fives north american

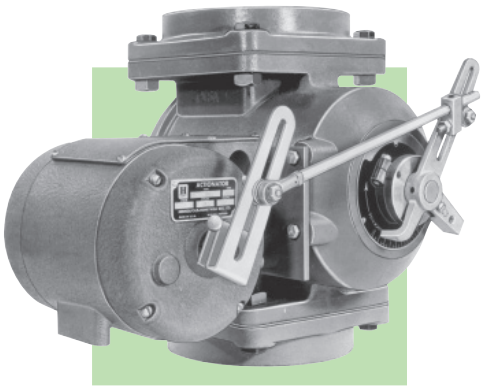
ADJUSTABLE PORT VALVES
Bulletin 1008A

December 2009

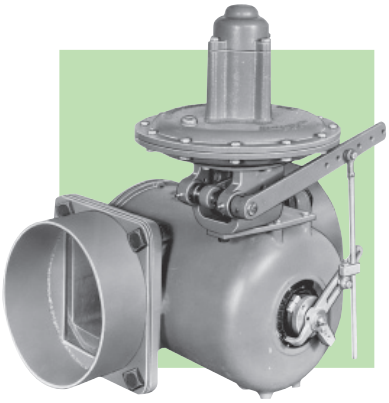
Adjustable Port Valves

for HOT or COLD AIR, GAS, OIL, WATER, STEAM

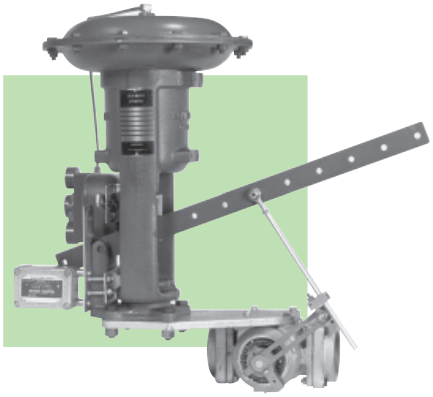
3" Adjustable Port Gas Valve
Beck Electric Operator



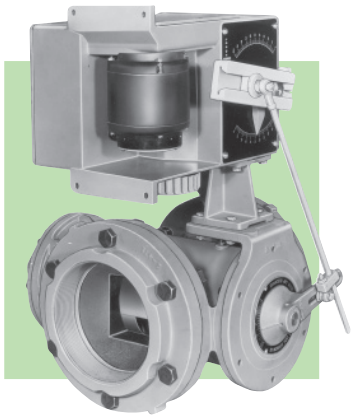
6" Adjustable Port Air Valve
Honeywell Electric Operator



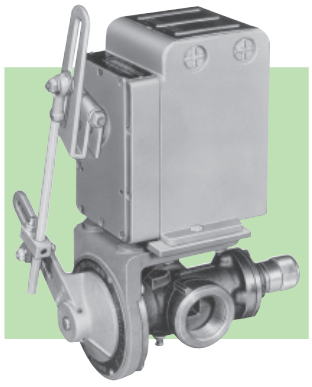
10" Adjustable Port Air Valve
N.A. Pneumatic Operator



2½" Adjustable Port Air Valve
Honeywell Pneumatic Operator



4" Adjustable Port Gas Valve
Honeywell Electric Operator

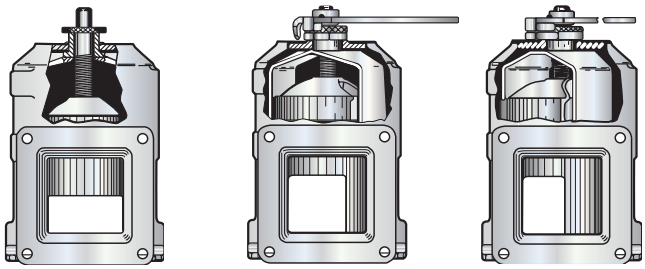


1¼" Adjustable Port Gas Valve
Barber-Colman Electric Operator

LOW TORQUE ● ROTARY PLUG ● EASILY CLEANED
pressure drop adjustable for best flow characteristic

Correct Valve Sizing

Made Easy



Curtain ½ open
Core full open

Curtain ¾ open
Core rotated ¼

Curtain ¾ open
Core rotated ½

Figure A. Turning curtain adjusting knob changes port opening so valve can constitute optimum resistance in the system for good control.

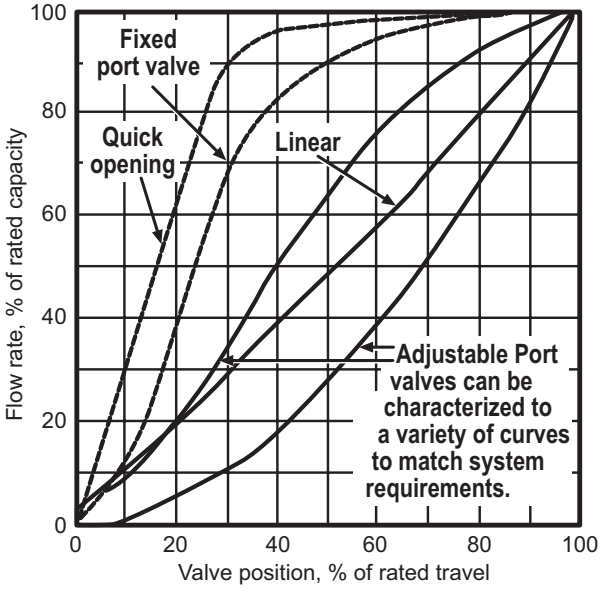


Figure B. Flow characteristics of valves installed in systems with downstream resistance. The three solid lines represent characterizable adjustable port valves.

For a valve operated by a modulating type control, either a linear or an equal percentage characteristic is preferred for most applications. These characteristics are shown in Figure B, together with two curves indicating very common but usually undesirable flow patterns: In their lower parts, change of flow is too fast, causing an "over correction;" while at the upper end there is practically no flow change in response to valve movements.

Shape of a flow curve depends (1) on valve **area characteristic**, and (2) on size of valve port relative to downstream resistances (piping, orifices, and burners), the sum of which is difficult to predict.

An Adjustable Port Valve solves the problem. Its linear area characteristic permits proper "sizing" of valve **after installation** without involved calculations.

Recommended procedure is to open valve control handle and valve curtain wide, then close curtain until pressure drop across valve is ⅕ to ⅙ of total system pressure drop. Flow characteristics shown as solid lines in **Figure B** can be realized with full valve stroke, enabling desired flow response to movements of the control motor.

Linkage between motor and valve can be "characterized" to produce the desired flow curve, e.g., linear or equal percentage.

Multiple Valve Combinations

Two or more Adjustable Port Valves can be used in combination to control air, fuel(s), and atomizing medium. In such combinations, valves can be "stacked" on a common shaft, or mounted side-by-side with linked control handles, or both.

A side-by-side arrangement generally allows more flexibility.

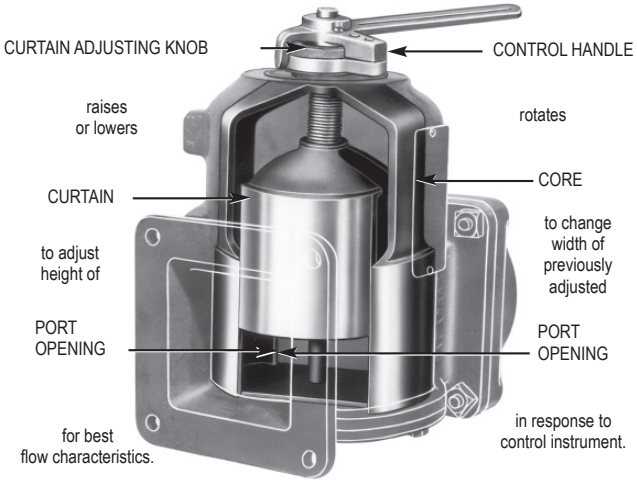


Figure C. Adjustable Port Valve for cold or hot air, 3 psi or less. All A.P. Valves have sliding gate action and rotary plug action.

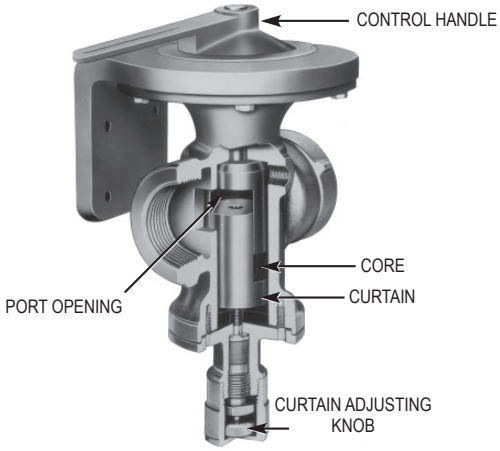


Figure D. A.P. Valve for gas, oil, water, steam, compressed air.

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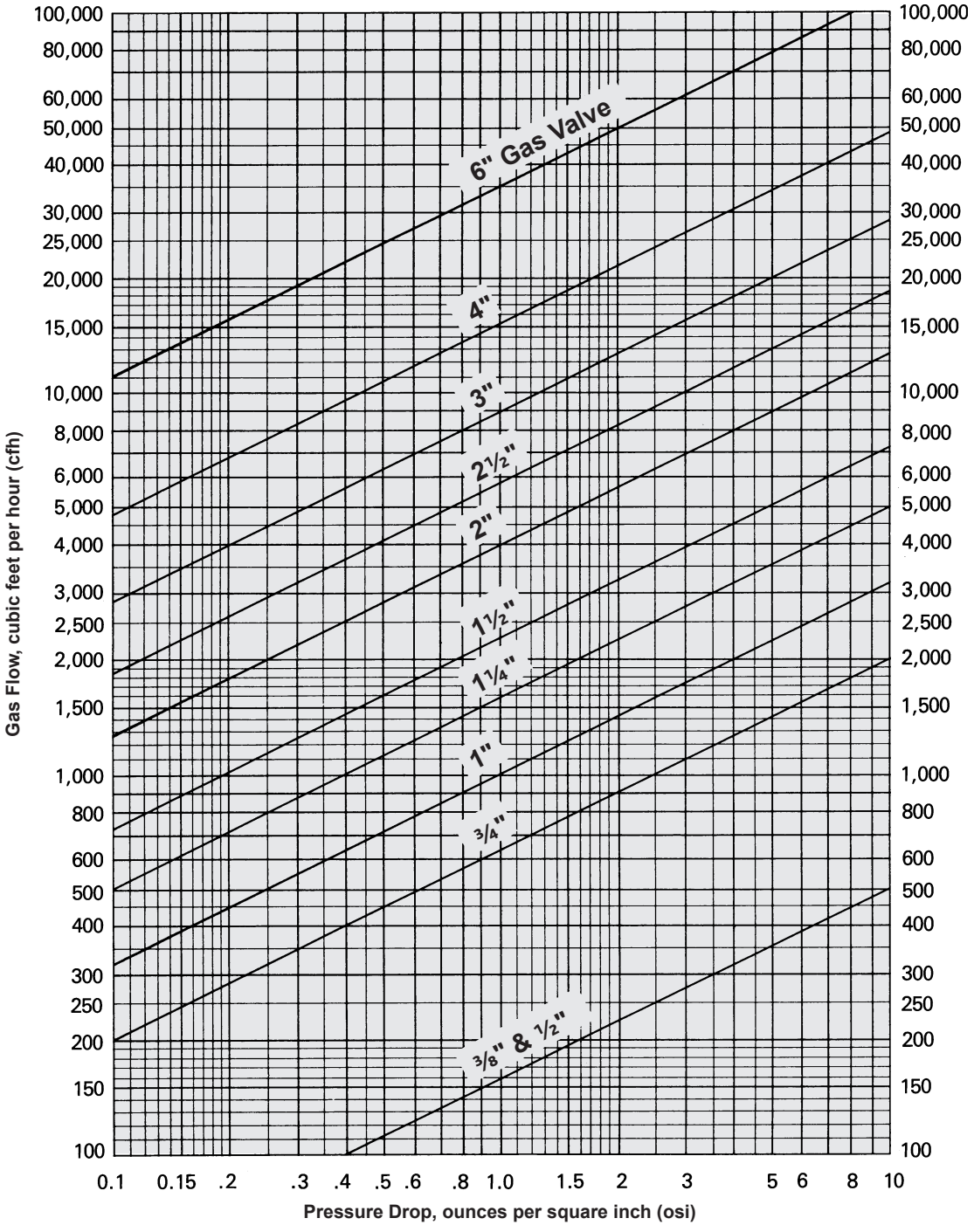
Fax 216.641.7852 - email: fna.sales@fivesgroup.com - www.fivesgroup.com/fivesna

Wide Open Gas Capacities
1008A Adjustable Port Valves
(0.6 specific gravity gas)

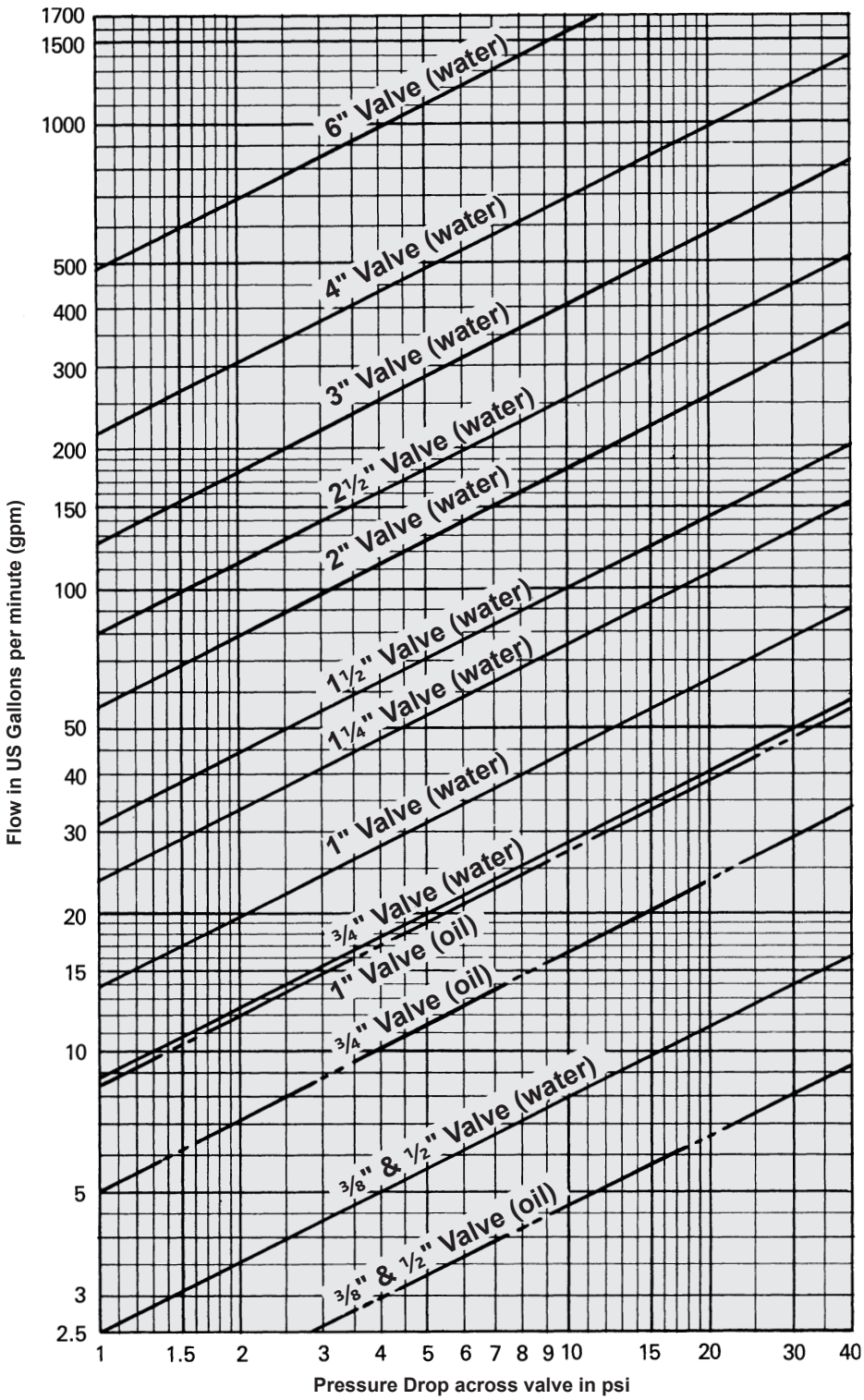
For other gravities, multiply these capacities by the following factors:

Gravity	Factor	Gravity	Factor
0.40	1.220	1.00	0.775
0.55	1.040	1.50	0.630
0.65	0.960	1.95	0.550



Wide Open Water and Oil Capacities
1008A Adjustable Port Valves

Flow is proportional to the square root of the pressure drop across the valve, except for fluids having high viscosities. Oil suitable for atomization at the burner (viscosity no greater than 150 SSU) follows the square root law.



WARNING: Situations dangerous to personnel and property may exist with the operation and maintenance of any combustion equipment. The presence of fuels, oxidants, hot and cold combustion products, hot surfaces, electrical power in control and ignition circuits, etc., are inherent with any combustion application. Parts of this product may exceed 160F in operation and present a contact hazard. Fives North American Combustion, Inc. urges compliance with National Safety Standards and insurance Underwriters recommendations, and care in operation.

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ADJUSTABLE PORT VALVES
Instructions & Parts List 1008A

January 2010

Adjustable port valves are for control purposes only. **They are not for tight shutoff.**

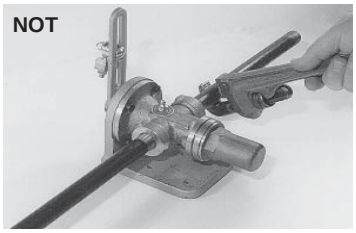
GENERAL INFORMATION

Adjustable Port Valves are ideal for automatic control of fuel or air flow to meet the requirements of modern instrumentation in combustion systems. The adjustable port feature permits sizing the valve to fit the application, after valve has been installed. Linkages can be adjusted for full or limited valve travel.

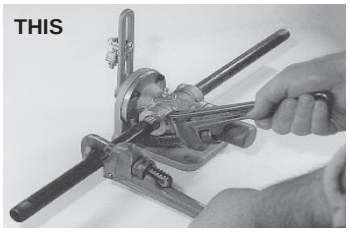
INSTRUCTIONS
gas, oil, steam, compressed air

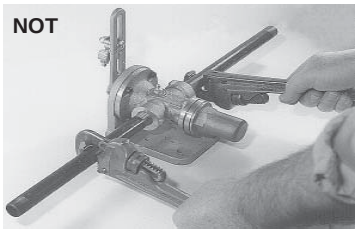
Adjustable Port Valves are precision built and should not be subjected to unnecessary strains or rough handling. Provide proper pipe alignment by use of pipe hangers and supports. Instead of holding the valve body itself between jaws of a vise, screw valve onto a piece of pipe held in a vise. When installing valve in a pipe line, use a pipe wrench at the lugs provided.

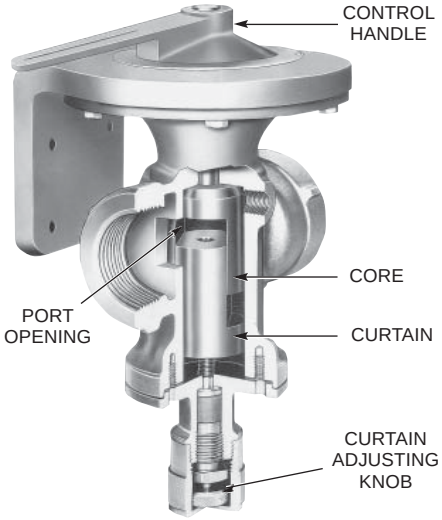
Valve port should be adjusted so some pressure drop is observed across valve at high fire. To adjust valve port opening for required flow conditions, set linkage at full valve travel. Remove adjusting screw cover. For sizes ¾" to 6" turn adjusting screw knob clockwise to increase or counterclockwise to decrease flow. For size ⅜" and ½" turn knob clockwise to decrease flow or counterclockwise to increase flow. This raises or lowers the curtain in the core, altering valve port opening.



Use two wrenches to tighten a pipe into the valve.







The packing nut should be tight to prevent valve from leaking around adjusting screw and it secures the adjusting screw in position, therefore it is difficult to operate the port adjustment by hand, necessitating use of a wrench.

Always assure packing nut is tightened to prevent leakage and always replace adjusting screw cover to prevent tampering after making any curtain adjustments.

1008A valves are factory lubricated with general purpose lithium #2 grease. For lubrication instructions see Sheet 1008A-3 (see Sheet 1010A-1 for oxygen use).

The table *(right)* shows the number of turns required for adjusting the curtain height from full open to fully closed.

Valve Size	Number of turns from full open to fully closed
⅜" and ½"	11
¾"	14
1"	16
1¼" and 1½"	23
2"	30
2½"	35
3"	43
4"	60
6v	87

1008A Replacement Parts

Starting in October 2009, the 1008 series valves were replaced with the redesigned 1008A series valves.

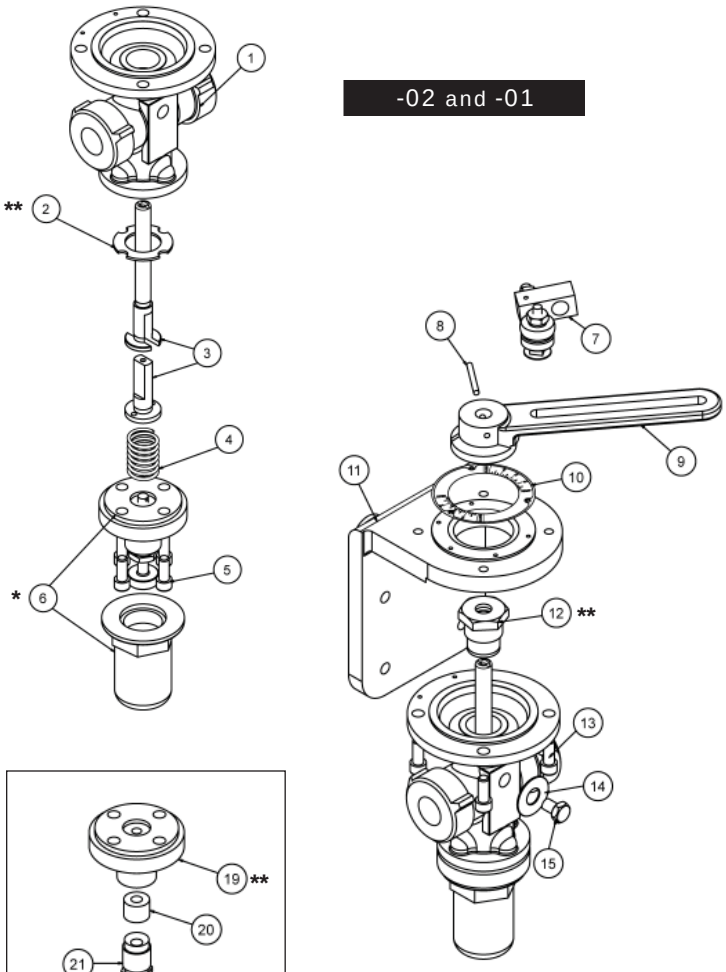
The differences between the 1008A and the 1008 valve designs are as follows:

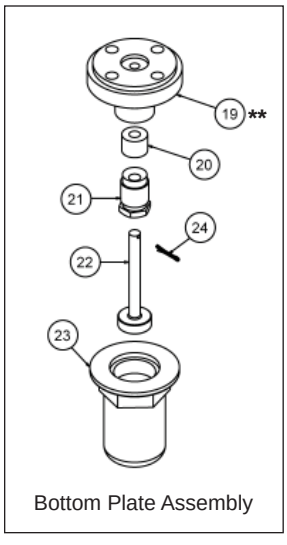
1. **The bottom plate and bottom plate gasket**. The old-style flat faced bottom plate and bottom plate gasket have been replaced with new raised face bottom plate and bottom plate gasket.
2. The **shaft seal with shaft seal nut**. The old style U-cup and U-cup retaining nut have been replaced by O-rings and O-ring seal nut.

The old-style 1008 **bottom plates and bottom plate gaskets** as well as the old-style **1008 U-cup shaft seal nuts and U-cup shaft seals** are no longer available as replacement parts. The new 1008A parts have been designed to fit into an old-style 1008 valve and are required to repair any old-style 1008 series valve. However it is important to note that the old-style U-cup nuts do not work with the new O-rings. The old bottom plates do not work with the new bottom plate gaskets.

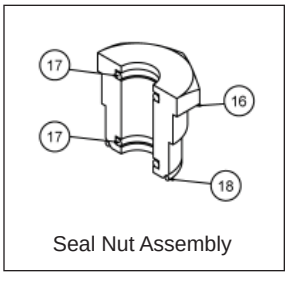
If an old-style 1008 bottom plate gasket or shaft seal requires replacement, the **new bottom plate and bottom plate gasket** or the new **shaft seal nut and O-ring seals** are required to repair and upgrade the 1008 series to be like the new 1008A series design.

The following table indicates the items required to repair and upgrade an old-style 1008 series valve.





Bottom Plate Assembly



Seal Nut Assembly

PARTS LIST		-02 (3/8")	-01 (1/2")
1	Body	2-0585-3	2-0585-4
2 **	Gasket	2-111323-11	2-111323-11
3	Core and Curtain assembly	2-8034-1	2-8034-1
4	Compression Spring	2-0453-1	2-0453-1
5	Bolt	R765-2070 (4) req'd	R765-2070 (4) req'd
6 *	Bottom Plate Adjusting Screw assembly	2-11348-1	2-11348-1
7	Swivel Block assembly	2-5021-2	2-5021-2
8	Handle Roll Pin	R570-4195	R570-4195
9	Handle	2-3706-10	2-3706-1
10	Indicator Dial	2-4349-1	2-4349-1
11	L Bracket Optimal U Bracket	2-05016-1 2-0588-1	2-0516-1 2-0588-1
12 **	Seal Nut assembly Standard (with O rings)	2-11334-1	2-11334-1
	Seal Nut assembly for Steam (with O rings)	2-11334-2	2-11334-2
13	Hex Bolt	R765-2070 (4) req'd	R765-2070 (4) req'd
14	Lubrication Tag (standard) Lubrication Tag (steam)	2-3737-1 15-0127-1	2-3737-1 15-0127-1
15	Hex Head Pipe Plug	R590-7814-S	R590-7814-S
SEAL NUT ASSEMBLY			
16	Seal Nut Standard (less O rings)	2-11283-1	2-11283-1
17	Inner O Rings Standard (2) required	R520-4080-V	R520-4080-V
18	Inner O rings Steam (2) required	R520-4080-EP	R520-4080-EP
	Outer O Ring Standard	R520-4115-V	R520-4115-V
	Outer O Ring Steam	R520-4115-EP	R520-4115-EP
BOTTOM PLATE ADJUSTING SCREW ASSEMBLY			
19 **	Bottom Plate	2-11324-1	2-11324-1
20	Packing	2-6563-1	2-6563-1
21	Packing Nut	2-0773-6	2-0773-6
22	Curtain Adjusting Screw	2-0450-1A	2-0450-1A
23	Adjusting Screw Cover	2-0449-1	2-0449-1
24	Cotter Pin	R570-0525-S	R570-0525-S

* The new bottom plate required to upgrade the 1008 series valve is available as a loose item or it comes included in the bottom plate adjusting screw assembly.

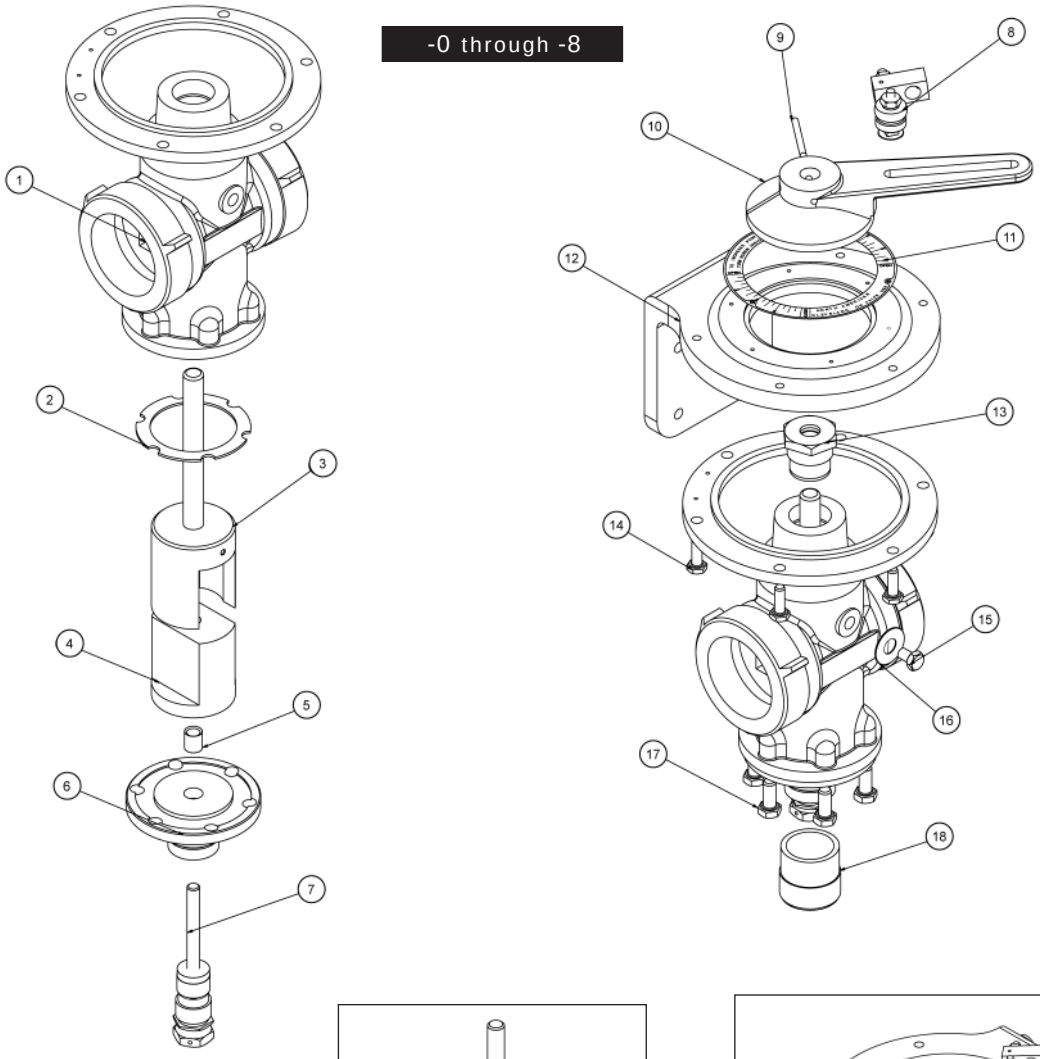
** Replacement parts required to upgrade an old-style 1008 series valve into a 1008A series valve. These parts are required to repair the shaft seal or bottom plate gasket seal on an old-style 1008 series valve (see Replacement Parts info on this sheet).

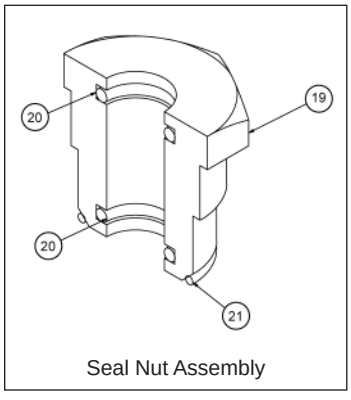
1008A Parts List

	PARTS LIST	-0 (3/4")	-1 (1")	-2 (1-1/4")	-3 (1-1/2"	- 4 (2")	-5 (2-1/2"	-6 (3")	-7 (4")	-8 (6")
1	Body	2-0679-2	2-1685-2	2-0738-2	2-0774-2	2-0775-2	2-0777-2	2-0796-2	2-0787-2	2-0778-2
2	Gasket **	2-11323-11	2-11323-12	2-11323-13	2-11323-14	2-11323-15	2-11323-16	2-11323-17	2-11323-18	2-11323-19
3	Core and Shaft assembly	2-11436-1	2-11436-2	2-11436-3	2-11436-4	2-11436-5	2-11436-6	2-11436-7	2-11436-8	2-11436-9
4	Curtain	2-8089-1	2-8016-1	2-8017-1	2-8018-1	2-8019-1	2-8020-1	2-8021-1	2-8022-1	2-8023-1
5	Spacer	2-7750-1	2-7750-1	2-7750-1	2-7750-2	2-7750-2	2-7750-2	2-7750-3	2-7750-3	2-7750-4
6	Bottom Plate **	2-11325-2	2-11326-2	2-11327-2	2-11328-2	2-11329-2	2-11330-2	2-11331-2	2-11332-2	2-11333-2
7	Adjusting Screw assembly	2-4888-1	2-4888-1	2-4888-1	2-4888-2	2-4888-2	2-4888-2	2-4888-3	2-4888-3	2-4888-4
8	Swivel Block assembly	2-5021-2	2-5021-2	2-5021-2	2-5021-2	2-5021-2	2-5021-2	2-5021-2	2-5021-2	2-5021-2
9	Handle Roll Pin	R570-4195	R570-4195	R570-4250	R570-4250	R570-4250	R570-4450	R570-4450	R570-4450	R570-4450
10	Handle	2-3706-1	2-3706-1	2-3707-1	2-3707-1	2-3707-1	2-3707-2	2-3707-2	2-3707-2	2-3707-2
11	Indicator Dial	2-4348-1	2-4348-1	2-4347-1	2-4347-1	2-4347-1	2-4347-1	2-4347-1	2-4347-1	2-4347-1
12	L Bracket Optional U Bracket	2-0516-1 2-0588-1	2-0516-1 2-0588-1	2-0587-1 2-0589-1	2-0517-1 2-0590-1	2-0517-1 2-0590-1	2-0518-1 2-0591-1	2-0518-1 2-0591-1	2-0518-1 2-0591-1	2-0518-1 2-0591-1
13	Seal Nut assembly Standard ** (with O rings)	2-11334-1	2-11334-1	2-11335-1	2-11335-1	2-11335-1	2-11336-1	2-11336-1	2-11336-1	2-11336-1
	Seal Nut assembly for Steam ** (with O rings)	2-11334-2	2-11334-2	2-11335-2	2-11335-2	2-11335-2	2-11336-2	2-11336-2	2-11336-2	2-11336-2
14	Hex Bolt	R765-2070 4 req'd	R765-2070 4 req'd	R066-2330-C 4 req'd	R066-2330-C 6 req'd	R066-2330-C 6 req'd	R066-2920-C 6 req'd	R066-2620-C 6 req'd	R066-2920-C 6 req'd	R066-2940-C 6 req'd
15	Hex Head Pipe Plug	R590-7814-S	R590-7814-S	R590-7814-S	R590-7814-S	R590-7814-S	R590-7814-S	R590-7814-S	R590-7814-S	R590-7814-S
16	Lubrication Tag (standard)	2-3737-1	2-3737-1	2-3737-1	2-3737-1	2-3737-1	2-3737-1	2-3737-1	2-3737-1	2-3737-1
	Lubrication Tag (steam)	15-0127-1	15-0127-1	15-0127-1	15-0127-1	15-0127-1	15-0127-1	15-0127-1	15-0127-1	15-0127-1
17	Hex Bolt	R765-2070 4 req'd	R765-2070 4 req'd	R066-2610-C 4 req'd	R066-2620-C 6 req'd	R066-2620-C 6 req'd	R066-2920-C 6 req'd	R066-2920-C 6 req'd	R066-2920-C 6 req'd	R066-2920-C 8 req'd
18	Adjusting Screw Cover	2-0682-1	2-0682-1	2-0682-1	2-0760-1	2-0760-1	2-0760-1	2-0791-1	2-0791-1	2-0782-1
	SEAL NUT ASSEMBLY									
19	Seal Nut Standard (less O rings)	2-11283-1	2-11283-1	2-11284-1	2-11284-1	2-11284-1	2-11285-1	2-11285-1	2-11285-1	2-11285-1
20	Inner O Ring Standard (2) req'd	R520-4080-V	R520-4080-V	R520-4102-V	R520-4102-V	R520-4102-V	R520-4140-V	R520-4140-V	R520-4140-V	R520-4140-V
	Inner O Ring Steam (2) req'd	R520-4080-EP	R520-4080-EP	R520-4102-EP	R520-4102-EP	R520-4102-EP	R520-4140-EP	R520-4140-EP	R520-4140-EP	R520-4140-EP
21	Outer O Ring Standard	R520-4115-V	R520-4115-V	R520-4166-V	R520-4166-V	R520-4166-V	R520-4207-V	R520-4207-V	R520-4207-V	R520-4207-V
	Outer O Ring Steam	R520-4115-EP	R520-4115-EP	R520-4166-EP	R520-4166-EP	R520-4166-EP	R520-4207-EP	R520-4207-EP	R520-4207-EP	R520-4207-EP
	ADJUSTING SCREW ASSEMBLY									
22	Curtain Adjusting Screw	2-0724-1A	2-0724-1A	2-0724-1A	2-4890-1	2-4890-1	2-4890-1	2-0792-1A	2-0792-1A	2-0783-1A
23	Collar	N/A	N/A	N/A	2-4889-1	2-4889-1	2-4889-1	2-0794-1A	2-0794-1A	2-0785-1A
24	Packing	2-6563-1	2-6563-1	2-6563-1	2-6563-2	2-6563-2	2-6563-2	2-6563-3	2-6563-3	2-6563-4
25	Packing Nut	2-0773-6	2-0773-6	2-0773-6	2-0773-3	2-0773-3	2-0773-3	2-0773-4	2-0773-4	2-0773-1
26	Adjusting Screw Knob	2-0725-1	2-0725-1	2-0725-1	2-0762-1	2-0762-1	2-0762-1	2-0793-1	2-0793-1	2-0784-1
27	Collar Roll Pin	N/A	N/A	N/A	R570-4130-S	R570-4130-S	R570-4130-S	R570-4180-S	R570-4180-S	R570-4220-S
28	Knob Roll Pin	R570-4130	R570-4130	R570-4130	R570-4135	R570-4135	R570-4135	R570-4190	R570-4190	R570-4230
29	Companion Flange	-	-	-	-	-	-	-	2-0855-1 (2 req'd)	2-3730-2 (2 req'd)
30	Flange Gasket	-	-	-	-	-	-	-	2-1295-4 (2 req'd)	2-1295-5 (2 req'd)
31	Flange Bolt	-	-	-	-	-	-	-	R066-3750 (10 req'd)	R066-3750 (12 req'd)
32	Flange Nut	-	-	-	-	-	-	-	R510-2399 (10 req'd)	R510-2399 (12 req'd)

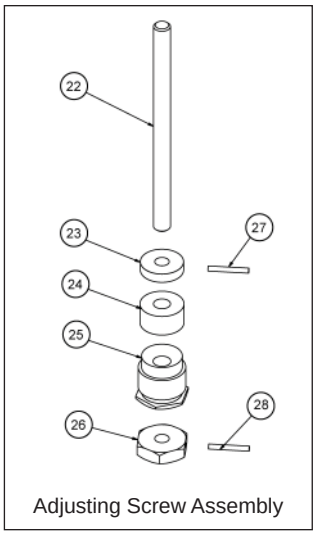
** Replacement parts required to upgrade an old-style 1008 series valve into a 1008A series valve. These parts are required to repair the shaft seal or bottom plate gasket seal on an old-style 1008 series valve (see Replacement Parts info on this sheet).

1008A Parts List, ***cont.***

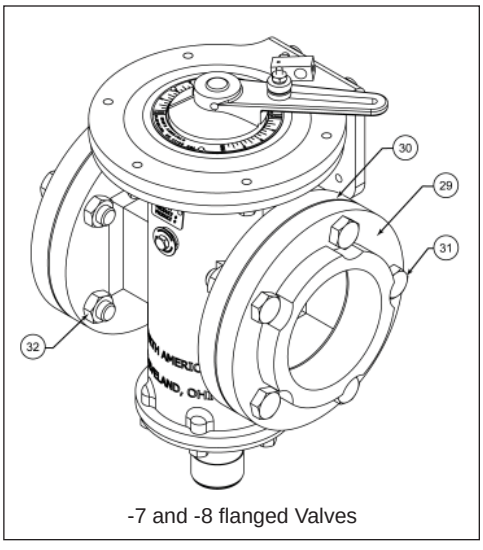




Seal Nut Assembly



Adjusting Screw Assembly



-7 and -8 flanged Valves

WARNING: Situations dangerous to personnel and property may exist with the operation and maintenance of any combustion equipment. The presence of fuels, oxidants, hot and cold combustion products, hot surfaces, electrical power in control and ignition circuits, etc., are inherent with any combustion application. Parts of this product may exceed 160F in operation and present a contact hazard. Fives North American Combustion, Inc. urges compliance with National Safety Standards and Insurance Underwriters recommendations, and care in operation.

fives north american

Flow Control Business Group

1008A ADJUSTABLE PORT VALVES

Specifications 1008A

December 2009

Valves for Gases, Oils, Steam, Compressed Air, Water. (For low pressure air valves, see Specifications 1004/1014.) All valves are for throttling control--not tight shutoff. (See Dimensions 1008A for weights and dimensions.)

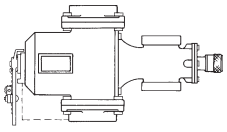
				Materials of Construction ■				
Valve	Pipe size	Max inlet pressure (PSI)	Maximum Temp F.	Body	Core and Curtain	Shaft	Grease	Shaft Seal
1008A Valves	⅜", ½"	125	350	BRS	BRS-ENP	BRS-ENP	Litium #2	Viton
	¾" thru 2"	125	350	DI	CRS-ENP	SST	Litium #2	Viton
	2-½" thru 6" ●	125	350	DI	BRS-ENP	SST	Litium #2	Viton
1008A-S (steam)	⅜", ½"	125	350	BRS	BRS-ENP	BRS-ENP	Silicone compound	EP
	¾" thru 2"	125	350	DI	CRS-ENP	SST	Silicone compound	EP
	2-½" thru 6" ●	125	350	DI	BRS-ENP	SST	Silicone compound	EP
1010A-S (steam)	¾" thru 3"	125	350	BRS	Monel	SST	Silicone compound	EP

Valves must be properly lubricated. See Sheet 1008A-3.

● 4" and 6" are flanged type, furnished with ductile iron companion flanges.

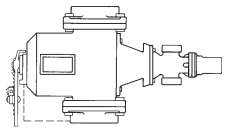
■ Materials abbreviations: BRS = brass, CRS = cold rolled steel, DI = ductile iron, SST = stainless steel, ENP = electroless nickel plating.

1015 COMMON SHAFT Valve Combinations – Air, Gas, and Oil (See Sheet 1015 for dimensions.)



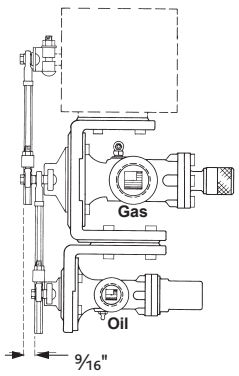
1015 common shaft combination 1004 Air and 1008A Gas

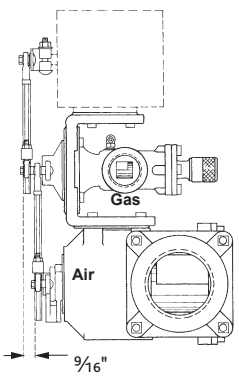
air valve	3-B (1½") or 4-B (2")		4-C (2") 5-C (2½") or 6-C (3")		6-D (3") or 7-D (4")		8-E (6")			9-F (8")		
gas valve	-0 (⅜")	-1 (1")	-1 (1")	-2 (1¼")	-3 (1½")	-4 (2")	-4 (2")	-5 (2½")	-6 (3")	-6 (3")	-7 (4")	-8 (6")
wt in lb	15	16	23	31	42	44	88	105	103	331	345	428



1015 common shaft combination 1004 Air and 1008A Oil

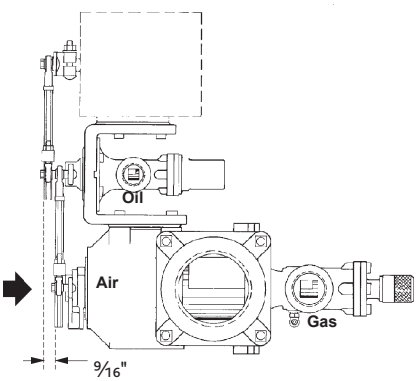
air valve	3-B (1½") or 4-B (2")	4-C (2") 5-C (2½") or 6-C (3")	6-D (3") or 7-D (4")	8-E (6")	9-F (8")
oil valve	-02 (⅜")	-02 (⅜")	-01 (½")	-0 (¾")	-0 (¾")
wt in lb	21	35	43	94	280





1003
SIDE-BY-SIDE VALVE COMBINATIONS
Several side-by-side valve combinations are available. Pictured on far left is a 1008AU Gas and 1008A Oil side-by-side combination. Next to it is a 1008AU Gas and 1004 Air side-by-side combination.1008AU Oil and 1004 Air side-by-side combinations are also available.

1018
THREE-WAY VALVE COMBINATIONS
Three-way valve combinations are available for Air-Gas-Oil and Air-Oil-Steam. The two valves on the common shaft must be from the common shaft combinations listed above.



SELECTION

Fluid	Pressure	Valve	Refer to
Air	0-3 psig 0-125 psig	1004, 1014 1008A	Specifications 1004/1014 Sheet 1008A-1 and example below
Gas, Oil Water	0-125 psig	1008A	Capacities 1008A Sheet 1008A-1 and example below
Steam (saturated)	0-125 psig	1008A-S 1010A-S	Capacities 1008A Sheet 1008A-1 and examples below

SIZING

Air, 3-125 psig. Subtract desired high flow pressure drop from absolute upstream of the valve to get absolute pressure downstream of the valve. Divide this by upstream absolute pressure. If the result is 0.7 or more, refer to Chart A of Sheet 1008A-1. Multiply the desired maximum air flow, scfm, by the appropriate density correction factor from the inset on Chart A, and locate the intersection of lines corresponding to corrected flow and pressure drop. The first diagonal line above this point indicates the correct valve size. If the ratio of downstream absolute pressure to upstream absolute pressure is 0.69 or less, read the intersection, on Chart B, of lines corresponding to upstream absolute pressure and flow, scfm (**do not** multiply by the density correction factor). The first diagonal line above this point represents the correct size valve.

Example: Select a valve to control 1225 scfm air in a 35 psig line. Maximum pressure drop across the wide open valve should be 10 psi. Pressure downstream of the valve will be (35 – 10) = 25 psig. Ratio of absolute pressures is (25 + 15) psia ÷ (35 + 15) psia = 0.8. Use Chart A. Density correction factor for 50 psia upstream pressure is 0.53 (from inset, Chart A). Corrected flow is 1225 scfm × 0.53 = 650 cfm. First diagonal line above intersection of 10 psi pressure drop and 650 cfm lines on Chart A represents a 2" valve.

Gas, 2 psig and up. Follow the same procedure as with 3-125 psig air, using Chart A for absolute pressure ratios of 0.7 and higher and Chart B for ratio of 0.69 or less. In either case, multiply flow, scfm, by the appropriate gas gravity correction factor from the two-line table across the top of the inset on Chart A.

Steam (saturated), up to 125 psig. (Specify "-S" model.) When ratio of downstream absolute pressure to upstream absolute pressure is 0.7 or greater, use same selection method as with 3-125 psig air, but select valve from Chart C. When pressure ratio is 0.69 or less, follow procedure for 3-125 psig air, but select valve from Chart D.

HOW TO ORDER

Valve	Code for pipe size	Options	
1008A-_-_			Standard Valve
1008AU-_-_			Valve with optional U bracket (for side by side combo)
1010A-_-_			Brass and Monel construction (for steam or oxygen* service)
	-02		⅜
	-01		½
	-0		¾
	-1		1
	-2		1¼
	-3		1½
	-4		2
	-5		2½
	-6		3
	-7		4
	-8		6
		blank	no option
		-R	reverse acting
		-S	steam service
		-L	NEMA 4 low fire switch
		-LD	manual locking device
		-LDL	manual locking device and NEMA 4 low fire switch
		-C	Cleaned for oxygen service *see Bulletin 1010A-C/1008A-C

Examples:	1008A-3-R	1½" adjustable port valve reverse acting
	1008AU-4-LDL	2" adjustable port valve with U bracket manual locking device and low fire switch
	1008A-8	6" adjustable port valve

*See Bulletin 1010A-C/1008A-C for oxygen service.

1020
Designates any single valve/operator combination that Fives North American is to ship assembled, regardless of whether FNA sold the operator along with the valve or the customer supplied the operator for FNA to mount.

Example: 1020 Valve combination consisting of 1008A-4 Valve with B & L and M940 Operator mounted.

1021
Designates any single valve that Fives North American is to ship with bracket and linkage only assembled without an actuator.

1003 Side-by-Side Valve Combinations – Valve combinations are entered in the following order:

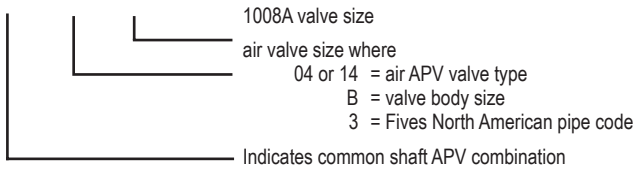
1. Fuel valve
2. Air valve or second fuel valve
3. Air valve
4. Bracket and linkage for customer's control motor, or operator that Fives North American is to supply and mount. Any other modifications of the linkage are also noted here.

The operator is normally mounted on the fuel valve, usually an adjustable port valve with "U" bracket.

	Quantity	Part Number	Description
Example	1	1003	Side-by-Side Valve Combination consisting of: 1008A-4 Valve w/ 1004-6-C Valve w/ B & L for M940

1015 Common Shaft Valve Combinations – Order write-up procedure:

1015 - 04B3 - 02 Common Shaft Valve Combination with B & L and



1018 Three-Way Valve Combinations

	Quantity	Part Number	Description
Example	1	1018	Three-Way Valve Combination consisting of: 1015 Common Shaft Valve Combination consisting of: 1008A-3 Valve w/ 1004-6-D Valve mounted side-by-side to 1008A-01 Valve w/ B & L for M940