



PVD Series Power Valves

Stand alone/stackable with modular solenoid pilot system

PVD Series Power Valves

General Description

Telepneumatic offers the unique benefits of ceramic slide construction with the PVD Series Power Valves. Of the different valve technologies commonly available, the ceramic slide valve provides the most compact size and highest durability. These valves are offered in 4-way directional, 3-way master supply and 2-way slow start configurations. Both single acting-spring return and double acting models are available.

All valves may be mounted flush on the machine or ganged on 35mm (DIN) rail. Each valve comes complete for either stand alone or manifold assembly without the need for additional porting blocks, tie rods, bolts or special parts to change configurations. Integral exhaust checks are provided to prevent unwanted cylinder motion through neighboring valves in manifold applications. Piloting can be accomplished by either pneumatic signals (standard) or by easily adding a 5 watt solenoid selected to match system voltage requirements.

Body material is of high strength, glass filled polyamide which means less weight. Locating pins insure proper valve body to subbase assembly and high rigidity. Both NPT and BSP threads are available to satisfy either domestic or international requirements.



Features

- Durable
- Compact size
- 35mm (DIN) mounting
- Manifold all sizes
- Vacuum rated
- High flow

Benefits

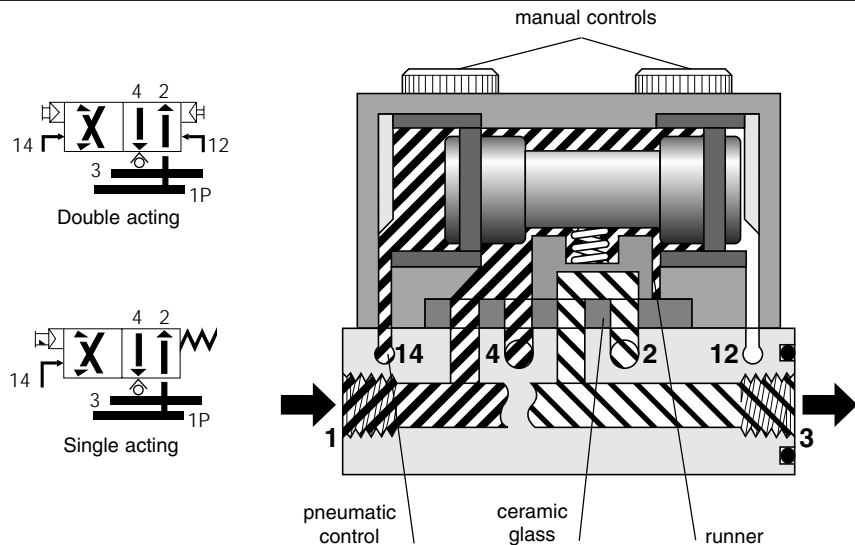
- Long life
- Space saving
- Reduced installation time
- Flexibility
- Wider cylinder range

Applications

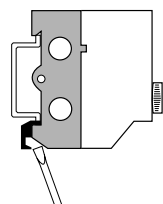
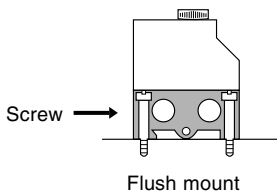
- Presses
- Fixtures
- Assembly equipment
- Robotics
- Packaging machines
- Material handling
- Machine tool
- Woodworking

Operation

The valve will shift the Delrin™ slide, connecting output port (2) to exhaust port (3) when pilot (14) is activated. At this time Main supply (1) is open to output (4). In the double acting valve shown to the right, pilot (12) must be activated to move the Delrin™ slide to the left connecting (1) supply to (2) output and (4) output to (3) exhaust. In the single acting, spring return type valve, removing pilot (14) will cause the spring to slide the valve to the left in place of pilot (12).



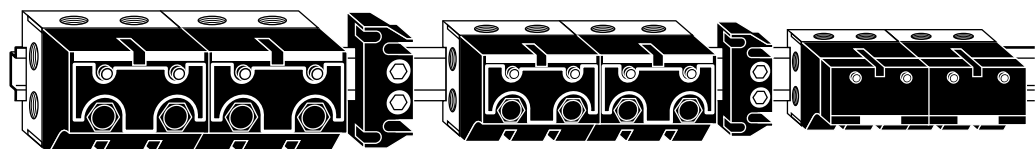
Mounting



Valves can be configured either stand alone or stackable. In either case, mounting can be by screws to flush mount or clipped onto a 35mm (DIN) rail. Units can be installed either in an enclosure or directly on the machine.

When a machine includes several cylinders in close proximity, it is practical to stack the valves involved in a bank installed near the cylinders: under the machine structure is often an area where free space is available. Different valve configurations and sizes can be mounted in the same stack by utilizing valve adaptor modules (page 7).

To form a bank of power valves, mount the subbases next to each other and join them together using the integral swivel screws (see page 5). Then mount the valve bodies onto the subbases.



Combination of three different sizes of power valves in the same bank

Power valves 4/2 with sub bases

Size 1/8"



PVDB1421287

Pneumatic or electrical piloting with manual override (1) (2)

Symbol	Connection	Piloting	Function	Catalog Number
	1P Threaded 3 1/8" NPT 4 2	Pneumatic	Double acting	PVDB1421287
			Single acting	PVDB1411287
	14 Instant 12 swivel 5/32" px M5	Electrical	Double acting	PVDB1424287
			Single acting	PVDB1414287

Size 1/4"



PVDC3422297

Pneumatic or electrical piloting with manual override (1) (2)

Symbol	Connection	Function	Catalog Number
	1P Threaded 2 1/4" NPT 3 4	Double acting	PVDC3422297
		Single acting	PVDC3412297
	12 Instant 14 swivel 5/32" px M5	Double acting	
		Single acting	

Size 3/8"



PVD-E2422237

Pneumatic and electrical piloting with manual override (1) (2)

Symbol	Connection (3)	Function	Catalog Number
	1P Threaded 3 1/2" NPT 4 Threaded 2 3/8" NPT	Double acting	PVDE2422237
		Single acting	PVDE2412237
	12 Instant 14 swivel 5/32" px M5	Double acting	
		Single acting	

(1) Electrical piloting by solenoid actuators **PVAF10••** (page 5).

(2) Single acting valves are equipped with latching manual overrides.

(3) Ports to cylinders (2 and 4) : threaded 3/8" NPT.
Supply and exhaust ports (1 and 3) : threaded 1/2" NPT.

Note : Sub bases for these valves are designed for either stand alone surface mount or stacking. Any unused supply ports (1P), regardless of mounting configuration, must be plugged.

Note: Valve bodies and sub bases are supplied unassembled, due to the requirement of mounting the sub base prior to mating with the valve body.

Master supply valves 3/2 and slow start valves 2/2 with sub bases

Master supply valves 3/2 - size 1/4"

Pneumatic or electrical piloting with non-latching manual override (1)



PVSC3312297

Symbol	Connection	Function	Catalog Number
	1P Threaded 2P 1/4" NPT	Double acting	PVSC3322297
	3 Threaded 3/8" NPT		
	10 Instant 12 swivel 5/32"	Single acting Spring return	PVSC3312297

Master supply valves 3/2 - size 1/2"

Pneumatic or electrical piloting with non-latching manual override (1)



PVSE2312227

Symbol	Connection	Function	Catalog Number
	1P Threaded 2P 1/2" NPT	Double acting	PVSE2322227
	3		
	10 Instant 12 swivel 5/32"	Single acting	PVSE2312227

Slow start valves 2/2 - size 1/4"

Pneumatic or electrical piloting with latching manual override (1)



PVPC3212297

Symbol	Connection	Function	Catalog Number
	1P Threaded 2P 1/4" NPT	Single acting	PVPC3212297
	10 Instant 12 swivel 5/32"		
	Supplied complete with interchangeable timing nozzles Ø 0.6, 0.9, and 1.2 mm		

Slow start valves 2/2 - size 1/2"

Pneumatic or electrical piloting with latching manual override (1)



PVPE2212227

Symbol	Connection	Function	Catalog Number
	1P Threaded 2P 1/2" NPT	Single acting	PVPE2212227
	12 Instant swivel 5/32"		
	Supplied complete with interchangeable timing nozzles Ø 1.0, 1.2, and 1.5 mm		

(1) Electrical piloting by solenoid actuators **PVAF10••** (page 5)

Note : Sub bases for these valves are designed for either stand alone surface mount or stacking. Any unused supply ports (1P), regardless of mounting configuration, must be plugged.

Solenoid actuators, mounting and auxiliary piloting

Solenoid actuator 5 W / 6 VA

With plunger and 22 x 30 mm plug-in electrical connector (1)



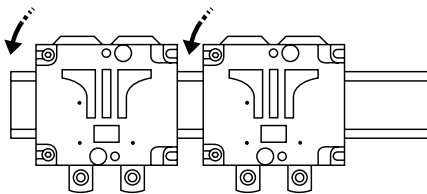
PVAF10**

Voltage	Consumption	Catalog Number
24 VDC	5 W	PVAF102B
48 VDC	5 W	PVAF102E
24 VAC 50 / 60 Hz	6 VA	PVAF101B
48 VAC 50 / 60 Hz	6 VA	PVAF101E
120 VAC 50 / 60 Hz	6 VA	PVAF101F
220 VAC 50 / 60 Hz	6 VA	PVAF101M

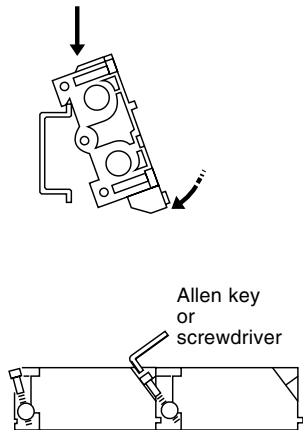
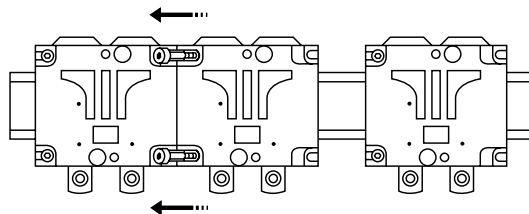
(1) Connector with cable gland. Screw type connectors to be used.

Mounting (stacking assembly)

Clip the sub bases onto 35mm DIN rail

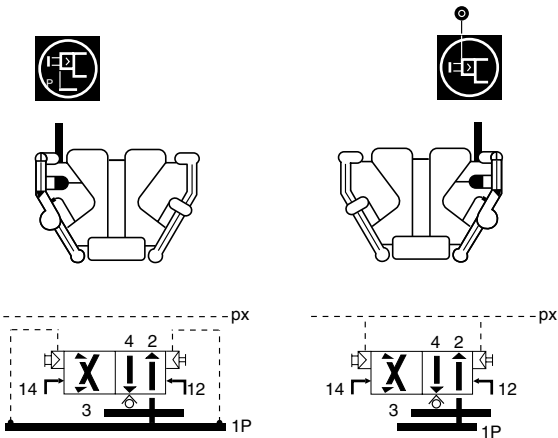


Join the sub bases together by swivelling and tightening the screws



Auxiliary piloting

PVD series valves require a minimum of 45 PSI for piloting. When low pressure or vacuum service is required, the gasket between the valve body and its sub base must be enabled. The location of the px port (external pressure) is shown on the drawing to the right.



Valve body / without sub base

(Revised Sept. 2004)

for power valves 4/2
for master supply valves 3/2
for slow start valves 2/2

Power valves 4/2 - size 1/8"



PVDB1421



PVDB1424

Symbol	Piloting	Mounting	Function	Catalog Number
	Pneumatic	on sub base PVUB14287	Double acting	PVDB1421
			Single acting	PVDB1411
	Electrical by solenoid actuator (1)	on sub base PVUB14287	Double acting	PVDB1424
			Single acting	PVDB1414

Power valves 4/2 - sizes 1/4" and 3/8"



PVDC3422

Symbol	Piloting	Size and mounting	Function	Catalog Number
	Pneumatic or	1/4" on sub base PVUC34297	Double acting	PVDC3422
			Single acting	PVDC3412
	Electrical by solenoid actuator (1)	3/8" on sub base PVUE14237	Double acting	PVDE2422
			Single acting	PVDE2412

Master supply valves 3/2 - sizes 1/4"



PVSC3312

Symbol	Piloting	Size and mounting	Function	Catalog Number
	Pneumatic or	1/4" on sub base PVUC33297	Double acting	PVSC3322
			Single acting	PVSC3312
	Electrical by solenoid actuator (1)			

Slow start valves 2/2 - sizes 1/4" and 1/2"



PVPC3212

Symbol	Piloting	Size and mounting	Function	Catalog Number
	Pneumatic or	1/4" on sub base PVUC32297	Single acting	PVPC3212
	Electrical by solenoid actuator (1)	1/2" on sub base PVUE12227	Single acting	PVPE2212

(1) 5W/6VA type PVA10** (Page 5)

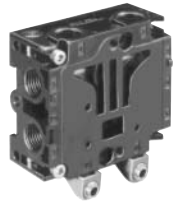
PVD sub bases

(Revised Sept. 2004)

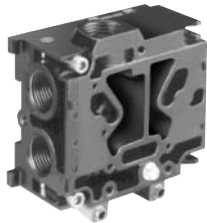
for power valves 4/2
for master supply valves 3/2
for slow start valves 2/2



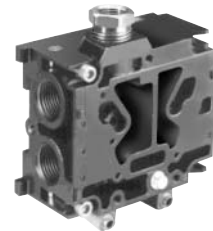
PVUB14287



PVUC34297



PVUC33297



PVUE12227

Sub bases for 4 way power valves

Connection	Pilot Connection	Catalog Number BSP	Catalog Number NPT
1P 3 1/8" threaded 4 2	instant swivel 5/32" OD tubing	PVUB1428	PVUB14287
1P 3 1/4" threaded 4 2	instant swivel 5/32" OD tubing	PVUC3429	PVUC34297
1P 3 1/2" threaded 4 2	instant swivel 5/32" OD tubing	PVUE1423	PVUE14237

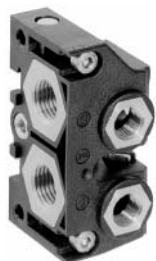
Sub bases for master supply valves

Connection	Pilot Connection	Catalog Number BSP	Catalog Number NPT
1P 3 1/4" threaded 4 2	instant swivel 5/32" OD tubing	PVUC3329	PVUC33297

Sub bases for slow start valves

Connection	Pilot Connection	Catalog Number BSP	Catalog Number NPT
1P 3 1/4" threaded 4 2	instant swivel 5/32" OD tubing	PVUC3229	PVUC32297
1P 3 1/2" threaded 4 2	instant swivel 5/32" OD tubing	PVUE1222	PVUE12227

Valve adaptor modules



PVUCB187

Description	Connectors	Catalog Number
Sub base union 1/4" - 1/8"	1P Threaded 2 1/4" NPT	PVUCB187
	1a Threaded 2a 1/8" NPT	
Sub base union 1/2" - 1/4"	1P Threaded 2 1/2" NPT	PVUEC197
	1a Threaded 2a 1/4" NPT	

Utilization

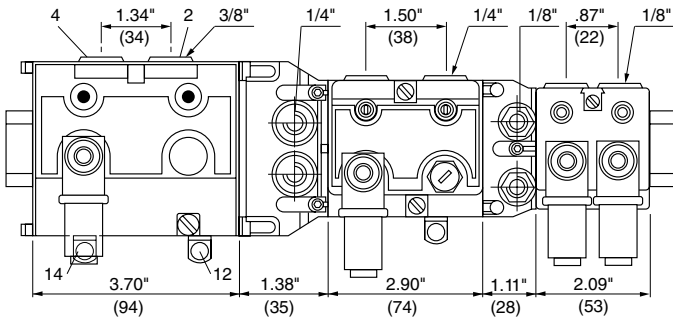
The valve adaptor module allows the combination of different size power valves within the same stack. This module also provides the means to add additional supply and exhaust ports, if required. Some applications may require the isolation of multiple supply pressures. The adaptor allows the isolation of upstream pressure, while introducing the secondary downstream supply. The valve adaptor can be used to provide a large number of arrangements.

Power valves 4/2, 3/2 and 2/2

(Revised Sept. 2004)

with sub bases -- dimensions

Power valves 4/2 - Sizes 3/8", 1/4", 1/8" in combination

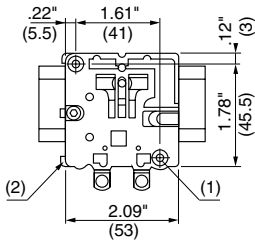


4 and 2 : output ports to cylinders

14 and 12 : piloting ports (5/32" instant swivel)

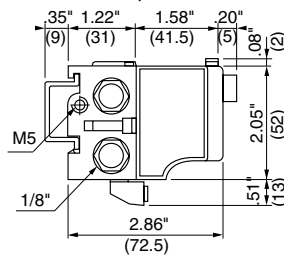
Power valves 4/2 - Size 1/8"

PVDB14**** Sub base



- (1) 2 mounting holes Ø 5/32", for 6-32 screw
- (2) Screwdriver 5 mm

Complete device



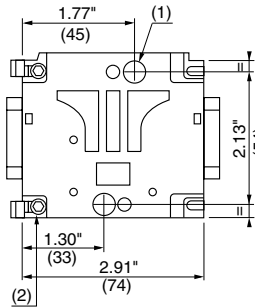
E : exhaust

px : auxiliary pressure

P : supply pressure

Power valves 4/2, unloading valves 3/2, slow start valves 2/2 - size 1/4"

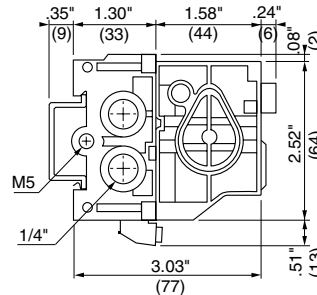
PVDC34****, PVSC33**** and Sub base



- (1) 2 mounting holes Ø 7/16" for 10-32 screw
- (2) Allen key 3 mm

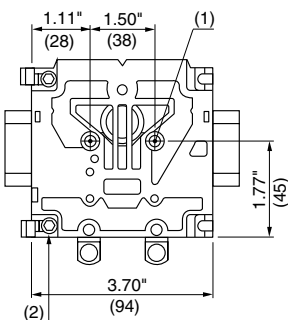
PVPC321229

Complete device

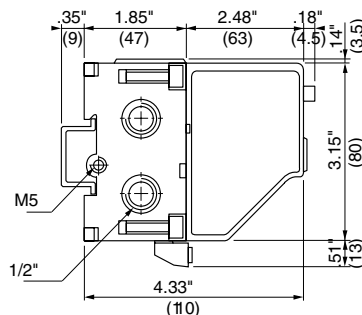


Power valves 4/2, unloading valves 3/2, slow start valves 2/2 - size 3/8" and 1/2"

PVDE24****, PVPE22**** Sub base



Complete device



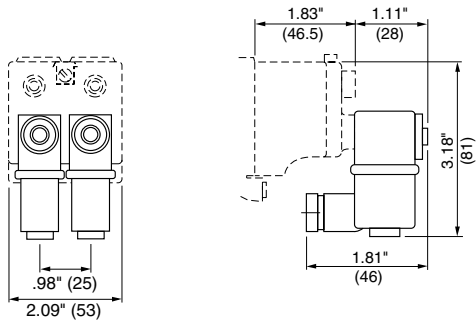
- (1) 2 mounting holes Ø 3/8", for 8-32 screw
- (2) Allen key 4 mm

Power valves 4/2, 3/2 and 2/2

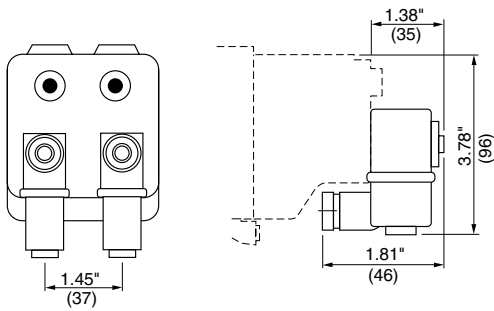
with sub bases -- dimensions

Electrical solenoid actuators

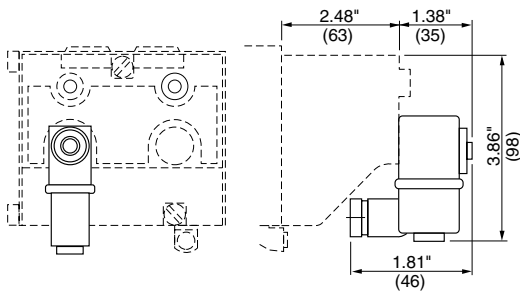
For power valves size 1/8"
PVAF10••



For power valves size 1/4"
PVAF10••

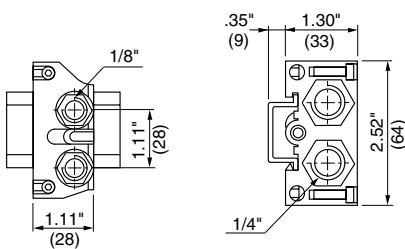


For power valves size 3/8" and 1/2"
PVAF10••

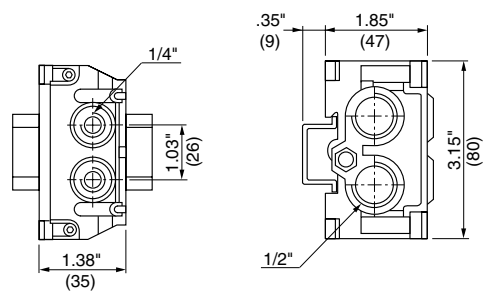


Valve adaptor modules

For combination sizes 1/4"-1/8"
PVU-CB18•



For combination sizes 1/2"-1/4"
PVU-EC19•



Specifications

Operating pressure range:

Working pressure 15 - 150 PSIG (1)
45 - 120 PSIG pilot pressure, double pilot models
50 - 120 PSIG pilot pressure, single pilot models

Operating temperature range:

5 to 140°F (-15 to 60°C)

Cv factors:

1/8" = .7
1/4" = 1.25
3/8" = 3
1/2" = 4.25

Operating medium:

Compressed air or neutral gasses

Medium quality:

Lubricated or non-lubricated
50u filtration

Operating principles:

4/2 ceramic slide valve
Solenoid or pneumatic piloted

Voltage tolerance (solenoid):

-10 to +5% of rated voltage

Power consumption (solenoid):

5 watts (6va)

Response time (pilot input to valve output)

Solenoid pilot: 25 msec
Pneumatic pilot: <10 msec

Valve size/port size:

1/8" - 1/8" supply/exhaust/outputs
1/4" - 1/4" supply/exhaust/outputs
3/8" - 1/2" supply/exhaust - 3/8" outputs
1/2" - 1/2" supply/exhaust/outputs

NOTE: All subbases have two (2) supply/exhaust ports

Mounting:

All units/stacks will surface mount or DIN rail mount

Materials:

Body: glass filled polyamide
Subbase: anodized aluminum
Slider: glass filled polyamide
Slide follower: delrin with polyurethane soft seats
Wear plate: ceramic
Seals: teflon x ring (quad)
Fittings: brass

Life expectancy (operations):

Dry air: 55 million
Lubricated: 75 million (2)

(1) When utilizing pressures from 15 - 45 PSIG, the auxiliary pilot (px) must be used (page 5).

(2) Once lubricated air is introduced to the valve, it is necessary to continue the use of lubricated air as the valve's self-lubricating ability will be lost.



WARNING

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

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7. Special Tooling: A tooling charge may be imposed for any special tooling, including without limitations, dies, fixtures, molds and patterns, acquired to manufacture items sold pursuant to this contract. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the items sold hereunder, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard

or otherwise dispose of any special tooling or other property in its sole discretion at any time.

8. Buyer's Property: Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer, or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

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

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

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

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

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



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