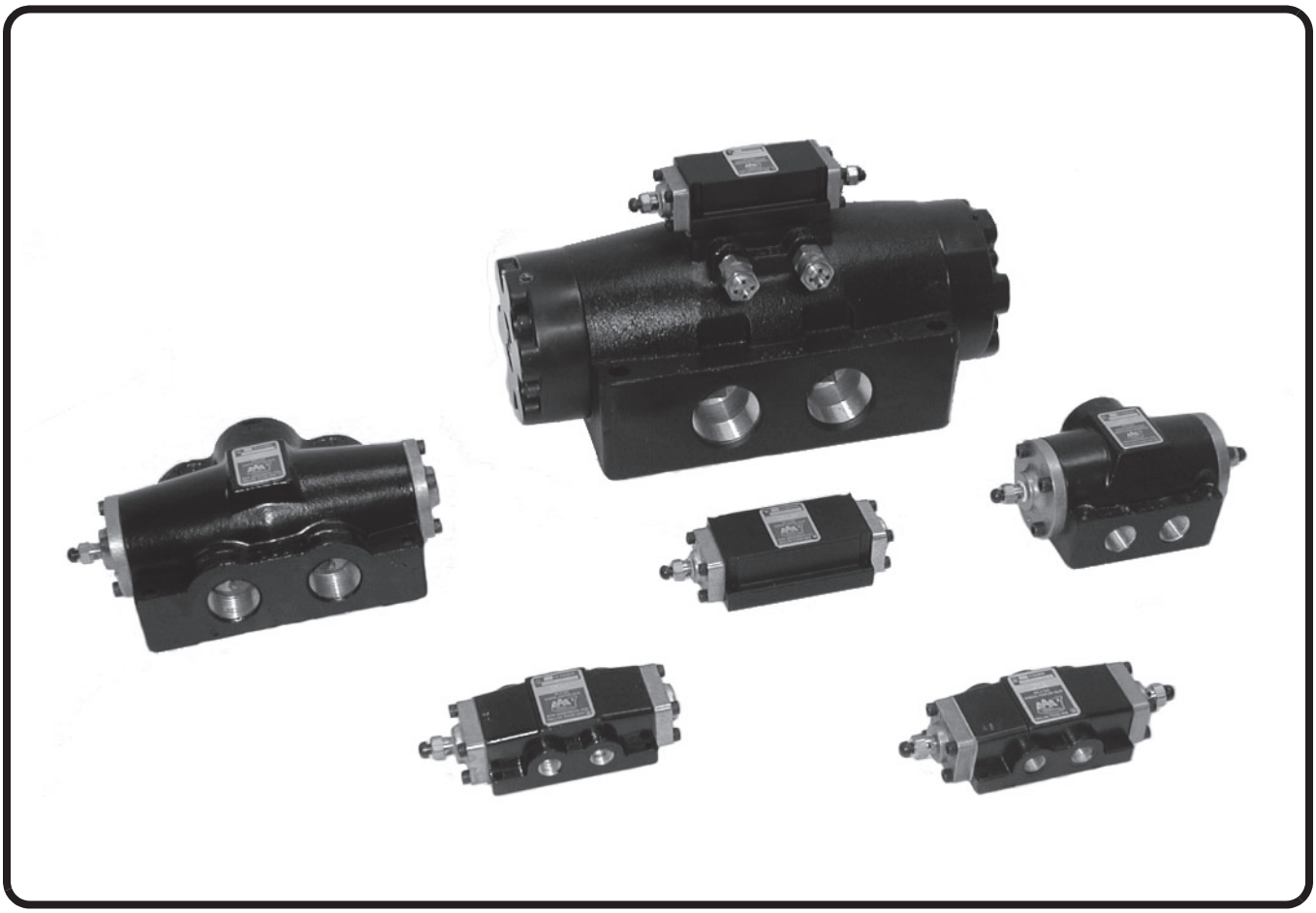
DIFFERENTIAL PILOT CONTROLLED AIR VALVES

4-WAY: 25 PSI TO 250 PSI



PART NUMBER STRUCTURE:

Part 1: The basic part number of an AAA valve is fairly simple to understand. The first part is both an operator style and valve operation. This position describes not only how the valve shifts positions but also what shifts the spool.

Part 2: The second portion is the valve port size and body style. This portion describes whether the valve is a threaded side ported body or a bottom bored subplate body.

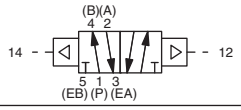
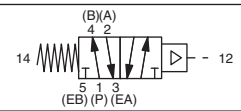
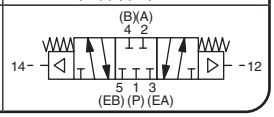
Part 3: The third part of the part number structure is the spool configuration. Normally only needed on three position valves, the spool configuration defines the flow at center position. You can have a spool other than the standard "Closed Center" on two position valves; however, the transitional flow is normally not needed for most applications.

Part 4: The fourth position of the part number structure is used to specify valve options.

Part 5: The final position allows you to specify different O-rings used in the main valve body. You choose the O-ring most suited for your application. This specification applies to the body O-rings only.

DO3PG -5

1 Operator Style

Code	Description	Symbol
D	2-position, double differential pilot, friction positioned. Spool stays in shifted position when buttons are released.	
DO	2-position, single differential pilot, spring returned spool. Spool returns to position “C” when the button is pressed.	
DY	3-position, spring centered. Spool returns to center position when both buttons are closed or open.	

2 Body Style

Side Ported

2 = 1/4" NPTF
3 = 3/8" NPTF
4 = 1/2" NPTF
6 = 3/4" NPTF
8 = 1" NPTF
12 = 1-1/2" NPTF

Subplate Mounted

3P = 3/8" flow
4P = 1/2" flow
8P = 1" flow
16P = 1-1/2" flow

3 Spool Configuration (Normally on 3-position valves, 2-position valves use a closed center spool)

blank = Closed center, all ports are blocked in the center position.
D = Regenerative center, ports 2 & 4 are connectect to port 1, ports 3 & 5 are blocked.
G = Float center, port 2 is connected to port 3, port 4 is connected to port 5, port 1 is blocked.

4 Valve Options

blank = No options selected.
U = Factory installed muffler/flow controls in ports 3 and 5 (body styles 2, 3 & 4 only).

5 Valve O-Ring Option (Only applies to valve body O-Rings)

blank = Viton for body styles 2, 3 & 3P, Buna-N for body styles 4, 6, 8, 12, 4P, 8P &16P.
-1 = Neoprene for freon (-40°F to 225°F).
-2 = Silicon (-80°F to 400°F).
-3 = Viton for most aromatic gases (-20°F to 400°F, 600°F for short time).
-4 = Butyl Rubber (-60°F to 200°F).
-5 = Teflon (-250°F to 450°F).
-7 = Urethane, 70 Durometer (-65°F to 200°F).
-9 = Buna-N (-40°F to 250°F).

GENERAL INFORMATION

Differential Pilot models are operated with a button bleeder that shifts the spool.

OPERATOR STYLE CODE:

DO: 2-position, spring returned spool. Spool returns to position "A" when button bleeder is depressed. Minimum operating pressure should be 50 PSI or greater.

D: 2-position, no springs. Spool shifts and remains shifted when one button bleeder or the other is momentarily or continuously depressed. Minimum operating pressure should be 25 PSI or greater.

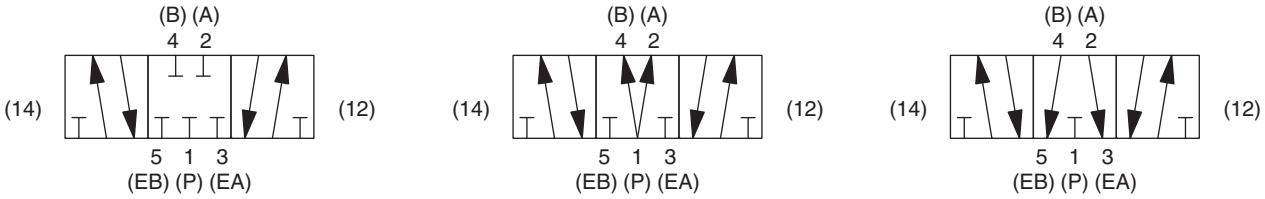
DY: 3-position, spring centered. Spool returns to position "B" when **both** button bleeders are released. Minimum operating pressure should be 50 PSI or greater.

BODY STYLE:

SIDE PORTED: Side ported valves can be installed inline. These valves have standard female "National Pipe Threads" to connect directly to installed air lines. The standard pipe sizes are 1/4", 3/8", 1/2", 3/4", 1" and 1-1/2" NPTF.

SUBPLATE MOUNTED: Subplated valves require a mounting base. This mounting base is pre-plumbed to existing control lines. Due to the nature of all the plumbing lines fixed to a mounting base, replacing subplate mounted valves is rapid and quick. All port connections, excluding differential pilot ports are made through O-ring sealed holes in the base of the valve through a subplate. The differential pilot connections can not be made through the subplate. O-ring seals and mounting screws are furnished with each subplate valve. Because the connections to a base mount can be of any size and configuration, subplate mounted valves are assigned a designation derived from a basic valve body size. A 3P size subplate valve will have the same flow characteristics as a 3/8" NPTF side ported valve body.

SPOOL CONFIGURATION (FOR 3-POSITION VALVES):



STANDARD: Most valves are supplied with a "Closed Center" spool. In the center position, all ports are blocked. If a valve is only a 2-position valve, the actual function of the center position is not critical. So most 2-position valves are "Closed Center". Some designs do require softer transitions, so we offer alternate spool configurations on 2-position valves.

REGENERATIVE: Spool Option "D". In the center position or during transition, ports 2 and 4 are connected to port 1. We call this a "Regenerative" spool since both cylinder ports 2 and 4 are supplied with pressure and flow from port 1.

FLOAT CENTER: Spool Option "G". In the center position or during transition, port 2 is connected to port 3 and port 4 is connected to port 5. We call this a "Float Center" spool since both standard cylinder ports 2 and 4 are vented to an exhaust port and no pressure or flow from port 1 is supplied.

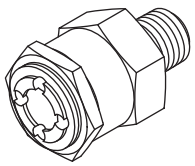
MOUNTING OF VALVES

AAA valves may generally be mounted in any position. But for safety, any valve which does not have springs or detents to hold the spool in position should be mounted with the spool horizontal unless pressure is continually applied to hold the spool in position.

VALVE OPTIONS:

OPTION U: EXHAUST FLOW CONTROLS

Available only on body styles 2, 3 and 4. A Model MFC flow control, listed on page 146, is screwed into each exhaust port, giving meter-out speed control of an associated air cylinder or air motor in both directions of travel. MFC flow controls not only give adjustable speed control but have a built-in muffler to reduce exhaust noise.



MFC Flow Control

OPTIONAL O-RING MATERIALS:

Unless otherwise specified, all 1/4" and 3/8" soft seal valves come standard with Viton O-rings and all 1/2", 3/4", 1", 1-1/2" and 2" soft seal valves come standard with Buna-N O-rings. If a different material is required, use the dash numbers following the basic valve numbering code. As an example, model SY3G-2 will have Silicon O-rings installed for a low temperature application. On valves larger than 1", consult factory on availability of O-ring materials.

Dash No.	O-ring Description	Temperature Rating
-1	Neoprene for freon	-40°F to 225°F
-2	Silicon	-80°F to 400°F
-3	Viton for most aromatic gases	-20°F to 400°F, 600°F for short time
-4	Butyl Rubber	-60°F to 200°F
-5	Teflon	-250°F to 450°F
-7	Urethane, 70 Durometer	-65°F to 200°F
-9	Buna-N	-40°F to 250°F

We are constantly researching O-ring materials to evaluate performance and durability in the AAA valve product line. Above is a compilation of the most commonly requested O-ring materials and the associated dash number. If you have a particular application that requires an O-ring material that is not listed, please contact us. Since we utilize standard O-ring dimensions in our valves, we can respond to the most obscure O-ring material request.

STANDARD TEMPERATURE RANGE

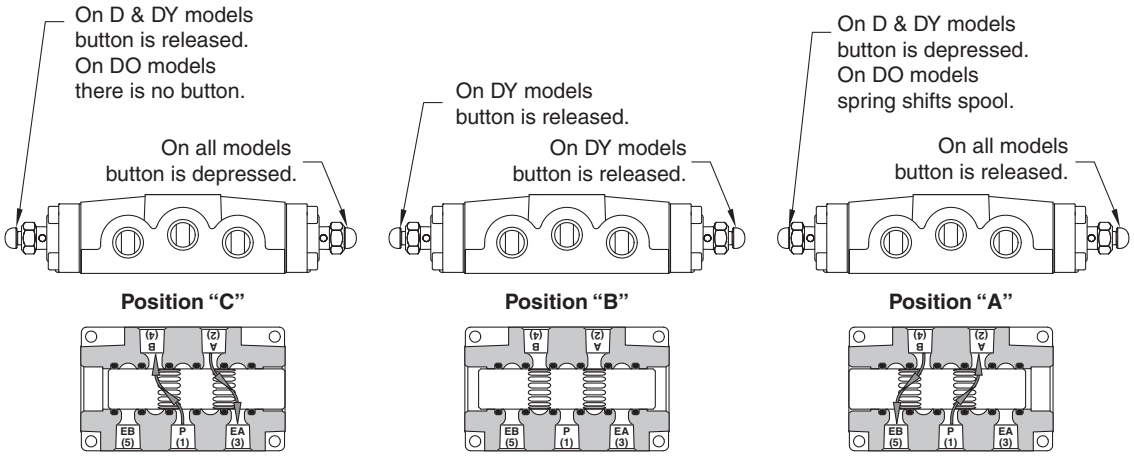
Operating temperature is dependent upon the seal materials used. The following are temperatures for standard valves:

1/4" and 3/8"valves use Viton O-rings: -20 to 400 °F, 600 °F for short time.

1/2", 3/4", 1", 1-1/2" and 2" valves use Buna-N O-rings: -40 to 250 °F.

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.

FLOW PATTERN:



1/4" through 1": If the button depressed causes the spool to be in position "A", port 1 will connect to port 2. When the button depressed causes the spool to be in position "C", port 1 will connect to port 4. The appropriate exhaust will connect to the un-pressurized port. In position "B", the connection of the ports depend on the style of spool used.

1-1/2" and 2": These larger valves use a "Piggy-Back" valve mounted to the top of the larger valve. The flow through the larger valve is the same as above.

AIR FLOW RATINGS:

Reference page 100 for SCFM and Cv ratings.

PRESSURE LIMITATION ON DIFFERENTIAL PILOT VALVES

Differential Pilot models are special types in which full line pressure is maintained on both ends of the main spool. To shift the spool, one or the other bleed buttons on the end caps must be momentarily pressed. This vents pressure from one end, permitting pressure on the other end to shift the spool. This diagram shows the working principle.

A minimum of 25 PSI is required for reliable shifting of non-spring models. Minimum pressure for spring offset and 3 position models is 50 PSI. They will not operate correctly on compressed air lines of less than 25 PSI. They are not suitable for liquids. By careful design they can be built in a 3-position, spring centered configuration.

The bleed buttons can be removed from the valve body and mounted on 1/4" hose or tube extensions for shifting the valve from a few feet away. Any other 2-way normally closed (N.C.) valve, manual, cam or solenoid can be substituted for either or both bleed buttons.

Differential Pilot valves can **NOT** be used on vacuum service.

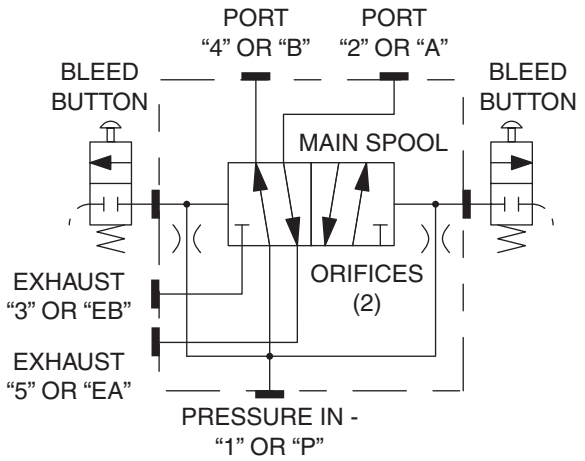


Diagram of Differential Pilot Valve

SEAL KITS:

ERKV-3: One kit required for each 1/4" or 3/8" valve. Includes six V-39 Viton body O-rings, two EMG3 Buna-N solenoid gaskets, two ECG3 composition end cap gaskets, two V-565 Buna-N Namur mounting O-rings, one PBG3 gasket, one PBG3-1 gasket, five V-92 Buna-N subplate O-rings and two V-93 Buna-N subplate pilot O-rings (Seals used determined by valve model and style).

ERKV-4: One kit required for each 1/2" valve. Includes six V-6 Buna-N body O-rings, two EMG3 Buna-N solenoid gaskets, two ECG48 composition end cap gaskets, five V-110 Buna-N subplate O-rings, two V-29 Buna-N subplate pilot hole O-rings (Seals used determined by valve model and style).

ERKV-8: One kit required for each 3/4" or 1" valve. Includes six V-30 Buna-N body O-rings, two EMG3 Buna-N solenoid gaskets, two ECG48 composition end cap gaskets, five V-90 Buna-N subplate O-rings, two V-89 Buna-N subplate pilot hole O-rings (Seals used determined by valve model and style).

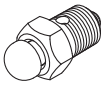
ERKV-16: One kit required for each 1-1/2" or 2" valve. Includes six V-123 Buna-N body O-rings, two V-124 Buna-N end cap O-rings, two V-89 Buna-N end cap pilot O-rings, five V-125 Buna-N subplate O-rings, two V-89 Buna-N subplate pilot O-rings (Seals used determined by valve model and style). To repair piggy back valve, use ERKV-3.

VGK-3: AAA valve grease to lubricate body O-rings during valve overhaul (Each seal repair kit does supply enough grease for complete seal replacement).

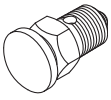
REPLACEMENT COMPONENTS:

Consult Factory. All AAA valves are designed for rugged applications. But sometimes unforeseen damage does occur. Please contact us for broken clevis', handles, tired springs, flattened cams or any other component that appears to be working less than optimum.

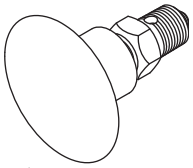
DIFFERENTIAL PILOT VALVE ACCESSORIES:



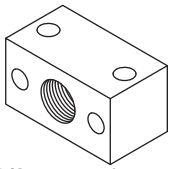
BB-1S Bleed Button



BB-1SSL Bleed Button



BB-1P Bleed Button



TB-1/8 Mounting Block

MODEL BB-1S: STEEL BLEED BUTTON. Replacement button same as original equipment on all AAA differential pilot valves. Threaded 1/8" NPT. Extends approximately 3/4" when installed. Requires 6 lbs operating force on 100 PSI line.

MODEL BB-1SSL: Same as BB-1S except with larger stainless steel head and spring for heavy duty applications.

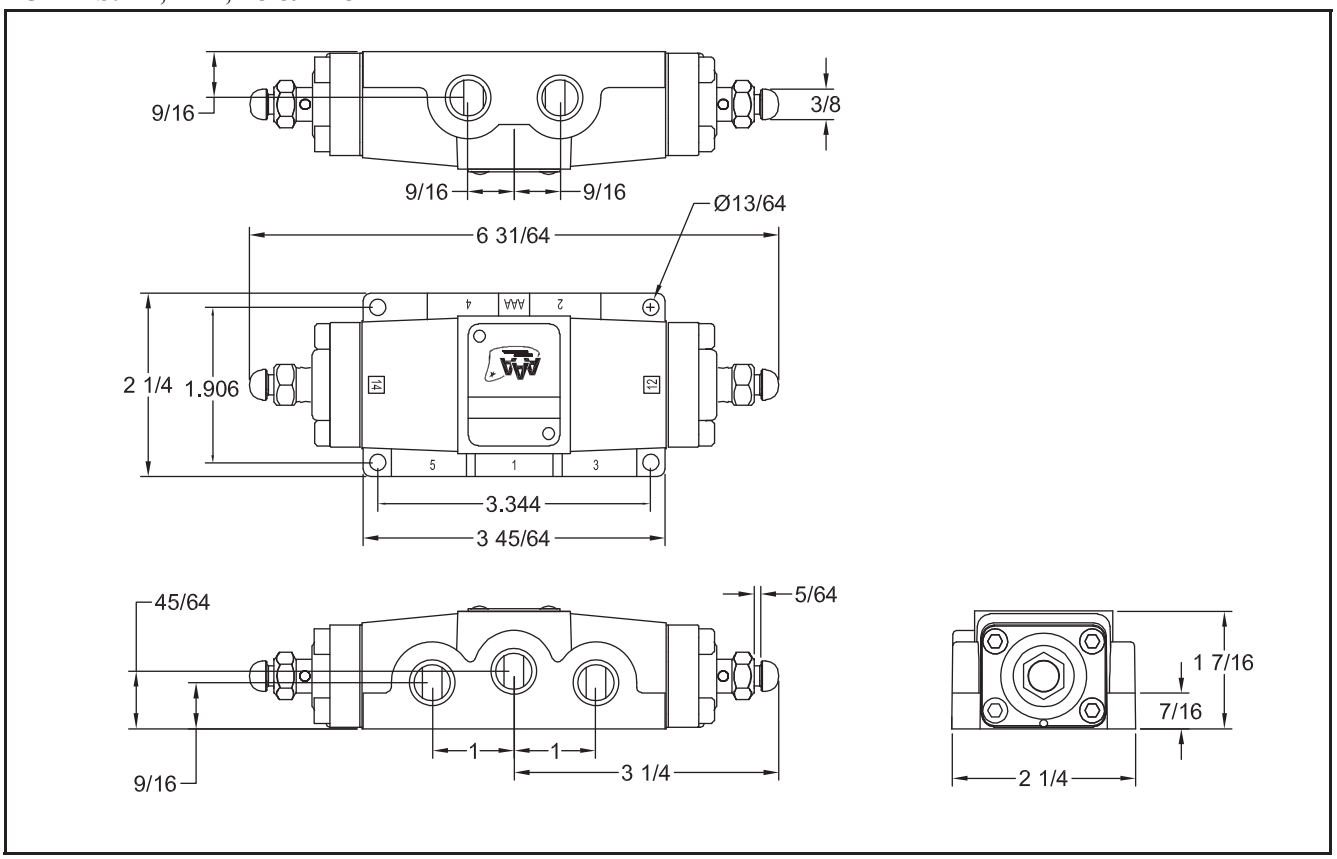
MODEL BB-1P: PALM DIFFERENTIAL PILOT. Same as BB-1S, with hard black plastic palm button 1-3/8" diameter. For use as manual control or panic button.

MODEL TB-1/8: MOUNTING BLOCK. A convenient means of mounting a bleed button remotely. Body is 3/4" square x 1-1/8" long. Universal mounting with 1/8" NPTF ports on two sides. Mounts with two No. 10 or 3/16" screws.

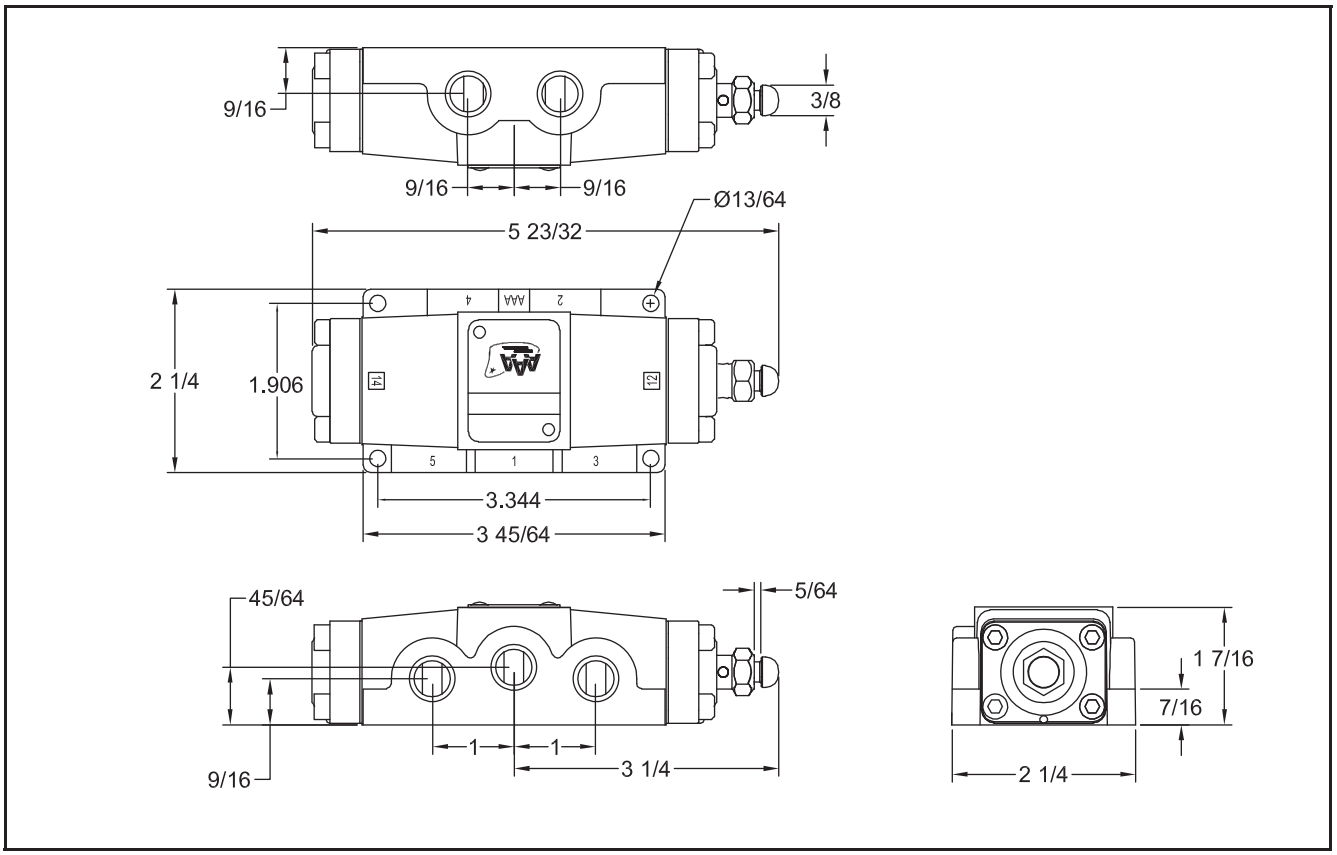
Unless otherwise noted all button bleed bodies are brass, with bronze internal spring and steel plunger button.

SEMI-DIMENSIONAL DRAWINGS:

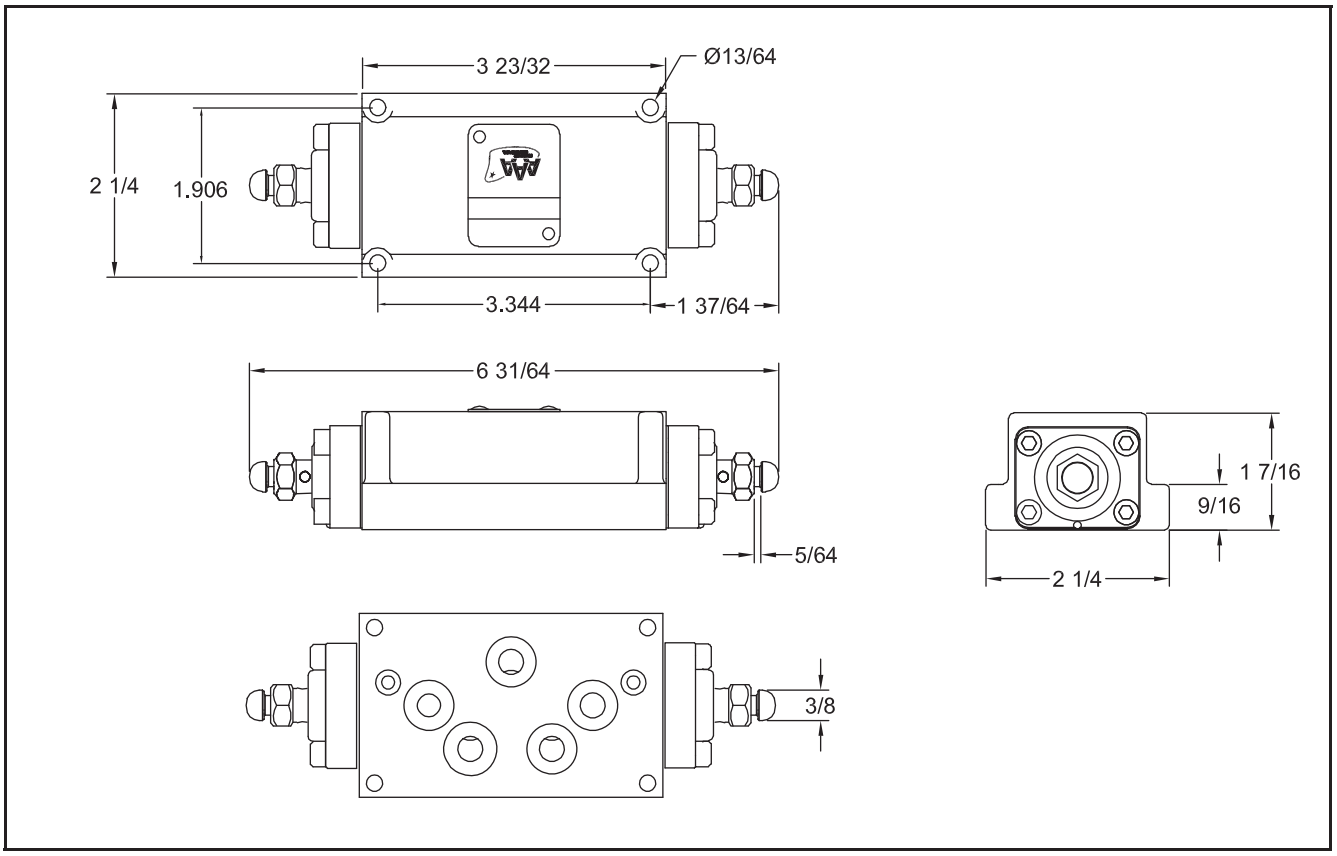
MODELS: D2, DY2, D3 & DY3



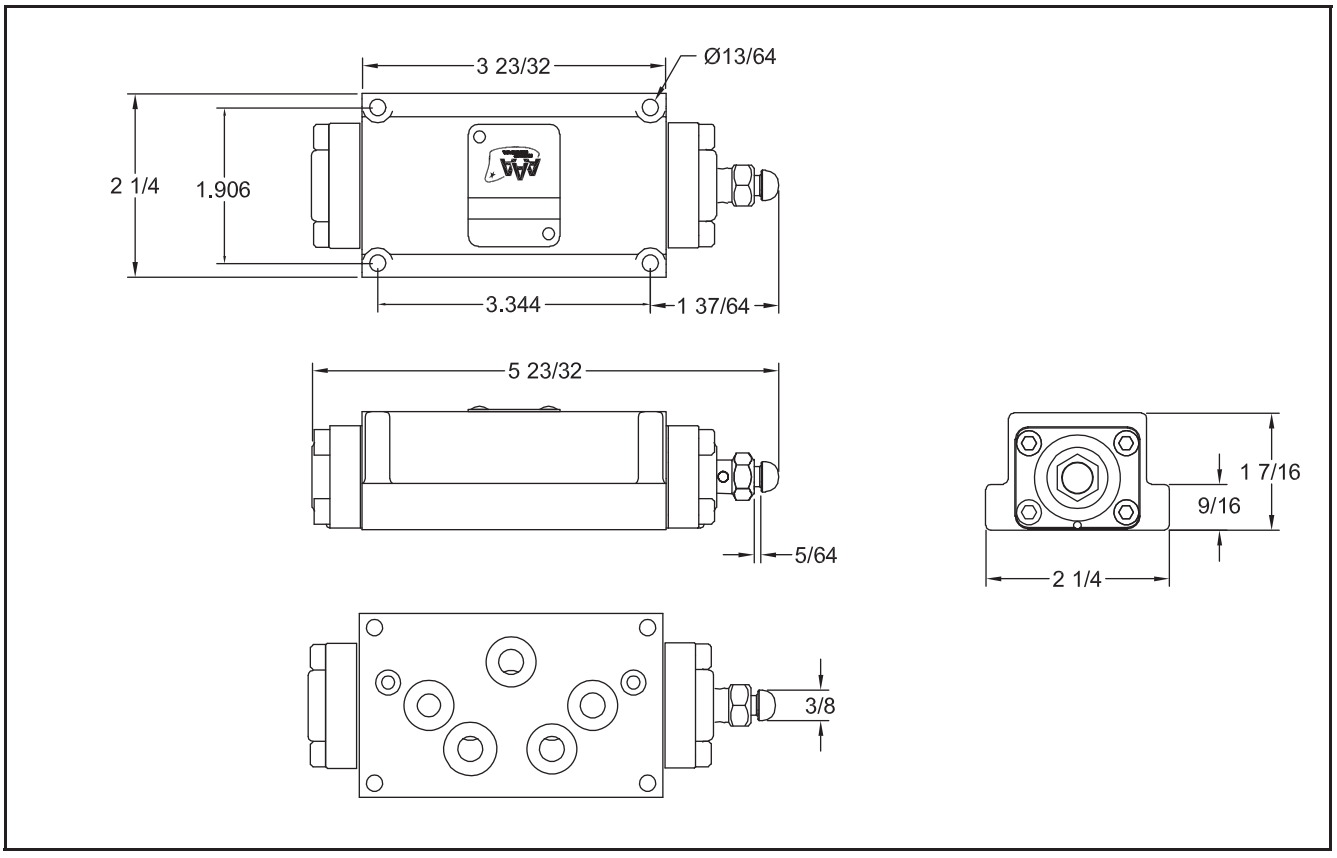
MODELS: DO2 & DO3



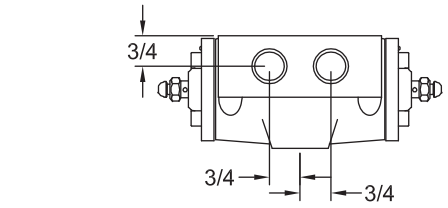
MODELS: D3P & DY3P

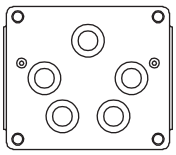


MODELS: DO3P

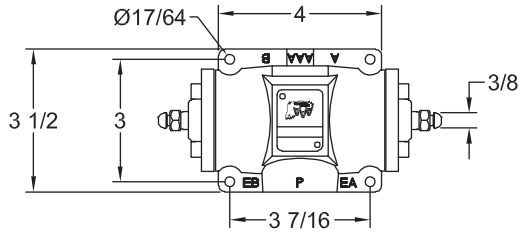


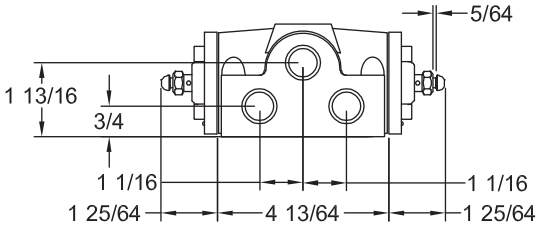
MODELS: D4, DY4, D4P & DY4P

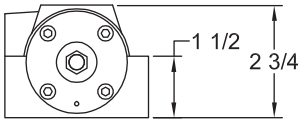




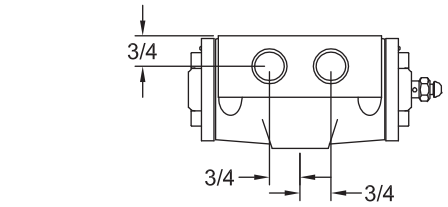
SUBPLATE VALVE PORTS
ARE LOCATED ON THE
BOTTOM OF THE BODY

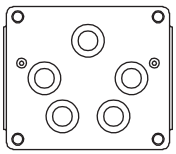




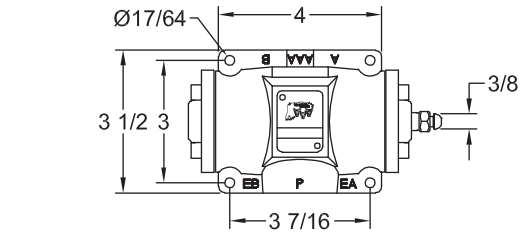


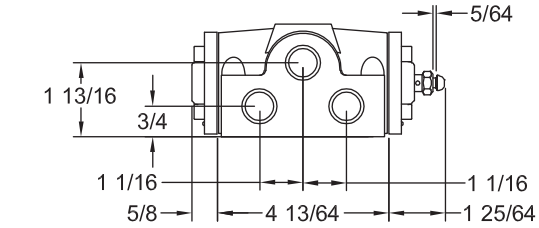
MODELS: DO4 & DO4P

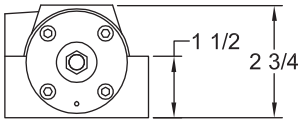




SUBPLATE VALVE PORTS
ARE LOCATED ON THE
BOTTOM OF THE BODY

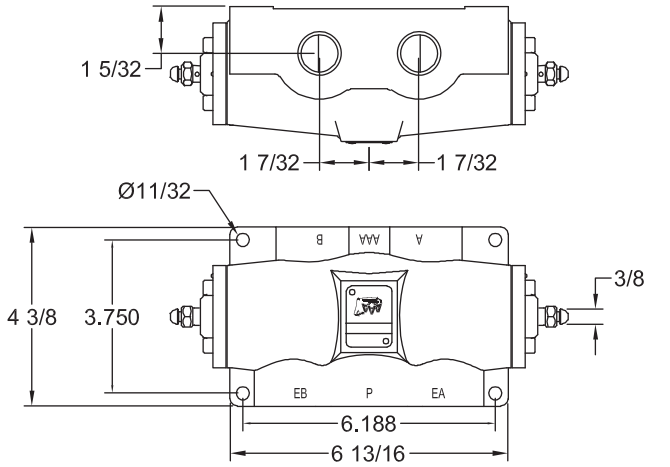


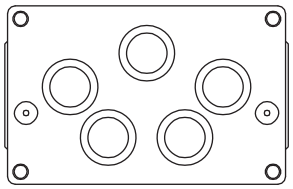




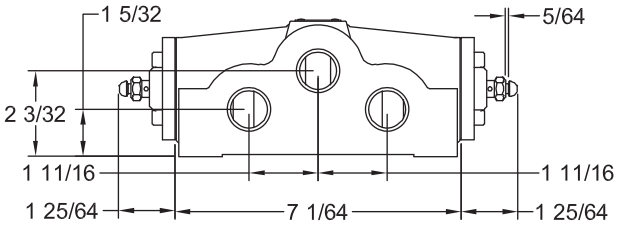
STANDARD 1/4" THROUGH 2" DIFFERENTIAL PILOT: D, DO, DY

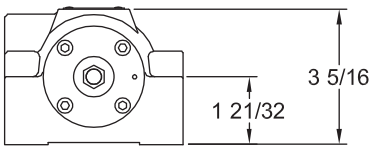
MODELS: D6, DY6, D8, DY8, D8P & DY8PP



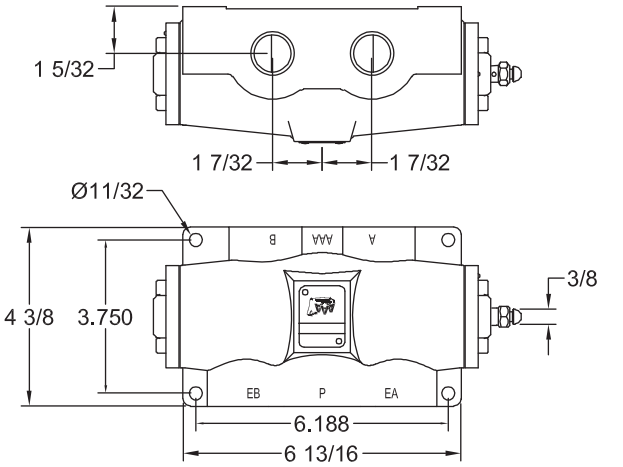


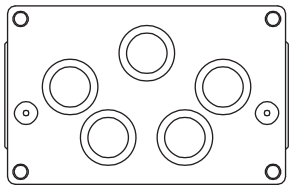
SUBPLATE VALVE PORTS ARE LOCATED ON THE BOTTOM OF THE BODY



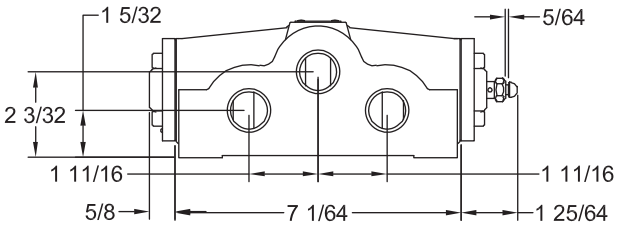


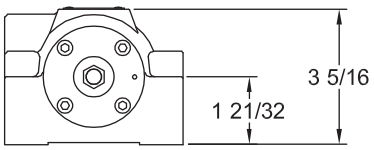
MODELS: DO6, DO8 & DO8P



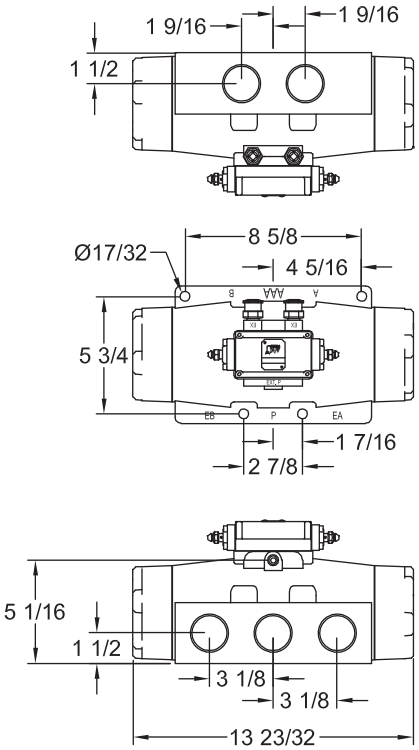


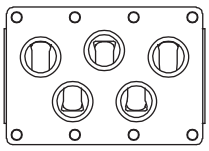
SUBPLATE VALVE PORTS ARE LOCATED ON THE BOTTOM OF THE BODY



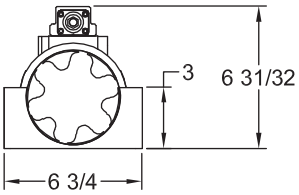


MODELS: D12, DY12, D16P & DY16P

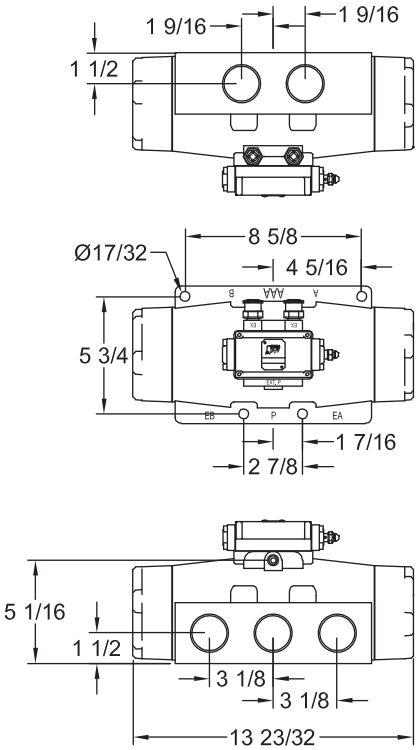


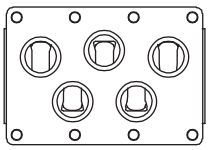


SUBPLATE VALVE PORTS
ARE LOCATED ON THE
BOTTOM OF THE BODY



MODELS: DO12 & DO16P





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