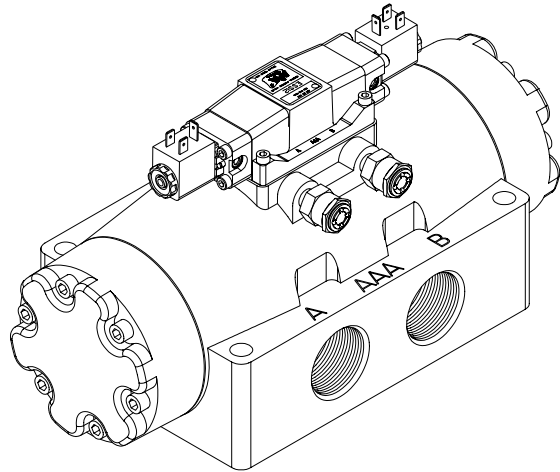


1-1/2" & 2" AIR VALVES

4-WAY — 50 TO 250 PSI AIR*

All valves in this listing have identical spool flow capacity, but are offered with choice of 1-1/2" NPTF threads in body, or for mounting on a subplate with choice of 1-1/2" or 2" NPTF connection threads. Use 2" size for long plumbing runs to reduce flow resistance. See also general information on AAA valves starting on page 42.



FLUID MEDIA. Designed for operation on compressed air; not suitable for liquid service. May be used to handle inert gases, although a source of compressed air may be required for spool shifting pressure, since pilot media is normally vented to atmosphere.

PRESSURE RATING. Normal operating range, 50 to 150 psi on main air inlet. May be used on vacuum or on lower or higher pressures, up to 250 psi, by converting the valve to shift on external pilot pressure as described elsewhere on this page.

FLOW CAPACITY. While valves are listed as 1-1/2" or 2" there is only one body size. Nomenclature is derived from the thread port size of the subplate on which the valve is mounted. All models have identical flow capacity: a flow area equal to the diameter of a 1-3/8" round hole.

MAIN SPOOL OPERATION. The main spool of all models is powered by air pilot pressure; return springs or centering springs are not used in any model. With the exception noted below, all models obtain air pilot pressure from the main inlet through a 3/8" AAA piggy-back pilot valve mounted on top of the main body.

EXCEPTIONS. Models GR and GY, pages 38 and 39, are exceptions. They do not use a piggy-back operator; piloting is from a remote source.

"SPRING RETURN", 2-POSITION MODELS. The piggyback valve is a standard AAA 3/8" spring return air valve, but the main spool has no springs; it is powered in both directions by pilot air pressure. (Example: ESO12)

"NO-SPRING", 2-POSITION MODELS. The piggy-back valve is a standard 2-position, no spring 3/8" AAA valve as listed on pages 6 through 13. The main spool follows the action of the piggy-back pilot spool but is powered in both directions by air pressure obtained from the valve inlet. (Example: ESS12)

"SPRING CENTERED", 3-POSITION MODELS. The piggy-back is a standard AAA 3/8" air valve, 3-position, with spring centered, regenerative (Type "D") spool. However, the main spool has no springs; it is powered in both directions and is centered by means of air pressure obtained from the main valve inlet. (Example: ESY12)

SPOOL SPEED CONTROL. All models (except GR and GY) are furnished with two Type MFC-2 combination muffler/speed controls (page 47). These may be adjusted to prevent high impact of the spool against the end caps. If nec-

essary to pipe away the exhaust, the MFC controls may be replaced with in-line needle valves.

LOW OR HIGH PRESSURE OPERATION. Normal assembly of all standard valves is for internal pilot operation, in which the air pressure for shifting the spool is internally tapped off the valve inlet. If the main spool is to handle pressures lower than 80 psi or more than 150 psi on solenoid models or from 50 to 250 psi on all other models, the valve should be factory ordered for "external pilot operation" by adding suffix "Z" after the regular model number. (Example SO12Z) Or, the valve can easily be converted in the field to external piloting as described below. This pressure limitation applies to all 1-1/2" and 2" valves, manual lever, solenoid, pilot, or differential pilot.

CONVERSION TO EXTERNAL PILOTING. Remove the entire pilot valve from the main body and lay it aside. Install a 1/16" NPT pipe plug in the threaded hole uncovered in the body mounting pad. Re-mount the piggy-back operator in the same position as before. Connect a pilot pressure air source (50 to 150 psi, on solenoid models and 50 to 250 psi on all other models) to the 1/4" NPTF external pilot port. This port is located on the side and near the top of the main body, on the side opposite the MFC flow controls. Do not use the 1/8" NPTF port on top of the solenoid structure.

THREADED BODY MODELS. Furnished in one thread size only, 1-1/2" NPTF. Not available with 2" NPTF threads.

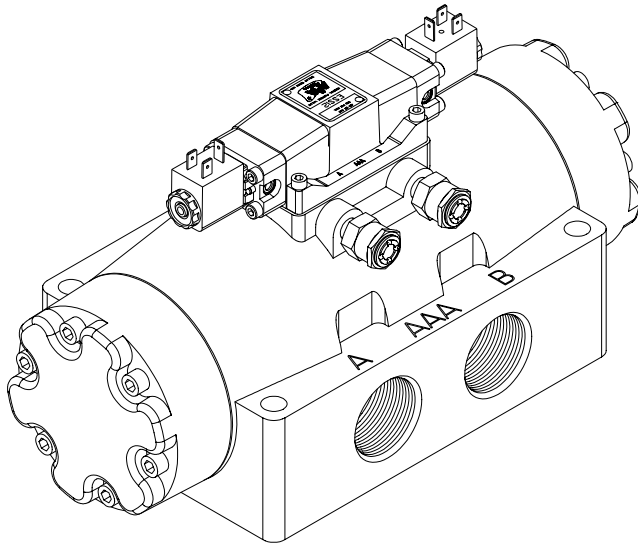
SUBPLATE MOUNTED MODELS. Subplate models shown in the selection charts, have unthreaded port holes, with O-ring seals, through the base of the valve. They can be bolted on user's special manifold or on standard AAA subplates, page 41. External pilot connection, if used, is not brought into the subplate, except on GR and GY models. A set of O-ring seals and hold-down screws are furnished with valve.

SUBPLATES. Standard AAA subplates are shown on page 41. They are available in 1-1/2" or 2" NPTF bottom ported style and 1-1/2" side ported style only.

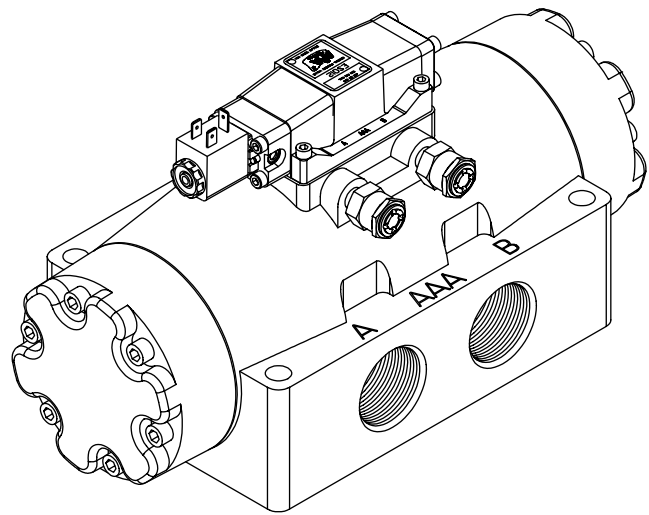
FLOW PATTERN. On solenoid and differential pilot models of 1-1/2" and 2" sizes, flow comes out cylinder port farthest from solenoid or button which was actuated. On manual lever models air comes out cylinder port toward which the handle was moved

*Operating pressure is subject to limitations stated on this page.

SOLENOID VALVE MODEL SELECTION — 1-1/2" & 2"



Double Solenoid Model - Weight 29-1/2 lbs.



Single Solenoid Model - Weight 27-3/4 lbs.

SPECIAL DATA FOR 1-1/2" & 2" SOLENOID VALVES

Solenoid coils are the same as used on all other AAA valves. Refer to page 49 for data on inrush and holding current and power consumption. Refer also to pages 44, 54 and page 54 for additional information on solenoid valves.

Operating pressure on 1-1/2" and 2" solenoid valves must be within the range of 50 to 150 psi because of pressure limitations on the solenoid operator. However, if converted to external pilot operation, following instructions on page 36,

the main ports will handle vacuum and up to 250 psi. Note: External pilot air, if used, must be connected to the 1/4" NPTF pilot port on the main body, not to the pilot port on the side of the solenoid structure.

A description of subplate models is on page 36. Select choice of subplate, if needed, from page 41.

Energizing a solenoid will cause air to flow out cylinder port farthest from the solenoid energized.

MODEL SELECTION — SOLENOID VALVES

Select basic model. See page 50 for optional spools.

MODEL NUMBER		DESCRIPTION	SYMBOL
Threaded body	Subplate		
1-1/2" NPTF	1-1/2" Capacity		
ESO12	ESO16P	Single solenoid, 2-position. Spool returns to original position when solenoid is de-energized.	
ESR12	ESR16P	Single solenoid, 2-position, pilot pressure returned spool. Pilot pressure from an external 3-way valve returns spool to its original position.*	
ESS12	ESS16P	Double solenoid, 2-position. Spool shifts and remains shifted when one solenoid or the other is momentarily or continuously energized.	
ESY12	ESY16P	Double solenoid, 3-position, closed center spool. All ports are blocked when both solenoids are de-energized. See page 50 for other spools.	

*A separate 3-way valve (not furnished) supplies the signal for returning the spool. Pilot air is applied to the 1/8" NPTF port on the end cap of the piggy-back body. This port must be vented to atmosphere at the time the solenoid is energized.

OTHER 1-1/2" & 2" AIR VALVES

4-WAY—50 TO 250 PSI AIR*



MANUAL LEVER

This assembly, with a manual lever piggy-back pilot valve mounted on top of the main body, is intended for applications where the operating position is at the main valve. If the operator control point is to be a little distance away, do not use this model. Use a model GR or GY to handle the main flow, and use a separate 1/4" AAA valve at the remote point. See "Remotely Piloted" description below.

Main line pressure must be at least 50 psi. If less, external piloting must be used, see page 36.

PILOT OPERATED

This valve is similar to the differential pilot model illustrated, except without bleed buttons. Consists of a pilot-operated piggy-back control valve mounted on top of the main pilot operated body. For applications where the pilot signal comes from a different medium, from an unusual source, or where two pilot signals are obtained from different sources.

For normal pilot-operated requirements, models GR or GY, listed at the bottom of this page, may be preferred, with the control valve mounted at the remote control point instead of at the main valve.

DIFFERENTIAL PILOT

A pair of bleed buttons is furnished, screwed into the end caps of the piggy-back operator. These may be removed and mounted on hose or tube extensions for actuation by a machine member or an operator.

Main line pressure must be not less than 50 psi for reliable shifting. For operation on low pressure or vacuum, the main valve must be converted to external pilot operation and a source of compressed air, 50 to 250 psi, connected to the external pilot port on the main valve body. For external piloting see page 36.

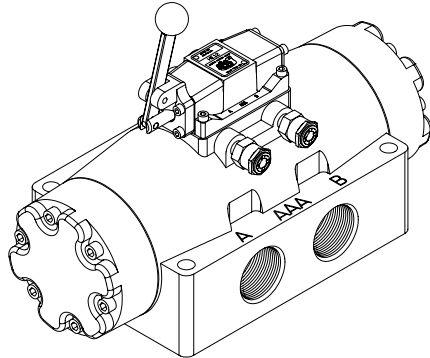
REMOTELY PILOTED

Models GR and GY do not have a piggy-back operator. They are controlled from a remote point with a small 4-way valve such as a 1/4" panel mounted manual lever or palm button valve, a pedal or treadle valve, or machine-mounted cam valve.

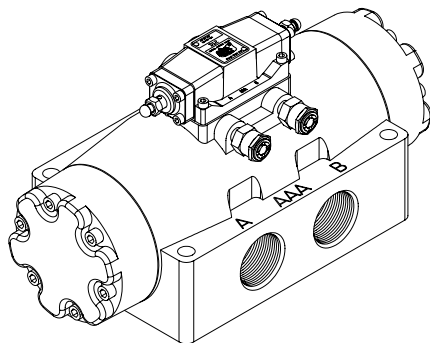
On the 2-position model GR, the remote valve may be any of the 2-position 1/4" types listed on pages 6 through 13, either threaded body or subplate type.

On 3-position model GY, the remote valve may be one of the 1/4" valves but must have a regenerative spool for the purpose of pressure centering the main valve spool. To order, use the model number, then add suffix "D". (Example: HY3D)

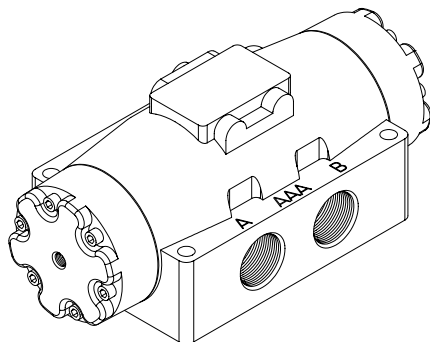
Pilot lines must be run from Port "A" and Port "B" on the remote control valve into the pilot ports of the main valve. These are located on the end caps. Pilot pressure must be in the range of 50 to 250 psi.



Manual Lever Valve - Weight 27-1/4 lbs.



Differential Pilot Valve - Weight 27 lbs.



Remote Piloted Valve - Weight 26 lbs.

* Main valves are limited to 50 psi minimum unless converted to external piloting. See instructions on page 36.

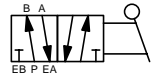

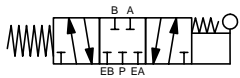
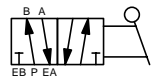
MODEL SELECTION 1-1/2" & 2" AIR VALVES

NOTES: General information on 1-1/2" and 2" valves is on page 36. Threaded body models are available with 1-1/2" NPTF ports only; not available in 2" size. Subplate models will fit choice of subplates with 1-1/2" or 2" NPTF connection threads, listed on page 41.



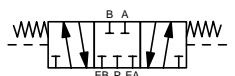



Graphic symbols in this chart are shown in simplified form, since the complete symbol is quite involved. For making circuit drawings, the simplified symbol is usually satisfactory. Closed center spools are supplied as standard on 3-position models.

MODEL SELECTION — MANUAL LEVER VALVES



Select basic model. See page 50 for optional spools.

MODEL NUMBER		DESCRIPTION	SYMBOL
Threaded body 1-1/2" NPTF	Subplate 1-1/2" Capacity		
HE12	HE16P	2-position, friction positioned. Main spool operates by pilot pressure in response to movement of manual lever on piggy back.	
HO12	HO16P	2-position. Manual lever is spring returned; main spool is powered by pilot pressure in both directions in response to movement of manual lever on piggy back.	
HY12	HY16P	3-position, closed center spool. Manual lever spring centered, main spool pressure centered by pilot pressure derived from inlet in main valve.	
HD12	HD16P	3-position, closed center spool. Manual lever has 3-detent action, main spool is pressure centered when lever is moved to center position.	

MODEL SELECTION — PILOT OPERATED & DIFFERENTIAL PILOT VALVES

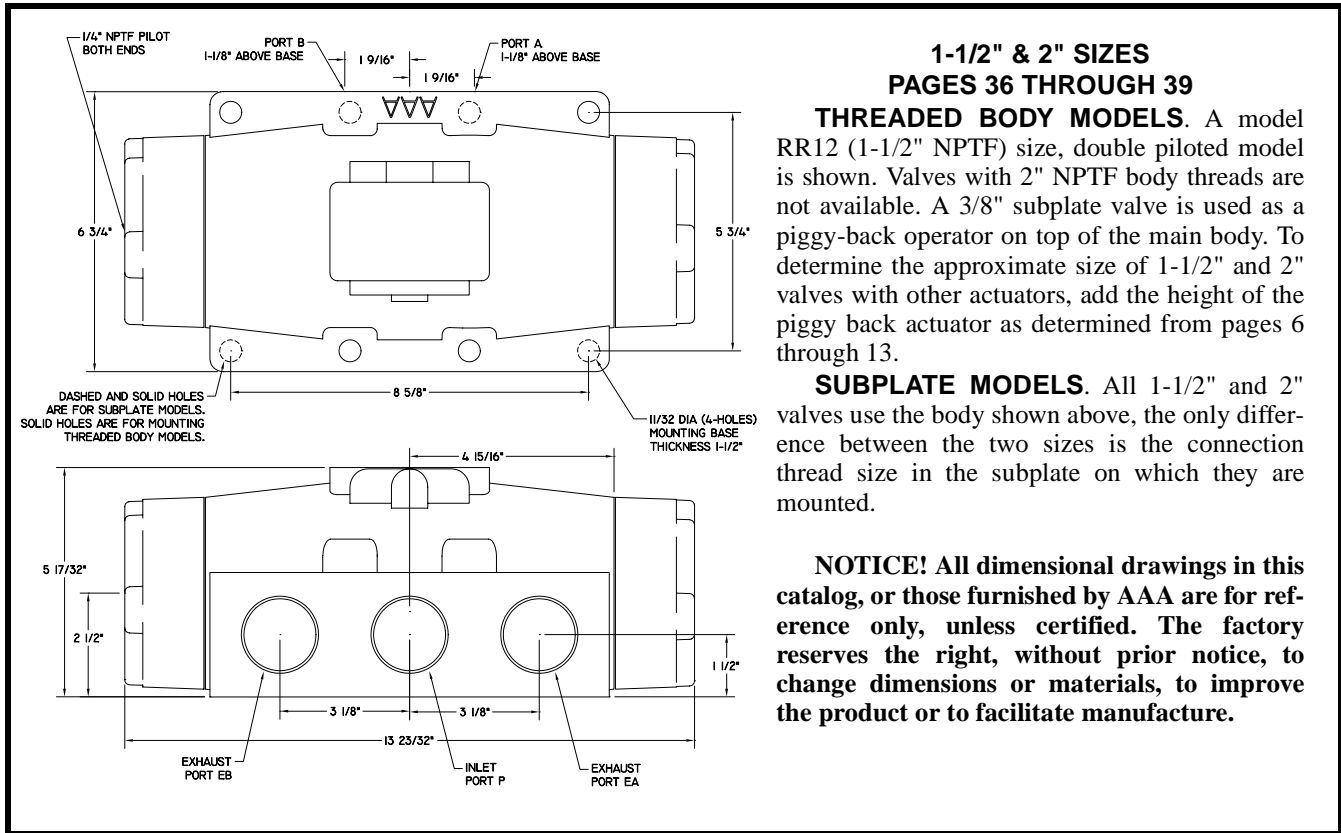
RR12	RR16P	2-position. Pilot valve is shifted by external pilot signal; main spool follows pilot valve, and is powered by air pilot pressure from main line.	
RO12	RO16P	2-position. Spring return of piggy back pilot valve. Main spool is powered by main inlet pressure in both directions.	
RY12	RY16P	3-position, double pilot, closed center spool. Piggy back spool spring centered, main spool powered both directions and centered by pilot pressure.	
D12	D16P	2-position, differential pilot. Main spool is powered by main inlet pressure in both directions.	
DY12	DY16P	3-position, differential pilot, closed center spool. Main spool is powered by main inlet pressure in both directions and centered.	
DO12	DO16P	2-position, differential pilot. Spring return of piggy back pilot valve. Main spool is powered by main inlet pressure in both directions.	

MODEL SELECTION — PILOT OPERATED REMOTELY CONTROLLED VALVES

GR12	GR16P	2-position, double pilot. Spool is powered by pilot pressure from a remote point. Spool stays in shifted position until powered by the opposite pilot.	
GY12*	GY16P*	3-position, closed center spool. Main spool is shifted by pilot pressure supplied from a remote point*.	

*The remote valve selected for controlling the model GY must have a regenerative spool in which both "A" and "B" ports are connected to pressure in center position of the spool. This pressure centers the main spool. Order remote control valve separately from 1/4", pages 6 through 13. Use model number and add suffix "D" for regenerative spool.

BODY DIMENSIONS— 1-1/2" & 2" VALVES



1-1/2" & 2" SIZES PAGES 36 THROUGH 39

THREADED BODY MODELS. A model RR12 (1-1/2" NPTF) size, double piloted model is shown. Valves with 2" NPTF body threads are not available. A 3/8" subplate valve is used as a piggy-back operator on top of the main body. To determine the approximate size of 1-1/2" and 2" valves with other actuators, add the height of the piggy back actuator as determined from pages 6 through 13.

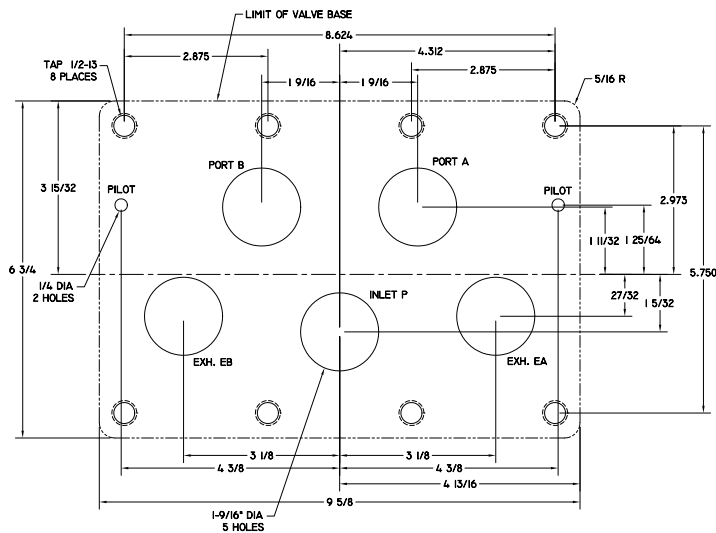
SUBPLATE MODELS. All 1-1/2" and 2" valves use the body shown above, the only difference between the two sizes is the connection thread size in the subplate on which they are mounted.

NOTICE! All dimensional drawings in this catalog, or those furnished by AAA are for reference only, unless certified. The factory reserves the right, without prior notice, to change dimensions or materials, to improve the product or to facilitate manufacture.

SPECIAL INFORMATION ON 1-1/2" & 2" SUBPLATE MOUNTED VALVES

USER'S SPECIAL MANIFOLDS

When laying out valves on a manifold or on a machine, be sure to allow sufficient clearance between valves for pilot connections, if any, and space for removing of solenoid covers for wiring.



MOUNTING PATTERN — 1-1/2" & 2" VALVES

STANDARD SUBPLATES

Factory-built subplates are listed on page 41.

SUBPLATE-TO-VALVE PORT SEALS

O-ring seals are furnished with each subplate valve for sealing between valve body and subplate. Replacement O-rings, if needed, can be purchased locally. Any material, such as Buna-N which is compatible with air line lubrication can be used. Seal kits obtained from the AAA factory include these seals.

Subplate No.	O-Ring for Replacement
SP12 & SP16	1-3/4" I.D. x 2" O.D.

PILOT PORT SEALS

Pilot O-ring seals are furnished with each subplate valve for sealing between valve body and subplate.

Subplate No.	O-Ring for Replacement
SP12 & SP16	3/8" I.D. x 9/16" O.D.

MOUNTING SCREWS FOR SUBPLATES

Mounting screws for attaching valves to subplate are normally furnished with each valve. If replacements are necessary, these can be obtained from the local industrial distributor in the following sizes.

Subplate No.	Thread	Length
SP12 & SP16	1/2-13	3-3/4"