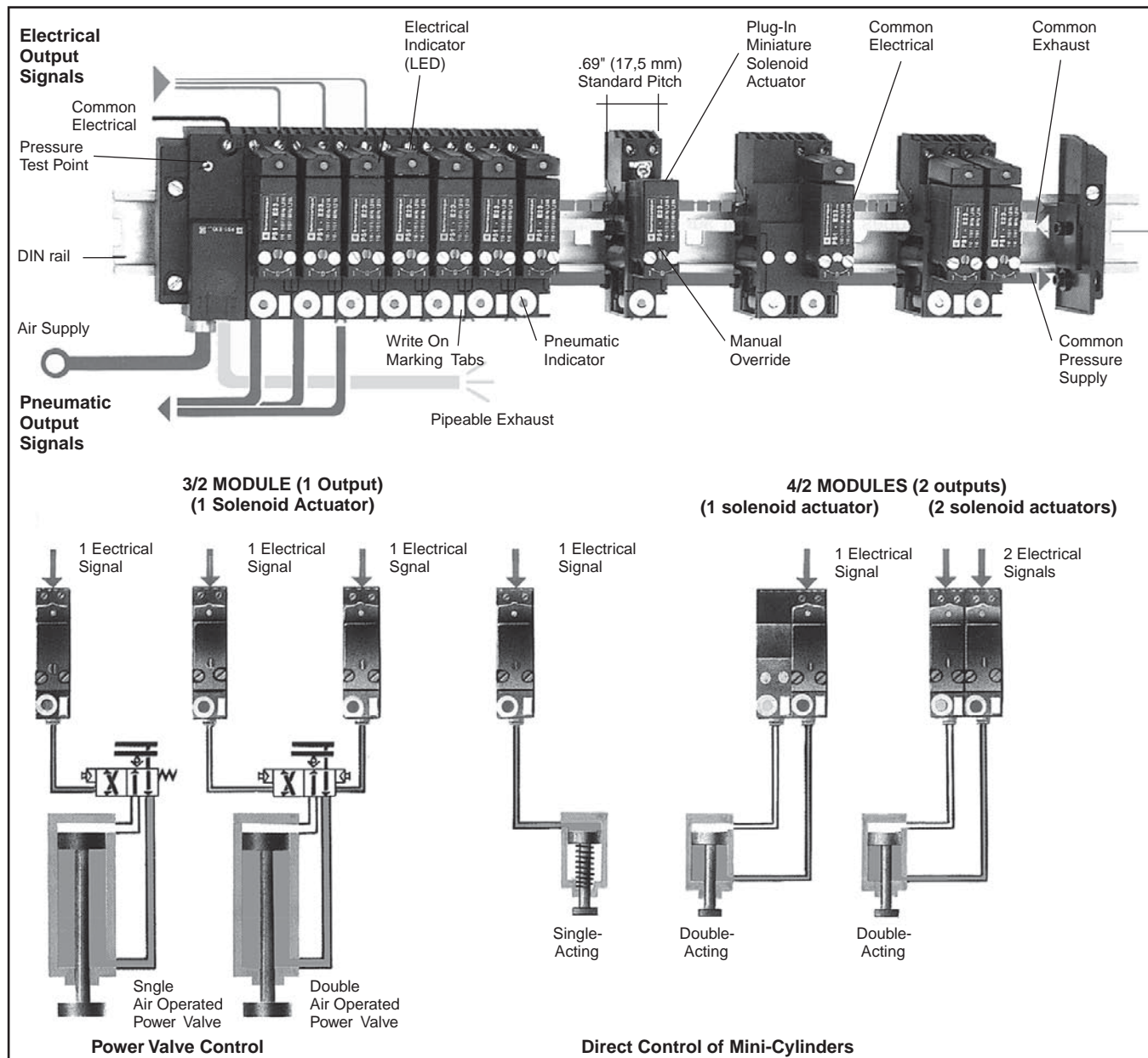
Easy To Install In Your System

- Modules snap together and mount on 35mm (DIN) rail.
- Micro-valve stack and PLC may be mounted in the same enclosure.
- Common air supply, exhaust, and electrical supply reduce connections to 1 wire and 1 tube per module.
- Supply and exhaust air can be piped with only one tube for each.
- Fast hook-up with captive wire clamp connections and push-in fittings.
- Compatible pneumo-electric module provides integrated feedback capability for the PLC.
- Eliminates cumbersome electrical connections on machine mounted solenoid valves.

Easy To Maintain System Operation

- Manual override for setup and troubleshooting.
- Poppet design for long, trouble free life (lubricated or non-lubricated air).
- Integrated diagnostics (main air test point, output pneumatic indicator, optional suppressor / LED) provide system status at a glance.
- All electrical connections are in a protected enclosure.
- Modular design and easy connection aid in module replacement or system expansion.

D



⚠ Caution: Because these are poppet valves, the common air supply pressure must be built up rapidly (never use a slow start valve 2/2 on the air supply for the interfaces).

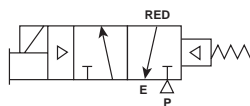
When pressure is applied, the 4/2 valve takes up a predetermined position (unactuated) when no electrical signal is present.

- Output 2 (yellow indicator) passing.
- Output 4 (red indicator) non-passing.

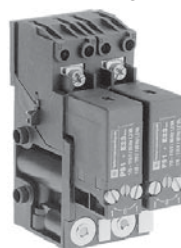
All units include pop-up indicator for pneumatic output. Red indicates NNP / NC function. Yellow indicates NP / NO function. All model numbers shown include non-locking manual override. (For other voltages, use component parts shown on page D5).



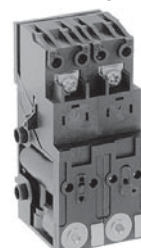
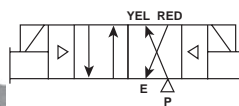
PS1E21102**



PS1E111



PS1E29102**



PS1E29102**

Assembled Units

Single Solenoid - Spring Return 3/2 -
Normally Non-Passing (NNP) /
Normally Closed (NC)

Voltage	Output Port Push-In Connection Size	
	5/32" (4 mm) Tube	1/4" Tube
12V DC	PS1E21102J	PS1E216702J
24V DC	PS1E21102B	PS1E216702B
24V AC	PS1E21101B	PS1E216701B
120V AC	PS1E21101F	PS1E216701F

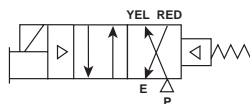
Weight: 0.21 lb (0.095 kg)

Valves Without Solenoid Operators

Output Port Push-In Connection Size		
5/32" (4mm) Tube	6mm Tube	1/4" Tube
PS1E111	PS1E116	PS1E1167



PS1E28102**



PS1E181

Assembled Units

Single Solenoid - Spring Return 4/2

Voltage	Output Port Push-In Connection Size	
	5/32" (4 mm) Tube	1/4" Tube
12V DC	PS1E28102J	—
24V DC	PS1E28102B	PS1E286702B
24V AC	PS1E28101B	PS1E286701B
120V AC	PS1E28101F	PS1E286701F

Weight: 0.36 lb (0.165 kg)

Valves Without Solenoid Operators

Output Port Push-In Connection Size		
5/32" (4mm) Tube	6mm Tube	1/4" Tube
PS1E181	PS1E186	PS1E1867

Assembled Units

Double Solenoid 4/2

Voltage	Output Port Push-In Connection Size	
	5/32" (4 mm) Tube	1/4" Tube
12V DC	PS1E29102J	—
24V DC	PS1E29102B	—
24V AC	PS1E29101B	PS1E296701B
120V AC	PS1E29101F	PS1E296701F

Weight: 0.45 lb (0.205 kg)

Valves Without Solenoid Operators

Output Port Push-In Connection Size		
5/32" (4mm) Tube	6mm Tube	1/4" Tube
PS1E191	PS1E196	PS1E1967

Head and Tail Sets

Used to mount valves to DIN rail and provide supply and exhaust ports. All hardware is included.

Single supply type supplies from one end of the manifold assembly with the other end blocked.

Double supply type provides pressure and exhaust ports on both ends of the assembly.



PS1E1027

Push-In Connection Ports	Single Supply	Double Supply
1/4" Tube	PS1E1017	PS1E1027
6mm Tube	PS1E101	PS1E102

Wt: 0.22 lb (0.100 kg) Wt: 0.28 lb (0.125 kg)

Intermediate Supply Module - PS1E10387

1/8" Pipe port for supply and exhaust ports.

Allows replenishment or isolation of the supply and / or exhaust ports using included plugs.

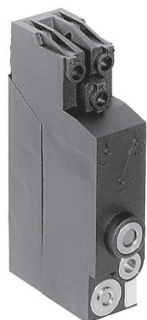
Weight: 0.28 lb (0.125 kg)



PS1E10387

1/8" Pipe Supply & Exhaust

NPT	PS1E10387
BSP	PS1E1038



PS1P10●●

Line Mounted Pressure Switch

Includes pop-up indicator to show presence of pressure.

Includes Clip for mounting on 35mm DIN Rail.

1 SPDT Contact.

5A 250V

5/32 (4 mm) Push-In Tubing Port

Shaded Items: Consult factory for availability.

Switching Pressure

20 PSIG Fixed	30 - 75 Adjustable
PS1P1081	PS1P1091

Wt: 0.11 lb (0.050 kg)



P2E-KS32C1

NC (NNP) 15mm Solenoids / Kits (8mm Pin Spacing DIN 43650C)

Voltages	Power Consumption	Holding Current	Id (Drop-Out Current)*	Kit Numbers With Non-Locking Flush Manual Override	Solenoid Only	Kit Numbers With Locking Flush Manual Override	Solenoid Only
12VDC	1.2W	100 mA	10 mA	PS3441B45P	P2E-KS32B1	PS3441C45P	P2E-KS32B2
24VDC	1.2W	50 mA	5 mA	PS3441B49P	P2E-KS32C1	PS3441C49P	P2E-KS32C2
24VAC	1.6VA	65 mA	22 mA	PS3441B42P	P2E-KS31C1	PS3441C42P	P2E-KS31C2
110VAC, 50Hz 120VAC, 60Hz	1.6VA	13.3 mA	5 mA	PS3441B53P	P2E-KS31F1	PS3441C53P	P2E-KS31F2

* When using a programmable controller, be sure that the leakage current of the controller outputs is lower than the drop-out current value.

Notes:

Kit includes: Solenoid, (2) machine screws, (2) self threading screws, (1) gasket, (1) 3-cell gasket, (1) L-shaped 3-cell gasket.

Valve Specifications

Body Material:

Glass filled polyamide

Electrical Connection:

Captive wire clamp

LED / Noise Suppressor*:

Combination LED (green) and zener diode

Life Expectancy:

10 million operations

Maximum operating frequency:

10 Hz

Medium Quality:

Standard shop air, lubricated or non-lubricated, 50µ filtered

Mounting:

35mm (DIN) rail

Operating Medium:

Compressed air

Operating Pressure Range:

40 to 120 PSI (3 to 8 bar)

Operating Principal:

Solenoid pilot operated poppet valve

Operating Temperature Range:

5° to 140°F (-15° to 60°C)

Response Time:

10-15 ms (electronic signal to pneumatic output)

Seal Material:

Poppet - polyurethane
 Seals - Nitrile (Buna N)

Supply and Exhaust Ports:

1/4"

Outlet port:	5/32"	1/4"
Flow rate: (SCFM @ 90 PSI)	7.1	9.2
Cv	.14	.16

Tube Connections:

Push-in (instant) fittings

Voltage Tolerance:

+10 to -15% of rated voltage @ 70°F

Wire Size:

14 - 22 AWG

Caution: Memory in double acting (Bistable) 4/2 modules is input dependent. Either air supply or electrical command signal must be maintained or memory may be lost.

*120/240VAC LED only (No noise suppressor)

Pressure Switch Specifications

Body Material:

Glass filled polyamide

Contact Material:

Silver

Contact Rating:

10A / 250VAC

Maximum Operating Frequency:

10 Hz

Mechanical Life:

30 million operations

Pressure Range:

Fixed pressure:

19 to 120 PSI (1.3 to 8 bar)

Adjustable pressure:

30 to 120 PSI (2 to 8 bar)

Operating Temperature Range:

5° to 140°F (-15° to 60°C)

Operating Principal:

Pressure operated micro switch

Seal Material:

Poppet - polyurethane

Seals - Nitrile (Buna N)

Switch Pressure:

Fixed pressure:

>19 PSI (>1.3 bar)

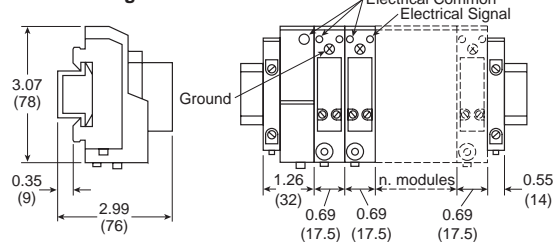
Adjustable pressure:

30 to 75 PSI (2 to 5 bar)

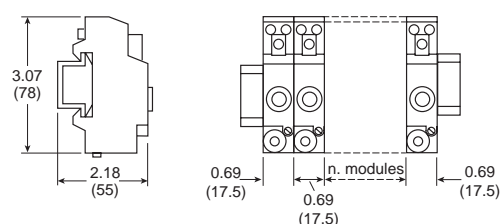
		AC				DC		
Contact life		24V	48V	120V	240V	12V	24V	48V
1 Million Operations	Inductive	25	56	115	140	17	24	37
	Resistive	86	190	370	440	42	58	88
2 Million Operations	Inductive	—	—	—	—	10	14	25
	Resistive	—	—	—	—	30	43	70
5 Million Operations	Inductive	10	14	19	21	—	—	—
	Resistive	35	82	160	200	—	—	—

Dimensions shown in inches (mm)

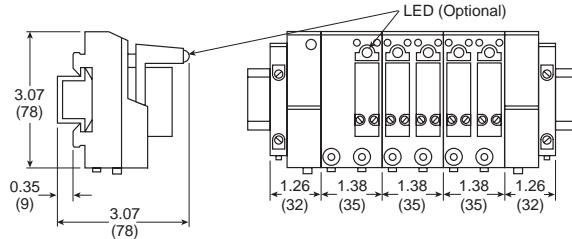
3/2 and Single Head and Tail Set



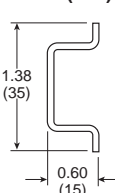
PS1 P1091



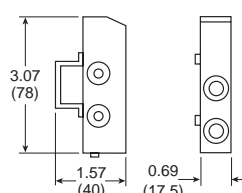
4/2 and Double Head and Tail Set



35mm (DIN) Rail*



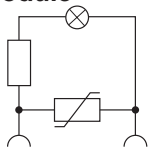
Intermediate Module



*Rail at less than 0.6" does not allow enough room for mounting clips and may cause air leaks.

Suppressor and LED Indicators for PS1E

Mount between Solenoid Valve and the Interface Module



Circuit Diagram



PS1E1620●

Characteristics	Voltage	Part Number	Weight	
			lb	kg
Indication by LED Sold in Lots of 5	24 VDC and 50/60 Hz	P8V-CR26C	.022	0.010
	48 VDC and 50/60 Hz	P8V-CR26D	.022	0.010
	120 V / 60 Hz 115 V / 50 Hz	P8V-CR24F	.028	0.012

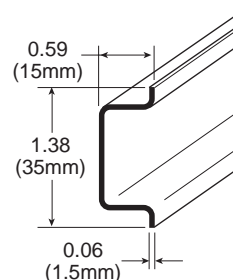
35mm DIN Rail

AM1DE200

6 Feet

Zinc chromated steel rail for easy mounting of stacks.

DIN rail can be mounted to grids or other surfaces to allow snap in mounting of pneumatic and electrical components.



Spare Parts

Description	Part Number
1 lot of 100 O-ring Seals Between Modules (Pressure - Exhaust)	PPR-L12
1 lot of 50 Seals Between Modules 3/2 or 4/2 and Coil PS1-E23 - 25 Seals (Type A) for Modules 3/2 and 4/2 Bistable - 25 Seals (Type B) for Modules 4/2 Monostable and Bistable	PPR-L13

Marking Accessories

To be used in place of Write-On Marking Tabs



AB1-G●

Clip-On Marker Strips	Part Number
Strip of 10 Identical Numerals (State the Number required)	AB1-R●
Strip of 10 Identical Letters (State the Letter required)	AB1-G●
Strip of 10 - Signs*	AB1-R13

*Sold in Lots of 25 Strips of 10 Markers

Notes

D

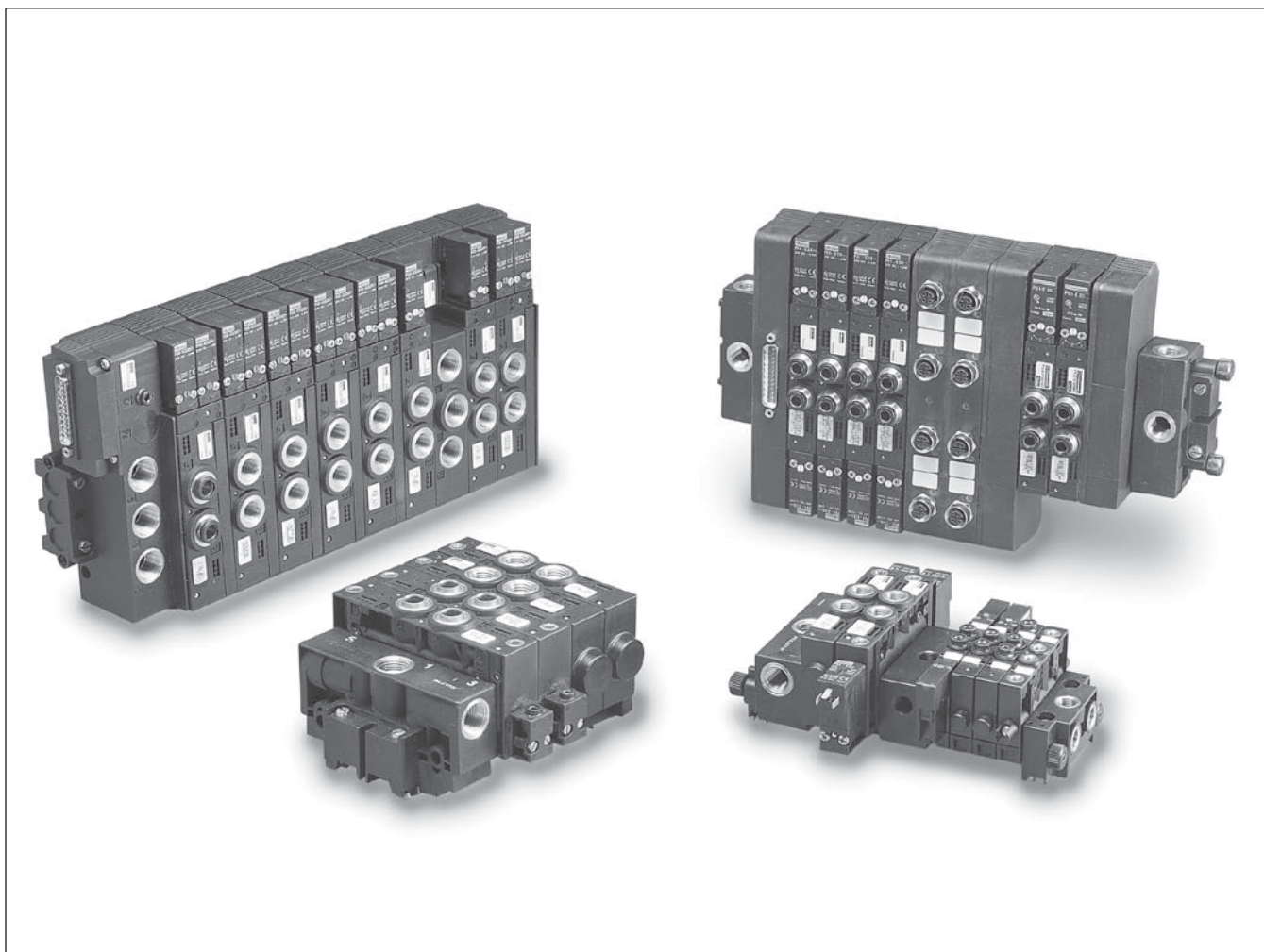


"PVL" Series

Solenoid & Remote Pilot Operated
1/8" & 1/4" Valves

Section E

www.parker.com/pneu/pvl



E

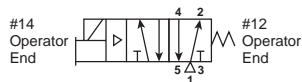
Basic Valve Functions	E2	Model Number Index, Solenoids (PVLB10 & PVLC10)	E16
Stacking Applications	E3-E4	PVLB10	E17-E19
Features (PVLB & PVLC).....	E5	PVLC10	E20-E22
Part Numbers-Stacking (PVLB & PVLC).....	E6	Pin Assignments (PVLB10 & PVLC10).....	E23
Accessories (PVLB & PVLC)	E7	Technical Data.....	E24-E25
Part Numbers-Inline, Model Number Index (PVLB & PVLC) ...	E8	Dimensions.....	E26-E34
Solenoids, Electrical Connectors.....	E9-E10	Cables	E35-E36
Stacking System Overview (PVLB10 & PVLC10)	E11	Accessories / Spare Parts.....	E37-E38
Electrical Connection (PVLB10 & PVLC10).....	E12		
Features (PVLB10 & PVLC10).....	E13		
Common Part Numbers (PVLB10 & PVLC10).....	E14-E15		

Bold Options Standard.
Regular text part numbers may have longer lead times.





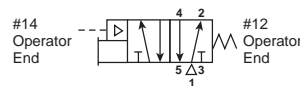
Single Solenoid 4-Way, 2-Position



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.

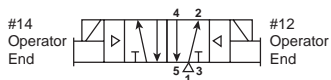
Single Remote Pilot 4-Way, 2-Position



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.

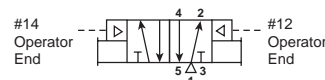
Double Solenoid 4-Way, 2-Position



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.

Double Remote Pilot 4-Way, 2-Position



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.

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.

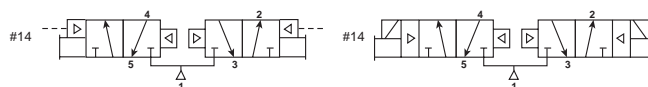
All Ports Blocked

All ports blocked in the center position.

Center Exhaust

Cylinder ports 2 and 4 connected to exhaust ports 3 and 5 in center position. Port 1 is blocked.

Double Solenoid / Remote Pilot Dual 3-Way, 2-Position NC



With #14 & #12 operators both de-energized – pressure at inlet port 1 blocked, outlet port 4 connected to exhaust port 5, outlet port 2 connected to exhaust port 3.

With #14 operator energized – pressure at inlet port 1 connected to outlet port 4, exhaust port 5 blocked, outlet port 2 connected to exhaust port 3.

With #12 operator energized – pressure at inlet port 1 connected to outlet port 2, exhaust port 3 blocked, outlet port 4 connected to exhaust port 5.

With #14 & #12 operators both energized – pressure at inlet port 1 connected to outlet ports 4 & 2, exhaust ports 3 & 5 blocked.



Application

The PVL Series stacking system permits assembly of several valves into one stack. Supply is connected at either a single or dual head / tail set.* Two common exhaust galleries are provided. Connections to outlet ports #2 and #4 on each valve can be accomplished by threaded pipe or instant tube fittings.

Electrical connection is made to each solenoid utilizing a 15mm, 3-Pin connector plug (PVLB & PVLC).

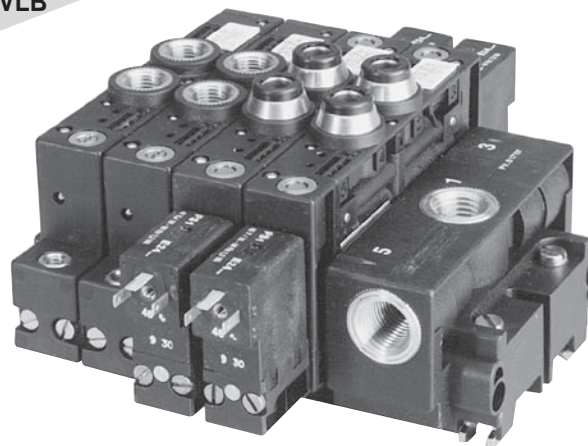
Each stack assembly can handle any combination of the following valve types:

- Single Solenoid
- Single Remote Pilot
- Double Solenoid
- Double Remote Pilot

Two valve sizes can be combined in one stack using a transition kit.

* For simultaneous operation of more than 5 valves, a dual head / tail set is recommended.

PVLB



Stack shows solenoid and remote pilot valves, threaded pipe ports, instant tube fittings, and a single supply head / tail set.

Features

- Greatly reduces installation costs.
- Reduces piping and the risk of leaks.
- Consolidates controls, saves space.
- Provides custom valving arrangements with standard components.
- Improves appearance of pneumatic equipment.
- Common main supply port.
- Allows for two common exhausts which can easily be plumbed away for cleanliness.
- Indicator lights and surge suppression available.
- Designed for 35mm DIN rail mounting. May be surface mounted by removing DIN rail clips.
- Servicing valves can be accomplished quickly without disassembling the entire stack or removing plumbing.

E



Mounting on 35mm DIN Rail

Valve stacks mount quickly and easily to 35mm DIN rail with the use of a pneumatic head / tail set. The dual head / tail set provides input and exhaust ports at both ends and is recommended if more than 5 valves are to be operated simultaneously.

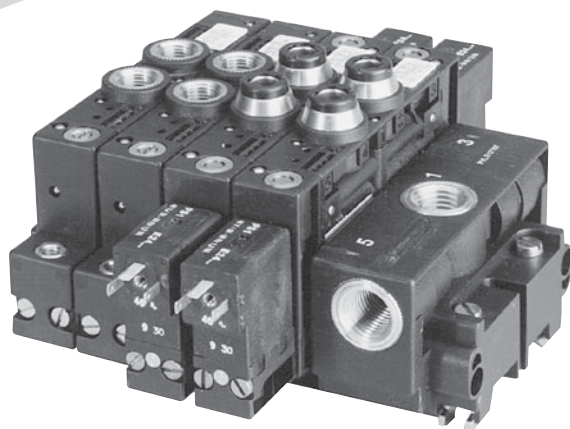
Surface Mounting

Stacks may be surface mounted by removing the 35mm DIN mounting hardware on the pneumatic head / tail set.

Removal or Replacement

Modules are removed in reverse of the order shown at right. Before removing a module for service or replacement, loosen the *pneumatic* tail piece.

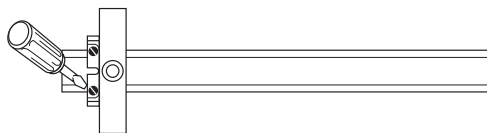
PVLB



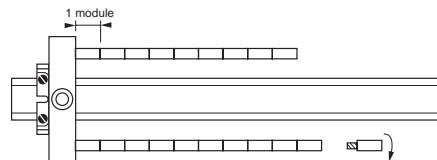
Stack shows solenoid and remote pilot valves, threaded pipe ports, instant tube fittings, and a single supply head / tail set.

Mounting Procedure

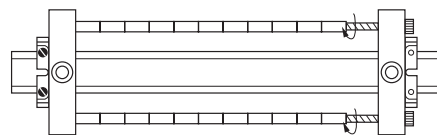
1. Clip on and tighten the pneumatic head piece.



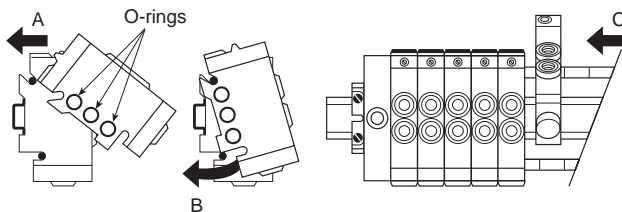
2. Assemble the two parallel mounting rods using cross rods provided with modules.



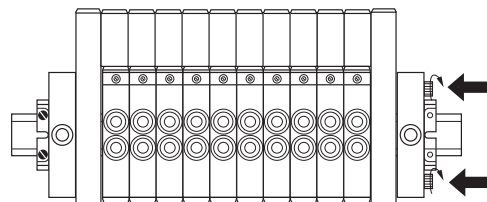
3. Clip on the pneumatic tail piece. Start screws into mounting rod but leave loose for module insertion.



4. To mount valves, position upper slot then push-lock lower slot. Mount modules (valves, modules, transition pieces, etc.) and press together.



5. Tighten the assembly.





"PVLB" Series

"PVLC" Series

Specifications

- 4-Way, 5-Port, 2 or 3-Position Valves
- Single & Double Solenoid
- Single & Double Remote Pilot
- Dual 3/2

PVLB - .6 Cv

- 1/8" NPT & BSP
- 1/4" & 6mm Tube Porting

PVLC - 1.2 Cv

- 1/4" NPT & BSP
- 3/8" & 6mm Tube Porting

Mounting Style

- Stacking Manifold Valve
- DIN Rail Mounting (35mm)

Solenoid Pilot Actuation

- Continuous Duty Rated

PVLB, PVLC

- 1.2W - 12VDC & 24VDC
- 1.6VA - 24VAC, 120VAC, 240VAC
- 3-Pin, 15mm (9.4mm Pin Spacing)

Manual Overrides

- Brass Locking & Non-Locking

Operating Pressure

- 30 to 150 PSI (310 to 1035 kPa)

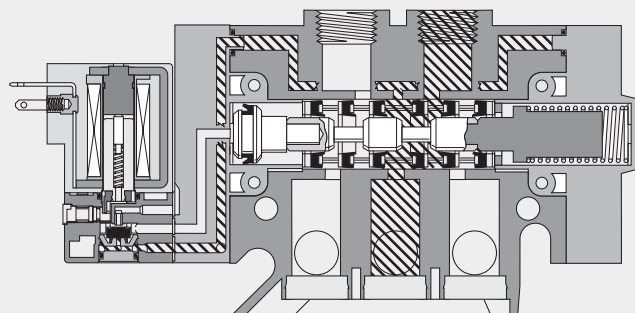
Operating Temperature

- 5°F to 140°F (-15°C to 60°C)

Certification / Approval

- Approved to be CE Marked
- UL (PVLB10 only)
- NFC 79 300

Note: DC units are polarity sensitive.



PVLB (1/8"), PVLC (1/4")

Shown De-Energized



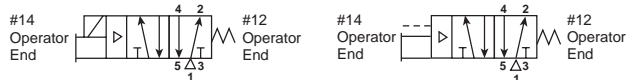
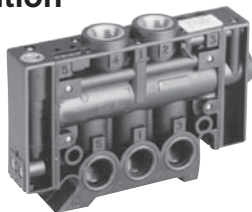
Pressure



Exhaust



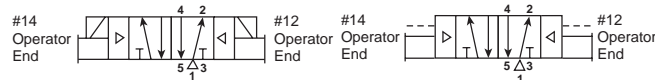
Single Solenoid / Remote Pilot 4-Way, 2-Position



Valve Only			
PVLB	PVLB121618	1/8" BSP	0.6 Cv
	PVLB1216187	1/8" NPT	
	PVLB121606	6mm Tube	
	PVLB1216067	1/4" Tube	
PVLC	PVLC1216197	1/4" NPT	1.2 Cv
	PVLC1216097	3/8" Tube	

Locking Manual Override, Valve Less Solenoid.

Double Solenoid / Remote Pilot 4-Way, 2-Position

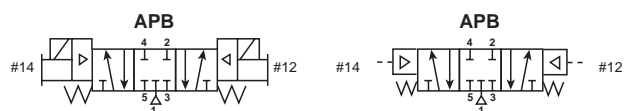
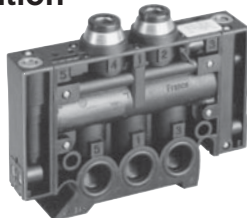


Valve Only			
PVLB	PVLB122618	1/8" BSP	0.6 Cv
	PVLB1226187	1/8" NPT	
	PVLB122606	6mm Tube	
	PVLB1226067	1/4" Tube	
PVLC	PVLC1226197	1/4" NPT	1.2 Cv
	PVLC1226097	3/8" Tube	

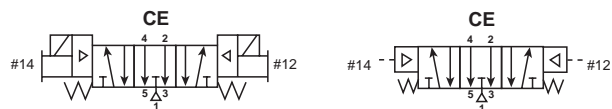
Non-Locking Manual Override, Valve Less Solenoid.

E

Double Solenoid / Remote Pilot 4-Way, 3-Position



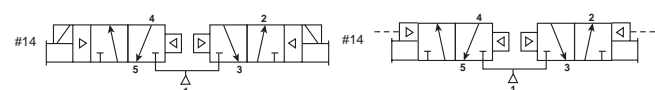
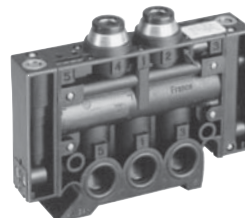
Valve Only			
PVLB	PVLB1276187	1/8" NPT	0.6 Cv
PVLC	PVLC1276197	1/4" NPT	1.2 Cv



Valve Only			
PVLB	PVLB1286187	1/8" NPT	0.6 Cv
PVLC	PVLC1286197	1/4" NPT	1.2 Cv

Non-Locking Manual Override, Valve Less Solenoid.

Double Solenoid / Remote Pilot Dual 3/2 Normally Closed



Valve Only			
PVLB	PVLB1256187	1/8" NPT	0.6 Cv
	PVLB1256067	1/4" Tube	
PVLC	PVLC1256197	1/4" NPT	1.2 Cv

Non-Locking Manual Override, Valve Less Solenoid.

NOTES:

Solenoids or Remote Pilot Adapter must be ordered separately from page F9.

Each valve is shipped with 2 tie rods for stacking assembly.

BOLD OPTIONS ARE MOST POPULAR.



Single Supply Head / Tail Sets



Series	Model Number	Port Size
PVL	PVLB17197	1/4" NPT
	PVLB1719	1/4" BSP
PVLC**	PVLC17137	3/8" NPT
	PVLC1713	3/8" BSP

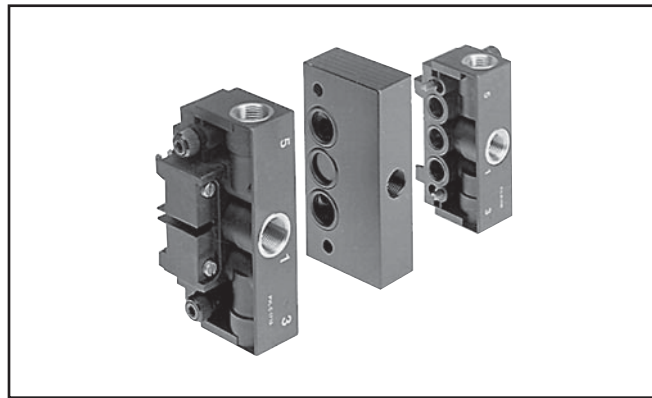
Kit includes: 1 Ported End (head) and 1 Blank End (tail) plus all necessary hardware.

* DIN rail mounting clips on both head and tail. Maximum stack length of 16 valves.

** **⚠ Caution:** DIN rail mounting clips on head piece only. Maximum stack length of 8 valves.

Note: DIN rail mounting clips may be removed for surface mounting.

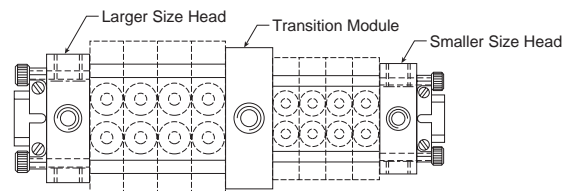
Transition Kits



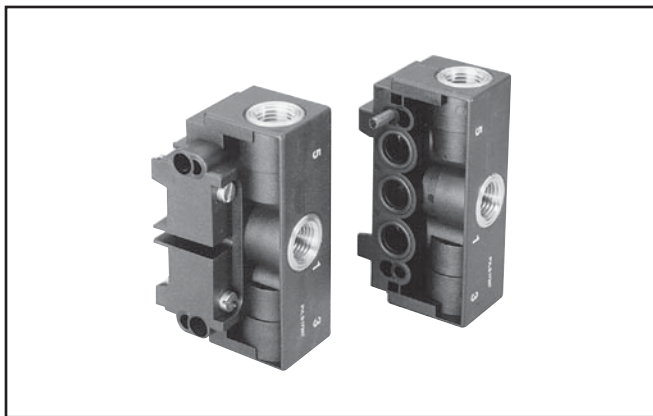
Combination	Model Number	Port Size
PVLB & PVLC	PVULCB1197	NPT
	PVULCB119	BSP

Kit enables valves of two different sizes to be combined in the same stack.

Kit includes: 2 Ported Heads (one for each valve size) and a Transition Module with an Auxiliary Supply Port. Maximum number of valves for each size is 16.



Dual Supply Head / Tail Sets



Series	Model Number	Port Size
PVLB	PVLB17297	1/4" NPT
	PVLB1729	1/4" BSP
PVLC	PVLC17237	3/8" NPT
	PVLC1723	3/8" BSP

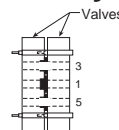
Kit includes: 2 Ported Ends (head and tail) plus all hardware. Mounts to 35mm DIN rail at both ends. Maximum stack length of 16 valves.

Note: DIN rail mounting clips may be removed for surface mounting.

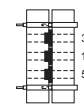
Pressure Isolation Kit



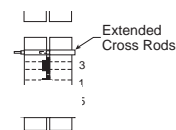
Assembly Instructions



Example 1: Two different pressures P1 and P2 can supply the same bank of power valves, the exhausts remaining common.



Example 2: Complete isolation of the commons in the same bank of power valves: main pressure and exhaust commons.



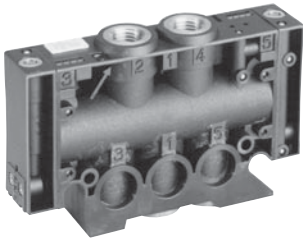
Example 3: The exhaust commons can be isolated within the same bank of power valves, while the main pressure supply remains common.

Series	Model Number	Kit includes:
PVLB	PVLB1901	3 isolation plugs, 2 open port plugs and 2 extended cross rods.
PVLC	PVLC1901	
PVLB	PVLB1902	10 isolation discs and 10 O-rings.
PVLC	PVLC1902	



Single Solenoid / Remote Pilot

4-Way, 2-Position

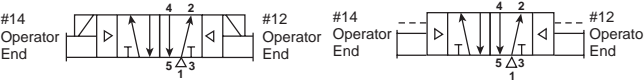
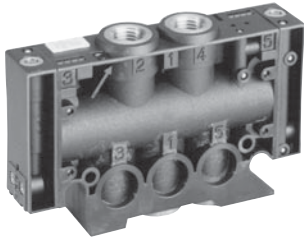


Valve Only			
PVLB	PVLB111618	1/8" BSP	0.6 Cv
	PVLB1116187	1/8" NPT	
	PVLB1116067	1/4" Tube	
PVLC	PVLC1116197	1/4" NPT	1.2 Cv
	PVLC1116097	3/8" Tube	

Solenoids or Remote Pilot Adapter must be ordered separately from page F9.

Double Solenoid / Remote Pilot

4-Way, 2-Position



Valve Only			
PVLB	PVLB112618	1/8" BSP	0.6 Cv
	PVLB1126187	1/8" NPT	
	PVLB1126067	1/4" Tube	
PVLC	PVLC1126197	1/4" NPT	1.2 Cv
	PVLC1126097	3/8" Tube	

Solenoids or Remote Pilot Adapter must be ordered separately from page F9.

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NOTE: BOLD OPTIONS ARE MOST POPULAR.



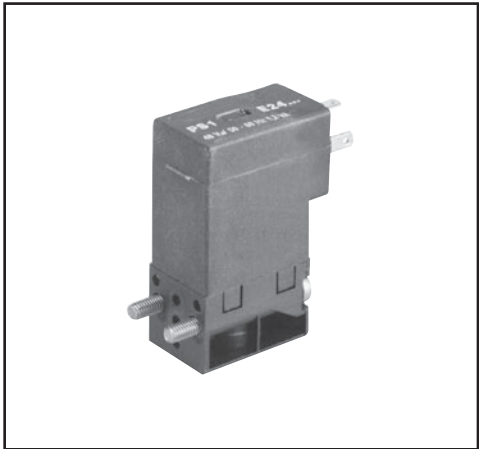
**PVLB & PVLC 3-Pin,
15mm Solenoids, Non-Locking, Flush Override
(w/o electrical connectors)**

Voltage	8mm Pin Spacing Kit Number	8mm Pin Spacing Solenoid	Power Consumption
12VDC	PS2982B45P	P2E-KV32B1	1.2W
24VDC	PS2982B49P	P2E-KV32C1	1.2W
24V-50/60Hz	PS2982B42P	P2E-KV31C1	1.6VA
120V/60Hz	PS2982B53P	P2E-KV31F1	1.6VA
240V/60Hz	PS2982B57P	P2E-KV31J1	1.6VA

Notes:

Kit includes: solenoid, (2) machine screws, (2) self threading screws, (1) gasket, (1) 3-cell gasket.

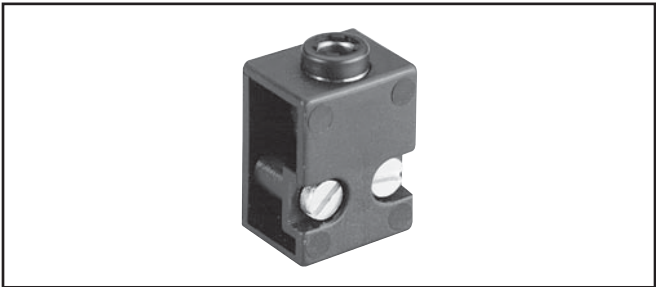
Electrical connectors must be ordered separately from the chart shown on page F10.



**Remote Pilot Connectors
PVLB (1/8") & PVLC (1/4") Valves**

Model Number	Port Fitting
PVAP111	5/32" Tube
PVAP115	10-32 UNF (M5)

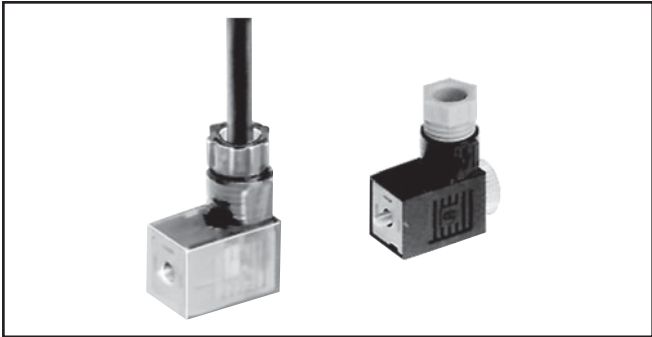
Supplied with two screws to quickly mate with the valve body.



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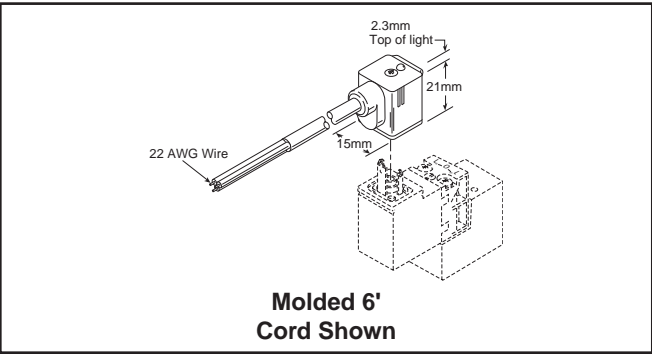
Replacement Plug-in Electrical Connectors - 9.4mm



Indication	Voltage	Unwired Plug	Plug with 6' Lead
None	N/A	PESC10	PESC12
LED & Suppression	12/24V	PESC2020B	PESC2220B
	120VAC	PESC2001F	PESC2201F

For use with 1.2W/1.6VA solenoids on PVLB (1/8") and PVLC (1/4") valves. These IP65 connectors use a maximum 20 AWG wire size or come pre-wired.

Female Electrical Connectors 15mm 3-Pin DIN 43650C - 8mm



Connector	Connector with Cord	Description
PS2932BP	PS2932HBP 18 Inches	Unlighted
PS2932BP	PS2932JBP 6 Feet	Unlighted
PS294675BP	PS2946J75BP* 6 Feet	Light – 12VAC or DC
PS294679BP	PS2946J79BP* 6 Feet	Light – 24VAC or DC
PS294683BP	PS2946J83BP* 6 Feet	Light – 110/120VAC
PS294687BP	N/A	Light – 240/230VAC

* LED with surge suppression.

Note: Max ϕ 6.5mm cable size required for connector w/o 6' (2m) cord.
IP65 rated when properly installed.

Engineering Data:

Conductors: 2 Poles Plus Ground
Cable Range (Connector Only): 4 to 6mm (0.16 to 0.24 Inch)
Contact Spacing: 8mm



"PVLB10" Series

"PVLC10" Series

Specifications

- 4-Way, 5-Port, 2 or 3-Position Valves
- Single & Double Solenoid
- Dual 3/2 Valves

PVLB10 - 0.6 Cv

- 1/8" NPT & BSP
- 1/4" & 6mm Tube Porting

PVLC10 - 1.2 Cv

- 1/4" NPT & BSP
- 3/8" & 8mm Tube Porting

Mounting Style

- DIN Rail Mounting (35mm)
- Stacking Manifold Valve

Solenoid Pilot Actuation

PVLB10, PVLC10

- Low watt solenoid pilots: 1.2W/1.6VA
- Lights & Surge Suppression Standard
- 12VDC to 120VAC

Operating Pressure

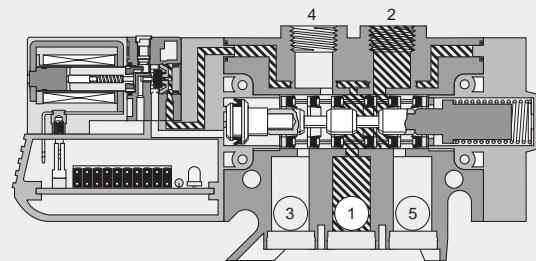
- 30 to 150 PSI (310 to 1035 kPa)

Operating Temperature

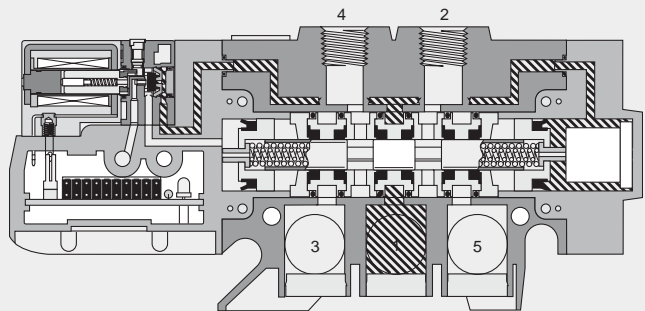
- 5°F to 140°F (-15°C to 60°C)

Certification / Approval

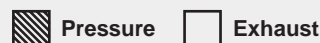
- Approved to be CE Marked
- IP65



PVLB10 Single Solenoid
Shown De-Energized



PVLC10 3-Position APB

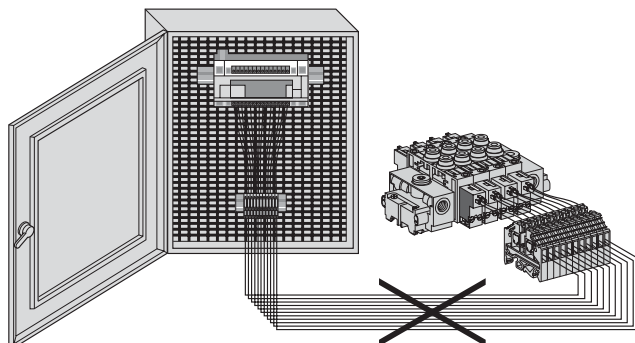


Note: DC units are polarity sensitive.



Simplified Electrical Wiring

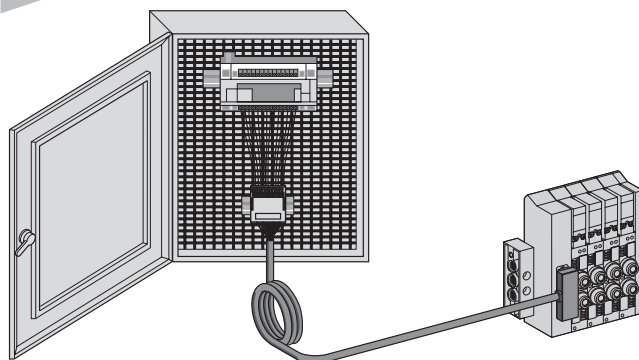
Eliminate costly wiring of individual solenoids with compact PVLB10 or PVLC10 stacks of up to 16 modules with built-in electrical connectors.



Simplified Setup

A single cable provides electrical connection to PLC or special terminal block.

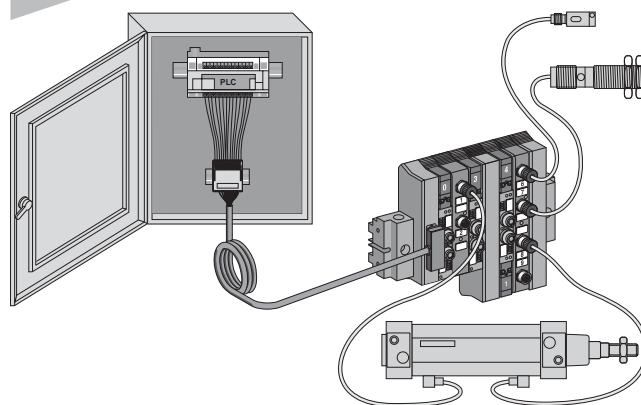
PVLB10



External Connections

External connection modules with PVLB10 valves allow sensor feedback or output connections to be integrated into the valve stack.

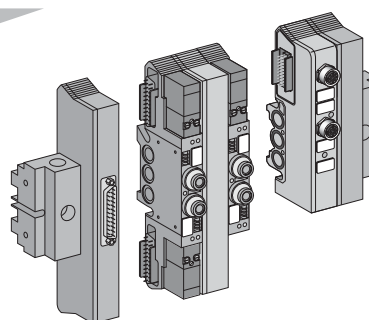
PVLB10



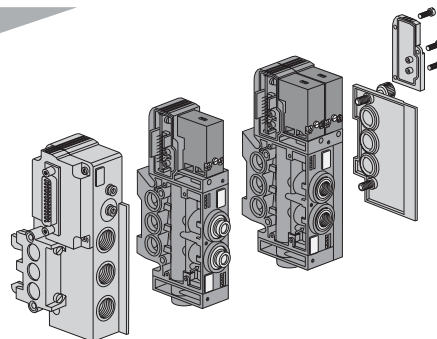
Modular Stacking

- The modular stacking system permits easy assembly of valves and external connection modules into a single stack.
- Integral supply and exhaust ports are manifolded as the stack is assembled.
- Intermodular electrical connection is accomplished through integral 20-Pin electrical connectors, eliminating the need for harnessing or wiring within the stack.
- PVLB10 single and double solenoid valves can be combined into one stack with the use of transition modules.
- PVLC10 single and double solenoid valves can be combined into one stack without any transition modules.
- The electrical head / tail set provides a single electrical connection from the stack to a PLC or terminal block.
- Each stack mounts easily to 35mm DIN rail by means of a pneumatic head / tail set, which also provides common air supply and exhaust.

PVLB10



PVLC10



Stacking System Benefits

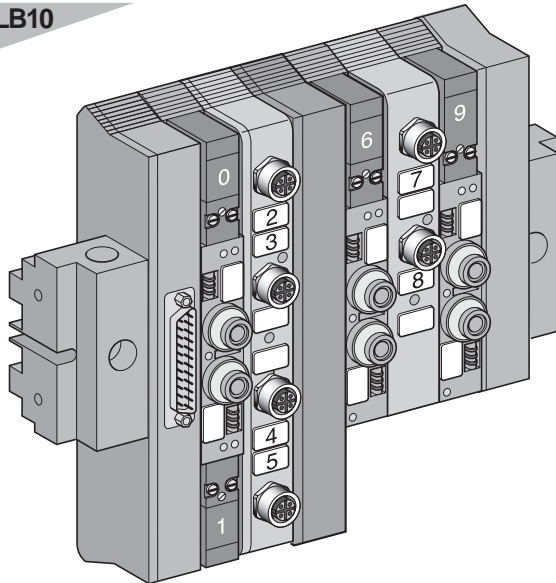
- Reduces wiring, saves space.
- Allows custom arrangements with standard components.
- Further reduces wiring by integrating feedback and output connections into the PVLB10 valve stack.
- Greatly reduces installation time and costs.
- Servicing valves can be accomplished quickly without disassembling the entire stack.



Autoconfiguration

The construction of the stack determines the relationship of each connector pin and the device it is to control. The address of each solenoid valve and each feedback or output connection is based on its physical position in the stack. For PVLB10, addresses are assigned consecutively from top to bottom and left to right beginning at top left with 0. For PVLC10, addresses are assigned consecutively from left to right and beginning at top left with 0.

PVLB10



It is easy to add or remove one or more modules to adapt to machine modifications. Once the controller is programmed, however, it is recommended that, where possible, the addition or permanent removal of any module be done at the tail (right-hand) end of the stack to prevent affecting the addresses of other modules in the stack. A change in address requires reprogramming of the controller.

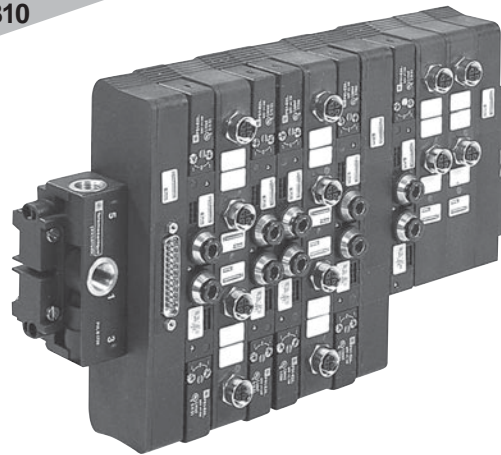
Connector Options

PVLB10



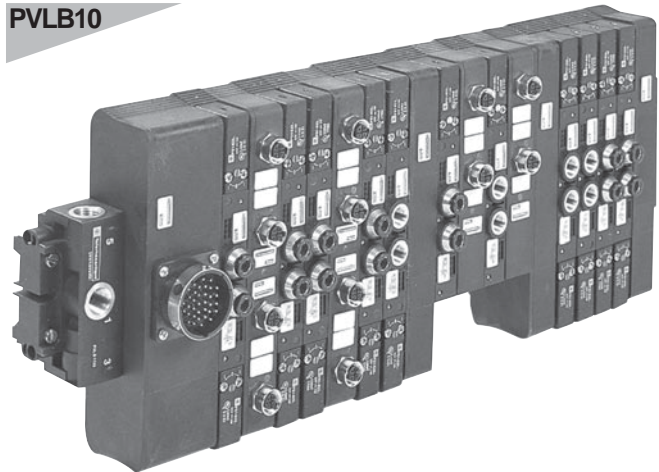
25-Pin Connector, Single Size Stack
Maximum 16 Addresses

PVLB10



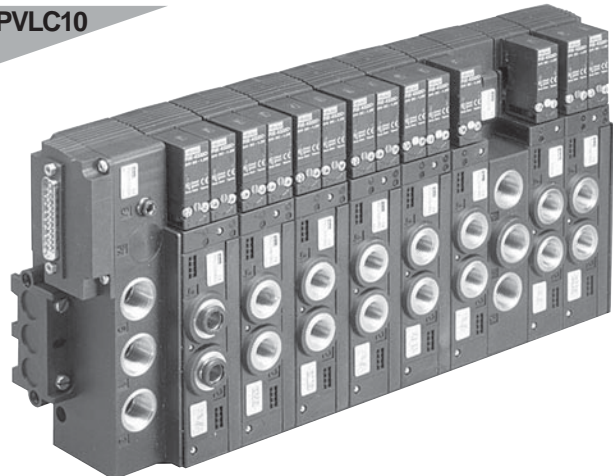
25-Pin Connector, Dual Size Stack
Maximum 21 Addresses

PVLB10



35-Pin Connector, Dual Size Stack
Maximum 32 Addresses

PVLC10

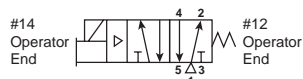
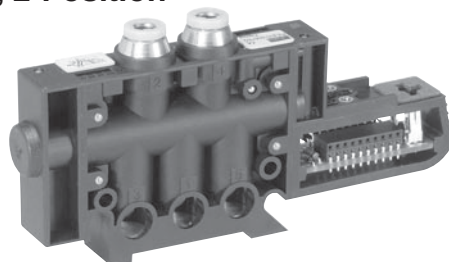


25-Pin Connector,
Maximum 16 Addresses



Single Solenoid

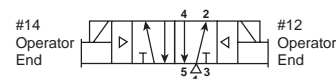
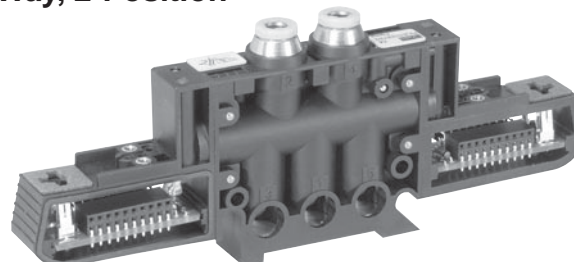
4-Way, 2-Position



Valve Only				
PVLB10	PVLB1016187W2	1/8" NPT	12-24 VDC	0.6 Cv
	PVLB1016187W1		24-120 VAC	
	PVLB1016067W2	1/4" Tube	12-24 VDC	
	PVLB1016067W1		24-120 VAC	

Double Solenoid

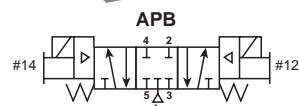
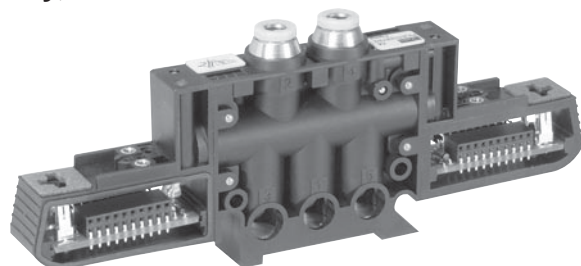
4-Way, 2-Position



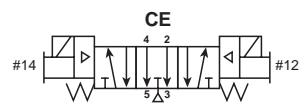
Valve Only				
PVLB10	PVLB1026187W2	1/8" NPT	12-24 VDC	0.6 Cv
	PVLB1026187W1		24-120 VAC	
	PVLB1026067W2	1/4" Tube	12-24 VDC	
	PVLB1026067W1		24-120 VAC	

Double Solenoid

4-Way, 3-Position APB



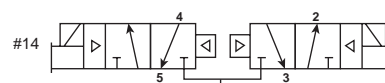
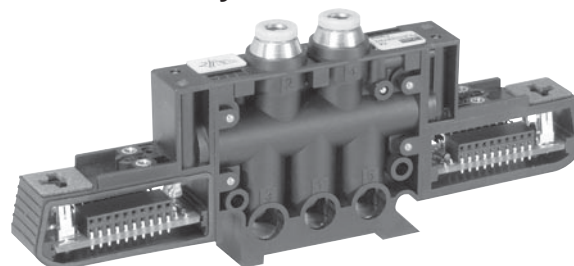
Valve Only				
PVLB10	PVLB1076187W2	1/8" NPT	12-24 VDC	0.6 Cv
	PVLB1076187W1		24-120 VAC	
	PVLB1076067W2	1/4" Tube	12-24 VDC	
	PVLB1076067W1		24-120 VAC	



Valve Only				
PVLB10	PVLB1086187W2	1/8" NPT	12-24 VDC	0.6 Cv
	PVLB1086187W1		24-120 VAC	
	PVLB1086067W2	1/4" Tube	12-24 VDC	
	PVLB1086067W1		24-120 VAC	

Double Solenoid

Dual 3/2 Normally Closed



Valve Only				
PVLB10	PVLB1056187W2	1/8" NPT	12-24 VDC	0.6 Cv
	PVLB1056187W1		24-120 VAC	

NOTES:

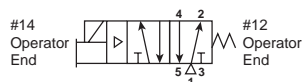
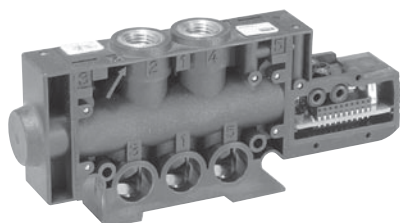
Solenoids sold separately on page F16.

Part Numbers Do Not include Solenoids.

BOLD OPTIONS ARE MOST POPULAR.

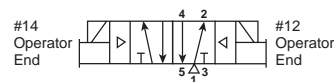


Single Solenoid 4-Way, 2-Position



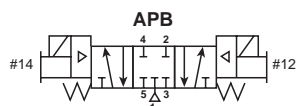
Valve Only				
PVLC10	PVLC1016197W2	1/4" NPT	12-24 VDC	1.2 Cv
	PVLC1016197W1		24-120 VAC	
	PVLC1016097W2	3/8" Tube	12-24 VDC	
	PVLC1016097W1		24-120 VAC	

Double Solenoid 4-Way, 2-Position



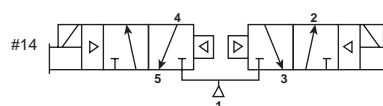
Valve Only				
PVLC10	PVLC1026197W2	1/4" NPT	12-24 VDC	1.2 Cv
	PVLC1026197W1		24-120 VAC	
	PVLC1026097W2	3/8" Tube	12-24 VDC	
	PVLC1026097W1		24-120 VAC	

Double Solenoid 4-Way, 3-Position APB

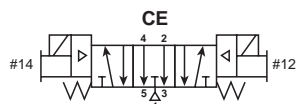


Valve Only				
PVLC10	PVLC1076197W2	1/4" NPT	12-24 VDC	1.2 Cv
	PVLC1076197W1		24-120 VAC	

Double Solenoid Dual 3/2 Normally Closed



Valve Only				
PVLC10	PVLC1056197W2	1/4" NPT	12-24 VDC	1.2 Cv
	PVLC1056197W1		24-120 VAC	



Valve Only				
PVLC10	PVLC1086197W2	1/4" NPT	12-24 VDC	1.2 Cv
	PVLC1086197W1		24-120 VAC	

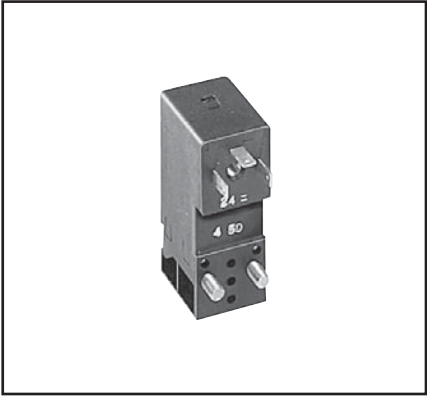
NOTES:

Solenoids sold separately on page F16.

Part Numbers Do Not include Solenoids.

BOLD OPTIONS ARE MOST POPULAR.

**PVLB10 & PVLC10 3-Pin,
15mm Solenoids / Kits
(8mm Pin Spacing) DIN43650C**



Voltages	Power Consumption	Holding Current	Id (Drop-Out Current)*	Kit Numbers With Non-Locking Flush Manual Override	Solenoid Only	Kit Numbers With Locking Flush Manual Override	Solenoid Only
12VDC	1.2W	100 mA	10 mA	PS3441B45P	P2E-KS32B1	PS3441C45P	P2E-KS32B2
24VDC	1.2W	50 mA	5 mA	PS3441B49P	P2E-KS32C1	PS3441C49P	P2E-KS32C2
24VAC	1.6VA	65 mA	22 mA	PS3441B42P	P2E-KS31C1	PS3441C42P	P2E-KS31C2
110VAC, 50Hz 120VAC, 60Hz	1.6VA	13.3 mA	5 mA	PS3441B53P	P2E-KS31F1	PS3441C53P	P2E-KS31F2

* When using a programmable controller, be sure that the leakage current of the controller outputs is lower than the drop-out current value.

Notes:

Kit includes: Solenoid, (2) machine screws, (2) self threading screws, (1) gasket, (1) 3-cell gasket, (1) L-shaped 3-cell gasket.

E



Constructing a PVLB10 Stack

When constructing a stack, the following rules apply:

1. A stack must have a pneumatic and an electrical head / tail set.
2. A stack has a physical limit of 16 active modules (valves, feedback modules and output modules), regardless of whether they are double or single.
3. Single feedback and output modules must be stacked with single solenoid valves, and double feedback and output modules must be stacked with double solenoid valves.
4. Double and single modules can be combined in a stack with the use of a transition module. A stack order of double to single is recommended to maximize the number of possible addresses.

CAUTION: If the application requires simultaneous operation of valves and/or external connection modules, see Technical Data page for operating limits.

Addressing

Addresses are automatically assigned to each solenoid and each external connection based on its position in the stack. Addresses are numbered consecutively from top to bottom and left to right beginning at the top left of the stack with 0.

To find the total number of addresses that will be required for a stack, calculate the following for each type of module based on table below and total:

Addresses x Quantity of Units = Addresses Required

Type of Module	Addresses Assigned	Quantity In stack	Addresses Required
Double solenoid valve	2	x	=
Double ck module	4	x	=
Double output module	4	x	=
Single solenoid valve	1	x	=
Single feedback module	2	x	=
Single output module	2	x	=
TOTAL ADDRESSES			=

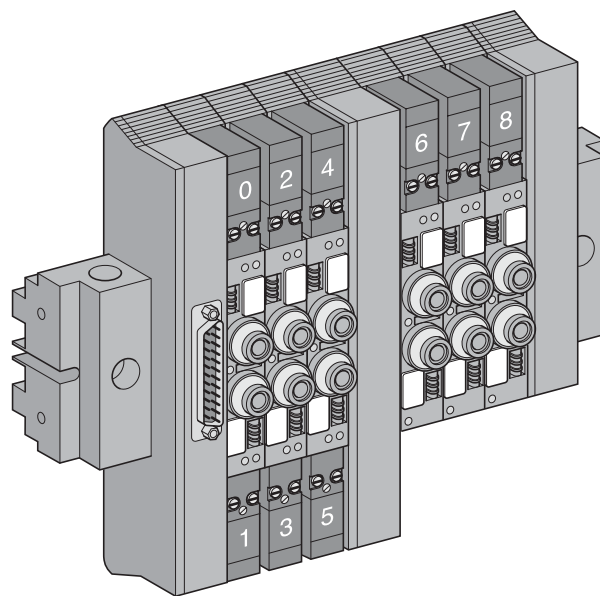
Electrical Connection

When selecting the electrical head / tail set, the following must be considered:

1. The size (double or single) of the electrical head piece must match that of the first module to its right.
2. The electrical connector must provide sufficient addresses for the stack.

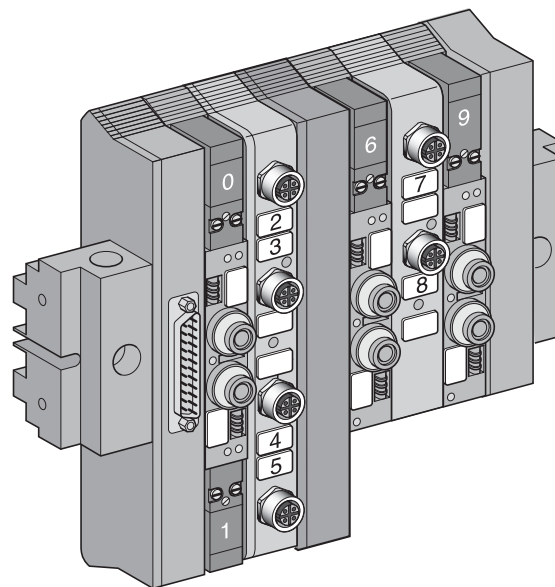
The number of addresses possible with each type of head / tail set is shown in the following table. Based on the head type needed, select the connector that provides sufficient addresses for the stack.

PVLB10



Double to Single Valve Stack with 25-Pin Connector:

6 valves
9 addresses



Double to Single Mixed Stack with 25-Pin Connector:

5 active modules
10 addresses

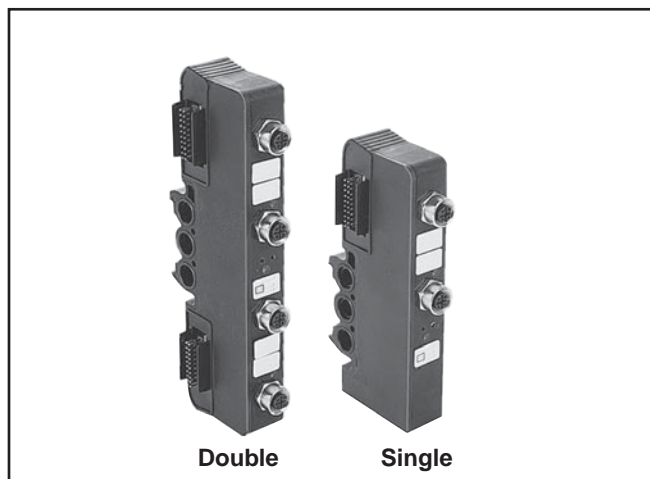
Head Type	Connector	Possible Addresses
Single	25-Pin	16
Double	25-Pin	21
	35-Pin	32



External Connection Modules

With 20-Pin intermodular system and 12mm (mini) connectors, these modules can be combined with valves and/or other modules. Feedback modules supply voltage to sensors and accept signals for communication back to the PLC. Feedback modules can be used for PNP or NPN sensors, indicator lights will only work on PNP sensors. Output modules allow connection and control of valves mounted externally from the stack.

Type	Size	Connections	Model Number
Feedback	Single	2 Inputs	PVLB1E1302
	Double	4 Inputs	PVLB1E2304
Output	Single	2 Outputs	PVLB1S1302
	Double	4 Outputs	PVLB1S2304



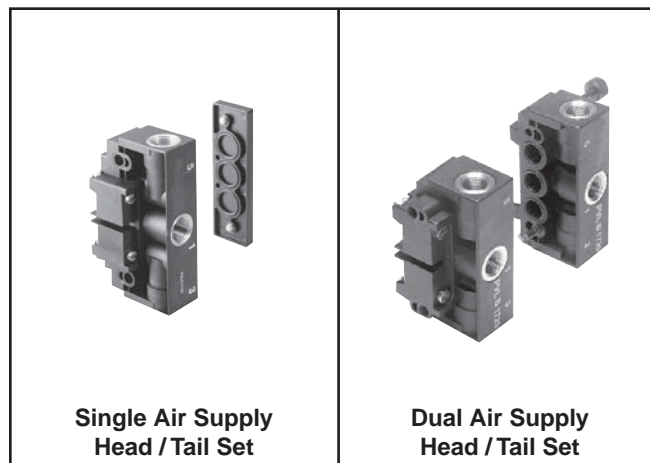
Head / Tail Sets

Pneumatic

Single air supply head / tail are used for shorter manifolds and dual air supply head / tail are used for longer manifolds.

Dual air supply head / tail sets contains 2 ported ends plus all hardware. Clamps to 35mm DIN rail. Removing 35mm hardware provides mounting holes for surface mounting. Single air supply head / tail sets clamp on one side only, Dual air supply head / tail sets clamp on both sides.

Type	Port Size	Model Number
Single	1/4" NPT	PVLB17197
Supply	1/4" BSP	PVLB1719
Double	1/4" NPT	PVLB17297
Supply	1/4" BSP	PVLB1729



Pressure Isolating Disc

Description	Model Number
Sold in lots of 10.	PVLB1902

Electrical

For use with single size stacks. Provides electrical link between all functions in the stack and the PLC.

Size	Connector	Model Number
Single	25-Pin (Male), D-Sub	PVLB191125
Double	25-Pin (Male), D-Sub	PVLB192125
	35-Pin (Male)	PVLB192235

For use with dual size stacks. Provides electrical connection to PLC and transition between single and double solenoid valves.

Stack Order	Connector	Model Number
Double then Single	25-Pin (Male), D-Sub	PVLB194125
	35-Pin (male)	PVLB194235
Single then Double	25-Pin (Male), D-Sub	PVLB193125





Input & Output Version



Description	Model Number
Head Module for Single Solenoid Valves with ASI, 4-Inputs and 4-Outputs	PVLBA1BA44 - with M12 (Micro) Connection
	PVLBA1BA44V - with Vampire Connection

Description	Model Number
Head Module for Single to Double Solenoid Valves with ASI, 4-Inputs and 4-Outputs. Use this module for Double Solenoid Valves. (Includes Transition Module)	PVLBA3BA44 - with M12 (Micro) Connection
	PVLBA3BA44V - with Vampire Connection

Description	Model Number
Auxiliary Head Module with ASI, 4-Inputs and 4-Outputs	PVLBA5BA44

Notes: If application requires control of 16 single solenoid (24VDC) PVLB10 valves and 16 inputs (PNP), select (1) PVLBA1BA44, (3) PVLBA5BA44 and the required air supply module. 4 ASI nodes are consumed.

If application requires control of 8 double solenoid (24VDC) PVLB10 valves and 16 inputs (PNP), select (1) PVLBA3BA44, (3) PVLBA5BA44 and the required air supply module. 4 ASI nodes are consumed.

Bus and power connection is through 4-Pin Micro (M12) single key male connectors or Vampire connection. Input connection is through 4-Pin Micro (M12) single key female connectors.

E



Constructing a PVLC10 Stack

When constructing a stack, the following rules apply:

1. A stack must have a pneumatic and an electrical head / tail set.
2. A stack has a physical limit of 16 solenoids.
3. Single and double solenoid valves can be combined into one stack without any transition module.

CAUTION: If the application requires simultaneous operation of valves and/or external connection modules, see Technical Data page for operating limits.

Addressing

Addresses are automatically assigned to each solenoid and each external connection based on its position in the stack. Addresses are numbered consecutively from left to right beginning at the top left of the stack with 0.

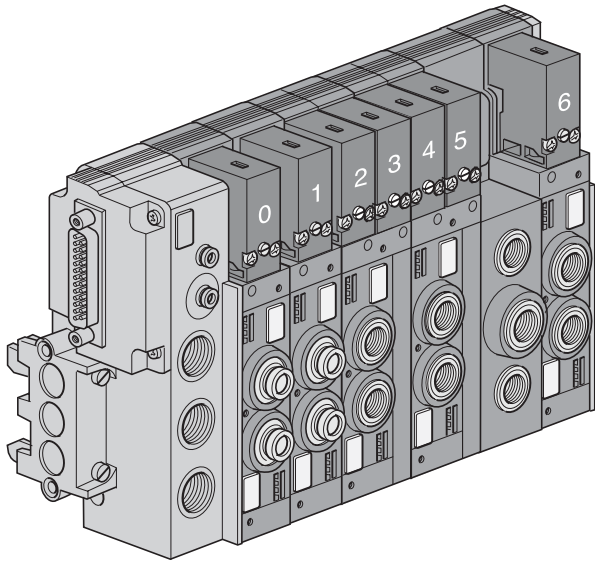
To find the total number of addresses that will be required for a stack, calculate the following for each type of module based on table below and total:

Addresses x Quantity of units = Addresses Required

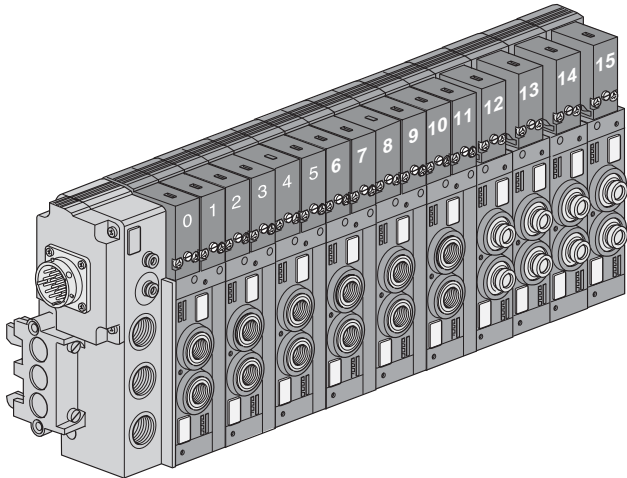
Type of Module	Addresses Assigned	Quantity In stack	Addresses Required
Double solenoid valve	2	x	=
Single solenoid valve	1	x	=
TOTAL ADDRESSES			=

Head Type	Connector Possible Addresses
25-Pin	16
19-Pin	16

PVLC10



**25-Pin Connector with
Intermediate Air Supply Module:
5 valves
7 addresses**



**19-Pin Connector:
10 valves
16 addresses**

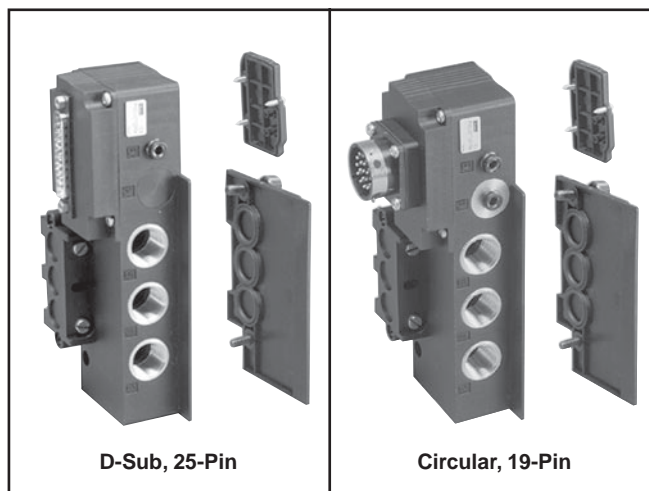
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Head / Tail Sets

Electrical / Pneumatic

Port Size / Type	Connector	Model Number
3/8" NPT, Single	D-Sub, 25-Pin w/External Pilot (Px)	PVLC27137D25A
3/8" NPT, Single	D-Sub, 25-Pin w/o External Pilot (Px)	PVLC17137D25A
3/8" NPT, Single	Circular, 19-Pin w/o External Pilot (Px)	PVLC17137C19A

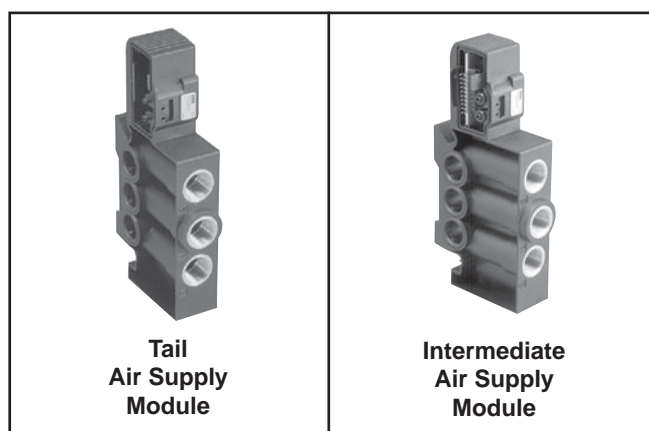


Air Supply Modules

Tail Air Supply Module to be mounted at the end of the manifold for dual air supply for longer manifolds.

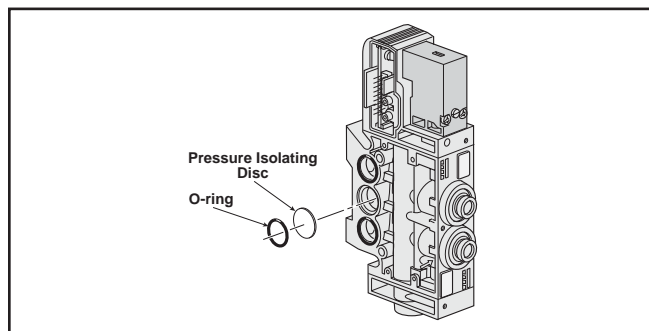
Intermediate Air Supply Module used when multiple pressures are required on a manifold.

Port Size / Type	Tail Air Supply Module	Intermediate Air Supply Module
3/8" NPT	PVULC2137	PVULC2137E
3/8" BSP	PVULC213	PVULC213E



Pressure Isolating Disc

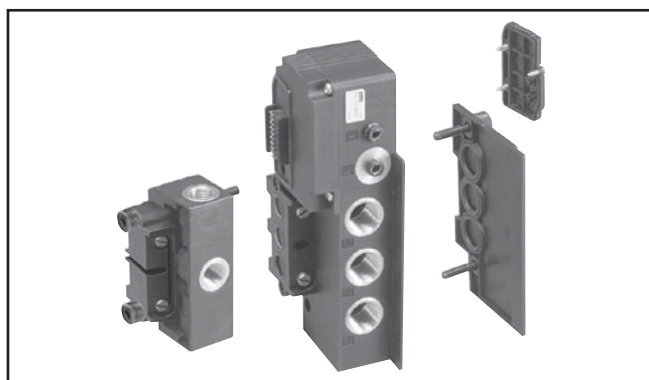
Description	Model Number
Sold in lots of 10	PVLC1902



Transition Kits

(PVLB10 to PVLC10)

Port Size / Type	Connector	Model Number
1/4" NPT to 3/8" NPT	Transition Kit with External Pilot (Px)	PVLC27137B19
1/4" NPT to 3/8" NPT	Transition Kit without External Pilot (Px)	PVLC17137B19
1/4" BSP to 3/8" BSP	Transition Kit with External Pilot (Px)	PVLC2713B19
1/4" BSP to 3/8" BSP	Transition Kit without External Pilot (Px)	PVLC1713B19





Input & Output Version



PVLBA1BA44

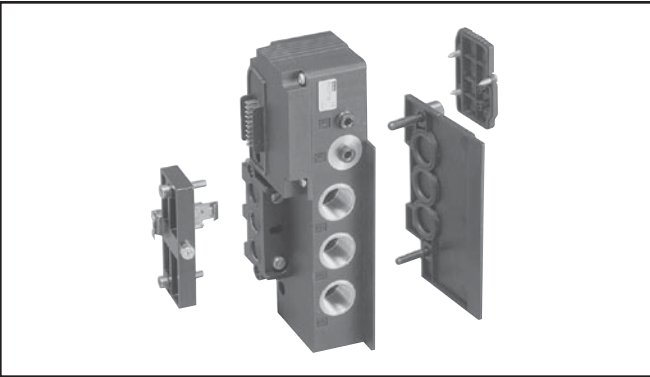
Description	Model Number
Head Module with ASI 4-Inputs and 4-Outputs	PVLBA1BA44 - with M12 (Micro) Connection
	PVLBA1BA44V - with Vampire Connection
Description	Model Number
Auxiliary Head Module with ASI, 4-Inputs and 4-Outputs	PVLBA5BA44

Note: If application requires control of 16 single or 8 double solenoid (24VDC) PVLC10 valves 16 inputs (PNP), select (1) PVLBA1BA44, (3) PVLBA5BA44 and the required Air Supply Module. 4 ASI nodes are consumed. Bus and external power connection is through 4-Pin Micro (M12) single key male connectors or Vampire connection. Input connection is through 4-Pin Micro (M12) single key female connectors.

Air Supply Module for
Serial Bus Communication

This module is required when using a Bus Communication Head Module.

Port Size / Type	Connector	Model Number
3/8" NPT	Air Supply Module with External Pilot (Px)	PVLC27137B
3/8" NPT	Air Supply Module without External Pilot (Px)	PVLC17137B

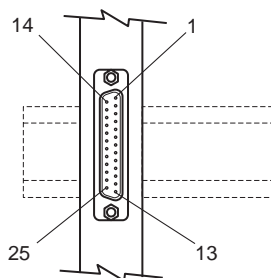


E



D-Sub, 25-Pin Single Size Head / Tail Set

Pin No.	Stack Address	Pin No.	Stack Address
13	0	8	10
25	1	20	11
12	2	7	12
24	3	19	13
11	4	6	14
23	5	18	15
10	6	5	Not Used
22	7	17	24V (feedback) (PVBL10)
9	8	4	0V (feedback) (PVBL10)
21	9	16	Common 0v

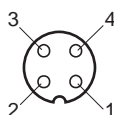


D-Sub, 25-Pin Double Size Head / Tail Set*

Pin No.	Stack Address	Pin No.	Stack Address
13	0	19	13
25	1	6	14
12	2	18	15
24	3	5	Not Used
11	4	17	24V (feedback)
23	5	4	0V (feedback)
10	6	16	Common 0v
22	7	3	16
9	8	15	17
21	9	2	18
8	10	14	19
20	11	1	20
7	12		

Feedback Connector*

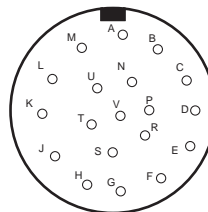
Pin No.	I/O	Pin No.	I/O
1	24V (feedback)	1	—
2	—	2	—
3	0V (feedback)	3	Common 0v
4	Input	4	Output



Notes: Solenoids are polarity sensitive. The common must be at 0V. Switching must be at the high potential.

* Available with PVLB10 Only

19-Pin Circular Connector†

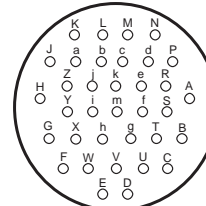
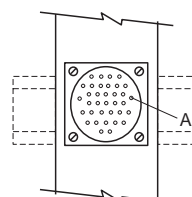


Pin No.	Stack Address
A	0
B	1
C	2
D	3
E	4
F	5
G	6
H	7
J	8
K	9
L	10
M	11
N	12
P	13
R	14
S	15
T	Common 0V
U	Not Used
V	Not Used

† Available with PVLC10 Only

Cylindrical, 35-Pin type "Trident Ringlock" Double Size Head / Tail Set*

Pin No.	Stack Address	Pin No.	Stack Address
A	0	V	18
B	1	W	19
C	2	X	20
D	3	Y	21
E	4	Z	22
F	5	a	23
G	6	b	24
H	7	c	25
J	8	d	26
K	9	e	27
L	10	f	28
M	11	g	29
N	12	h	30
P	13	i	31
R	14	j	Common 0V
S	15	k	0V (feedback)
T	16	m	24V (feedback)
U	17		



* Available with PVLB10 only.



Operating Pressure Range:

Single Pilot 45 to 150 psi (311 to 1035 kPa)
 Double Pilot 30 to 150 psi (207 to 1035 kPa)

Temperature Range (Ambient)

Operating 5° to 140°F (-15° to 60°C)
 Storage -40° to 158°F (-40° to 70°C)

⚠ CAUTION:

If it is possible that the ambient temperature may fall below freezing, the medium must be moisture free to prevent internal damage or unpredictable behavior.

Medium: Dry or lubricated air or inert gas

Medium Quality:

PVLB & PVLC Dry or lubricated air at 50 micron filtration

Materials:

Body Glass filled polyamide
 Seals Polyurethane
 Fittings Brass

Mounting:

Inline Surface mount on flat surface
 Stacking Mount on 35mm DIN rail or flat surface

Mounting Orientation: All positions

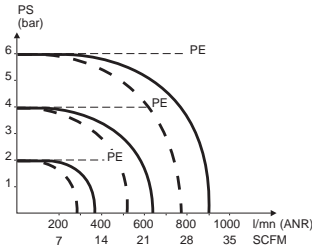
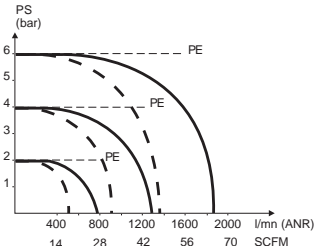
Manual Overrides: Locking or non-locking

Lubrication

Valves are pre-lubricated and may be operated with dry air.
 If lubrication is desired, use F442 oil.

Cycle Life: 30 million (dry air)

Specific Characteristics

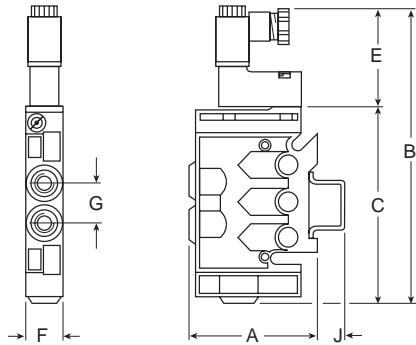
Description		1/8" Valves (PVLB) (PVLB10)	1/4" Valves (PVLC) (PVLC10)		
Cv		0.6	1.2		
Flow Rates					
PS = input pressure PE = output pressure					
Port Sizes	Instant tube fitting	1/4"	3/8"		
	Threaded	1/8" Pipe	1/4" Pipe		
Maximum Valve Fitting Torque		7.4 ft-lb (10Nm)	14.8 ft-lb (20Nm)		
Head / Tail Port Size / Max. Torque		1/4" Pipe / 14.8 ft-lb (20Nm)	3/8" Pipe / 40.6 ft-lb (55Nm)		
For Air Operated Valves:		Single Acting	Double Acting	Single Acting	Double Acting
Response Time (Input to Output)*		14 ms	8 ms	25 ms	11 ms
Pilot Pressure (@ 90 PSIG Inlet)		44 PSI	29 PSI	44 PSI	29 PSI
Depilot Pressure (@ 90 PSIG Inlet)		15 PSI	—	22 PSI	—
Maximum Operating Frequency		5 Hz	10 Hz	5 Hz	10 Hz
For Solenoid Operated Valves:		Single Acting	Double Acting	Single Acting	Double Acting
Response Time (Input to Output)*		22 ms	12 ms	39 ms	17 ms
Maximum Operating Frequency		5 Hz	10 Hz	5 Hz	10 Hz
Power Consumption Hold		DC = 1.2 Watt, AC = 1.6VA		DC = 1.2 Watt, AC = 1.6VA	
Power Consumption Inrush		DC = 1.2 Watt, AC = 3.5VA		DC = 1.2 Watt, AC = 3.5VA	
Voltage Tolerance		+10% to -15% rated voltage @ 70° F (20° C)		+10% to -15% rated voltage @ 70° F (20° C)	
Standard Voltages		12 and 24 VDC 24 and 120 VAC		12 and 24 VDC 24 and 120 VAC	
Rated Insulation Voltage		1500 Volts		1500 Volts	
Protection Rating		IP65		IP65	
Standards		UL (except 240 VAC) and NFC 79 300			

* Valves tested with test chamber at 90 PSIG inlet pressure.

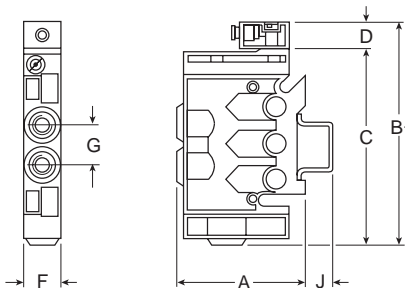


PVLB Valves

Single Solenoid



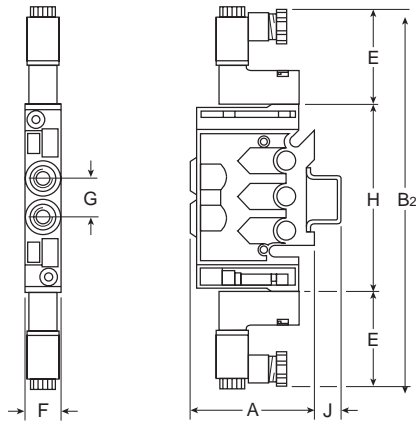
Single Remote Pilot



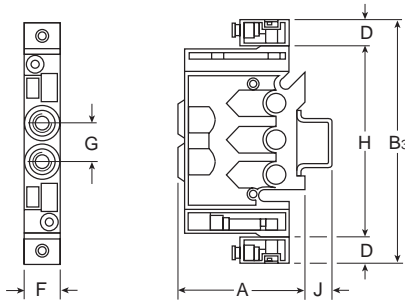
Dimensions

A (Inline Pipe)		2.40 (61)		
A (Inline Tube)		2.80 (71)		
A (Stacking Pipe)		2.40 (61)		
A (Stacking Tube)		2.68 (68)		
B	B₁	B₂	B₃	C
5.91 (150)	4.25 (108)	7.91 (201)	4.60 (117)	3.74 (95)
D	E	F	G	H
.51 (13)	2.17 (55)	.71 (18)	.79 (20)	3.58 (91)
J				
.47 (12)				

Double Solenoid



Double Remote Pilot

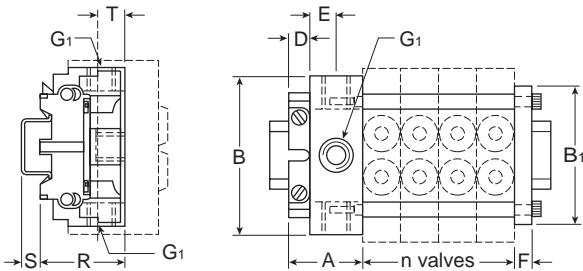


Inches (mm)

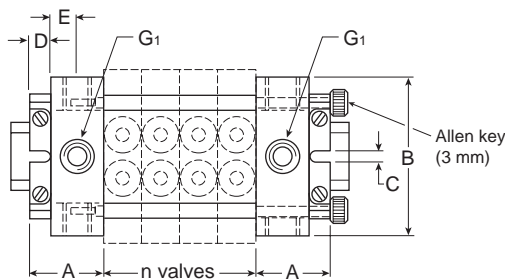
1/8" Pipe or 1/4" tube or 6mm tube for main ports.

Stacking System – PVLB

Single Air Supply



Double Air Supply



Dimensions

A	B	B₁	C*	D
1.50 (38)	3.27 (83)	2.76 (70)	.17 (4.2)	.39 (10)
E	F	G₁	R	S
.47 (12)	.31 (8)	1/4"	1.73 (44)	.35 (9)
T				
.43 (11)				

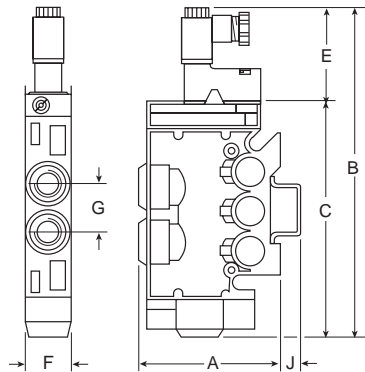
Inches (mm)

* Clearance for #6 screw.

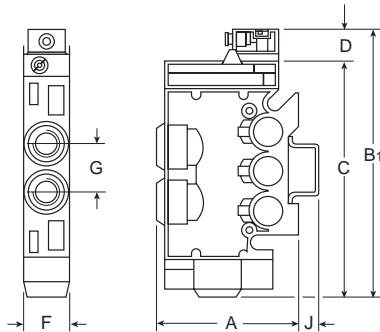


PVLC Valves

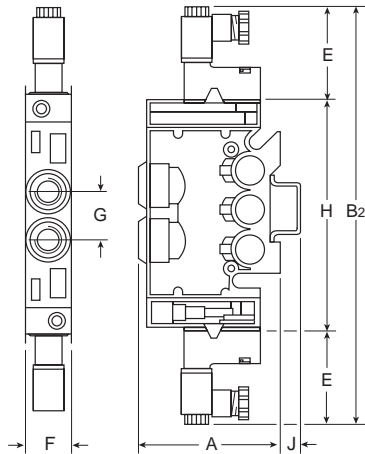
Single Solenoid



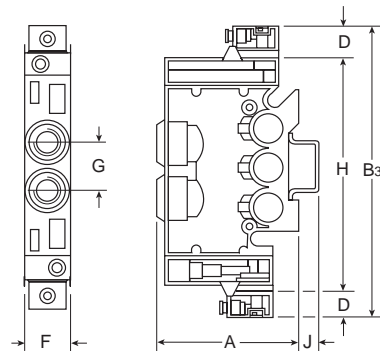
Single Remote Pilot



Double Solenoid



Double Remote Pilot



Dimensions

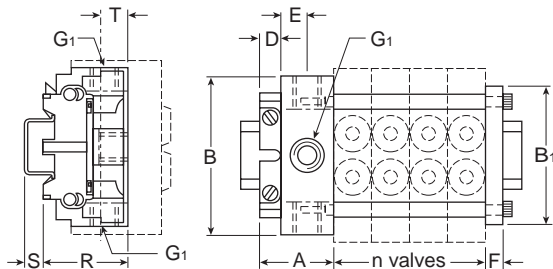
A (Inline Pipe)		2.87 (73)		
A (Inline Tube)		3.66 (93)		
A (Stacking Pipe)		2.87 (73)		
A (Stacking Tube)		3.27 (83)		
B	B ₁	B ₂	B ₃	C
7.00 (178)	5.35 (136)	8.94 (227)	5.62 (143)	4.84 (123)
D	E	F	G	H
.51 (13)	2.17 (55)	.98 (25)	1.00 (26)	4.61 (117)
J				
.43 (11)				

Inches (mm)

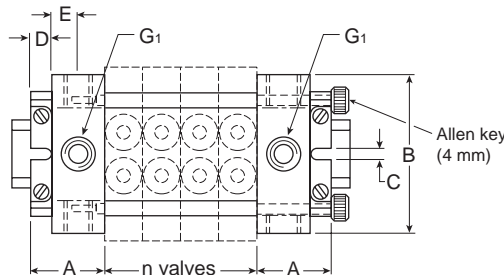
1/4" Pipe or 3/8" tube or 8mm tube for main ports.

Stacking System – PVLC

Single Air Supply



Double Air Supply



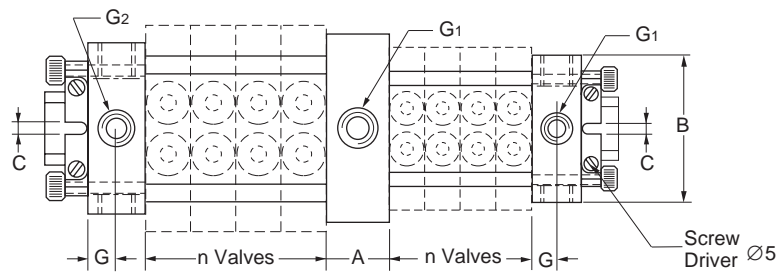
Dimensions

A	B	B ₁	C*	D
1.50 (38)	4.25 (108)	3.94 (100)	.17 (4.2)	.39 (10)
E	F	G ₁	R	S
.47 (12)	.31 (8)	3/8"	2.17 (55)	.35 (9)
T				
.51 (13)				

Inches (mm)

* Clearance for #6 screw.

Transition Kits – PVLB & PVLC Valves



Dimensions

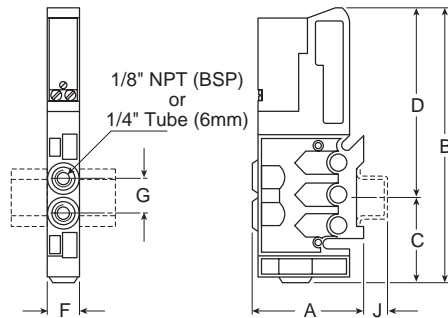
A	B	C	G	G ₁
.98 (25)	3.94 (100)	.17 (4.2)	.47 (12)	1/4"
G ₂ 3/8"				

Inches (mm)

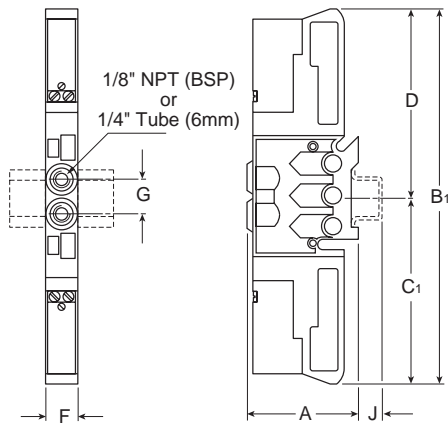
E



Single Solenoid



Double Solenoid



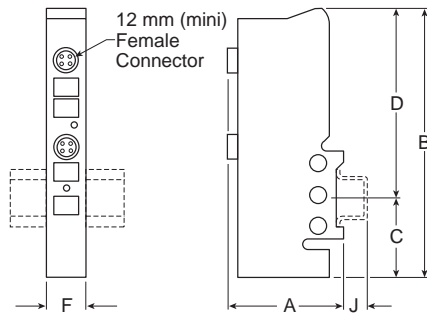
Dimensions

A (Inline Pipe)	2.87 (73)
A (Inline Tube)	3.66 (93)
A (Stacking Pipe)	2.87 (73)
A (Stacking Tube)	3.27 (83)
B	5.43 (138)
B₁	6.97 (177)
C	1.93 (49)
C₁	3.46 (88)
D	3.50 (89)
F	.71 (18)
G	.79 (20)
J	.47 (12)

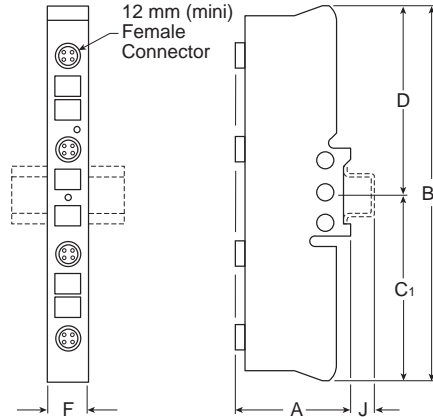
Inches (mm)

External Connection Modules

Single



Double



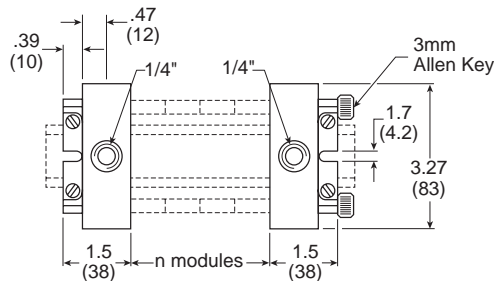
Dimensions

A	2.72 (69)	B	5.31 (135)	B₁	6.97 (177)	C	1.81 (46)	C₁	3.46 (88)
D	3.50 (89)	F	.87 (22)	J	.47 (12)				

Inches (mm)

Pneumatic Head / Tail Set

To calculate stack length, add the width of the pneumatic and electrical head / tail sets plus (quantity x width) for each type of active module. Widths shown in inches (mm).

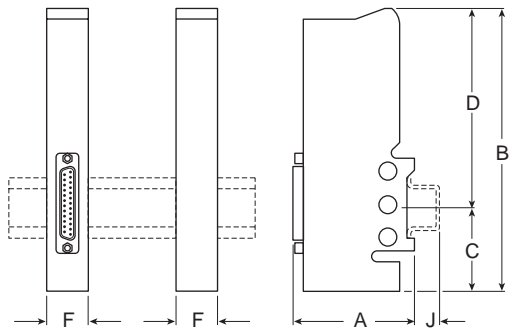


Module	Qty	Width	Total Width
Pneumatic head / tail set	1 x	3.00" (76)	= 3.00" (76)
Electrical head / tail set:	1 x		=
Select 25-Pin head / tail		1.73" (44)	
or 25-Pin w/transition		2.60" (66)	
or 35-Pin head / tail		2.76" (70)	
or 35-Pin w/transition		3.62" (92)	
Valves	x	.71" (18)	=
Feedback/output modules	x	.87" (22)	=
TOTAL STACK LENGTH			=



Electrical Head / Tail Sets*

Single Stack D-Sub, 25-Pin Connector



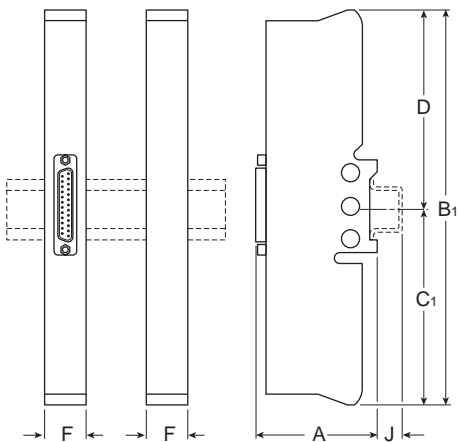
Dimensions

A 2.48 (63)	A₁ 2.40 (60)	B 5.31 (135)	B₁ 6.97 (177)	C 1.81 (46)
C₁ 3.46 (88)	D 3.50 (89)	E .39 (10)	F .87 (22)	H 1.57 (40)
J .47 (12)	K 1.89 (48)			

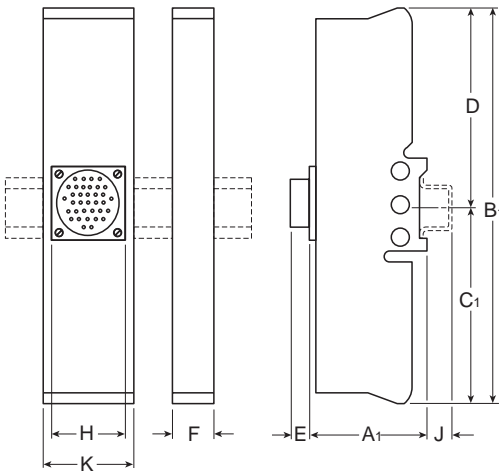
* When the stack contains both single and double modules, you must use a head / tail set that includes a size transition module (shown below).

Inches (mm)

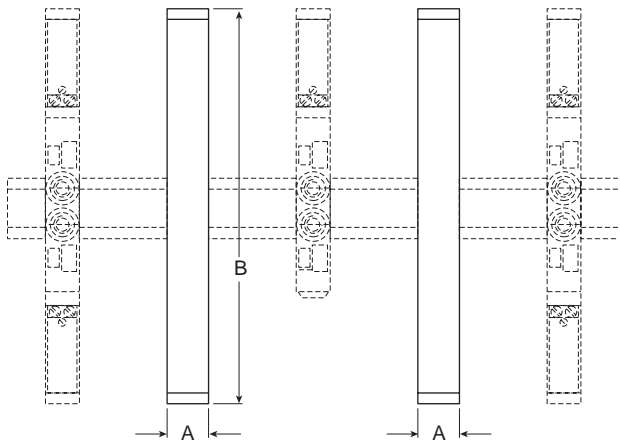
Double Stack D-Sub, 25-Pin Connector



Cylindrical 35-Pin Double Size Head / Tail Set



Size Transition Module



Dimensions

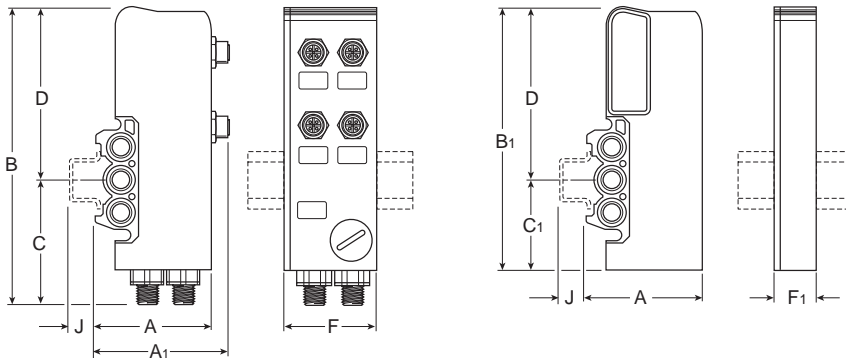
A .87 (22)	B 6.97 (177)			
-------------------------	---------------------------	--	--	--

Inches (mm)

E



ASI Head Module, 4 Input & 4 Output Version
(PVLBA1BA44 with Transition Module Shown)

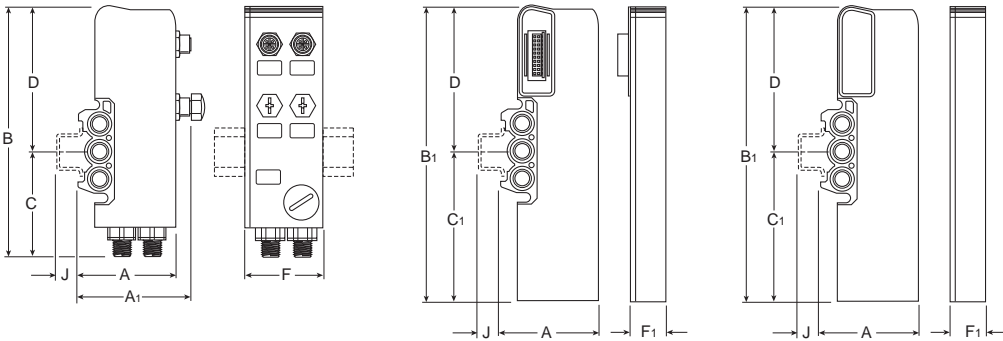


Dimensions

A	A₁	B	B₁	C
2.31 (59)	2.88 (73)	6.00 (153)	5.25 (133)	2.50 (64)
C₁	D	F	F₁	J
1.75 (44)	3.50 (89)	1.89 (48)	.87 (22)	.47 (12)

Inches (mm)

ASI Head Module for Single to Double Solenoid Valves,
4 Input and 4 Output Version
(PVLBA3BA44 with Transition Modules Shown)



Dimensions

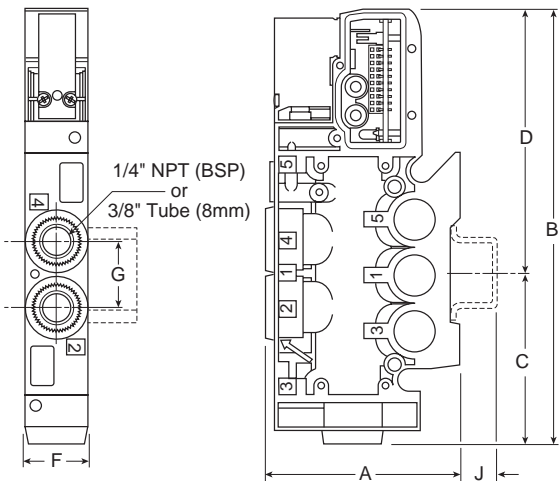
A	A₁	B	B₁	C
2.31 (59)	2.88 (73)	6.00 (153)	6.97 (177)	2.50 (64)
C₁	D	F	F₁	J
3.47 (88)	3.50 (89)	1.89 (48)	.87 (22)	.47 (12)

Inches (mm)

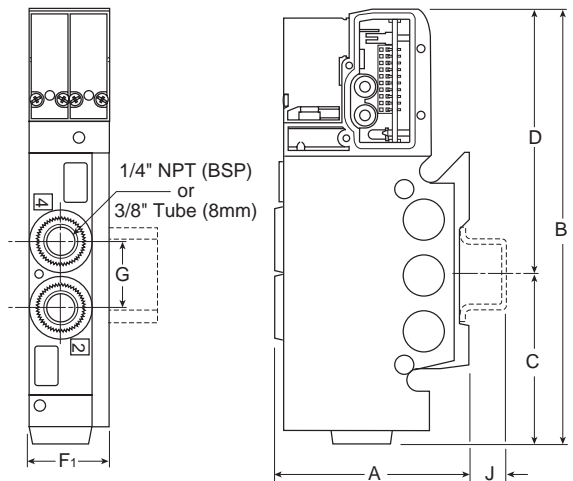
E



Single Solenoid



Double Solenoid

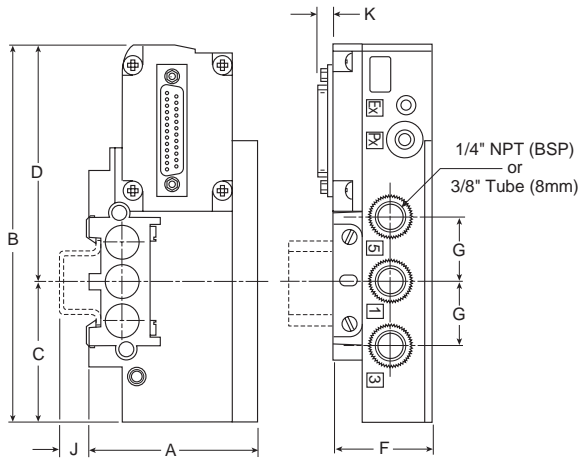


Dimensions

A (Inline Pipe)		2.87 (73)		
A (Inline Tube)		3.66 (93)		
A (Stacking Pipe)		2.87 (73)		
A (Stacking Tube)		3.27 (83)		
B	C	D	F	F ₁
6.50 (165)	2.56 (65)	3.94 (100)	1.00 (25.4)	1.31 (33)
G	J			
1.00 (25.4)	.47 (12)			

Inches (mm)

D-Sub, 25-Pin Connector

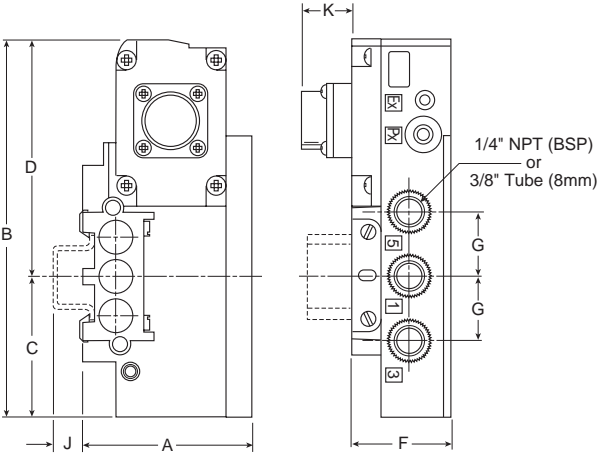


Dimensions

A	B	C	D	F
2.75 (70)	6.22 (158)	2.28 (58)	3.94 (100)	1.65 (42)
G	J	K		
1.06 (27)	.39 (10)	.12 (3)		

Inches (mm)

Cylindrical Connector



Dimensions

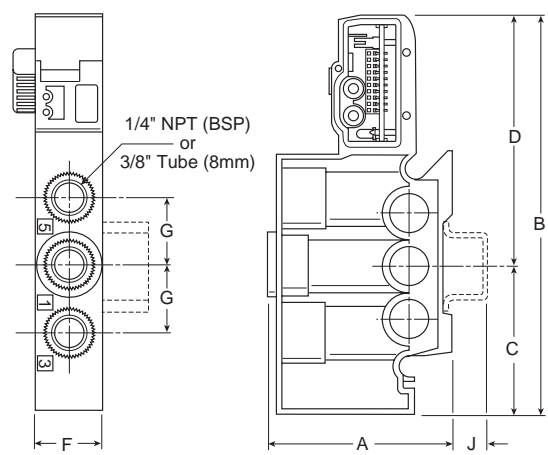
A	B	C	D	F
2.75 (70)	6.22 (158)	2.28 (58)	3.94 (100)	1.65 (42)
G	J	K		
1.06 (27)	.39 (10)	.30 (8)		

Inches (mm)

E



Intermediary Air Supply Module

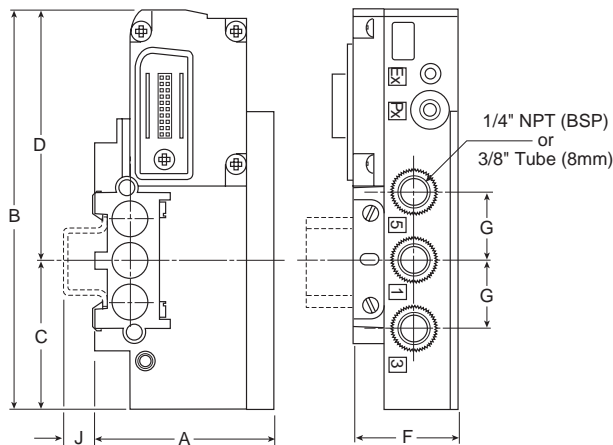


Dimensions

A	B	C	D	F
2.94 (75)	6.22 (158)	2.28 (58)	3.94 (100)	1.08 (28)
G	J			
1.06 (27)	.47 (12)			

Inches (mm)

Transfer Module



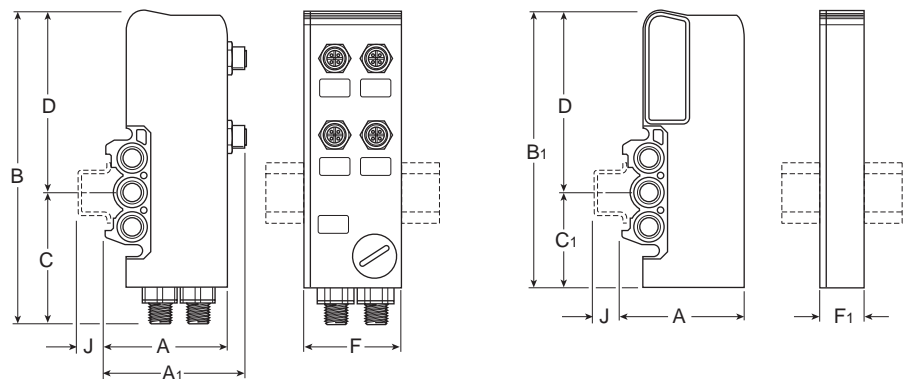
Dimensions

A	B	C	D	F
2.75 (70)	6.22 (158)	2.28 (58)	3.94 (100)	1.65 (42)
G	J			
1.06 (27)	.39 (10)			

Inches (mm)

E

ASI Head Module, 4 Input & 4 Output Version
(PVLBA1BA44 with Transition Module Shown)



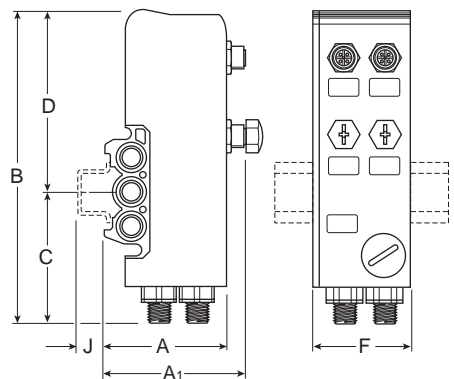
Dimensions

A	A ₁	B	B ₁	C
2.31 (59)	2.88 (73)	6.00 (153)	5.25 (133)	2.50 (64)
C ₁	D	F	F ₁	J
1.75 (44)	3.50 (89)	1.89 (48)	.87 (22)	.47 (12)

Inches (mm)

E

ASI Head Module for Single to Double Solenoid Valves,
4 Input and 4 Output Version
(PVLBA3BA44 Shown)



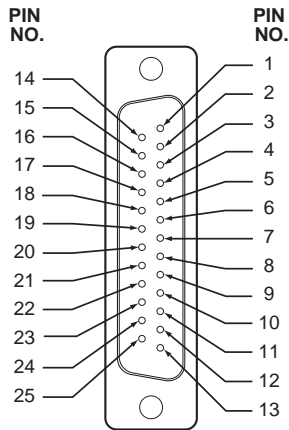
Dimensions

A	A ₁	B	C	D
2.31 (59)	2.88 (73)	5.25 (133)	1.75 (44)	3.50 (89)
F	J			
1.89 (48)	.47 (12)			

Inches (mm)



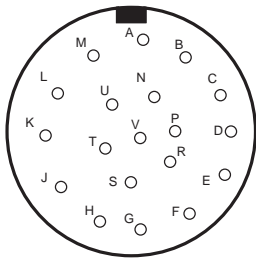
Pin Out Detail D-Sub, 25-Pin Connector



Output Solenoid No.	D-Sub 25-Pin No.	IP65 Cable Colors	Output Solenoid No.	D-Sub 25-Pin No.	IP65 Cable Colors
1	13	Green	11	8	Blue / Black
2	25	Transparent	12	20	White / Black
3	12	Dark Blue	13	7	Khaki
4	24	Light Blue	14	19	Orange
5	11	Pink	15	6	White
6	23	Purple	16	18	Gray
7	10	Dark Green / Black	Not Used	5	Red / Black
8	22	Yellow	Not Used	17	Red
9	9	Light Green / Black	Not Used	4	Brown
10	21	Yellow / Black	Valve Common	16	Black

Notes: Solenoids are polarity sensitive. The common must be at OV. Switching must be at the high potential. Maximum 16 solenoid outputs with one valve (negative) common line on Pin 16.

19-Pin Circular Connector*

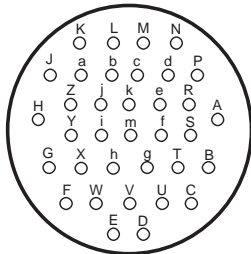


Output Solenoid No.	19-Pin Connector	IP65 Cable Colors	Output Solenoid No.	19-Pin Connector	IP65 Cable Colors
1	A	Pink / Brown	11	L	Blue
2	B	White / Green	12	M	Pink
3	C	White / Yellow	13	N	Grey
4	D	White / Grey	14	P	Yellow
5	E	White / Pink	15	R	White
6	F	Brown / Green	16	S	Green
7	G	Red / Blue	Valve Common	T	Black
8	H	Grey / Pink	Not Used	U	Brown
9	J	Brown / Yellow	Not Used	V	Red
10	K	Violet			

* Available with PVL C10 Only.

Notes: Solenoids are polarity sensitive. The common must be at OV. Switching must be at the high potential. Maximum 16 solenoid outputs with one valve (negative) common line on Pin T.

35-Pin Circular Connector*



Output Solenoid No.	35-Pin Connector	IP65 Cable Colors	Output Solenoid No.	35-Pin Connector	IP65 Cable Colors
0	A	White / Brown	18	V	Brown / Pink
1	B	White / Green	19	W	Brown / Blue
2	C	White / Yellow	20	X	Brown / Red
3	D	White / Grey	21	Y	Brown / Black
4	E	White / Pink	22	Z	Green / Grey
5	F	White / Blue	23	a	Green / Pink
6	G	White / Red	24	b	Green / Blue
7	H	White / Black	25	c	Green / Red
8	J	Brown / Yellow	26	d	Green / Black
9	K	Violet	27	e	Yellow / Grey
10	L	Blue	28	f	Yellow / Pink
11	M	Pink	29	g	Yellow / Blue
12	N	Grey	30	h	Yellow / Red
13	P	Yellow	31	i	Yellow / Black
14	R	White	0 V valves	j	Black
15	S	Green	0 V inputs	k	Brown
16	T	Brown / Green	24 V inputs	m	Red
17	U	Brown / Grey			

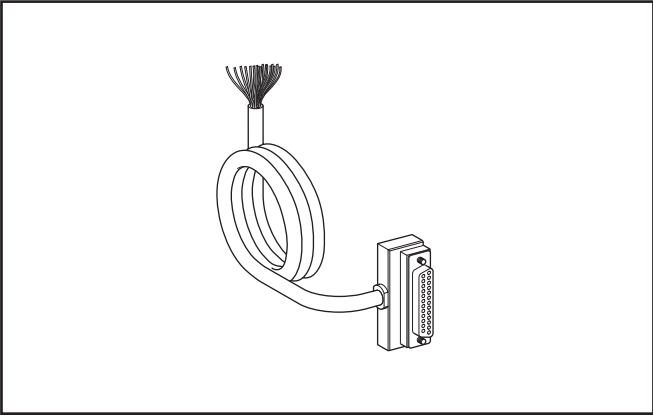
* Available with PVL B10 Only.



Cable with Female D-Sub, IP 65 Rated, 25-Pin Connector

P8L-MD25A5B	5 Meters / 16.40 Ft
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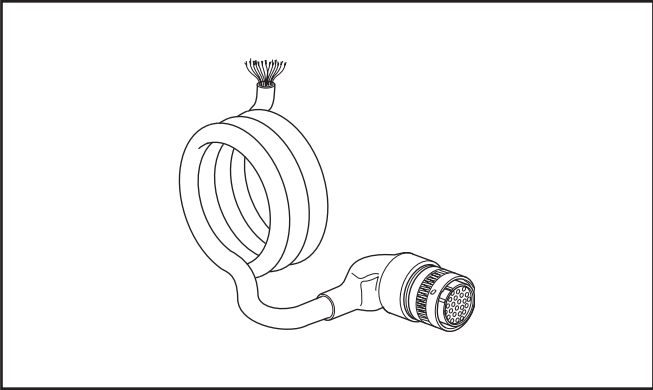
Connection to the control system is through 20 colored wires AWG 24, rated at 2.5 amp.



Cable with Female IP65 Rated, 19-Pin Connector

P8L-MC19A5	5 Meters / 16.40 Ft
-------------------	---------------------

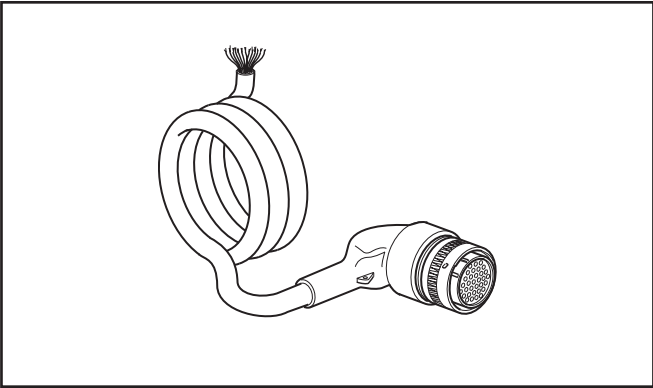
Connection to the control system is through 19 colored wires AWG 20, rated at 5 amp.



Cable with Female IP65 Rated, 35-Pin Connector

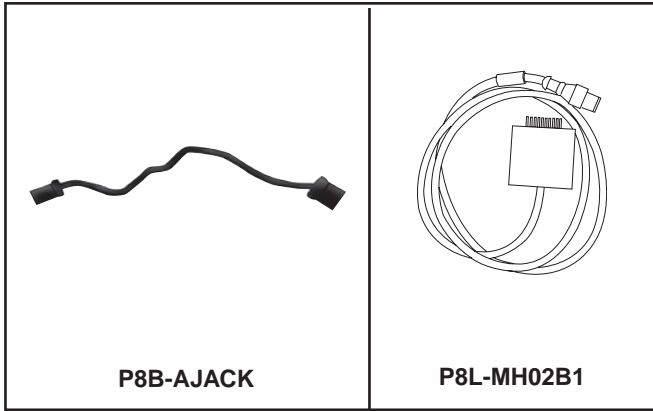
P8L-MC35A5	5 Meters / 16.40 Ft
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Connection to the control system is through 35 colored wires AWG 20, rated at 5 amp.



ASI Module Addressing Cables

P8B-AJACK	2 Meters / 6.56 Ft
Used to connect ASI Head Module for PVLB10 and PVLC10 to an ASI Programming Unit.	
P8L-MH02B1	1 Meter / 3.28 Ft
Used to program ASI Output Head and Auxilliary head modules.	



P8B-AJACK

P8L-MH02B1

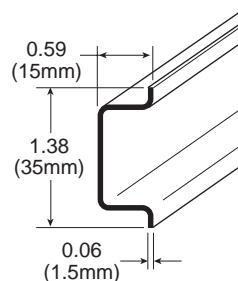


35mm DIN Rail

AM1DE200	6 Feet
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Zinc chromated steel rail for easy mounting of stacks.

DIN rail can be mounted to grids or other surfaces to allow snap in mounting of pneumatic and electrical components.



Adapter Kits

Contains a size transition module and a replacement tail piece for field conversion to a combination stack.

PVLB1940	Double then Single
PVLB1930	Single then Double



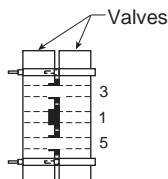
Pressure Isolation Kit

Series	Model Number	Kit includes:
PVLB	PVLB1901	3 Isolation Plugs, 2 Open Port Plugs and 2 Extended Cross Rods.
PVLC	PVLC1901	
PVLB	PVLB1902	10 Isolation Discs
PVLC	PVLC1902	

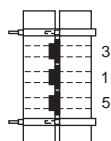


Assembly Instructions

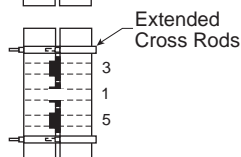
Example 1: Two different pressures P1 and P2 can supply the same bank of power valves, the exhausts remaining common.



Example 2: Complete isolation of the commons in the same bank of power valves: main pressure and exhaust commons.



Example 3: The exhaust commons can be isolated within the same bank of power valves, while the main pressure supply remains common.





Seals and Gaskets

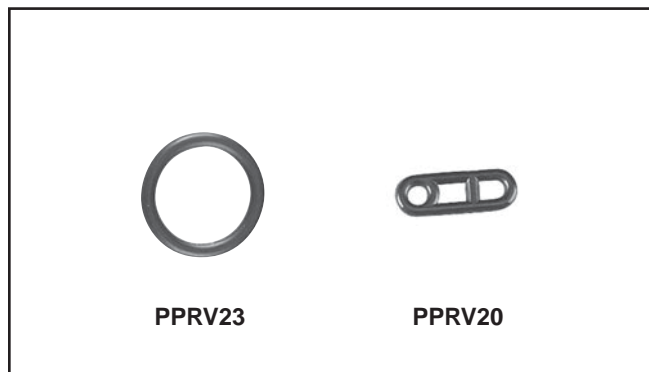
Series	O-Rings ¹	Gaskets ²
PVLB	PPRV23	PPRV20
PVLC	PPRV24	PPRV20

Series	O-Rings
PVLB10	PPRV23
PVLC10	PPRV24

Notes:

¹ O-rings seal between stackable valve bodies.
Sold in set of 30.

² 3-cell gaskets seal between pilot and valve body.
Sold as one set of 20 gaskets.



E

Cross Rods

Series	Model Number
PVLB	PPRV21
PVLC	PPRV22

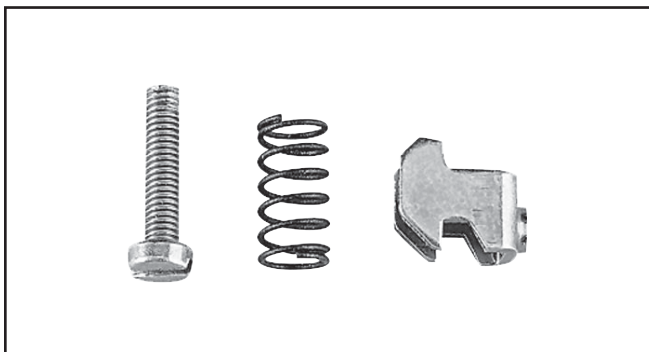
Used in valve stack mounting.
Sold as 1 set of 10 cross rods.



DIN Rail Clip Assembly

PPRL09	Head / Tail Set – All Sizes
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Assembly includes: clamp, screw, and spring.
Sold as 1 set of 20 each.



Section F



F

Flow Control Valves

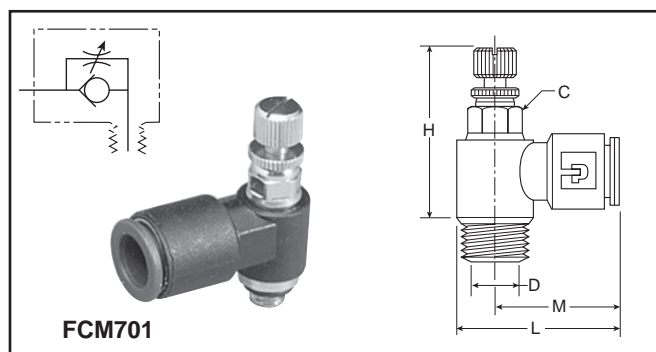
"FCM701 & FCM703" Series	F2
"FC800 & FC806" Series	F3-F4
PWRA & PWRE	F5-F7
"3251" Series	F8
"337" Series	F9
"3250" Series	F10-F11
"338" Series	F12

Check Valves

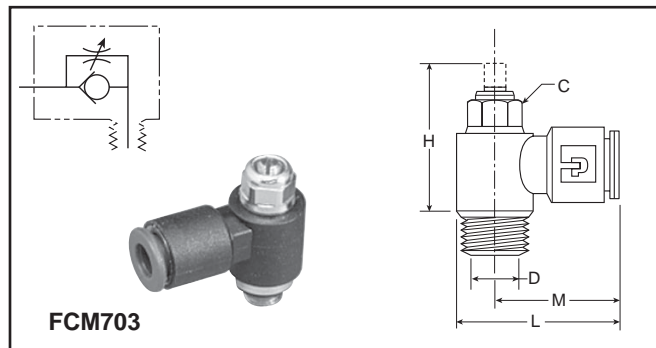
"339" & "3047" Series Check Valve	F13
"VC" Series Check Valve	F14

Tank Valves & Air Chucks	F15
--------------------------------	-----

"EM" Series Exhaust Mufflers	F16
Muffler / Flow Controls	F16
Breather Vents	F17
"ES" Series Silencer	F17
ASN Air Line Silencer	F18
P6M Air Line Silencer	F19
Muffler-Reclassifier ECS	F20
Automatic Drip Leg Drain & Relief Valve	F21
Relief Valves - Diaphragm Type	F22
Shuttle Valves & Quick Exhaust	F23-F25
Pressure Switches	F26-F28
Drain Valves	F29-F30



FCM701



FCM703

General Information

Miniature right angle flow controls provide meter out control of exhaust air from an air cylinder while providing full flow in the reverse direction. The 10-32 male thread can be used to mount directly to cylinder ports. The inlet ports are available in 5-32 or 1/4" instant tube fittings. The adjustment screw is captive and discourages tampering.

This compact flow control saves space and reduces the number of fittings involved in making the connection. Plumbing can be oriented 360° about the cylinder port.

Valve Specifications

Maximum Operating Pressure 145 PSIG (10 bar, 1000 kPa) max.

Temperature Range* 0°F to 140°F (-18°C to 60°C)

* Ambient temperatures below freezing require moisture-free air. Ambient temperatures below freezing and above 180° require lubricants especially selected for suitability at these temperatures. Pneumatic valves should be used with filtered and lubricated air.

Component Materials

Body Polyamide

Mounting Thread Brass

Dimensions

Miniature Exhaust Flow Control FCM701

Composite Body

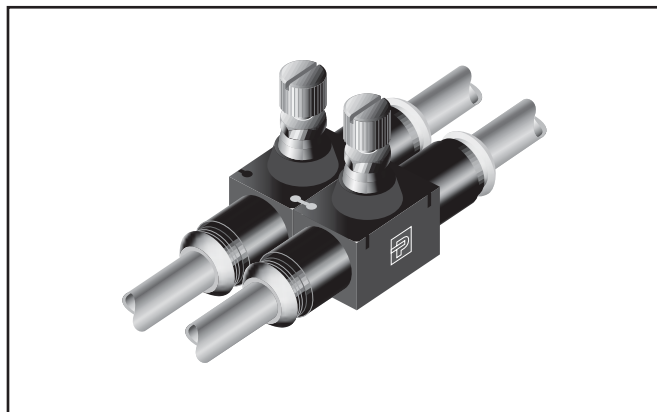
Part No.	Tube Size	Thread Size	C Hex (mm)	H Closed	H Open	L	M	Flow Dia. D	Adjusted Flow (SCFM)	Free Flow (SCFM)
FCM701-5/32-0	5/32	10-32	6	0.925	1.023	0.846	0.669	0.080	5.23	2.90
FCM701-5/32-2	5/32	1/8	7	1.000	1.083	0.935	0.708	0.100	8.41	6.32
FCM701-4-0	1/4	10-32	6	0.925	1.023	0.885	0.708	0.080	9.94	3.86
FCM701-4-2	1/4	1/8	7	1.000	1.083	0.957	0.730	0.100	10.56	5.08
FCM701-4-4	1/4	1/4	8	1.083	1.180	1.013	0.748	0.160	18.79	10.79

Knobless Miniature Exhaust Flow Control FCM703

Composite Body

Part No.	Tube Size	Thread Size	C Hex (mm)	H Closed	H Open	L	M	Flow Dia. D	Adjusted Flow (SCFM)	Free Flow (SCFM)
FCM703-5/32-0	5/32	10-32	6	0.650	0.787	0.846	0.669	0.080	7.43	4.76
FCM703-4-2	1/4	1/8	7	0.708	0.860	0.956	0.730	0.100	12.08	5.86
FCM703-4-4	1/4	1/4	8	0.826	0.964	1.013	0.748	0.160	19.55	10.89

F



General Information

It is sometimes impossible to mount a flow control directly on the port of the cylinder, either due to lack of space or because of the need for remote adjustment of the flow control. To resolve this problem in-line flow controls are designed to mount on the piping between the directional valve and the cylinder or can be mounted on the control panel next to other control units.

Designed to be Versatile

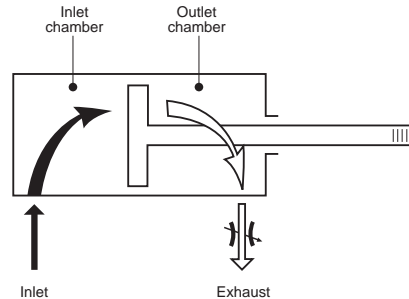
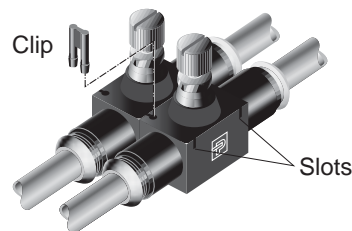
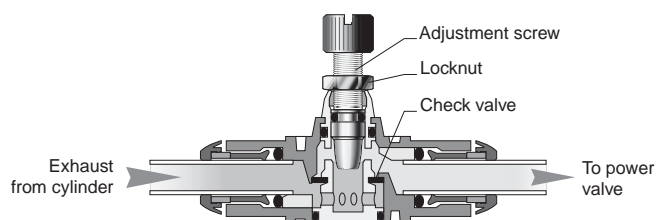
Parker In-Line Flow Controls are unidirectional flow control valves. Intake air flows freely through the flow control; exhaust air is metered out through a specially designed adjustment screw. An arrow on the body of the valve indicates the direction of controlled flow. Since it is a tube to tube connection, our in-line flow controls may be installed as a meter in or a meter out device. Parker in-line flow controls can be easily added to existing circuitry. Simply splice it into the cylinder port line. In-line flow controls may be used individually or, they may be stacked together using two joining clips, supplied standard with each valve. Panel mounting is accomplished by using the through holes in the molded body.

Adjustment Characteristics

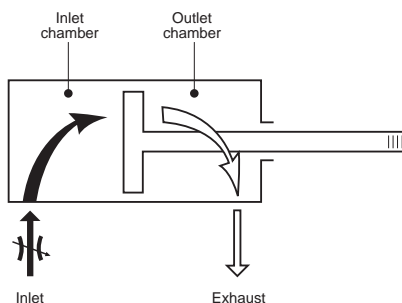
Control is achieved through a finely threaded special adjustment screw. The special shaped adjustment screw produces a more linear flow control than ordinary tapered screws. With the use of a locking nut, the in-line flow control may be secured in its final setting. Settings are maintained even under adverse conditions such as vibration. A captive adjustment screw prevents loss or dangerous blow out.

Full Flow in Both Directions

Intake capacity is always slightly greater than the full open exhaust capacity, enabling maximum variation of speeds between outward and return strokes.



Flow regulation on the exhaust port



Flow regulation on the inlet port



F



Advantages

- Assembly in Banks
- Panel Mounting
- Allows other Function Fittings to be Mounted on a Cylinder
- Space Saving
- Weight Saving
- Flexibility

Valve Specifications

Maximum Working Pressure.....145 PSI

Operating Temperature 5° to 150°F

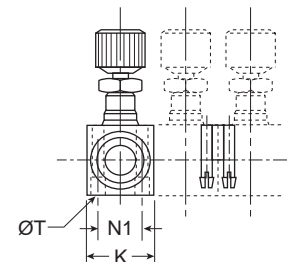
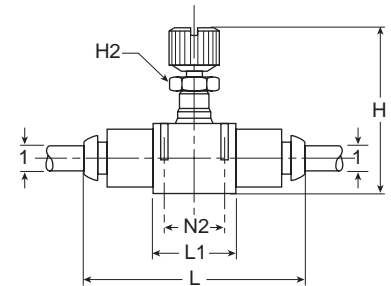
Body Material.....High Resistance Polyamide

Adjustment Screw Material.....Brass

Dimensions

FC800 In-Line Flow Control with Push-in Connection

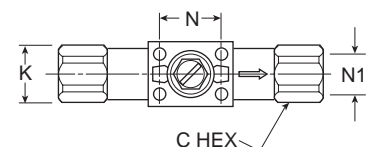
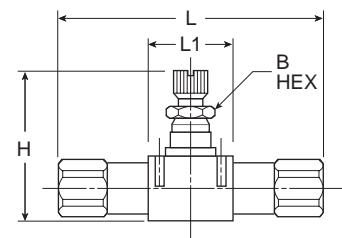
Part No.	1 ØD	H Min.	H Max.	L	L1	K	N1	N2	T	Orifice	H2 (mm)
FC800-5/32	5/32	1.15	1.31	1.52	.59	.47	.31	.43	.09	.12	5
FC800-4	1/4	1.54	1.74	2.11	.90	.66	.43	.66	.12	.16	8
FC800-6	3/8	2.03	2.38	2.96	1.29	.94	.62	1.01	.16	.31	14
FC800-8	1/2	2.24	2.63	3.35	1.37	1.09	.78	1.07	.16	.39	14



Supplied with 2 clips

FC806 Threaded In-Line Flow Control

Part No.	Thread Size	B Hex (mm)	C Hex (mm)	H Closed	H Open	L	L1	K	N	N1
FC806-2	1/8	13	8	1.56	1.75	2.70	.91	.67	.67	.43
FC806-4	1/4	16	11	1.73	1.97	3.27	1.02	.73	.79	.49
FC806-6	3/8	22	14	2.05	2.40	3.82	1.30	.94	1.02	.63
FC806-8	1/2	24	14	2.26	2.66	4.76	1.38	1.10	1.08	.79





General Description

Flow Control – PWRE (Thermoplastic)

These rugged flow controllers enhance the performance of pneumatic cylinders by precise control of piston motion in both directions. They allow full inlet flow to the cylinder while providing fine adjustment of the exhaust flow.

Right angle construction provides for convenient mounting where the cylinder is best controlled . . . at the cylinder port.



PWRA

The PWRA series is made of zinc alloy, built for rugged applications and is available in sizes ranging from 1/8" through 1/2" with cylinder port fittings in either NPT or BSP. Tubing connections are offered either as instant fittings (fractional or metric) or threaded fittings (NPT or BSP). To prevent unwanted drift due to shock or vibration, these devices are fitted with adjustment locking nuts.

PWRE

The PWRE series has a thermoplastic body with brass fittings giving lighter weight and lower profile than its metal counterpart to the left. These flow controls are supplied with instant tube fittings (fractional or metric) and NPT or BSP cylinder port fittings.

Valve Specifications

Maximum Operating Pressure..... 145 PSIG (10 bar)

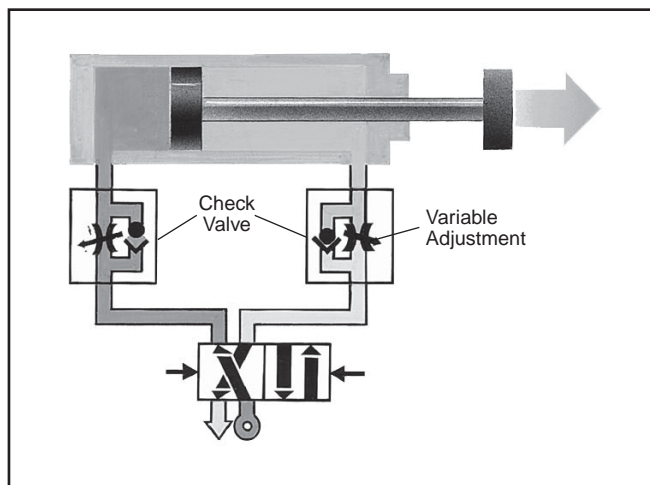
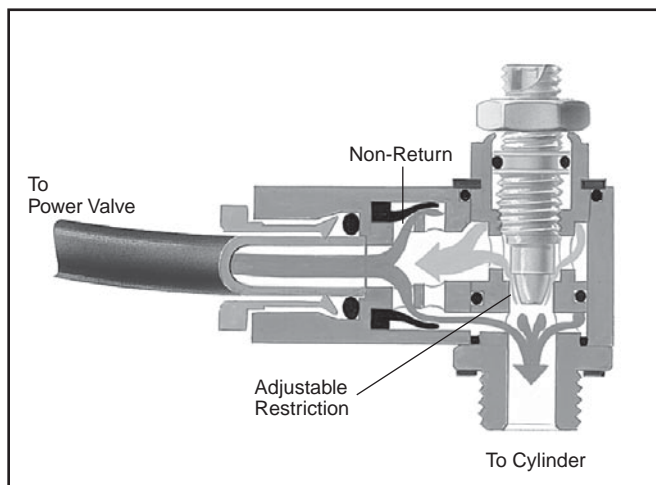
Operating Temperature 0° to 140°F* (-18°C to 60°F)

* Ambient temperatures below freezing require moisture-free air. Ambient temperatures below freezing and above 180° require lubricants especially selected for suitability at these temperatures. Pneumatic valves should be used with filtered and lubricated air.

Flow

No of Turns	Exhaust (Screw Open)	Inlet (Screw Closed)
12	1.8 SCFM	1.8 SCFM

F





For Cylinder Mounting
(Can also be mounted in Threshold Sensor Banjo)

With Instant Tube Fittings

with Allen key adjustment and locknut



PWRA3469

Symbol	BSP			Symbol	NPT		
	Cylinder Port Thread	Connection for Tube	Catalog Number		Cylinder Port Thread	Connection for Tube	Catalog Number
	1/8"	6mm	PWRA1468		1/8"	1/4"	PWRA3468
		8mm	PWRA1488				
	1/4"	6mm	PWRA1469		1/4"	1/4"	PWRA3469
	3/8"	8mm	PWRA1483		—	—	—
	1/2"	12mm	PWRA1412		1/2"	1/2"	PWRA3412

With Threaded Connection

with Allen key adjustment and locknut

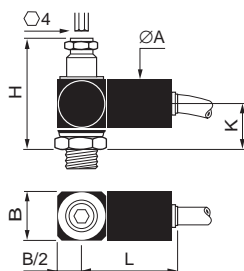


PWRA3833

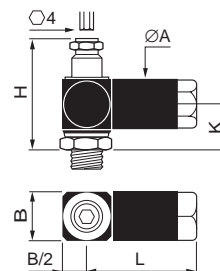
Symbol	BSP			Symbol	NPT		
	Cylinder Port Thread	Connection Tapped Thread	Catalog Number		Cylinder Port Thread	Connection Tapped Thread	Catalog Number
	1/8"	1/8"	PWRA1888		—	—	—
	1/4"	1/4"	PWRA1899		1/4"	1/4"	PWRA3899
	3/8"	3/8"	PWRA1833		3/8"	3/8"	PWRA3833
	1/2"	1/2"	PWRA1822		1/2"	1/2"	PWRA3822

Dimensions: Inches (mm)

PWRA14**/34**



PWRA18**/38**



	Adjustment*	Flow**	ØA	B	K	H	L
PWRA1468/3468	10	15.9	0.67" (17)	0.71" (18)	0.67" (17)	1.77" (45)	1.26" (32)
PWRA1488	14	23.0	0.87" (22)	0.83" (21)	0.83" (21)	2.17" (55)	1.54" (39)
PWRA1469/3469	14	26.5	0.87" (22)	0.83" (21)	0.83" (21)	2.17" (55)	1.54" (39)
PWRA1483	14	61.8	1.06" (27)	1.10" (28)	1.02" (26)	2.36" (60)	1.97" (50)
PWRA1412/3412	20	97.1	1.22" (31)	1.30" (33)	1.38" (35)	3.03" (77)	2.60" (66)
PWRA1888	10	15.9	0.67" (17)	0.71" (18)	0.67" (17)	1.77" (45)	1.44" (36.5)
PWRA1899/3899	14	31.8	0.87" (22)	0.83" (21)	0.83" (21)	2.17" (55)	.71" (43.5)
PWRA1833/3833	14	68.9	1.06" (27)	1.10" (28)	1.02" (26)	2.36" (60)	2.19" (55.5)
PWRA1822/3822	20	97.1	1.22" (31)	1.30" (33)	1.38" (35)	3.03" (77)	2.48" (63)

* Number of turns (4mm Allen key)

** SCFM at 90 PSI with screw closed



For Cylinder Mounting
 (Can also be mounted in Threshold Sensor Banjo)

With Instant Tube Fittings

with Allen key adjustment and fine thread friction locking



PWRE14457



PWRE14697



Symbol	BSP			NPT		
	Cylinder Port Thread	Connection for Tube	Catalog Number	Cylinder Port Thread	Connection for Tube	Catalog Number
	M5	4mm	PWRE1445	10-32 UNF	5/32"	PWRE14457
					10-32 UNF	PWRE14557
	1/8"	4mm	PWRE1448	1/8"	5/32"	PWRE14487
		6mm	PWRE1468		1/4"	PWRE14687
	1/4"	6mm	PWRE1469	1/4"	1/4"	PWRE14697
	3/8"	8mm	PWRE1483	3/8"	3/8"	PWRE14937
Reverse Flow	M5	4mm	PWRE1145	10-32UNF	5/32"	PWRE11457

General Information

Miniature right angle flow controls provide meter out control of exhaust air from an air cylinder while providing full flow in the reverse direction. The

M5 (10-32) male thread can be used to mount directly to cylinder ports. The inlet ports are available in M5 (10-32) male or 5/32" instant tube fitting. The adjustment screw is captive and discourages tampering.

This compact flow control saves space and reduces the number of fittings involved in making the connection. Plumbing can be oriented 360° about the cylinder port.

Valve Specifications

Maximum Operating Pressure..... 145 PSIG (10 bar)

Operating Temperature0° to 140°F* (-18°C to 60°F)

* Ambient temperatures below freezing require moisture-free air. Ambient temperatures below freezing and above 180° require lubricants especially selected for suitability at these temperatures. Pneumatic valves should be used with filtered and lubricated air.

Component Materials

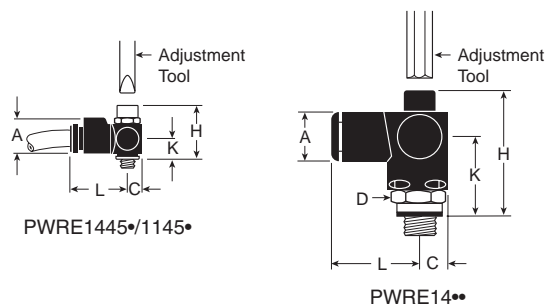
Body Polyamide

Mounting Thread..... Brass

Flow

No of Turns	Exhaust (Screw Open)	Inlet (Screw Closed)
12	1.8 SCFM	1.8 SCFM

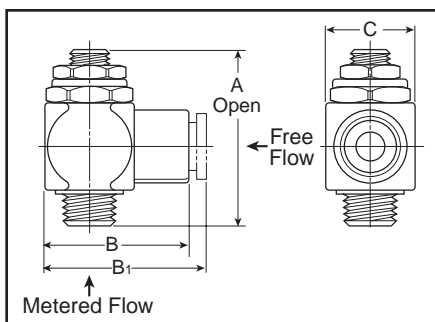
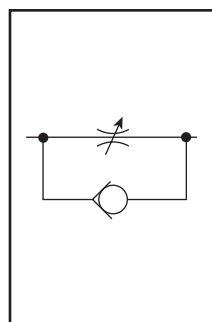
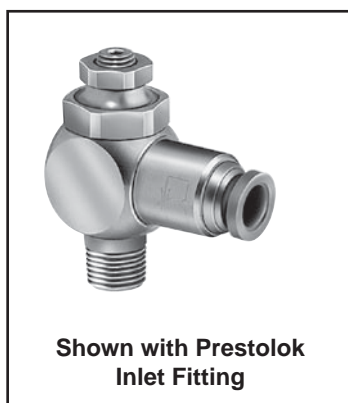
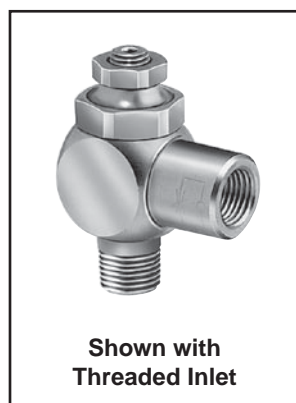
Dimensions: Inches (mm)



	Adjustment	# Turns	Flow*	ØA	C	D Hex.	K	H	L
PWRE1445/14457 PWRE1145/11457 PWRE14557	3mm screwdriver	12	1.8	0.43" (11)	0.16" (4)	5/16" (8)	0.28" (7.2)	0.67" (17)	0.83" (21)
PWRE1448/14487	3mm Allen key	14	10.2	0.55" (14)	0.31" (8)	9/16" (14)	0.94" (23.8)	1.77" (45)	0.94" (24)
PWRE1468/14687	3mm Allen key	14	23.0	0.55" (14)	0.31" (8)	9/16" (14)	0.94" (23.8)	1.77" (45)	0.94" (24)
PWRE1469/14697	4mm Allen key	18	23.0	0.63" (16)	0.41" (10.5)	11/16" (17)	1.04" (26.5)	1.94" (49.3)	1.06" (27)
PWRE1483/14937	4mm Allen key	18	47.7	0.79" (20)	0.45" (11.5)	7/8" (22)	1.17" (29.8)	2.24" (56.8)	1.30" (33)

* SCFM at 90 PSI with screw closed





Application

The Right Angle Flow Control is an ideal solution to cylinder speed control where space is at a premium. Costly fittings, connections and piping expenses can be eliminated because the valve can rotate 360°, the piping alignment can be in any direction. The 1/8" model can be rotated after final assembly.

Operation

Install by threading male end directly into cylinder port. The free-flow and metered-flow direction is automatically predetermined. Free-flow direction is into cylinder and metered-flow is out of the cylinder. Flow is adjusted with an Allen wrench and locked with nut.

Right Angle Flow Control also available with Prestolok fittings on inlet port to accommodate 5/32 - 3/8 tube sizes. This allows for quick connection and eliminates need for separate tube fitting.

Valve Specifications

Body Brass

Plunger Brass and Acetal

Seals Buna N

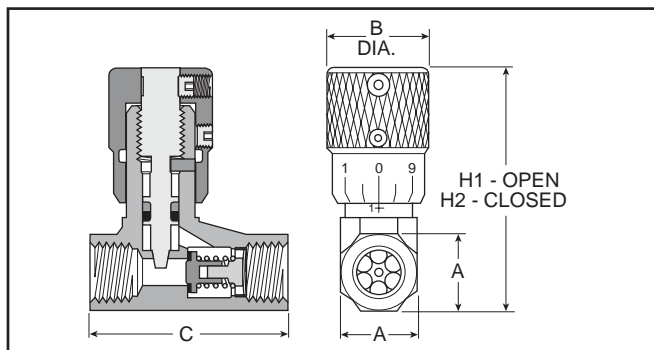
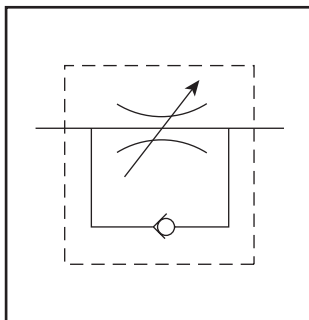
Temperature Range 0°F to 140°F (-18°C to 60°C)

Pressure Rating 125 PSIG (863 kPa) max.

Model Selection Information and Dimensions

Model Number	Thread (NPT) Male	Thread (NPT) Female	A		B		C		Weight		Cv	
			Inches	mm	Inches	mm	Inches	mm	oz.	kg.	Adjusted Flow	Free Flow
03251 0125	1/8	1/8	1.74	44	1.18	30	0.67	17	2.0	0.9	0.26	0.20
03251 0250	1/4	1/4	1.99	51	1.40	36	0.91	23	4.5	2.0	0.75	0.68
03251 0375	3/8	3/8	2.28	58	1.71	43	1.06	27	7.0	3.2	0.84	0.72
03251 0500	1/2	1/2	2.69	68	1.98	53	1.26	32	11.0	5.0	1.64	1.41
With Prestolok Fittings	Thread (NPT)	Tube Size	A		B ₁		C		Weight		Cv	
03251 1215	1/8	5/32	1.74	44	1.18	30	0.67	17	2.0	0.9	0.19	0.16
03251 1225	1/8	1/4	1.74	44	1.18	30	0.67	17	2.0	0.9	0.28	0.22
03251 2525	1/4	1/4	1.99	51	1.40	36	0.91	23	4.5	2.0	0.51	0.44
03251 2538	1/4	3/8	1.99	51	1.40	36	0.91	23	4.5	2.0	0.62	0.53
03251 3838	3/8	3/8	2.28	58	1.71	43	1.06	27	7.0	3.2	0.78	0.65

CAUTION: If it is possible that the ambient temperature may fall below freezing, the medium must be moisture-free to prevent internal damage or unpredictable behavior.



General Information

The "337" Series Flow Control Valves meter flow of air in one direction and allow free flow in the reverse direction.

The "337" Series valves are manufactured with a fine tapered needle providing precise flow control, even at low flow rates. The perimeter of the adjustment knob features numerical micrometer position markings providing a visual indication of the setting. Once the desired flow is selected, a set screw can be tightened to maintain the setting.

These valves are available with NPTF ports in 1/8", 1/4", 3/8", 1/2", and 3/4" sizes. This series is recommended for pneumatic service.

Valve Specifications

Maximum Operating Pressure 250 PSI
 Cracking pressure for
 return check poppet 1 to 2 PSIG

Operating Temperature Standard: 0° to 180°F*
 Extended Temperature 0° to 300°F* (consult factory)

* Ambient temperatures below freezing require moisture-free air. Ambient temperatures below freezing and above 180° require lubricants especially selected for suitability at these temperatures. Pneumatic valves should be used with filtered and lubricated air.

Component Materials

Body Material Brass
Needle Stainless Steel
Check Seal Urethane
Needle Seals Buna N
 (Fluorocarbon optional – consult factory)
Knob Aluminum
Spring Stainless Steel
Retainer Zinc- Plated Steel
Set Screw Steel

Model Selection and Dimensions

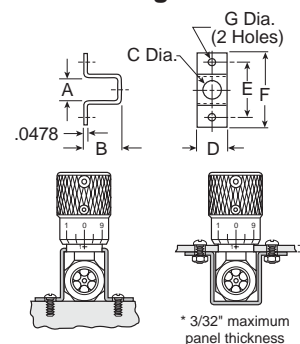
Port Size	Model	Flow (SCFM†)		Dimensions					Service Kit
		Adj.	Free Flow	A	B	C	H1	H2	
1/8"	00337 1000	15	32	9/16"	0.75	1.47	2.03	1.81	00337 8000
1/4"	00337 1001	28	75	11/16"	0.75	1.47	2.28	2.03	00337 8001
3/8"	00337 1002	59	139	7/8"	0.88	2.31	2.84	2.53	00337 8002
1/2"	00337 1003	126	183	1-3/16"	1.06	3.25	3.62	3.22	00337 8003
3/4"	00337 1004	140	327	1-3/8"	1.06	3.25	3.72	3.31	00337 8004

† At 100 PSIG inlet pressure with full pressure drop.

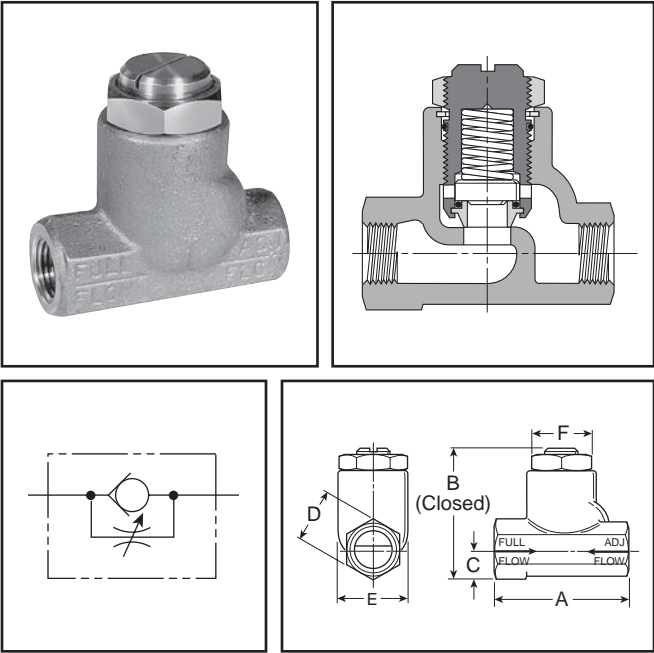
Mounting Bracket Model Selection and Dimensions

Port Size	Mounting Bracket Model No.	Dimensions						
		A	B	C	D	E	F	G
1/8"	00337 8100	0.66	0.66	0.505	0.75	1.38	1.88	0.22
1/4"	00337 8101	0.75	0.89	0.505	0.75	1.50	2.00	0.22
3/8"	00337 8102	0.94	1.12	0.630	1.25	1.75	2.31	0.27
1/2"	00337 8103	1.25	1.62	0.755	1.75	2.06	2.62	0.27
3/4"	00337 8104	1.44	1.72	0.755	1.75	2.25	2.81	0.27

Mounting Bracket



* 3/32" maximum panel thickness



Application

The “3250” Series Flow Control Valves are specifically designed to accurately meter the flow of air in one direction and allow free flow in the opposite direction. The “3250” Series Flow Control Valves are also suitable for low pressure hydraulic service.

Operation

When air is moving in the free flow direction through the valve, it forces the poppet off its seat and unrestricted air flow is permitted.

When air is moving in the metered direction through the valve, air pressure and the force of the poppet spring causes the poppet to close. Flow must then be through the orifice that is controlled by the metering screw. Opening this screw allows more flow; closing it, less flow.

Technical Specifications

BodyBrass
Port Size1/8", 1/4", 3/8", 1/2", 3/4"
Internal ComponentsBrass, Stainless Steel
Seals Buna N
Operating Temperature Standard: 0°F to 180°F
Extended Options: 0°F to 300°F

Operating Pressures:

Air.....250 PSIG
Hydraulic.....250 PSIG

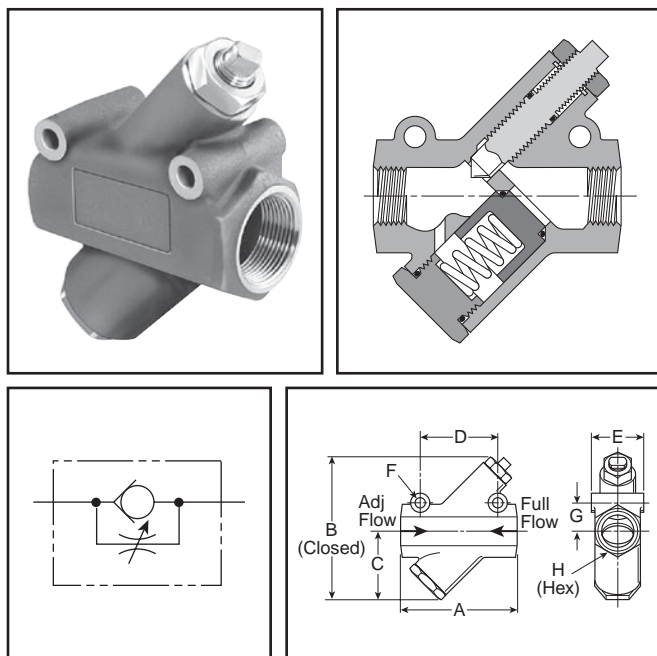
Valve will operate mounted in any position.
Lock nut on metering screw prevents change in setting during operation.

Flow Rating (SCFM)

Flow Path	Valve Port Size				
	1/8"	1/4"	3/8"	1/2"	3/4"
Maximum Flow in Metered Direction	70	130	220	295	420
Maximum Flow in Free Flow Direction	60	120	205	346	615

Model Selection Information and Dimensions

Model Number	03250 0119		03250 0219		03250 0319		03250 0419		03250 0519	
Port Size NPTF	1/8"		1/4"		3/8"		1/2"		3/4"	
	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
A	1.75	45	2.33	59	2.66	68	3.11	79	3.56	90
B	1.56	40	1.97	50	2.44	62	3.06	78	3.69	94
C	0.37	9	0.44	11	0.56	14	0.75	19	0.88	22
D	0.62	16	0.75	19	1.00	25	1.25	32	1.50	38
E	0.81	21	1.09	28	1.38	35	1.63	41	2.00	51
F	0.68	17	0.94	24	1.19	30	1.38	35	1.75	44



Application

These extra large flow control valves have been developed to provide effective flow settings for large diameter cylinders and for other similar air applications. Each valve has a fine screw adjustment allowing precise settings which are secured by a sturdy lock nut.

Operation

Large internal port passages coupled with unique soft seal poppet and inline design provide maximum full flow capacity and minimum pressure drop in the free flow direction. Their cone shaped brass metering valve will provide consistent cylinder speed by regulating cylinder exhaust.

Technical Specifications

BodyCast Aluminum
Port Size1", 1-1/4", 1-1/2"
Internal ComponentsBrass, Aluminum
SealsBuna N, Urethane
SpringStainless Steel
Operating Temperature:
 Standard-40°F to 180°F
 Extended Options.....-40°F to 350°F
Operating Pressures:
 Maximum Air.....250 PSIG

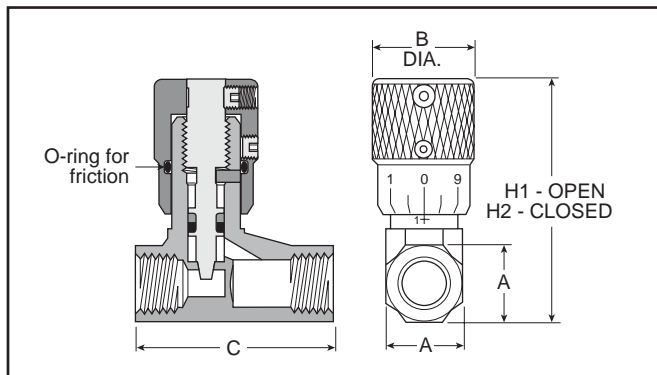
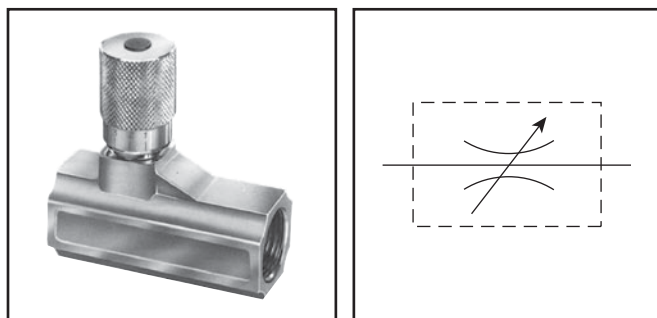
Flow Capacity In Full Flow Direction

Port Size (NPTF)	Max. Flow (Needle Open)		Model Number
	SCFM**	C _v	
1	1000	12.3	03250 1000
1-1/4	1200	13.8	03250 1250
1-1/2	1800	17.5	03250 1500

** At 100 PSIG inlet pressure with full pressure drop.

Model Selection Information and Dimensions

Model Number	03250 1000		03250 1250		03250 1500	
Port Size NPTF	1"		1-1/4"		1-1/2"	
	Inches	mm	Inches	mm	Inches	mm
A	5.00	127	5.00	127	5.88	149
B	6.50	165	6.50	165	8.00	203
C	3.00	76	3.00	76	3.75	95
D	3.25	83	3.25	83	3.50	89
E	2.25	57	2.25	57	2.50	64
F	.39	10	.39	10	.39	10
G	1.31	33	1.31	33	1.50	38
H	2.13	54	2.13	54	2.38	60



General Information

"338" Series needle valves bi-directionally meter the flow of air through the valve.

This series features a fine tapered needle providing precise flow of air in both directions. Numerical micrometer position markings are stamped on the perimeter of the adjustment knob which provide a visual indication of the setting. Once the desired flow is selected, a set screw can be tightened to maintain the setting.

These valves are available with NPTF ports in 1/8", 1/4", 3/8" 1/2" and 3/4" sizes. This series is recommended for pneumatic service

Valve Specifications

Maximum Operating Pressure 250 PSIG (Air)

Operating Temperature Standard: 0° to 180°F*

Extended Temperature 0°F to 300°F* (Consult factory)

* Ambient temperatures below freezing require moisture-free air. Ambient temperatures below freezing and above 180° require lubricants especially selected for suitability at these temperatures. Pneumatic valves should be used with filtered and lubricated air.

Component Materials

Body Material Brass

Internal Components Stainless Steel / Brass

Seals Nitrile (Fluorocarbon optional – consult factory)

Model Selection and Dimensions

Model Number	Port Size	Dimensions					Kit
		A	B	C	H1	H2	
00338 1100	1/8"	9/16"	0.75	1.47	2.03	1.81	00337 8000
00338 1101	1/4"	11/16"	0.75	1.47	2.28	2.03	00337 8001
00338 1102	3/8"	7/8"	0.88	2.31	2.84	2.53	00337 8002
00338 1103	1/2"	1-3/16"	1.06	3.25	3.62	3.22	00337 8003
00338 1104	3/4"	1-3/8"	1.06	3.25	3.72	3.31	00337 8004

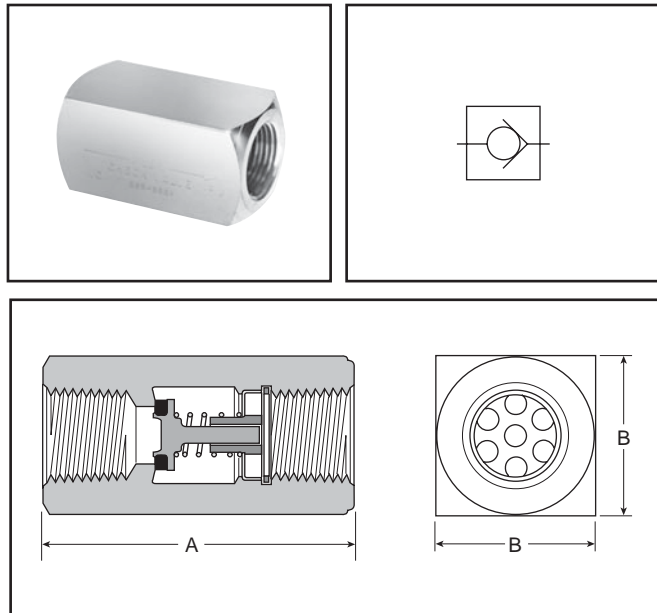
Performance Data – Flow

Model Number	Port Size	Flow (SCFM†)
00338 1100	1/8"	15
00338 1101	1/4"	28
00338 1102	3/8"	59
00338 1103	1/2"	126
00338 1104	3/4"	140

† At 100 PSIG inlet pressure with full pressure drop.

F

"339" Series – 1/8" to 3/4" Ports



General Information

"339" Series check valves allow free flow in one direction and provide positive checked (zero flow) in the reverse direction. These valves are available with NPTF ports in 1/8", 1/4", 3/8", 1/2" & 3/4" sizes. This series is recommended for pneumatic service.

Valve Specifications

Maximum Operating Pressure:

250 PSIG

Cracking Pressure: 1 to 2 PSIG

Operating Temperature:

Standard: 0° to 180° F*

Extended Temperature Option: 0°F to 300°F*

* Ambient temperatures below freezing require moisture-free air. Ambient temperatures below freezing and above 180° require lubricants especially selected for suitability at these temperatures. Pneumatic valves should be used with filtered and lubricated air.

Component Materials

Body Material..... Brass

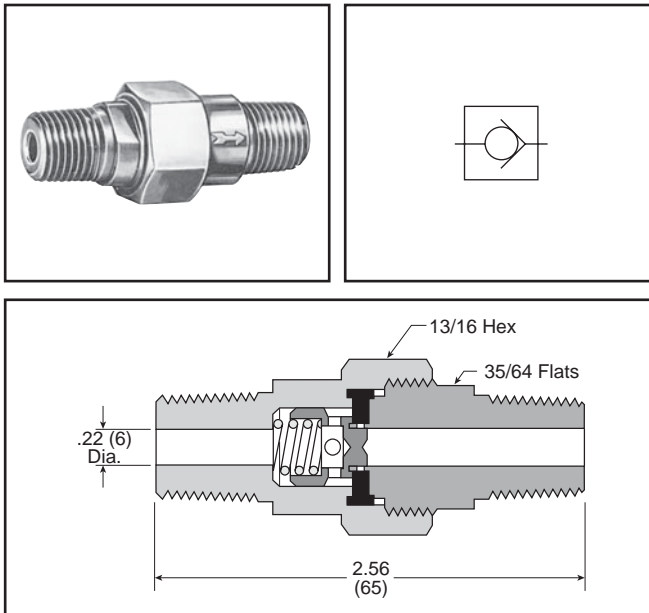
Internal ComponentsBrass / Stainless Steel /
Zinc-Plated Steel

SealsUrethane (standard),
Fluorocarbon (optional – consult factory)

Model Selection and Dimensions

Model Number	Port Size	Flow† (SCFM)	Dimensions		Service Kit
			A	B	
00339 3000	1/8"	35	1.22	0.56	00337 8000
00339 3001	1/4"	75	1.34	0.69	00337 8001
00339 3002	3/8"	143	2.00	0.88	00337 8002
00339 3003	1/2"	162	2.56	1.19	00337 8003
00339 3004	3/4"	323	2.66	1.38	00337 8004

"3047" – 1/4" Male Pipe



General Information

"3047" Series check valves allow free flow in one direction and provide positive checked (zero flow) in the reverse direction. This valve is available with a male 1/4" NPTF connection and is recommended for pneumatic service.

Valve Specifications

Maximum Operating Pressure:

250 PSIG

Cracking Pressure: 1 to 2 PSIG

Operating Temperature:

Standard: 0° to 180° F*

* Ambient temperatures below freezing require moisture-free air. Ambient temperatures below freezing and above 180° require lubricants especially selected for suitability at these temperatures. Pneumatic valves should be used with filtered and lubricated air.

Component Materials

Body Material..... Brass

Internal ComponentsBrass / Stainless Steel

SealsNitrile

Model Selection

Model Number	Pipe Thread	Flow† (SCFM)
03047 0099	1/4"	30

† At 100 PSIG inlet pressure with full pressure drop.

“VC” – Check Valve



General Information

Push-to-Connect check valves that ensures protection against reversal of flow. The valves have an arrow molded into the body to indicate the direction of flow. Valves are designed for connection with either thermoplastic or soft metal tubing and are intended for use with liquids only.

Valve Specifications

Working Pressure:

Up to 150 PSI depending on tubing being used

Temperature Range:

+34°F (1° C) to +150°F (65°C)

Cracking Pressure: 1/3 PSI

Assembly Instructions

1. Cut tubing squarely, be certain the tubing is clean and free of debris.
2. Insert tubing into check valve until it bottoms. A slight twisting motion will ease the insertion. Pull on tubing to verify it is properly retained in the fitting.
3. To disassemble, simply push in the release button against the body and remove the tubing

Component Materials

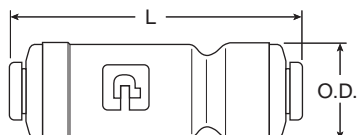
Body Acetal

O-ring EPDM

Metal Grip Edge..... 300 Stainless

Model Selection and Dimensions

Part No.	Tube Size	L	O.D.
A4VC4-MG	1/4	2.00	0.66
A5VC5-MG	5/16	2.10	0.70
A6VC6-MG	3/8	2.15	0.80

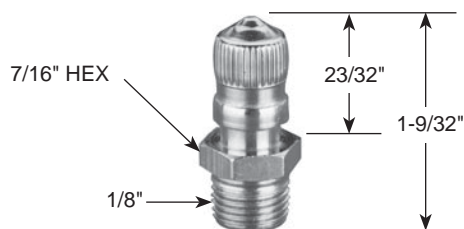


Tank Valves

For tanks, steel barrels, compressors and other pneumatic containers where a dependable automatic air valve is needed. Equipped with standard valve core and sealing cap. Maximum operating pressure is 185 PSIG. Temperature range is -40°F to 220°F.

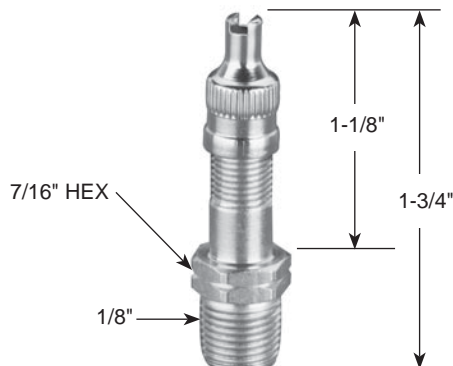
Model No. 09166 0060

Has a 1/8" pipe thread at bottom for minimum protrusion. N/P finish, dome shaped cap. Packed 25 to a box.



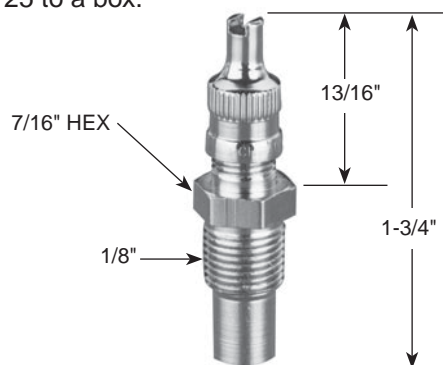
Model No. 00645 0060

A 1/8" pipe thread at bottom permits maximum protrusion. N/P finish, screwdriver type cap. Packed 25 to a box.



Model No. 01468 0006

Has a 1/8" pipe thread part way up the stem which allows for minimum protrusion. N/P finish, has screwdriver type cap. Packed 25 to a box.



Air Chucks

For regular airlines.

Model No. 05499 0000

Ball-foot air chuck, 1/4" female port. Packed 10 to a box.

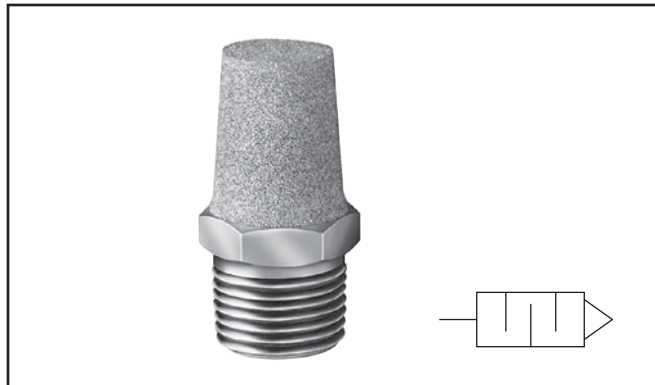


Model No. 06739 0000

Ball-foot air chuck with clip. Fits standard valve mouth. Saves holding on by hand. Has 1/4" port for connecting to hose. Packed 10 to a box.

**F**

“EM” Series – Sintered Bronze Muffler / Filters



General Description

Muffler / filters effectively reduce air exhaust noises to an industry accepted level with minimum flow restriction. They protect valves, impact wrenches, screw drivers and other air tools by preventing dirt and other foreign matter from entering the system. Non-corrosive. Can be cleaned with many common solvents.

Specifications

Maximum Operating Pressure.....250 PSIG (Air)

Operating Temperature 0° to 300°F*

* Ambient temperatures below freezing require moisture-free air. Ambient temperatures below freezing and above 180° require lubricants especially selected for suitability at these temperatures. Pneumatic valves should be used with filtered and lubricated air.

Model Number	Pipe Thread	Overall Length	Hex Size
EM12	1/8"	1.00	7/16"
EM25	1/4"	1.32	9/16"
EM37	3/8"	1.54	11/16"
EM50	1/2"	1.85	7/8"
EM75	3/4"	2.29	1-1/16"
EM100	1"	2.91	1-5/16"
EM125	1-1/4"	3.25	1-11/16"
EM150	1-1/2"	3.69	2"

Muffler / Flow Controls



General Description

Muffler / flow controls provide an acceptable exhaust noise level and effectively meter exhaust. Installed in valve exhaust ports, they control cylinder piston speeds throughout a wide range. The adjusting screw cannot be accidentally blown out, can be locked to maintain setting. Brass and bronze construction. Clean with commonly used solvents.

Specifications

Maximum Operating Pressure.....250 PSIG (Air)

Operating Temperature 0° to 300°F*

* Ambient temperatures below freezing require moisture-free air. Ambient temperatures below freezing and above 180° require lubricants especially selected for suitability at these temperatures. Pneumatic valves should be used with filtered and lubricated air.

Model Number	Pipe Thread	Overall Length	Hex Size
04502 0002	1/8"	1.15	9/16"
04504 0004	1/4"	1.42	1/2"
04506 0060	3/8"	1.49	11/16"
04508 0080	1/2"	1.77	7/8"
04512 0012	3/4"	1.98	1-1/16"
04516 0016	1"	2.15	1-5/16"

Breather Vents



NOTE: Breather vents should not be used as exhaust mufflers.

General Description

These low silhouette versions of the muffler / filter are useful where space is a problem and / or to prevent contamination. Use for vacuum relief or pressure equalization in gear boxes, oil tanks, reservoirs, etc. Non-corrosive.

Specifications

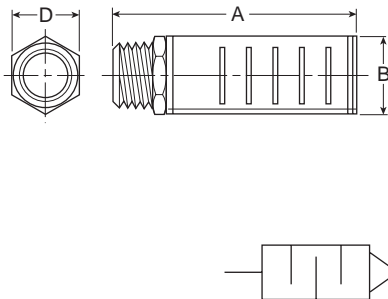
Maximum Operating Pressure..... 150 PSIG (Air)

Operating Temperature 0° to 300°F*

* Ambient temperatures below freezing require moisture-free air. Ambient temperatures below freezing and above 180° require lubricants especially selected for suitability at these temperatures. Pneumatic valves should be used with filtered and lubricated air.

Model Number	Pipe Thread	Overall Length	Hex Size
04702 0002	1/8"	0.44	7/16"
04704 0004	1/4"	0.63	9/16"
04706 0006	3/8"	0.75	11/16"
04708 0008	1/2"	0.88	7/8"
04712 0012	3/4"	1.00	1-1/6"
04716 0016	1"	1.31	1-5/16"
04720 0020	1-1/4"	1.41	1-11/16"
04724 0024	1-1/2"	1.50	2"

"ES" Series – Silencer



General Description

These low silhouette versions of the muffler / filter are useful where space is a problem and / or to prevent contamination. Use for vacuum relief or pressure equalization in gear boxes, oil tanks, reservoirs, etc. Non-corrosive.

The silencer is designed to give superior performance in noise control with a minimum effect on air efficiency. "Trimline" design allows location in the tightest places without extra plumbing and fittings. Fits directly into the exhaust port of more than 90% of present commercial valves. Slotted body permits rapid discharge of air without undesirable back pressure. Unique nylon screen element resists dirt buildup or clogging.

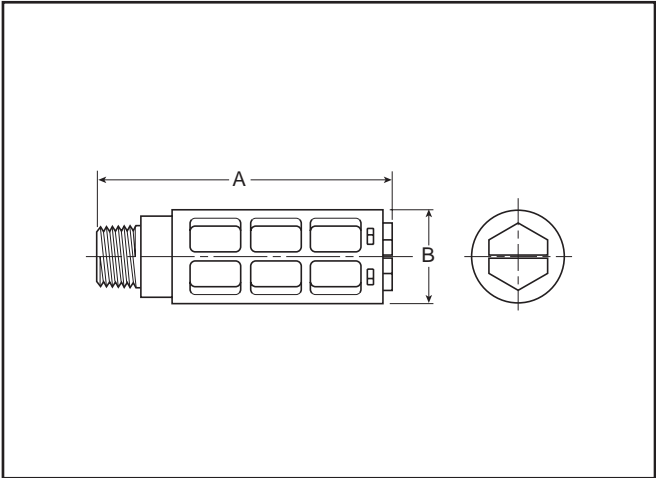
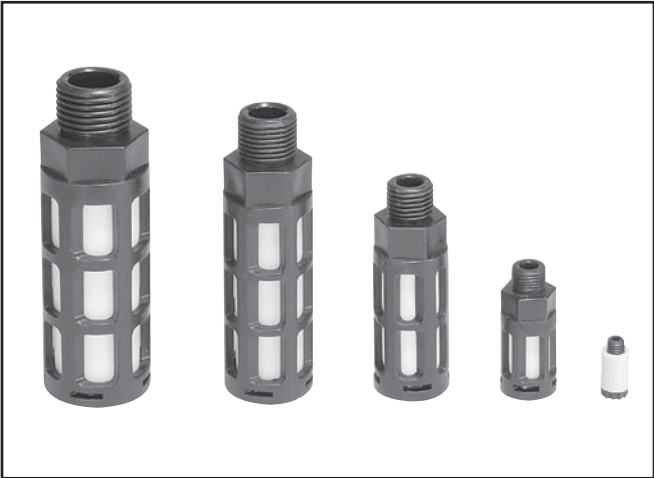
Specifications

Maximum Operating Pressure..... 250 PSIG (Air)

Operating Temperature 0° to 300°F*

* Ambient temperatures below freezing require moisture-free air. Ambient temperatures below freezing and above 180° require lubricants especially selected for suitability at these temperatures. Pneumatic valves should be used with filtered and lubricated air.

Model Numbers		Pipe Thread	Flow SCFM @ 100 PSIG Inlet	Dimensions		
NPTF	BSPT (R)			A	B	D
ES12MC	ESB12MC	1/8"	115	1.85	0.81	0.63
ES25MC	ESB25MC	1/4"	129	1.85	0.81	0.63
ES37MC	ESB37MC	3/8"	219	3.31	1.26	1.00
ES50MC	ESB50MC	1/2"	549	3.31	1.26	1.00
ES75MC	ESB75MC	3/4"	893	4.56	2.01	1.62
ES100MC	ESB100MC	1"	1,013	4.56	2.01	1.62
ES125MC	ESB125MC	1-1/4"	1,486	5.69	2.88	—
ES150MC	ESB150MC	1-1/2"	1,580	5.69	2.88	—



Features

- Compact
- Lightweight
- Easy to Install
- Excellent Noise Reduction
- Protects Components from Contamination
- NPT and BSPT Threads Available

Part Number		Thread Size	A (mm)	B (mm)	Maximum Flow (SCFM) 100 PSIG Inlet	Sound Pressure Level (dBA)	
NPT	BSPT					20 PSIG Inlet	100 PSIG Inlet
AS-5		M5	0.43 (11)	0.32 (8)	15	69	79
ASN-6	AS-6	1/8"	1.57 (40)	0.63 (16)	51	69	81
ASN-8	AS-8	1/4"	2.56 (65)	0.83 (21)	124	67	84
ASN-10	AS-10	3/8"	3.35 (85)	0.98 (25)	247	83	98
ASN-15	AS-15	1/2"	3.74 (95)	1.18 (30)	370	69	96

Application

The plastic silencer is designed to give excellent noise reduction with a minimum effect on air efficiency. The "Trimline" design allows for locating the silencer in the tightest places without extra plumbing or fittings. Fits directly into the exhaust port of most commercial valves. Open surface area of element allows for rapid discharge of air without undesirable back pressure.

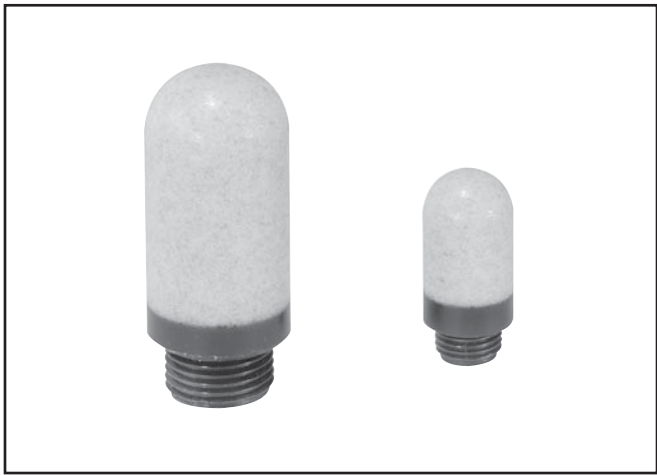
Specifications

Pressure Rating.....0 to 150 PSIG
(0 to 10 bar, 0 to 1034 kPa)

Temperature Rating 14°F to 140°F (-10°C to 60°C)

BodyAcetal (Plastic)

ElementPolyethylene



Features

- All Plastic Ultra Light Weight Versions
- High Noise Level Reduction
- Low Back Pressure Generation

Application

The plastic silencer is designed to give excellent noise reduction with a minimum effect on air efficiency. The “Trimline” design allows for locating the silencer in the tightest places without extra plumbing or fittings. Fits directly into the exhaust port of most commercial valves. Open surface area of element allows for rapid discharge of air without undesirable back pressure.

Port Thread	A	Diameter B	C	Weight (grams)	Part Number
M5	0.91 (23)	0.26 (6,5)	0.16 (4)	0.01	P6M-PAC5
G1/8	1.14 (29)	0.55 (14)	0.24 (6)	0.02	P6M-PAB1
G1/4	1.34 (34)	0.67 (17)	0.24 (6)	0.04	P6M-PAB2
G3/8	2.36 (60)	0.98 (25)	0.35 (9)	0.06	P6M-PAB3
G1/2	2.52 (64)	0.98 (25)	0.43 (11)	0.10	P6M-PAB4
G3/4	5.51 (140)	1.50 (38)	0.55 (14)	0.50	P6M-PAB5
G1	6.30 (160)	1.89 (48)	0.79 (20)	0.62	P6M-PAB6

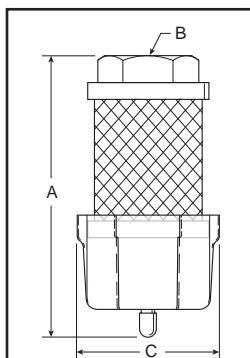
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Specifications

Pressure Rating.....0 to 246 PSIG
(0 to 17 bar, 0 to 1700 kPa)

Temperature Rating

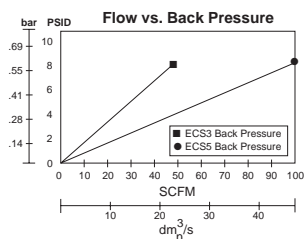
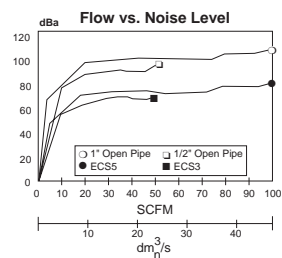
Plastic 14°F to 176 °F (-10°C to 80°C)
Metal..... 14°F to 165 °F (-10°C to 74°C)
Efficiency 92%



Dimensions:

Model	A	B	C
ECS3	5.30 (135 mm)	1/2" NPT	2.57 (65 mm)
ECS5	7.30 (185 mm)	1" NPT	2.57 (65 mm)

Performance Characteristics



Features

The ECS (Muffler-Reclassifier) eliminates unwanted oil mist and reduces exhaust noise from pneumatic valves, cylinders and air motors.

- 99.97% Oil Removal Efficiencies
- 25 dBA Noise Attenuation
- 1/2" NPT and 1" NPT
- Disposable Units
- Continuous or Plugged Drain Option
- Metal Retained Construction
- Fast Exhaust Time

Improve Overall Plant Environment

Exhaust oil mist and noise pollution have a direct impact on worker productivity.

Oil aerosol mist from lubricators and compressors is pervasive and enters the industrial plant environment through the exhaust ports of valves, cylinders and air motors. This rapidly expanding exhaust also produces sudden and excessive noise.

The ECS (Muffler-Reclassifier) is 99.97% efficient at removing the oil aerosols. The ECS also acts as a silencer to lower the dBA levels below O.S.H.A. requirements.

The result is a cleaner, quieter environment which equates to greater work productivity and safety.

Operation

Compressor oils and lubricating oils are exhausted from valves, cylinders and air motors into the ECS. Oil aerosols are "coalesced" into larger droplets and gravity pulls them into the attached drain sump. The sump can then be drained manually or by using a 1/4" ID plastic tube drain. The air flowing into the ECS is also muffled or silenced as it enters the inside of the ECS and passes through the filter media into the atmosphere.

Proven Technology

The ECS units are constructed from the same materials that go into our oil removal coalescing filter elements.

The seamless design insures media uniformity and strength. This proven technology provides high coalescing efficiency with low pressure drop.

The filter media is supported by cylindrical perforated steel retainers both inside and out. These retainers, fully plated for excellent corrosion resistance, give the ECS units high rupture strength in either flow direction. These filters can also be used as high efficiency inlet or bypass filters for vacuum pumps, or breather elements to protect the air above critical process liquids.

ECS3 / ECS5

The ECS solves two problems inherent in compressed air exhaust from valves, cylinders and air motors - oil mist removal and noise abatement.

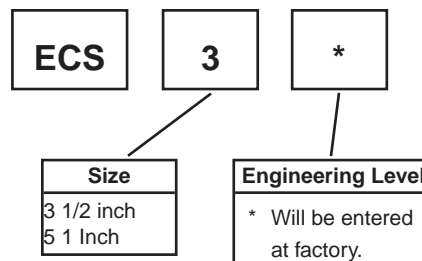
The ECS will improve your industrial plant environment, thereby improving worker productivity.

Specifications

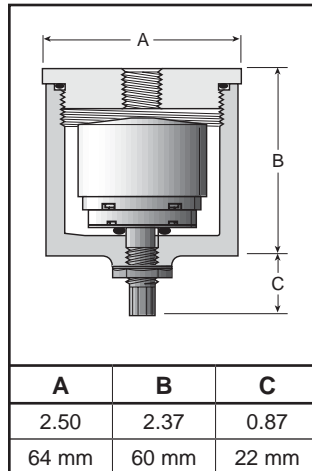
Maximum Operating Temperature 125°F (52°C)

Maximum Line Pressure..... 100 PSIG (6.8 bar)

Ordering Information



Automatic Drip Leg Drain



Features

- Auto drain ported 1/8" to pipe away liquid.
- Drain has manual override.
- Easily serviced without tool.
- 20-250 PSIG range.
- Compact size.



Specifications

Housing & Cap..... Aluminum

Port Threads..... 1/4" - 1/2" Top
1/8" Drain

Pressure and Temperature Ratings:

Metal Bowl..... 20 to 250 PSIG (0 to 17.2 bar)
32°C to 175°F (0°C to 80°C)

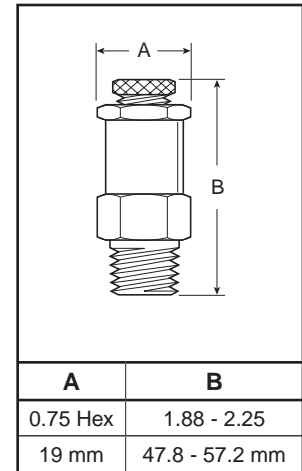
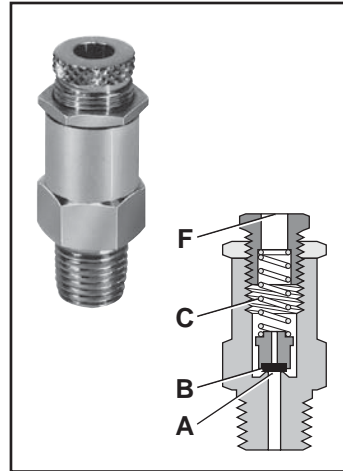
Seals..... Buna N

Ordering Information

Consists of Drip Leg Drain Housing WITH Auto Drain.

Model No.	Size
06D1NA	1/4"
06D3NA	1/2"

Relief Valve



Features

- Large Relief Capacity (70.39 SCFM @ 150 PSI when fully opened) in a Compact Size
- Lightweight aluminum construction with resilient seat.

Application

The RV01A1N Pop Off Relief Valve is designed to protect against excessive pressure buildup in a pneumatic circuit or system.

Operation*

With the relief valve mounted in a reservoir or system, the force of system pressure at (A) is offset by the force of spring (C) acting on poppet seat (B). At pressures lower than the setting, the poppet seat (B) is held against the body at (A) effecting a seal. As pressure approaches set point, the poppet begins to vent until set point is reached, at which time the poppet seat (B) lifts off the body at (A) allowing the excess pressure to vent to atmosphere at (F). When the excess pressure has been vented, the spring (C) acts on the poppet seat (B) forcing it to seat on the body at (A), sealing off the flow of air.

Specification

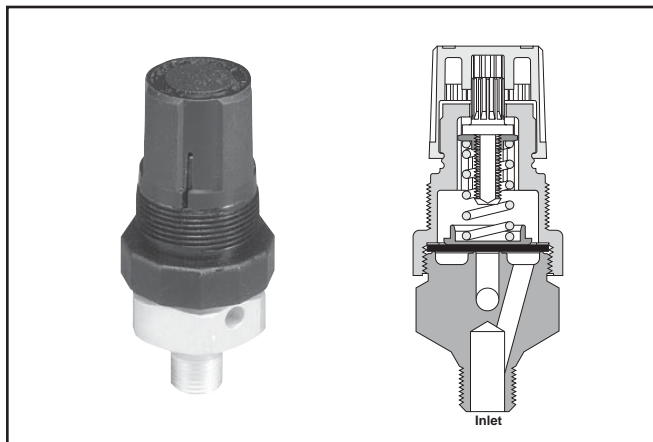
Body & Adjusting Screw..... Aluminum
Locking Nut..... Steel
Seat..... Nitrile
Spring..... Steel
Poppet..... Plastic
Operating Temperature..... 32°F to 200°F (0°C to 93°C)
Port Threads..... 1/4 Inch Male
Relief Range..... 10 to 200 PSIG (.7 to 14 bar)
with standard spring.

* Ref: 1RV100B Installation & Service Instructions

Ordering Information

RV01A1N	XXX	Seals
10 -200 PSI	Blank	BUNA
	V	Fluorocarbon

130 Relief Valve



Features

- Compact, sensitive diaphragm-type relief valve.
- Push-pull, locking knob.
- Knob and top work the same as a miniature regulator.
- 130 has lightweight aluminum construction.
- 134 has a brass body, captured exhaust and is an inline type with 3 inlet ports and 1 outlet port.

Applications

- Designed to protect against excessive pressure buildup in a pneumatic circuit or system.
- For use where gradual proportional relief is required.

Operation

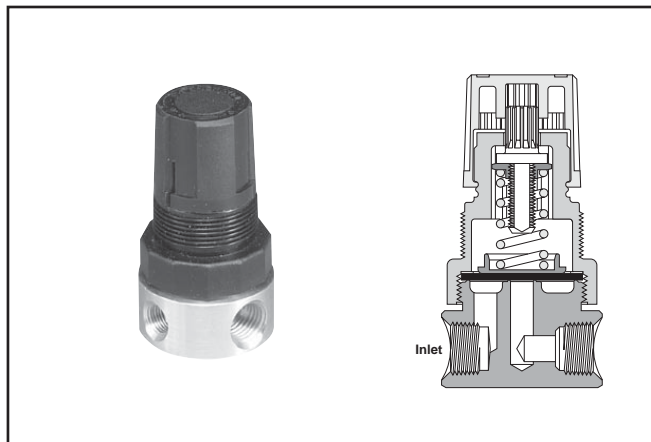
- Turn relief valve knob clockwise for maximum pressure.
- Set pressure going into relief valve at desired pressure.
- Turn relief valve knob counter-clockwise until exhaust starts to bleed.
- Turn relief valve knob clockwise until exhaust stops bleeding. Push to lock knob.

Ordering Information

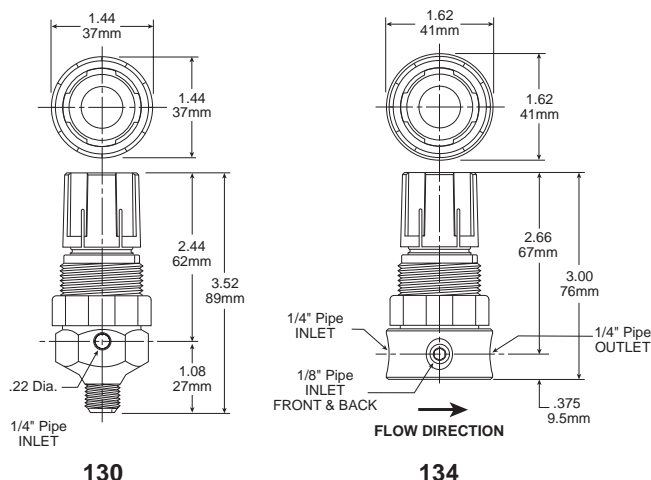
Relief Valve	Spring Range			
	0-15 PSIG	0-25 PSIG	0-50 PSIG	0-100 PSIG
130	130-02AA	130-02A	130-02B	130-02C
	130-02AAP*	130-02AP*	130-02BP*	130-02CP*
134	134-02AA	134-02A	134-02B	134-02C
	134-02AAP*	134-02AP*	134-02BP*	134-02CP*

* Panel mount nut included.

134 Relief Valve



Dimensions



Relief Valve Kits

Bonnet Assembly Kit	PCKR364Y
Panel Mount Nut	PR05X51

Specifications

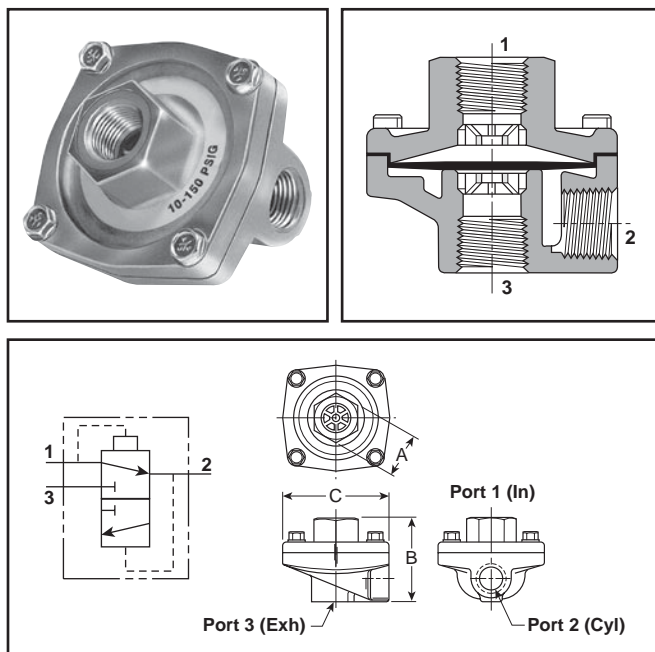
Relief Range	0 to 100 PSIG (0 to 6.9 bar)
Maximum Inlet Pressure	300 PSIG (20.7 bar)
Operating Temperature	40°F to 120°F (4°C to 49°C)

Port Threads:

130	1/4" Pipe Male Only
134	Inlet Port – Two 1/8" & One 1/4" Pipe Outlet Port – 1/4" Pipe

Materials of Construction

Adjusting Knob	Polypropylene
Adjusting Screw	Zinc-plated Steel
Body	Aluminum (130); Brass (134)
Diaphragm / Disc	Buna-N
Nut	Chromated Steel
Spring Cage	Acetal
Spring	Zinc-plated Steel



General Information

Quick exhaust valves provide rapid exhaust of control air when placed between control valve and actuator. They can also be used as shuttle valves. Diaphragm materials are available in urethane, Nitrile, Fluorocarbon, and PTFE to meet a wide variety of operating conditions.

Valve Specifications

Operating Pressure (Air)

Maximum:

150 PSIG

200 PSIG for Model No. 0R37TB (PTFE diaphragm)

Minimum:

3 PSIG

50 PSIG for Model No. 0R37TB (PTFE diaphragm)

Operating Temperature:

Urethane: 0°F to 180°F* (-18°C to 80°C)

Nitrile: 0°F to 180°F* (-18°C to 80°C)

Fluorocarbon: 0°F to 400°F* (-18°C to 205°C)

PTFE: 0°F to 500°F* (-18°C to 260°C)

* Ambient temperatures below freezing require moisture-free air.
Ambient temperatures below freezing and above 180° require lubricants especially selected for suitability at these temperatures.
Pneumatic valves should be used with filtered and lubricated air.

Component Materials

Body Material..... Die cast aluminum

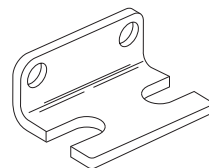
Static Seals..... Nitrile standard with urethane
(Others see below)

Diaphragm Standard – Urethane
Optional – Fluorocarbon, PTFE, or Nitrile
(Depending on size)

Mounting Bracket Kit – No. 03640 8100

(Including body screws)

For "0R12" and "0R25" sizes
with 7/8" "A" Dimension.

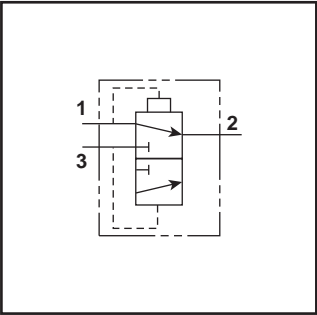


Model Selection, Performance Data and Dimensions

Port			Flow (SCFM†)	Model Number		A	B	C	Service Kit No.
1	2	3		NPTF	BSPP “G”				
STANDARD URETHANE DIAPHRAGMS (Nitrile static seals)									
1/4"	1/4"	3/8"	150	0R25NB	0RB25NB	1" Hex	2.06	2.44	03340 0105
	3/8"	3/8"	240	0R25PB	—	1" Hex	2.06	2.44	03340 0105
3/8"	3/8"	3/8"	240	0R37B	0RB37B	1" Hex	2.06	2.44	03340 0105
1/2"	1/2"	1/2"	450	0R50B	0RB50B	1-1/2" Hex	2.88	3.38	03475 0109
3/4"	3/4"	3/4"	550	0R75B	0RB75B	1-1/2" Hex	2.88	3.38	03475 0109
NITRILE DIAPHRAGMS (Nitrile static seals)									
1/8"	1/8"	1/8"	70	0R12B	0RB12B	7/8" Sq.	1.75	1.88	03640 8000
	1/8"	1/4"	70	0R12NB	0RB12NB	7/8" Sq.	1.75	1.88	03640 8000
1/4"	1/4"	1/4"	90	0R25B	0RB25B	7/8" Sq.	1.75	1.88	03640 8000
	1/4"	3/8"	90	0R25NFB	0RB25NFB	7/8" Sq.	1.75	1.88	03340 8000
3/8"	3/8"	3/8"	240	0R37FB	0RB37FB	1" Hex	2.06	2.44	03340 8000
3/4"	3/4"	3/4"	550	0R75FB	0RB75FB	1-1/2" Hex	2.88	3.38	03475 9000
FLUOROCARBON DIAPHRAGMS for extended temperature operation (Fluorocarbon static seals)									
1/8"	1/8"	1/8"	70	0R12VB	0RB12VB	7/8" Sq.	1.75	1.88	03650 8000
	1/8"	1/4"	70	0R12NVB	0RB12NVB	7/8" Sq.	1.75	1.88	03650 8000
1/4"	1/4"	1/4"	90	0R25VB	0RB25VB	7/8" Sq.	1.75	1.88	03650 8000
3/8"	3/8"	3/8"	240	0R37VB	0RB37VB	1" Hex	2.06	2.44	03340 0319
1/2"	1/2"	1/2"	450	0R50VB	0RB50VB	1-1/2" Hex	2.88	3.38	03475 0120
3/4"	3/4"	3/4"	550	0R75VB	0RB75VB	1-1/2" Hex	2.88	3.38	03475 0120
PTFE DIAPHRAGMS for higher pressure and temperature (Fibre static seals)									
3/8"	3/8"	3/8"	240	0R37TB	0RB37TB	1" Hex	2.06	2.44	03340 0504

† At 100 PSIG inlet pressure with full pressure drop.

BOLD ITEMS ARE MOST POPULAR.



General Information

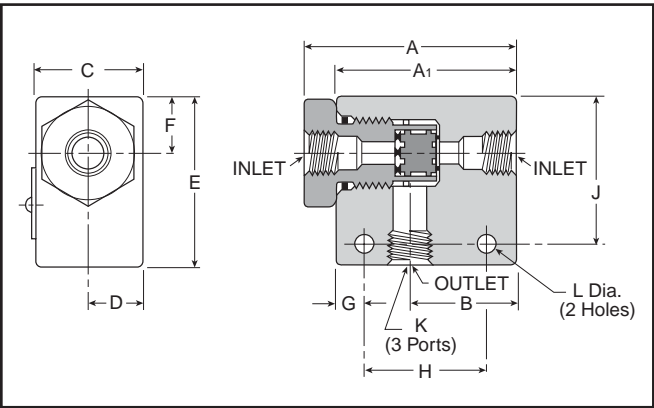
Shuttle valves determine a single pneumatic output from two separate inputs. If pressure is applied to both ports simultaneously, the valve will select the port with the higher pressure.

Valve Specifications

Maximum Operating Pressure.....200 PSIG Maximum
3 PSIG Minimum: Differential Pressure

Operating Temperature0° to 160°F*

* Ambient temperatures below freezing require moisture-free air. Ambient temperatures below freezing and above 180° require lubricants especially selected for suitability at these temperatures. Pneumatic valves should be used with filtered and lubricated air.



Component Materials

Body Material..... Aluminum
Internal Components..... Aluminum
Seals Nitrile

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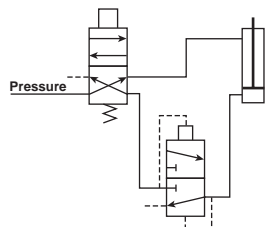
Model Selection and Dimensions

Model Number	Port Size	Dimensions											
		A	A1	B	C	D	E	F	G	H	J	K	L
N164 1001	1/8"	N/A	1.62	0.81	0.62	0.31	1.00	0.281	0.312	1.00	0.75	1/8 - 27	0.219
N164 2003	1/4"	2.50	2.12	1.25	1.25	0.62	2.00	0.67	0.265	1.25	1.35	1/4 - 18	0.219
N164 3003	3/8"	2.50	2.12	1.25	1.25	0.62	2.00	0.67	0.265	1.25	1.35	3/8 - 16	0.219

Performance Data – Flow

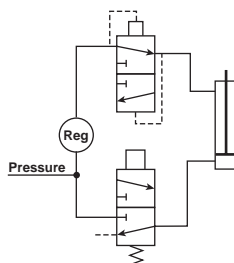
Model Number	Port Size	Flow (Cv)
N164 1001	1/8"	0.32
N164 2003	1/4"	1.65
N164 3003	3/8"	2.02

Typical “Quick Exhaust Valve” Applications



Rapid Retraction – Double Acting Cylinder

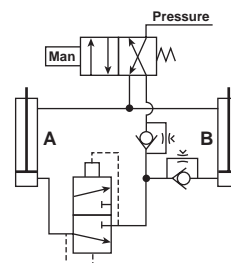
In this circuit, air is exhausted through a Quick Exhaust Valve that is **close coupled** to the cap end of the cylinder. Because the Quick Exhaust Valve has a greater exhaust capacity than the four-way Control Valve, increased cylinder speed can be accomplished with a smaller and less expensive control valve.



Dual Pressure Actuation of Double Acting Cylinder

This circuit utilizes a Quick Exhaust Valve and a three-way Control Valve to permit rapid extension of the cylinder at a high pressure. Under life.

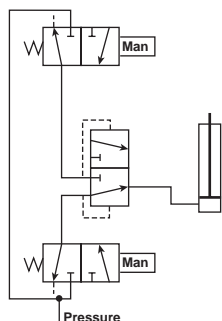
NOTE: Line pressure must be 3 or 4 times greater than rod end pressure. Effective working pressure is the differential between the cap and rod end.



Bi-Directional Control of Two Double Acting Cylinders

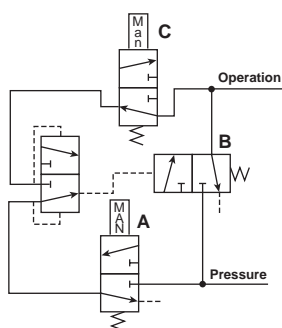
This circuit provides maximum control with a minimum of valving. A large four-way Control Valve is not needed to permit the rapid retraction of Cylinder A, as the Quick Exhaust Valve performs this function. The extension of Cylinders A and B and retraction of Cylinder B are controlled by Speed Control Valves.

Typical “Shuttle Valve” Applications



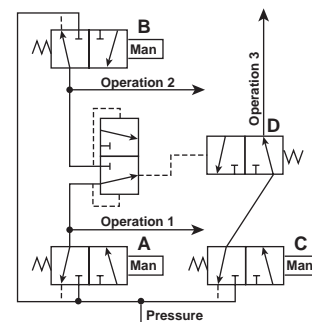
“OR” Circuit

The most common application of the Shuttle Valve is the “OR” Circuit. Here a cylinder or other work device can be actuated by either control valve. The valves can be manually or electrically actuated and located in any position.



Memory Circuit

This circuit enables continuous operation once initiated. Pressure is delivered to the circuit when Valve A is actuated. This allows pressure to pass through the shuttle valve actuating Valve B. Pressure then flows through Valve B and also the other side of the shuttle valve which holds Valve B open for continuous operation. To unlock the circuit, Valve C must be opened to exhaust the circuit and allow Valve B to return to its normally closed position.

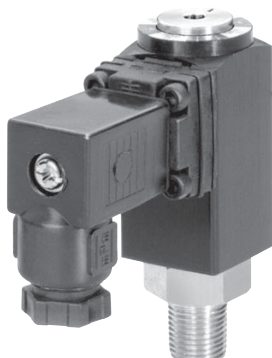
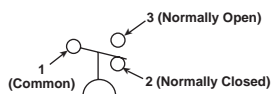


Interlock

This circuit prevents the occurrence of a specific operation while one or another operation takes place. When either Valve A or B is actuated to perform operation 1 or 2, Valve D is shifted to the closed position and prevents operation 3 from occurring.

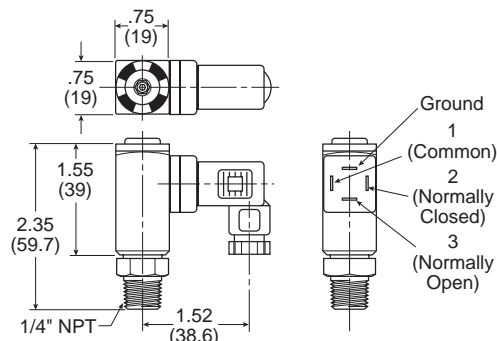


Pressure Switch – P01909



Features:

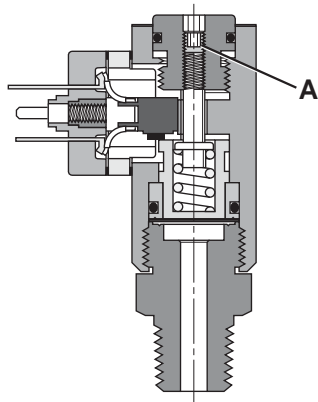
- Inline mounting
- Dial indicator for easy pressure setting
- 5 amp rated snap action micro switch
- Heavy duty Aluminum components
- Compact size
- DIN 43650HCM connector
- IP65 Rated
- Field adjustable 30-150 PSIG
- +/- 2% repeatability
- Single pole/Double throw switch



Operation

The pressure switch monitors the air pressure in your pneumatic system. When the pressure in your system either drops below or exceeds the set point pressure, an electrical output is given.

Using a 0.125" (3mm) hex wrench, turn the adjusting screw **(A)** clockwise to increase the pressure set point and counterclockwise to decrease the pressure setting. One complete revolution of the adjusting screw covers the complete adjustment range of 30 to 150 PSIG (2 to 10 bar).



Definitions and Terminology

Repeatability — Accuracy is the maximum allowable set point deviation of a single pressure or temperature switch under one given set of environmental and operational conditions.

Single Pole Double Throw (SPDT) Switching element — A SPDT switching element has one normally open, one normally closed and one common terminal. Three terminals mean that the switch can be wired with the circuit either normally open (NO), or normally closed (NC), or both.

Dead Band — The dead band, sometimes referred to as "differential" or "hysteresis", is the change in pressure between actuation and deactuation set points.

F

Kits and Accessories

Bushing 1/4" to 3/8"	209P-6-4
Bushing 1/4" to 1/2"	209P-8-4

Specifications

Electrical	5 AMP, 12/24VDC, 125/250VAC
Maximum Inlet Pressure	300 PSIG (20 bar)
Mechanical Life	10 ⁶ at standard operating conditions
Electrical Connection	DIN 43650HCM
Electrical Protection	IP65
Repeatability	±2% at 70°F (20°C) Ambient
Temperature Range	-40°F to 180°F (-40°C to 80°C)
Weight	0.13 lb. (0.06 Kg)

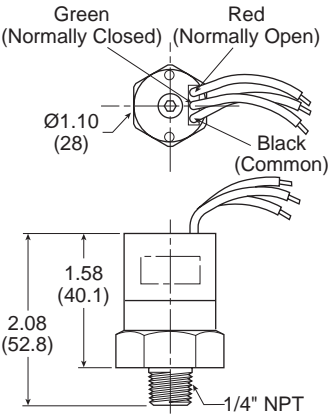
Materials of Construction

Diaphragm	Nitrile
Housing	Anodized Aluminum

Pressure Switch – P01908



- Features:**
- Inline mounting
 - 5 amp rated snap action micro switch
 - Brass body
 - Compact size
 - Flying leads electrical connection
 - IP65 Rated
 - Field adjustable 25-100 PSIG
 - +/- 2% repeatability
 - Single pole/Double throw switch

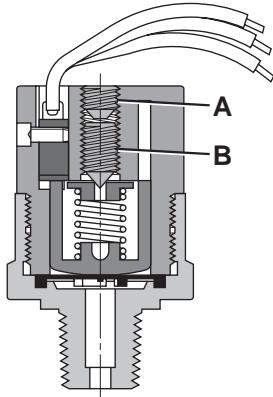


Operation

The pressure switch monitors the air pressure in your pneumatic system. When the pressure in your system either drops below or exceeds the set point pressure, an electrical output is given.

Remove screw **(A)** from the top of the switch. Using a 0.125" (3mm) hex wrench, turn the adjusting screw **(B)** clockwise to increase the pressure set point and counterclockwise to decrease the pressure setting, replace screw **(A)**. Adjustment range of 25 to 100 PSIG (1.7 to 7.5 bar).

- Standard electrical circuit**
- Black.....Common
- Green.....Normally Closed
- Red.....Normally Open



Definitions and Terminology

Repeatability — Accuracy is the maximum allowable set point deviation of a single pressure or temperature switch under one given set of environmental and operational conditions.

Single Pole Double Throw (SPDT) Switching element — A SPDT switching element has one normally open, one normally closed and one common terminal. Three terminals mean that the switch can be wired with the circuit either normally open (NO), or normally closed (NC), or both.

Dead Band — The dead band, sometimes referred to as “differential” or “hysteresis”, is the change in pressure between actuation and deactuation set points.



Kits and Accessories

- Bushing 1/4" to 3/8"209P-6-4
- Bushing 1/4" to 1/2"209P-8-4

Specifications

- Electrical** 5 AMP, 12/24VDC, 125/250VAC
- Maximum Inlet Pressure**300 PSIG (20 bar)
- Mechanical Life**2x10⁶ at 75 PSIG (5 bar)
- Electrical Connection** 18" Flying Leads
- Electrical Protection** IP65
- Repeatability** ±2% at 70°F (20°C) Ambient
- Temperature Range** -40°F to 180°F (-40°C to 80°C)
- Weight** 0.23 lb. (0.11 Kg)

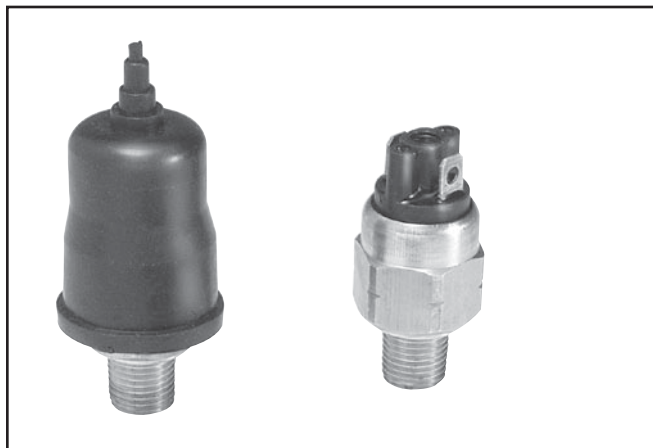
Materials of Construction

- Diaphragm**Nitrile
- Housing**Brass

Mobile Pressure Switch

P04159 – Normally Closed

P04160 – Normally Open



Features:

- Inline Mounting
- 4 Amp Rated Snap Action Micro Switch
- Brass Body
- Compact Size
- Spade Electrical Connection
- Field Adjustable 15 to 150 PSIG
- Rubber Boot Protection
- $\pm 5\%$ Repeatability @ 70°F (20°C) Ambient Temperature
- Temperature Range -40°F to 220°F (-40°C to 105°C)

Applications

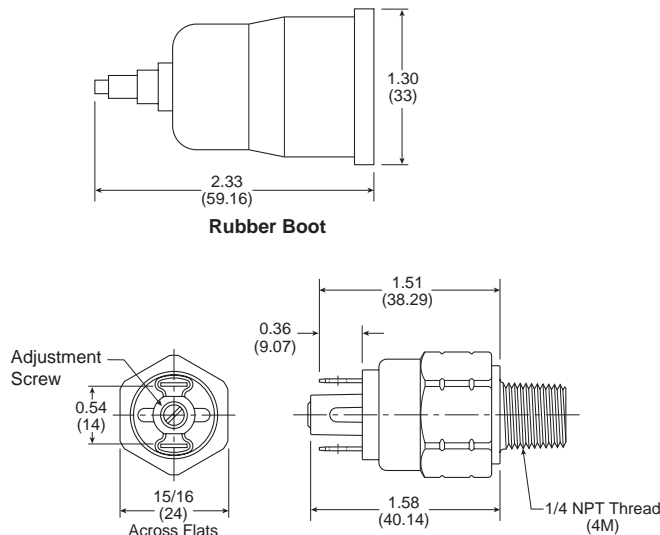
These Pressure Switches are intended for use in mobile, general-purpose, compressed air systems. Product is suitable for all trailer air-ride systems, truck suspension systems, associated bus door systems, and electro-pneumatic operations. The performance requirements and reliability are suitable for the extreme cold weather environment of North American winters.

Operation

The pressure switch monitors air pressure and provides an electrical output when the pressure drops below or exceeds an adjustable preset pressure.

Adjust the pressure switch using a flat head screwdriver; turn adjustment screw clockwise to increase set point or counterclockwise to decrease set point.

Dimensions



Kits and Accessories

Rubber Boot P04161

Specifications

Switch Position	
P04159	Normally Closed
P04160	Normally Open
Electrical Rating	100VA
Electrical Life	4 Amp in Rush @ 12VDC >2,000,000 Cycles
Maximum Inlet Pressure	300 PSIG (20 bar)
Mechanical Life	>2 x 10 ⁶ @ 75 PSIG (5 bar)
Electrical Connection	1/4 x 1/32 Spade
Electrical Protection	Rubber Boot
Repeatability	$\pm 5\%$ @ 70°F (20°C)
Ambient & Medium Temperature Range	-40°F to 220°F (-40°C to 105°C)
Weight	0.14 lb. (0.06 Kg)

Materials of Construction

Diaphragm.....	Kapton
Housing	Brass

Automatic Electrical Drain Valve WDV3-G



WDV3-G

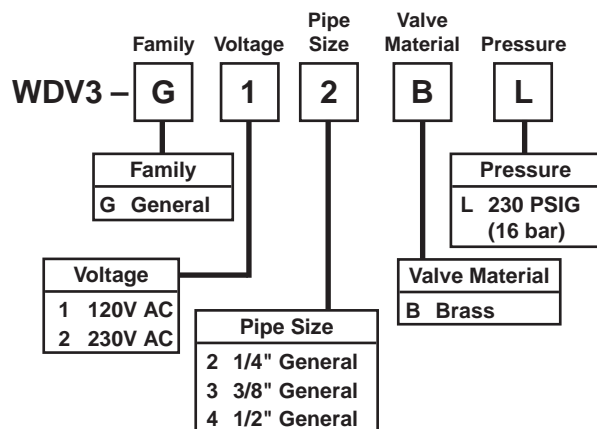
The WDV3 Electrical Drain is designed to remove condensate from compressors, compressed air dryers and receivers up to any size, type or manufacturer.

The WDV3 offers true installation simplicity and it is recognized as the most reliable and best performing condensate drain worldwide. The large orifice in the direct acting valve, combined with its sophisticated timer module ensure many years of trouble-free draining of condensate.

Benefits

- Does Not Air-Lock During Operation.
- Compressed Air Systems Up to Any Size.
- Also Available In Stainless Steel.
- The Direct Acting Valve Is Serviceable.
- Suitable for All Types of Compressors.
- TEST (Micro-Switch) Feature.
- High Time Cycle Accuracy.
- Large (4.5mm) Valve Orifice.

Ordering Information



Specifications

Operating Pressure 230 PSIG (15,9 bar)

Ambient Operating Range Temperature:

34° to 130°F (1,1° to 54°C)

Coil Insulation

Class H 340°F (171,1°C)

Voltages

AC 115, 230/50-60

Timer:

Open Time5 to 10 sec., Adjustable

Cycle Time5 sec. to 45 min., Adjustable

Maximum Current Rating 4mA Max.

Port Size 1/4, 3/8, 1/2 NPT

Weight 1.8 lb. (0,8 kg)

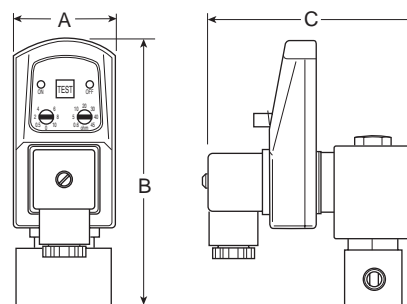
Materials of Construction

Valve Body Brass / Stainless Steel

Enclosure (NEMA 4) ABS Plastic

Internal Parts Brass / Stainless Steel

Sealing Material FPM (Fluorocarbon)



Front View

Side View

Model Selection and Dimensions

Model Number	A	B	C
WDV3-G**BL	1.73 (44)	4.53 (115)	3.46 (88)

Zero Loss Drain – WDV2



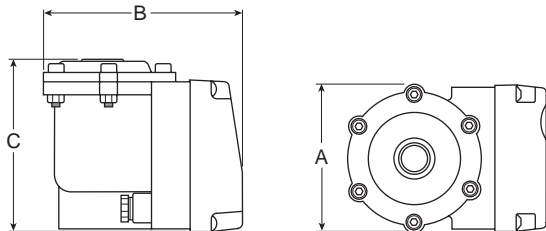
WDV2-425

Features

- Zero Air Loss.
- Automatically Self-Adjusting for Voltages from 110 to 230V.
- Sensor Device with No Moving Parts.
- Sophisticated Electronic Controls.
- Alarm with Remote Contacts.
- Large Inlet Port to Eliminate Clogging.
- Manual Push-to-Test Button.
- Automatically Clears Slugs.

Benefits

- Energy Efficient.
- World-Wide Applications.
- Long Life.
- High Reliability.
- Versatility, Early Warning.
- Low Maintenance.
- On Demand Operation.
- Maintenance Free.



Model Selection and Dimensions

Model Number	A	B	C
WDV2-425	3.23 (82)	4.61 (117)	4.65 (118)

Specifications

Drain Volume	0.01 Gallons / Cycle
Maximum Fluid Temperature	150°F (60°C)
Voltage	110 to 240V, 50/60 Hz
Inlet Ports (2)	1/2" NPT
Outlet Ports (1)	5/16" (8mm) I.D. Hose

Operating Conditions

Ambient Temperature	33° to 140°F (0° to 60°C)
Maximum Operating Pressure	232 PSIG (16 bar)

The WDV2 Electronic Demand Drain Valves, with zero air loss, are suitable for all compressed air system applications from aftercoolers to filters to receivers to refrigerated dryers. These drain valves activate automatically and are both reliable and economical.

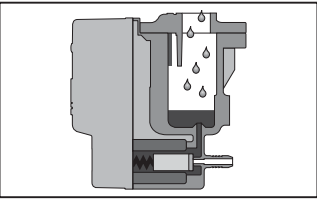
Alarm Mode

Should the drain fail to discharge due to an excessive volume of condensate or blocked outlet piping, an alarm condition is activated. During the alarm condition, the drain cycles continuously in an attempt to remove the excess condensate. At the same time, the volt free alarm contacts activate and the normally green power LED flashes as a problem. When the excess condensate or has been cleared, the drain will resume normal

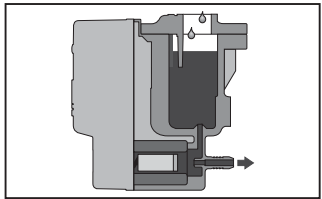
Electrical Drain Valve

Operation

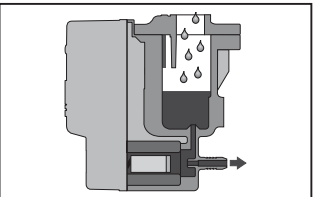
When power up, the outlet valve is closed and sensor is constantly monitoring for presence of liquid.



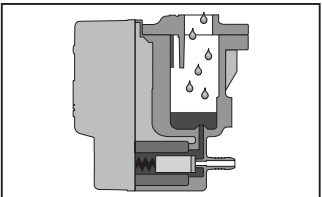
2. When condensate is detected by the sensor, the outlet valve is opened for a pre-set time.



3. The condensate is discharged from the outlet port, due to the system pressure acting on the top of the liquid.



4. The outlet valve is closed after a pre-set time has expired. The opening time has been calculated to always ensure a small amount of liquid remains in bowl. This liquid acts as a seal, preventing air loss.



Level monitoring and discharge operation are continuous.

*Don't Forget,
See Section A for more Accessory Products....*

<i>Regulation Modules.....</i>	<i>P2M2PXS</i> <i>N</i>
<i>Pressure Regulation Module with Gauge.....</i>	<i>P2M2PXS</i> <i>R</i>
<i>Dual P.O. Check Valve.....</i>	<i>P2M1PX</i> <i>CA</i>
<i>Dual Flow Control.....</i>	<i>P2M1PX</i> <i>FA</i>
<i>Complete Peripheral Module.....</i>	<i>P2M1PXS</i> <i>GF7F7</i>
<i>Vacuum Generator.....</i>	<i>P2M1PX</i> <i>VA</i>

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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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Safety Guide

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

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

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

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

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

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

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

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

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

9. Loss to Buyer's Property. Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

10. Special Tooling. A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

11. Buyer's Obligation; Rights of Seller. To secure payment of all sums due or otherwise, Seller shall retain a security interest in the goods delivered and this agreement shall be deemed a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest. Seller shall have a security interest in, and lien upon, any property of Buyer in Seller's possession as security for the payment of any amounts owed to Seller by Buyer.

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

13. Cancellations and Changes. Orders shall not be subject to cancellation or change by Buyer for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change product features, specifications, designs and availability with notice to Buyer.

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

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

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

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

18. Governing Law. This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement. Disputes between the parties shall not be settled by arbitration unless, after a dispute has arisen, both parties expressly agree in writing to arbitrate the dispute.

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

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

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

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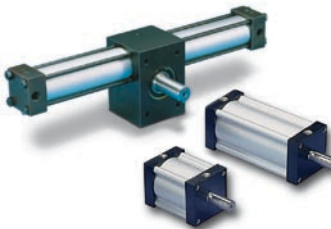
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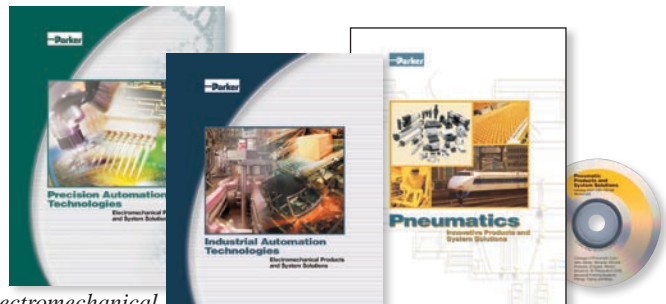
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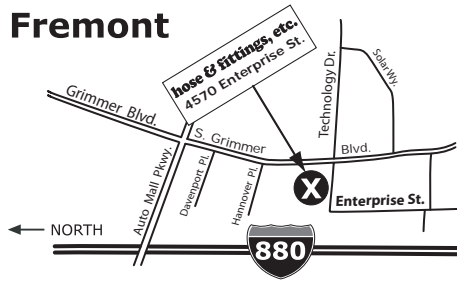
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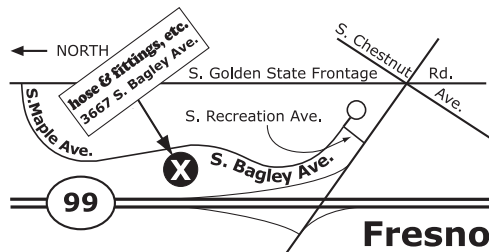
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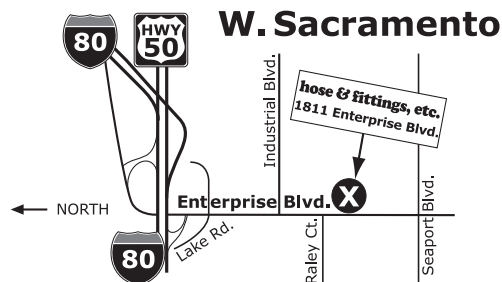
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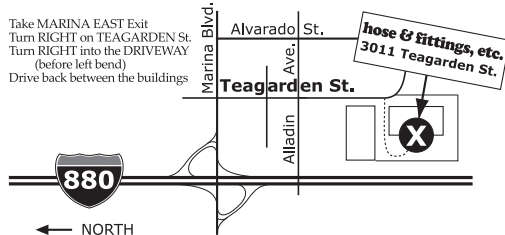


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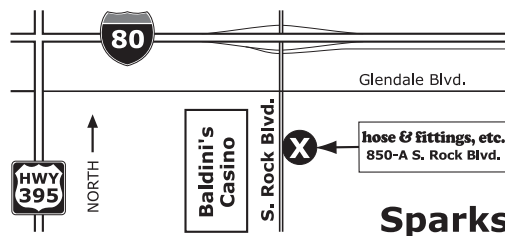


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