

**Warning, Offer of Sale**

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** 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.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application including consequences of any failure, and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

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

**Offer of Sale**

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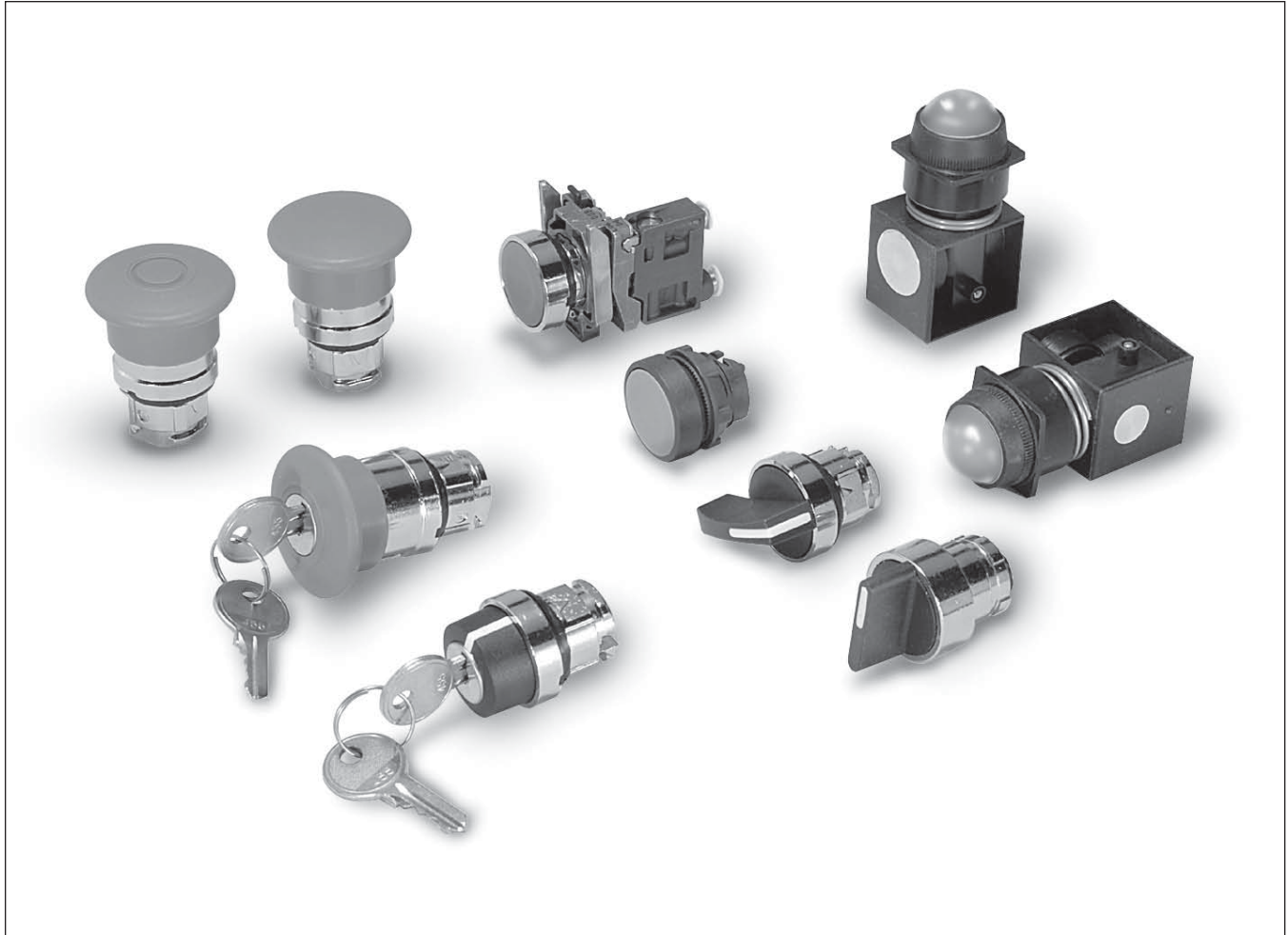
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**Table of Contents**

<b>QUBE Modular FRL System</b>	<b>A</b> QUBE Modular FRL System
<b>Air Preparation Units</b>	<b>B</b> Air Preparation Units
<b>Precision and Proportional Regulators</b>	<b>C</b> Precision & Proportional Regulators
<b>Miniature FRL's</b>	<b>D</b> Miniature FRLs
<b>Stainless Steel FRL's</b>	<b>E</b> Stainless Steel FRLs
<b>Control Panel Products</b>	<b>F</b> Control Panels
<b>LV / EZ Lockout Valves</b>	<b>G</b> LV / EZ Lockout Valves
<b>Integrated Fittings</b>	<b>H</b> Integrated Fittings
<b>Accessories</b>	<b>J</b> Accessories
<b>Ball Valves / Plug Valves</b>	<b>K</b> Ball Valves / Plug Valves
<b>Quick Couplings</b>	<b>L</b> Quick Couplings
<b>Hose &amp; Fittings</b>	<b>M</b> Hose & Fittings
<b>Tubing &amp; Fittings</b>	<b>N</b> Tubing & Fittings
<b>Safety Guide, Offer of Sale</b>	<b>P</b> Safety Guide, Offer of Sale

## Section F

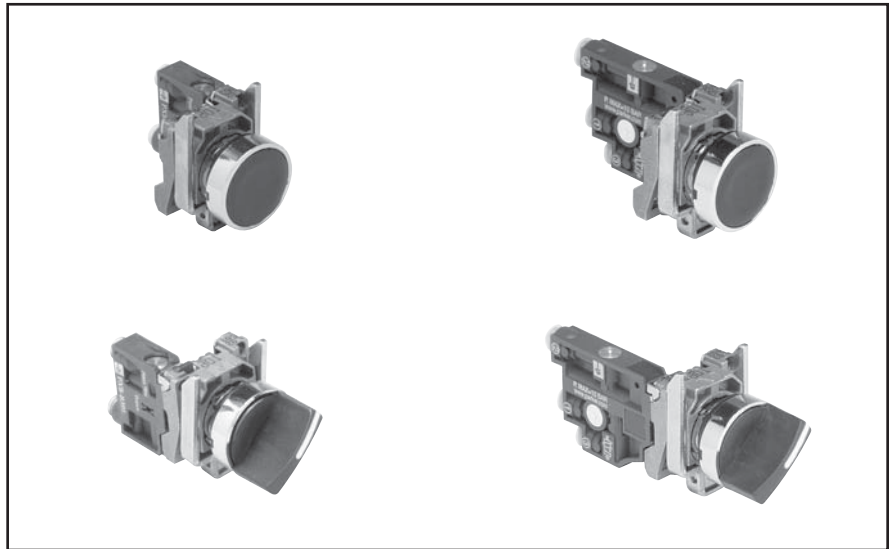


**F**

Basic Features .....	F2-F3	Mounting.....	F10
Push Button Bodies.....	F4	Visual Indicators 22mm (7/8") .....	F11
Push Buttons .....	F5	Rotary Selector Switches, 22mm (7/8") .....	F12
Selector Switches.....	F6	Joystick Operators.....	F13
Valve Bodies & Accessories.....	F7	Foot Pedal Operated Switches.....	F14
Dimensions & Assembly.....	F8	Two-Hand Controls.....	F15-F16
Legend Plates, Specifications .....	F9		

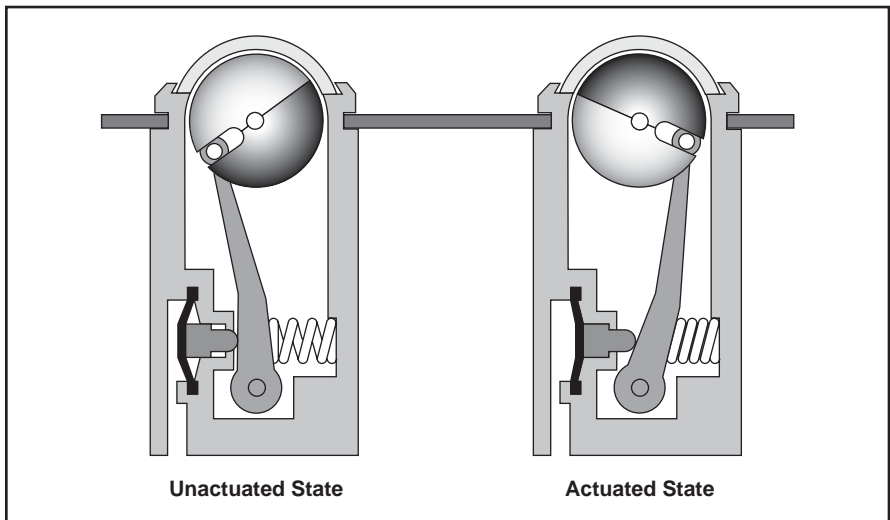
**Basic Features**

HUMAN-MACHINE DIALOG requires devices such as push buttons and selector switches to provide command inputs. A wide variety of these devices is available to meet most application needs. Both pneumatic and electrical switch bodies are available to match system technology. All of these devices use the 22 mm (7/8") mounting standard.



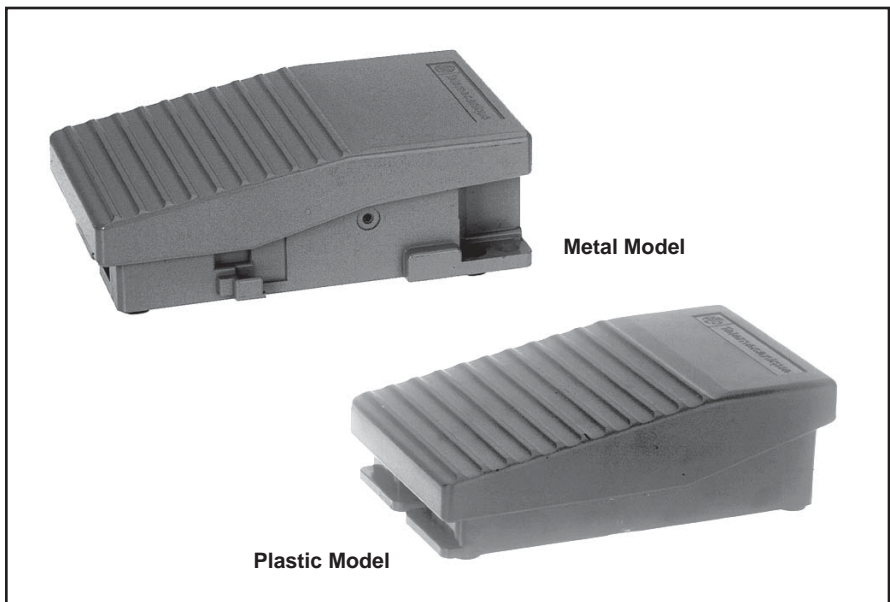
**PNEUMATIC VISUAL INDICATORS**

An indicator ball is rotated by a pneumatic input, changing the visible color. The ball sits behind a clear plastic window, providing a wide field of view. The visual indicators are available in five brightly colored Day-Glow paints for increased visibility. Like push buttons and selector switches, visual indicators use the 22mm (7/8") mounting standard.



**FOOT PEDAL SWITCHES**

When the application requires the use of foot pedals, these devices can be used to initiate a cycle or a step within a cycle. A metal foot pedal is available with protective guard.



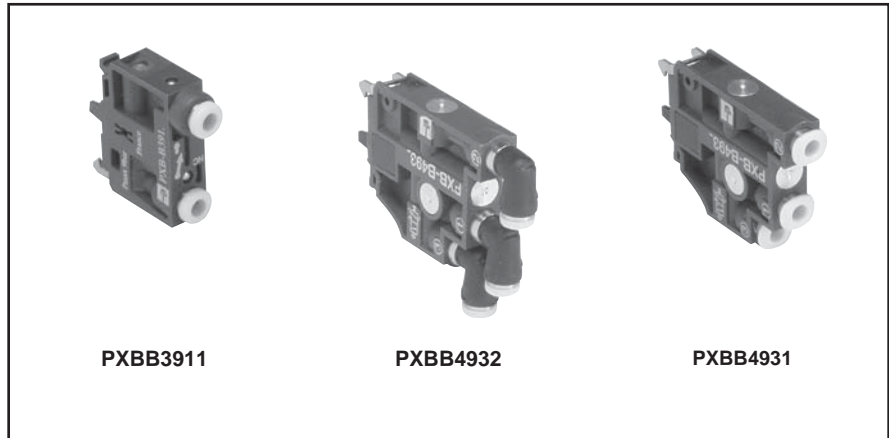
**F**

**MODULAR  
 PNEUMATIC / ELECTRIC  
 PUSH BUTTONS**

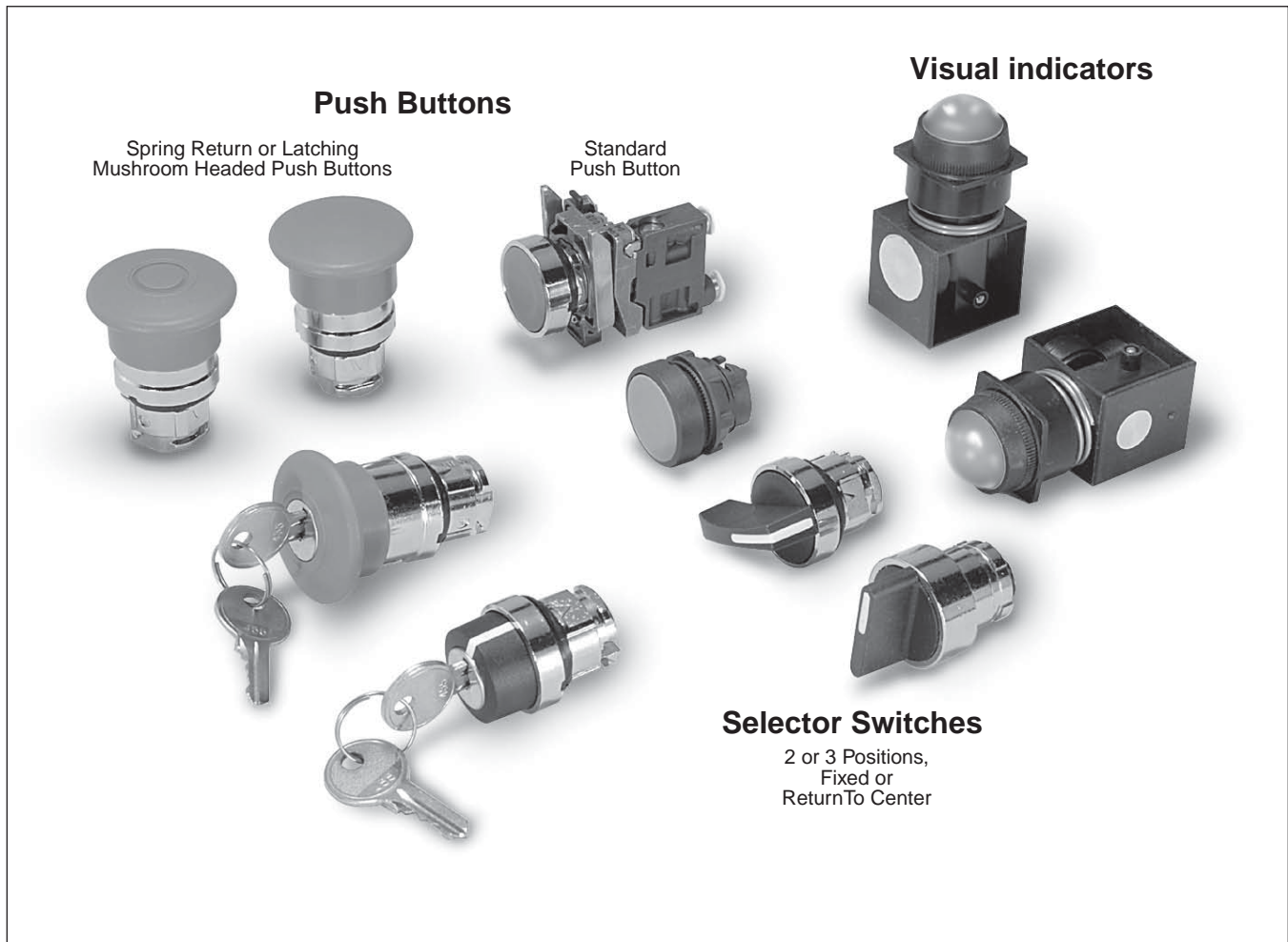
As with electrical contact switches, pneumatic valve modules can be mounted on a number of different operating heads.

- Pneumatic normally non passing (NNP) is equivalent to electrical normally open (N.O.).
- Pneumatic normally passing (NP) is equivalent to electrical normally closed (N.C.).

Note: Electrical switches can be stacked, but the rear connection on pneumatic switches prevents stacking. Therefore, when mixing electrical and pneumatic switch bodies on the same operator, the pneumatic switch must be mounted last.



**F**



**With 3/2 Valve Bodies 5/32" Instant Straight Connections**

**Flush Push Buttons**

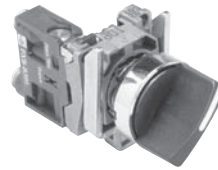


PXBB3111BA2

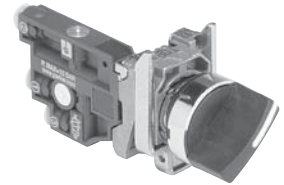


PXBB4131BA2

**Selector Switches**



PXBB3111BD2



PXBB4131BD2

Part Number	Color	Function	Type of Switching*
PXBB3111BA2	Black	Spring Return	NNP
PXBB3111BA3	Green		
PXBB3111BA4	Red		
PXBB3251BA2	Black	Spring Return	NNP+NP
PXBB4131BA2	Black	Spring Return	Single Universal 3-Way
PXBB4131BA3	Green		
PXBB4131BA4	Red		
PXBB4231BA2	Black	Spring Return	Dual Universal 3-Way

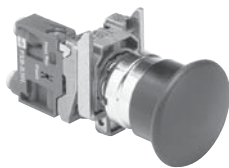
\* Type of switching: Universal 3-way: valve can be connected either as NP or NNP as required by connecting the primary air supply to port 1 or port 3.

Note: Mount up to three valves on mounting ring.

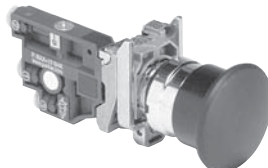
Part Number	Color	Function	Type of Switching*
PXBB3111BD2	Black	2 Maintained	NNP
PXBB3211BD2	Black	Positions with	NNP+NNP
PXBB3251BD2	Black	Std. Handle	NNP+NP
PXBB3211BD3	Black	3 Maintained Positions with Std. Handle	NNP+NNP
PXBB3251BD3	Black		NNP+NP
PXBB3211BJ5	Black	3 Positions, Spring Return to Center with Long Handle	NNP+NNP
PXBB4131BD2	Black	2 Maintained Positions with Std. Handle	Single Universal 3-Way
PXBB4231BD2	Black	2 Maintained Positions with Std. Handle	Dual Universal 3-Way
PXBB4231BD3	Black	3 Maintained Positions with Std. Handle	Dual Universal 3-Way
PXBB4231BJ5	Black	3 Maintained Positions with Long Handle	Dual Universal 3-Way

\* Type of switching: Universal 3-way: valve can be connected either as NP or NNP as required by connecting the primary air supply to port 1 or port 3.

**Mushroom Head Push Buttons (40mm Diameter)**



PXBB3111BC2



PXBB4131BC2

Part Number	Color	Function	Type of Switching*
PXBB3111BC2	Black	Spring Return	NNP
PXBB3111BT4	Red	Push-Pul	
PXBB3121BT4	Red	Push-Pull	NP
PXBB4131BC2	Black	Spring Return	Single Universal 3-Way
PXBB4131BT4	Red	Push-Pull	

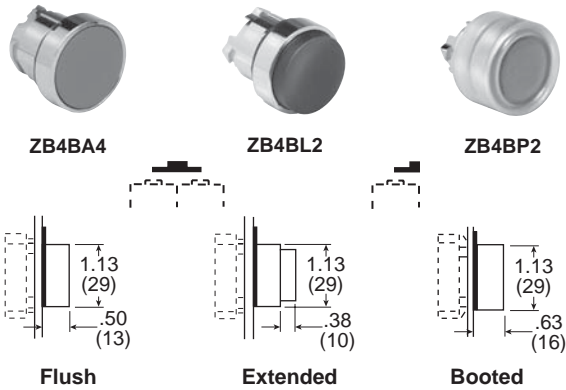
\* Type of switching: Universal 3-way: valve can be connected either as NP or NNP as required by connecting the primary air supply to port 1 or port 3.

Note: Mount up to three valves on mounting ring.

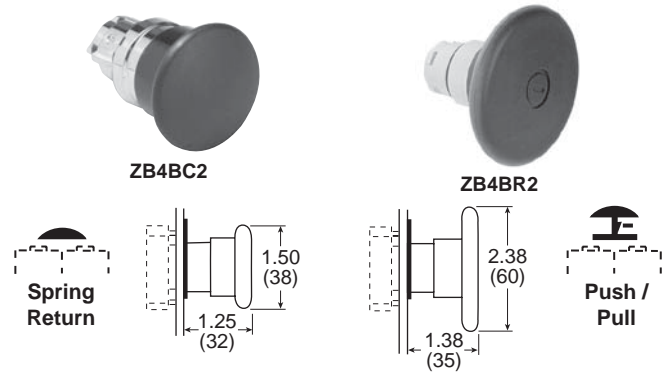
**BOLD ITEMS ARE MOST POPULAR.**

**For Use With PXBB Valve Bodies and ZBE Electrical Switch Bodies**

**Push Buttons**



**Mushroom Head Push Buttons**



Plastic Head ZB5**	Metal Head ZB4*	Color	Function	Description
ZB5AA2	<b>ZB4BA2</b>	Black	Spring Return	Flush
ZB5AA3	<b>ZB4BA3</b>	Green		
ZB5AA4	<b>ZB4BA4</b>	Red		
—	ZB4BA5	Yellow		
—	ZB4BA6	Blue		
ZB5AL2	<b>ZB4BL2</b>	Black	Spring Return	Extended
ZB5AL3	<b>ZB4BL3</b>	Green		
ZB5AL4	<b>ZB4BL4</b>	Red		
—	ZB4BL5	Yellow		
—	ZB4BP2	Black	Spring Return	Booted
—	ZB4BP3	Green		
—	ZB4BP4	Red		

Part Number*	Color	Function	Description
<b>ZB4BC2</b>	Black	Spring Return	Ø 40mm Head
<b>ZB4BC3</b>	Green		
<b>ZB4BC4</b>	Red		
<b>ZB4BT2</b>	Black	Latching Push-Pull	
<b>ZB4BT3</b>	Green		
<b>ZB4BT4</b>	Red		
<b>ZB4BR2</b>	Black	Spring Return	Ø 60mm Head
ZB4BR3	Green		
ZB4BR4	Red		

\* ZB4\*\*\* Model Numbers are Metal Head Operators

\* ZB4\*\*\* Model Numbers are Metal Head Operators  
 \*\* ZB5\*\*\* Model Numbers are Plastic Head Operators

**Push / Push Buttons**



ZB4BH02

Part Number*	Color	Function	Description
ZB4BH02	Black	Detent 2-Position	Flush
ZB4BH03	Green		
ZB4BH04	Red		

\* ZB4\*\*\* Model Numbers are Metal Head Operators

**Mounting Accessories**



ZB5AZ905

Part Number	Color	Description
ZB5AZ905	—	Plastic Head (ZB5) Mounting Nut Tightening Tool
ZBZ1602	Black Plastic	Guard for 40mm

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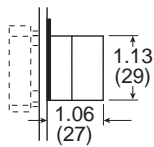


**For Use With PXBB Variable Composition Switch Bodies**

**Selector Switches**



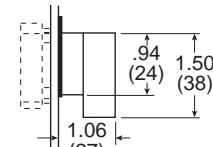
**ZB4BD3**



**Standard Selector**



**ZB4BJ3**

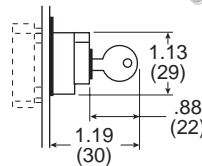


**Knob Lever**

**Key Operated Selectors**



**ZB4BG2**



<b>Standard Black Handle</b>		
Part Number*	Description	Function
<b>ZB4BD2</b>	Maintained	2-Positions
ZB4BD4	Spring Return from Right to Left	
<b>ZB4BD3</b>	Maintained	3-Positions
<b>ZB4BD5</b>	Spring Return to Center from Left and Right	
ZB4BD7	Maintained Right Spring Return from Left to Center	3-Positions
ZB4BD8	Maintained Left Spring Return from Right to Center	3-Positions
<b>Long Black Handle</b>		
<b>ZB4BJ2</b>	Maintained	2-Positions
ZB4BJ4	Spring Return from Right to Left	
<b>ZB4BJ3</b>	Maintained	3-Positions
<b>ZB4BJ5</b>	Spring Return to Center from Left and Right	

\* ZB4\*\*\* Model Numbers are Metal Head Operators

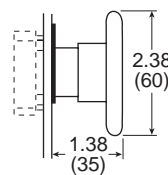
<b>Key Operated</b>		
Part Number*	Key Withdrawal	Function
<b>ZB4BG2</b>	Left	2 Maintained Positions
ZB4BG4	Left and Right	
<b>ZB4BG3</b>	Center	3 Maintained Positions
ZB4BG5	Left and Right	
ZB4BG7	Center	3-Positions 2 Spring Return to Center

\* ZB4\*\*\* Model Numbers are Metal Head Operators

**Mushroom Head Push Buttons with Key Select**



**ZB4BS24**



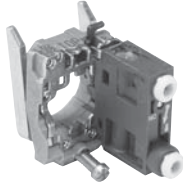
Part Number*	Color	Function	Description
ZB4BS54	Red	Latching Turn to Release	Ø 40mm Head
ZB4BS14	Red	Key Latching	
ZB4BS64	Red	Latching Turn to Release	Ø 60mm Head
ZB4BS24	Red	Key Latching	

\* ZB4\*\*\*\* Model Numbers are Metal Head Operators

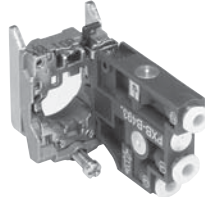
**BOLD ITEMS ARE MOST POPULAR.**

**For Use With 22mm (7/8") Metal Operating Heads 5/32" Instant Connections**

**3/2 Valve Bodies with Mounting Ring**



PXBB3111B



PXBB4131B

Part Number	Connections	Function	Type of Switching*
PXBB3111B	5/32" Instant	3/2	NNP
PXBB3121B	5/32" Instant	3/2	NP
PXBB4131B	5/32" Instant	3/2	Universal 3-Way

Note: • Mount up to 3 valves on mounting ring for push buttons.  
 • Mount up to 2 valves on mounting ring for selector switches,  
 Valves **cannot** be mounted in center position.

**Specifications**

Air Quality –  
 Standard Shop Air, Lubricated or Dry..... 40 µm Filtration

Flow –  
 PXBB3•..... Cv=.08  
 PXBB4•..... Cv=.18

Materials –  
 Body ..... Polyamide  
 Operating Head ..... Zinc Alloy & Plastic  
 Operating Positions ..... All Positions

Operating Pressure –  
 PXBB3•..... 15 to 115 PSIG (1 to 9 bar)  
 PXBB4•..... 15 to 145 PSIG (1 to 10 bar)

Ports .....5/32" Instant for Semi-Rigid Nylon or Polyurethane Tube

Temperature –  
 Operating.....5°F to 140°F (-15°C to + 60°C)



**Additional Valve Bodies**



PXBB3911



PXBB4932



PXBB4931

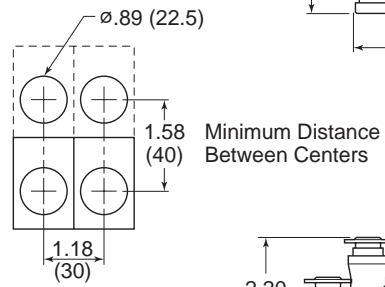
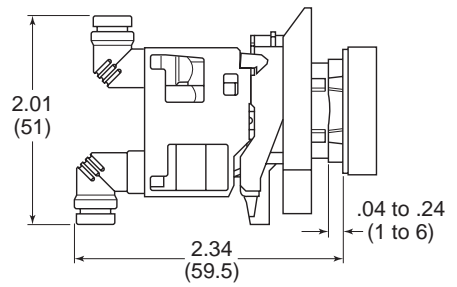
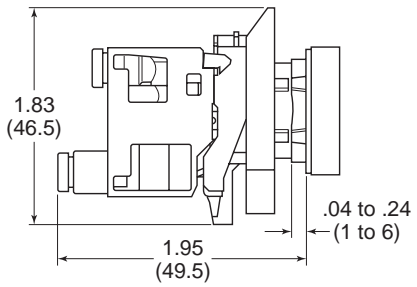
Part Number	Connections	Function	Type of Switching*
PXBB3911	5/32" Instant Straight	3/2	NNP
PXBB3912	5/32" Instant Swivel		
PXBB3921	5/32" Instant Straight	3/2	NP
PXBB3922	5/32" Instant Swivel		
PXBB4931	5/32" Instant Straight	3/2	Universal 3-Way
PXBB4932	5/32" Instant Swivel		

**BOLD ITEMS ARE MOST POPULAR.**

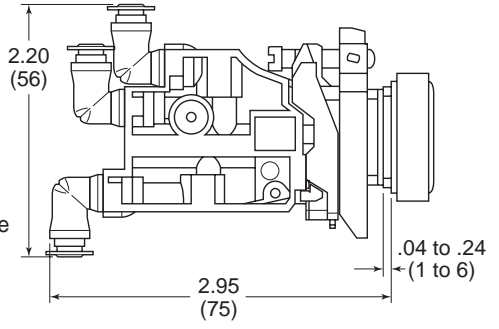
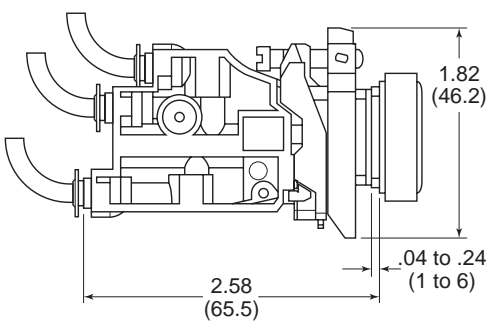


**Dimensions & Assembly**

**PXB-B3 Dimensions**



**PXB-B4 Dimensions**



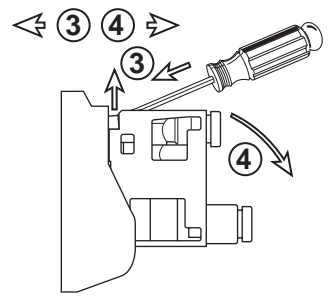
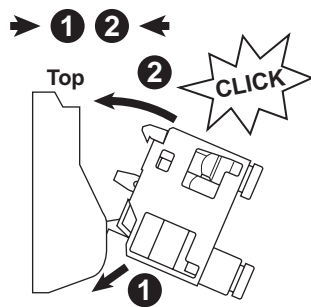
**Tube Bending Radius For PXBB3 and PXBB4**

- 4 mm O.D. x 2 mm I.D. Tube = Minimum 0.39 (10) Radius
- 4 mm O.D. x 2.7 mm I.D. Tube = Minimum 0.59 (15) Radius

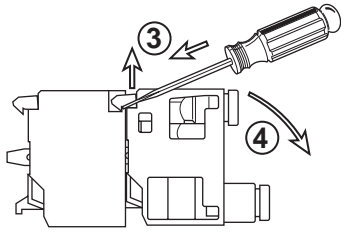
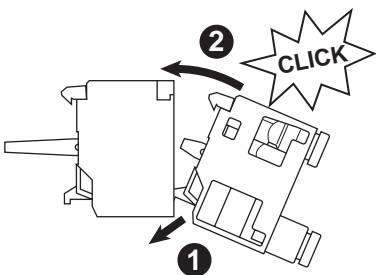
**F**

**Assembly**

**Assembling PXB Valves On Mounting Block**



**Assembling PXB Valves On the Back of the Electrical Contact**



**For Push Buttons and Visual Indicators**

**Legend Plates for PXBB Devices (22mm)**



Part Number	Description
<b>Without Text For Customer Engraving</b>	
ZBY2101	Black / Red Background (White Letters)
ZBY4101	Yellow / White Background (Black Letters)
<b>With Text For Push Buttons</b>	
ZBY2303	Start
ZBY2304	Stop
ZBY2305	Forward
ZBY2306	Reverse
ZBY2307	Up
ZBY2308	Down
ZBY2309	Right
ZBY2310	Left
ZBY2311	On
ZBY2312	Off
ZBY2313	Open
ZBY2314	Close
ZBY2321	Inch
ZBY2323	Reset
ZBY2326	Power On
ZBY2327	Slow
ZBY2328	Fast
ZBY2330	Emergency Stop
ZBY2334	Run
<b>With Text For 2-Position Selectors</b>	
ZBY2367	Off On
<b>With Text For 3-Position Selectors</b>	
ZBY2387	Hand Off Auto

**Blank Legend Plates for Inscription**

<b>For PXBB Devices (2 lines of 11 characters maximum)</b>	
<b>Please indicate the required text when ordering.</b> (Allow 3 weeks for delivery)	
Part Number	Description
ZBY2002	Black Background / White Letters



**For 22mm Visual Indicators Only**

<b>2 lines of 11 characters maximum</b>	
<b>Please indicate the required text when ordering.</b> (Allow 3 weeks for delivery)	
Part Number	Description
ZB2BY2002	Black Background / White Letters

**Accessories**



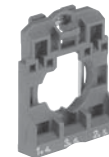
ZBE101

<b>Electrical Switch Bodies</b>	
When combined with pneumatic valves, these contact blocks allow different forms of power to be provided from a single push button. Can be mounted with both types of valves PXBB3 / PXBB4.	
<b>Electrical Specification: 240V, 10Amp</b>	
Part Number	Type of Contact
ZBE101	 Normally Open (NO)
ZBE102	 Normally Closed (NC)

Note: Plastic Mounting Ring ZB5AZ009 to be used with ZB5 Plastic Operating Heads.  
 Metal Mounting Ring ZB4BZ009 to be used with ZB4 Metal Operating Heads.



Metal: ZB4BZ009



Plastic: ZB5AZ009

<b>Mounting Ring for Valve Bodies, Switch Bodies and Operating Heads</b>	
To make up a complete push button with one to three switching elements with 5/32" instant connections, use this mounting block and select the operating heads and bodies in this Section.	
Part Number	Description
ZB4BZ009	Metal Mounting Ring
ZB5AZ009	Plastic Mounting Ring
To make up a complete selector switch with one or two switching elements with 5/32" instant connections, use this mounting block and select the operating heads and bodies in this Section.	
Part Number	Description
ZB4BZ009	Metal Mounting Ring
ZB5AZ009	Plastic Mounting Ring

**Note:** To release push button from mounting ring, pull lever on top of mounting ring up and remove push button operator. To assemble push button operator to mounting ring, align arrows and snap into place.

**BOLD ITEMS ARE MOST POPULAR.**



## Functionality Explanation

Fluid Power		Universal Description	Electrical	
Function	Symbol		Function	Symbol
Normally Closed (N.C.)		Normally Non-Passing (NNP)	Normally Open (N.O.)	
Normally Open (N.O.)		Normally Passing (NP)	Normally Closed (N.C.)	

**Type of Switching:** Universal 3-Way: Valve can be connected either as NP or NNP as required by connecting the primary air supply to port 1 or port 3.

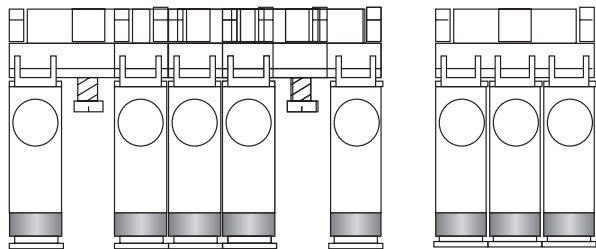


- NNP: Normally Non-Passing.
- NP: Normally Passing.
- NNP + NNP: Double Switch Body, Both Normally Non-Passing.
- NNP + NP: Normally Non passing and Normally-Passing.
- NP + NP: Both Normally Passing.

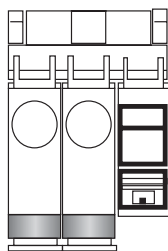
### Combination of Output Devices on a Single Mounting Block

Up to 3 output devices (valves or electrical contacts) can be mounted side by side on 1 mounting block.

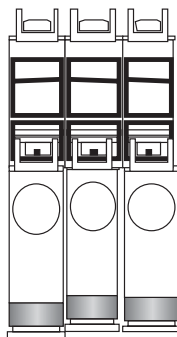
**Note:** The central position can only be activated by push button heads.



Electrical Contacts and Valves can be Combined Either Side by Side, or by Mounting the Valve on the Back of the Electrical Contact.

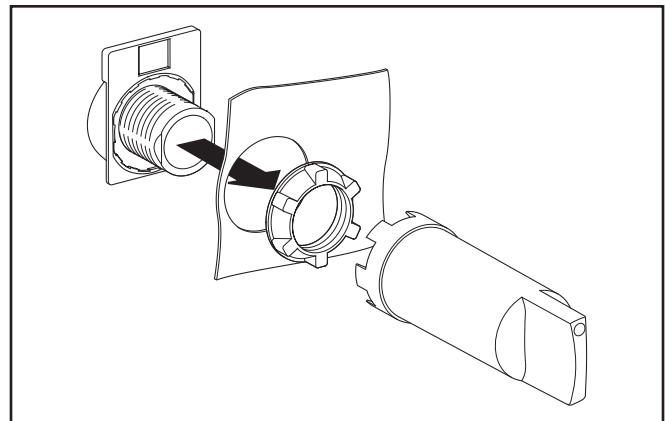


Side by Side Combination

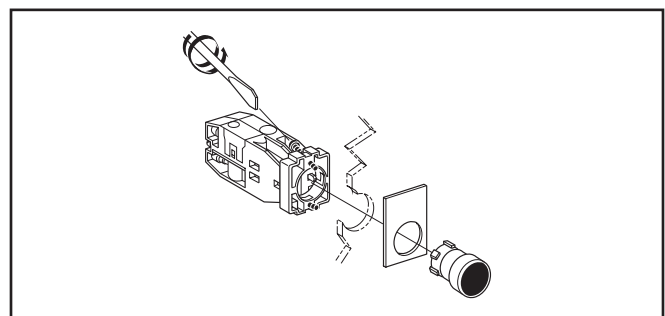


Combination by Mounting Valves On the Back of the Electrical Contact

### Assembling Output Devices and Heads on ZB5 Series Mounting Block



### Replacement Old Style Mounting

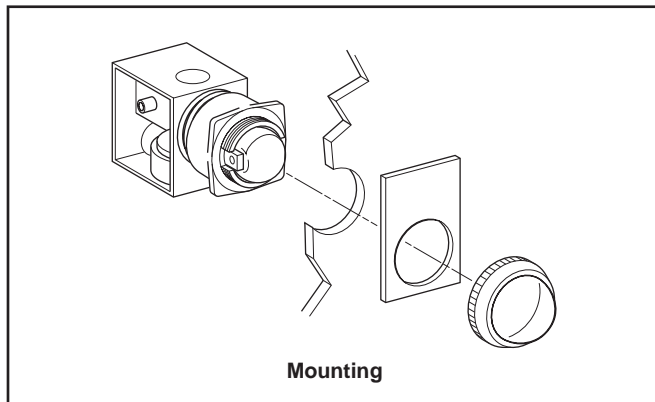


**With 5/32" Instant Connections**

**22mm Visual Indicators**



**PXVF131**



**Mounting**

**Specifications**

- Air Quality –  
 Standard Shop Air, Lubricated or Dry, 40µm Filtration
- Materials –  
 Body .....Polyamide  
 Operating Head .....Zinc Alloy & Plastic
- Number of Operations with Dry Air at 90 PSI (6 bar) and 68°F (20°C) - Frequency 1 Hz .....1 million Operations  
 Mushroom Head .....300,000 Operations
- Operating Positions .....All Positions
- Operating Pressure ..... 15 to 115 PSIG (1 to 8 bar)
- Ports –  
 Standard: 5/32" Instant for Semi- Rigid Nylon or Polyurethane Tube  
 10-32 UNF Available.
- Temperature –  
 Operating ..... 32°F to 122°F (0°C to + 50°C)  
 Storage ..... -22°F to 140°F (-30°C to +60°C)



**Black Plastic Bezel**

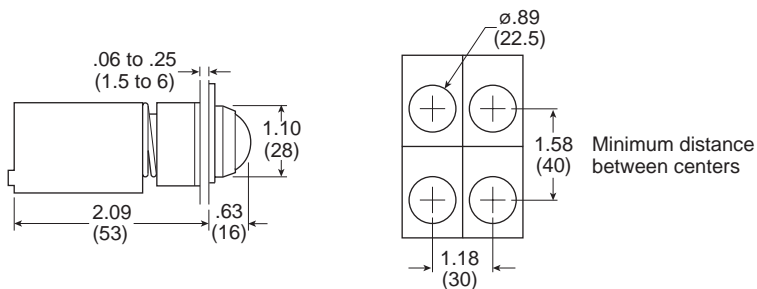
Part Number "ON" Indicator	Part Number "OFF" Indicator	Color
PXVF131	PXVF1213	Green
PXVF141	PXVF1214	Red
PXVF151	PXVF1215	Yellow
PXVF161	PXVF1216	Blue
PXVF111	PXVF1211	White

**Notes:**

- The Pneumatic Indicators are black in one position and colored in the other. The colored position corresponds either to the presence of a pressure ("ON" Indicator) or the absence of pressure ("OFF" Indicator).
- For Legend Plates, see page F9.

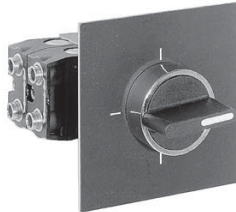
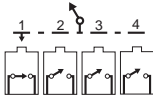
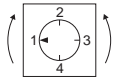
**Dimensions**

PXVF1••



**With 5/32" Instant Connections, 1/16" I.D. Internal Orifice**

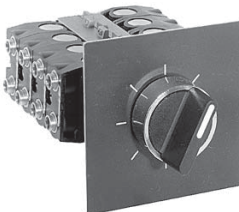
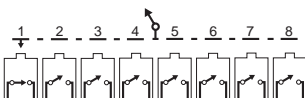
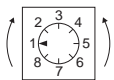
**4-Positions, 4-Outputs 3/2**



PXBDD104

Without Mechanical Stop		
Part Number	Operating Head	Type of Switching*
PXBDD104	Black Handle with 2.5" x 2.5" (64 x 64 mm) Legend Plate, Red or Black Background	NNP

**8-Positions, 8-Outputs 3/2**



PXBDD508

Without Mechanical Stop		
Part Number	Operating Head	Type of Switching*
PXBDD508	Black Handle with 2.5" x 2.5" (64 x 64 mm) Legend Plate, Red or Black Background	NNP

**Specifications**

Air Quality –  
 Standard Shop Air, Lubricated or Dry, 40µm Filtration

Materials –  
 Body ..... Polyamide  
 Operating Head ..... Zinc Alloy & Plastic  
 Minimum Operating Force ..... 9.4 Lb (42 N)

Number of Operations with Dry Air at 90 PSI (6 bar) and .....  
 68°F (20°C) - Frequency 1 Hz ..... 1 million Operations  
 Mushroom Head ..... 300,000 Operations

Operating Positions ..... All Positions  
 Operating Pressure ..... 15 to 115 PSIG (1 to 8 bar)

Ports –  
 Standard: 5/32" Instant for Semi- Rigid Nylon or Polyurethane Tube  
 10-32 UNF Available.

Temperature –  
 Operating ..... 32°F to 122°F (0°C to + 50°C)  
 Storage ..... -22°F to 140°F (-30°C to +60°C)

**Notes:**

These Rotary Switches operate in either direction. They come assembled with switch PXBB1921 (Normally Passing). All switches are held in the actuated non-passing position except the one associated with a given dial position, which is in the unactuated Normally Passing position.

Example of Operation: Rotation from Position 1 to Position 2:

- Switch 1 changes from unactuated Normally Passing to actuated non-passing.
- Switch 2 changes from actuated non-passing to unactuated Normally Passing.

Units will accept all switch bodies shown earlier in this Section, but care must be taken in selecting switch type.

**F**

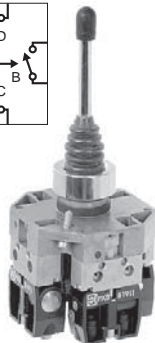
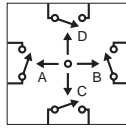
**With 5/32" Instant Connections, 1/16" I.D. Internal Orifice**

**2-Position Unit**



**PXBGA8211**

**4-Position Unit**



**PXBGA8411**

**Note:** These Joystick Operators come assembled with switch type PXBB1911, but will accept all Switch Bodies shown later in this Section.

Part Number	Position	Function	Type of Switching*	Operating Head
PXBGA8211	2	Maintained Position in Each Direction	NNP	Chrome Plated Lever with Protective Bellows 1.6" x 2.5"
PXBGA8411	4			
PXBGA8221	2	Spring Return in Each Direction	NNP	(40 x 64 mm) Legend Plate Red or Black Background
PXBGA8421	4			

\* NNP: Normally Non-Passing.

**Specifications**

**Air Quality –**  
 Standard Shop Air, Lubricated or Dry, 40µm Filtration  
 Flow at 90 PSI (6 bar) in SCFM (l/mn ANR)..... 1.8 (50)

**Materials –**  
 Body ..... Polyamide  
 Operating Head ..... Zinc Alloy & Plastic  
 Nominal Bore Ø in Inches (mm) ..... 1/16" (1.5)  
 Number of Operations with Dry Air at 90 PSI (6 bar) and 68°F (20°C) - Frequency 1 Hz ..... 1 million Operations  
 Operating Angle..... 18°  
 Operating Positions ..... All Positions  
 Operating Pressure ..... 15 to 115 PSIG (1 to 8 bar)  
 Operating Torque ..... 59.5 oz-in (420 mNm)

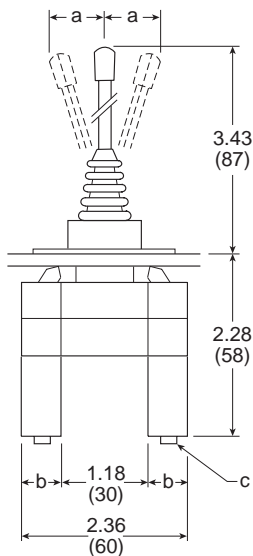
**Ports –**  
 Standard: 5/32" Instant for Semi- Rigid Nylon or Polyurethane Tube  
 10-32 UNF Available.

**Temperature –**  
 Operating..... 32°F to 122°F (0°C to + 50°C)  
 Storage..... -22°F to 140°F (-30°C to +60°C)



**Dimensions**

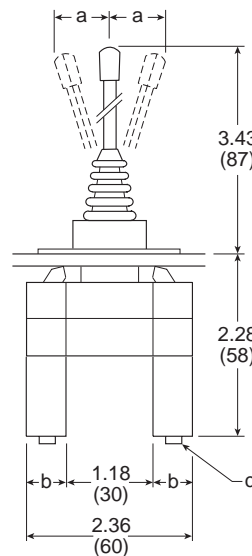
**PXBGA82\*\***



	inch	mm
a*	1.57	40
b	.59	15
c	5/32 Dia.	4 Dia.

\* In both directions

**PXBGA84\*\***



	inch	mm
a*	1.57	40
b	.59	15
c	5/32 Dia.	4 Dia.

\* In all 4 directions

**Standard Duty 1/6" I.D. Valves with 5/32" Instant Connections**

**Protective Guard**



PXPEM510

Part Number	Function	Material	Type of Switching*
PXPEM510	High resistance protective guard, with interlock mechanism to prevent accidental operation by a falling object.	Metal	NNP

**Foot Switches Without Protective Guard**



PXPEA110

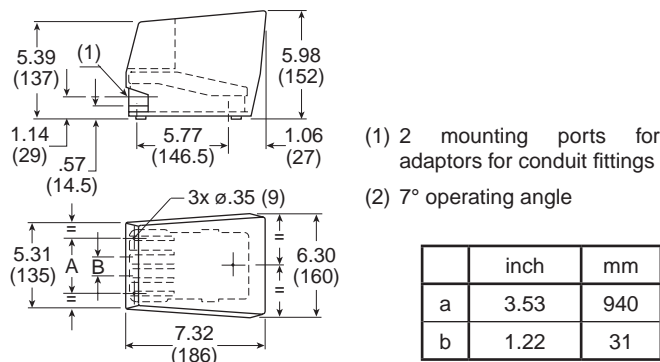
Part Number	Function	Material	Type of Switching*
PXPEA110	Spring Return	Plastic	NNP
PXPEM110	Spring Return	Metal	NNP

**CAUTION:**  
 This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.217.

F

**Dimensions**

PXPEM510

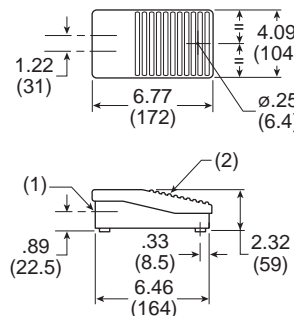


**Notes:** These Foot Pedal Operators come assembled with switch PXBB1921 (Normally Passing). With the pedal in the unoperated position, the switch is in the actuated non-passing position. With the pedal actuated, the switch is in the unactuated Normally Passing position.

Units will accept all switch bodies shown earlier in this Section, but care must be taken in selecting switch type.

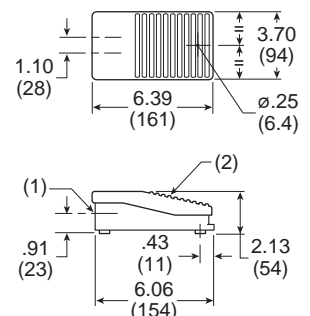
**Dimensions**

PXPEM110



(1) .825" diameter thru hole  
 (2) 6° operating angle

PXPEA110



**Specifications**

Air Quality –  
 Standard Shop Air, Lubricated or Dry, 40µm Filtration  
 Flow at 90 PSI (6 bar) in SCFM (l/mn ANR)..... 1.8 (50)  
 Materials –  
 Body ..... Polyamide  
 Operating Head ..... Zinc Alloy & Plastic  
 Nominal Bore Ø in Inches (mm) ..... 1/16" (1.5)  
 Number of Operations with Dry Air at 90 PSI (6 bar) and 68°F (20°C) - Frequency 1 Hz ..... 1 million Operations

Operating Positions ..... All Positions  
 Operating Pressure ..... 15 to 115 PSIG (1 to 8 bar)  
 Ports –  
 5/32" Instant for Semi-Rigid Nylon or Polyurethane Tube  
 Temperature –  
 Operating ..... 32°F to 122°F (0°C to + 50°C)  
 Storage ..... -22°F to 140°F (-30°C to + 60°C)

\* NNP: Normally Non-Passing.

## Pre-Assembled Two-Hand Control Enclosure

### Features

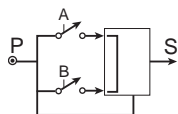
- The pre-assembled two-hand control enclosure occupies both hands of an operator by requiring nearly simultaneous operation of two pushbuttons
- Poppet – snap-acting (no spools)
- Same air as in cylinders – Filtration: 40 micron
- No lubrication required



PXPC111

Part Number	Connections
PXPC111	5/32" Instant

### Operation



- Output "S" will appear only if "A" and "B" are simultaneously operated (within .5 seconds or less of each other).
- If the operator actuates only one pushbutton, either "A" or "B", or if both "A" and "B" are actuated but at an interval greater than .5 seconds, output "S" will not appear.
- Output "S" is regenerated by supply "P". Output "S" will therefore disappear if supply "P" is cut off.
- Output "S" will disappear if either "A" or "B" is released.
- If output "S" disappears for any reason, "A" and "B" must be nearly simultaneously actuated to again provide output "S".
- Since output "S" is regenerated it appears sharply, at full force (snap-acting), and is quickly exhausted upon deactivation. In addition the module is not affected by the length or diameter of tubing used for output "S".

### General Characteristics

**Operating Pressure** ..... 40 to 120 PSI (3 to 8 bar)

**Permissible Fluids** –

Air or neutral gas 40 micron filtration, lubricated or dry

**Flow at 90 PSI (6 bar)** ..... 7 SCFM (200 l/mn ANR)

**Operating Temperature** ..... -5°F to 140°F (-15°C to 60°C)

Below 40°F (5°C), an air dryer is required

**Storage Temperature** ..... -40°F to 160°F (-40°C to 70°C)

**Number of operations with dry air at 90 PSI (6 bar), 68°F (20°C), frequency 1 Hz** ..... 1 Million Operations

**Vibration resistance** –

Conforms to section 19-2 of bureau Véritas regulations.... (November 1987)

**Materials** –

Body..... Glass Filled Nylon

Operating Head ..... Zinc Alloy and Plastic

**Connections:**..... 5/32" instant

### Mounting

#### Approvals:

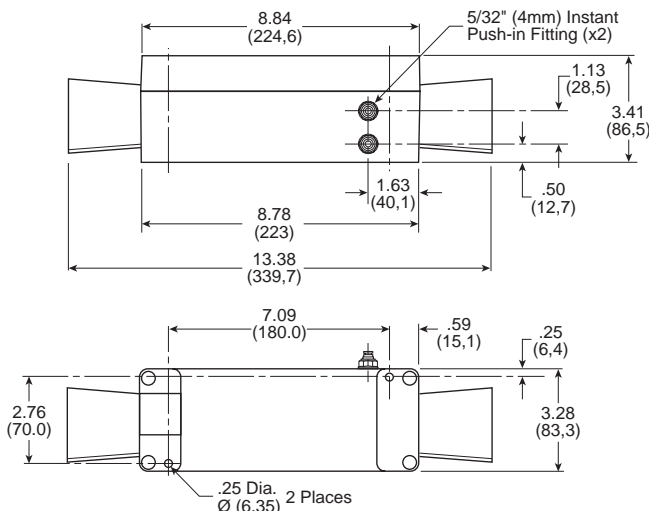
- In accordance with European Standard EN 574 - September 1996
- Conforms to the model that has obtained CE Type Test Certificate No. 02526 520 4631 0397

**⚠ WARNING**

**These devices should NOT be used in any application involving rotary clutch presses. Two hand control modules do not of themselves insure the safety of any machine. Users and original equipment manufacturers are responsible for making sure that installations meet all relevant safety regulations.**

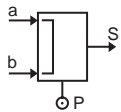
### Dimensions

Inches (mm)



**Control Module & Repair Parts**

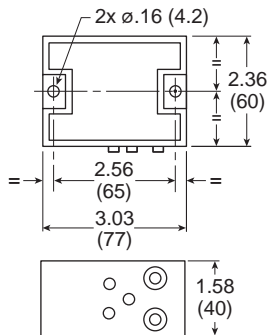
**Two-Hand Control Module**



PXPA11

Part Number	Connections
PXPA11	5/32" Instant

**Dimensions**



PXPA11

**Specifications**

Air Quality –  
 Standard Shop Air, Lubricated or Dry, 40µm Filtration  
 Flow at 90 PSI (6 bar) in SCFM (l/mn ANR)..... 7 (200)  
 Materials –  
 Body ..... Polyamide  
 Operating Head ..... Zinc Alloy & Plastic  
 Nominal Bore Ø in Inches (mm) ..... 7/64" (2.5)  
 Number of Operations with Dry Air at 90 PSI (6 bar) and 68°F (20°C) - Frequency 1 Hz ..... 1 million Operations  
 Operating Positions ..... All Positions  
 Operating Pressure ..... 40 to 115 PSIG (3 to 8 bar)  
 Ports –  
 5/32" Instant for Semi-Rigid Nylon or Polyurethane Tube  
 Temperature –  
 Operating ..... 32°F to 122°F (0°C to + 50°C)  
 Storage ..... -22°F to 140°F (-30°C to + 60°C)  
 Vibration resistance:  
 Conforms to section 19-2 of bureau Véritas regulations (November 1987)

<b>WARNING</b>
<p>These devices should <b>NOT</b> be used in any application involving rotary clutch presses. Two hand control modules do not of themselves insure the safety of any machine. Users and original equipment manufacturers are responsible for making sure that installations meet all relevant safety regulations.</p>

**Notes:** These two-hand control modules provide an output signal upon nearly concurrent operation of two pushbuttons.

**Two-Hand Control Module Guard**



PPRL15

Part Number	Base Component
PPRL15	PXPC111

**Two Hand Repair Parts**

Part Number	Quantity Required	Description
PXPA11	1	Control Module
PXBB3111B	2	Valve Body & Mounting Ring
ZB4BR*	2	Push Button
PPRL15	2	Control Module Guard

\* 2 = Black, 3 = Green, 4 = Red

# 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](http://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 Watts valves, FRLs or vacuum products without thoroughly reading and understanding this safety guide as well as the specific Watts 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 Watts 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 Watts technical service department if you have any questions or require any additional information. See the Watts publication for the product being considered or used, or call 269-629-5000, or go to [www.wattsfluidair.com](http://www.wattsfluidair.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, ketones, 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.

## 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:** Watts published Installation Instructions must be followed for installation of Watts valves, FRLs and vacuum components. These instructions are provided with every Watts valve or FRL sold, or by calling 269-629-5000, or at [www.wattsfluidair.com](http://www.wattsfluidair.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 Watts valve and FRL sold, or are available by calling 269-629-5000, or by accessing the Watts web site at [www.wattsfluidair.com](http://www.wattsfluidair.com).

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

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

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

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

**4.5. Routine Maintenance Issues:**

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

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

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

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

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

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

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

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

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

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

**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 deferral 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.