fives north american

ADJUSTABLE PORT VALVES

Instructions & Parts List 1004/14

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. The adjustable port feature permits sizing the valve to fit the job, after valve has been installed. Linkages can be adjusted for full or limited valve travel.

INSTRUCTIONS – 1004 and 1014 VALVES for air at 3 psi or less

When installing valves, support piping properly so there is no undue stress on the valves. Grease or other lubricants should not be applied to valve core or curtain, since dirt adhering to the lubricant increases friction.

To adjust port area, set linkage for full valve travel. With valve handle at the wide open position, loosen screw (6) and retract the curtain fully (open) by turning knob (8) clockwise.

Set burners for slightly more than maximum desired firing rate, using individual manual valves at the burners. Turn adjusting knob (8) counterclockwise until air pressure gauge shows a slight decrease, or until desired pressure is obtained. Tighten screw (6) into one of the holes in the adjusting knob (8) to prevent accidental shifting. Adjust linkage for low fire desired.

Valve internals can be cleaned or replaced without removing the valve from the pipe line.

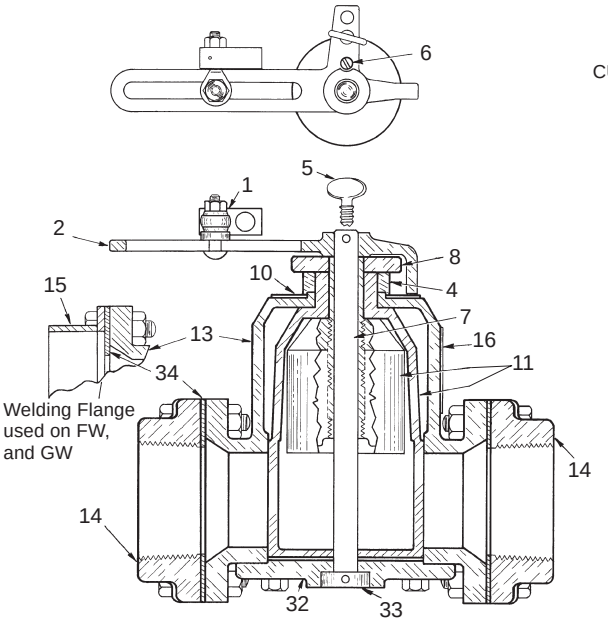
The following table shows the number of turns required for adjusting the curtain height from full open to fully closed.

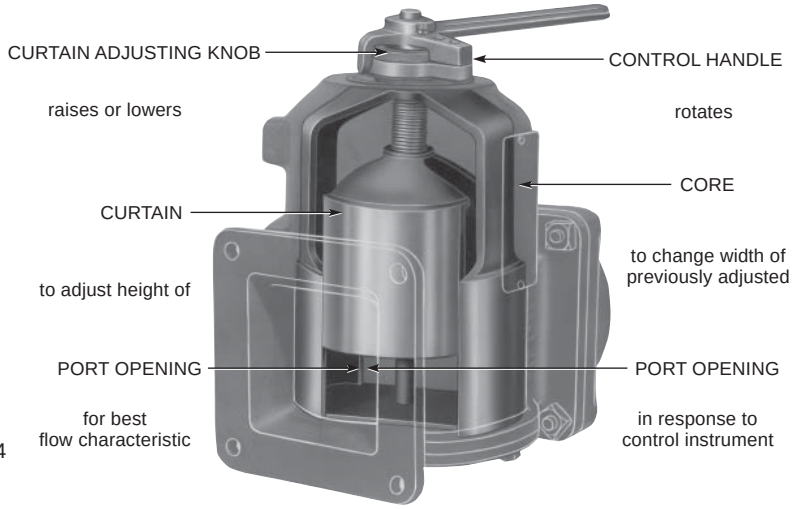
1004 and 1014 Valves

Valve size	Number of Turns from Full Open to Fully Closed
B	27
C	32
D	48
E	48
F	72
G	36

WARNING: Situations dangerous to personnel and property may exist with the operation and maintenance of an 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.

1004 AND 1014 PARTS LIST





All Air Valves include threaded companion flanges unless suffix "W" is used, which means welding type companion flange.

Item No.	Item Name	Series 100__	Valve Designation B	C	D	E	F	G
1	Simple Swivel Assem.	4, 14	2-5021-2	2-5021-2	2-5021-2	2-5021-2	2-5021-2	2-5021-2
2	Control Handle	4, 14	2-3434-2	2-3435-2	2-3435-2	2-3436-2	2-3436-2	2-3437-2
4	Quadrant	4, 14	2-1161-1	2-1162-1	2-1162-1	2-1163-1	2-1163-1	—
5	Handle Locking Screw	4, 14	R777-5230	R777-5230	R777-5230	R777-5350	R777-5350	R777-5340
6	Curtain Locking Screw	4, 14	R775-1940	R775-1940	R775-1940	R775-2870	R775-2870	R775-3550
7	Shaft	4 14	2-0890-1 2-0890-1A	2-0890-2 2-0890-2A	2-0890-3 2-0890-3A	2-0890-4 2-0890-4A	2-0890-5 2-0890-5A	2-0890-6 2-0890-6A
8	Curtain Adj. Screw and Knob	4, 14	2-1617-1	2-1617-2	2-1617-3	2-1617-4	2-1617-5	2-1617-6
10	Indicator Plate	4, 14	2-0810-1	2-1137-1	2-1137-1	2-0686-1	2-0686-1	2-1613-1
11	Core (Sleeve)† and Curtain (Slide)† Ass'y	4 14	2-5897-1 2-5897-2	2-5897-3 2-5897-4	2-5897-5 2-5897-6	2-5897-7 2-5897-8	2-5897-9 2-5897-10	2-5897-11 2-5897-12
13	Body	4 14	2-1626-1	2-0371-1	2-0410-1	2-0405-1	2-0424-1	2-0355-2Δ 2-0354-1○ 2-0355-2AΔ 2-0354-1○
14	Flange	4, 14	8765-3-B(1½") 8765-4-B(2")	8765-4-C(2") 8765-5-C(2½") 8765-6-C(3")	8765-6-D(3") 8765-7-D(4") 8765-8 × 7-D(6" × 4")	8765-8-E(6")	8765-9-F(8")	
15	Welding Flange	4, 14	—	—	—	—	8765-9-FW(8") 2-9914-1(10")	2-3753-1(10") 2-3754-1(12") 2-3749-1(14")
16	Nameplate	4, 14	2-0993-1	2-0993-1	2-0993-1	2-0993-1	2-0993-1	2-0993-1
32	Coverplate	4, 14	2-0394-1	2-0427-1	2-0428-1	2-0429-1	2-0888-1	2-0889-1
33	Collar	4, 14	2-0891-1	2-0891-2	2-0891-2	2-0891-3	2-0891-3	2-0891-4
34	Gasket	4, 14	4-5371-1	4-5371-2	4-5371-3	4-5371-4	4-5371-5	4-5371-6

† The Core and curtain are ground as a unit for a precision fit and must be purchased as a set.
Δ Upper Half of Body. ○ Lower Half of Body.

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ADJUSTABLE PORT AIR VALVES
Capacities, Dimensions
Specifications 1004/1014

September 2007

Valves are designed for control of combustion air up to 3 psi. They are not for tight shutoff and cannot be used for gas.

Maximum air temperatures:

1004 (formerly Fig. 4).....300 F
1014 (formerly Fig. 14).....900 F

Per Bulletin 1008, Adjustable Port Valve flow characteristics can be set in the field after valve has been installed in the pipe. This is desirable to achieve linear, equal percentage, or other control characteristic.

VALVE SELECTION

Use North American's COMBUSTION HANDBOOK, pipe rule or other source to determine the pipe size for the required flowing volume, piping configuration and allowable pressure loss. Table A lists available valve/body sizes for selected pipe size. Graph 1 is used to determine pressure drop when valve is wide open. As long as valve body is large enough, its curtain can be adjusted for optimum drop under field conditions.

Valve sizes 1 1/2" through 8" are provided with threaded adapter flanges while optional 8" and 10" through 14" have welding adapters.

PREHEATED AIR

When using 1004 (300 F maximum) or 1014 (900 F maximum) Valves with hot air, multiply scfh by Table B correction factor and use resultant figure for valve sizing from Graph 1.

Graph 1. **CAPACITIES**
scfh air
with curtain and valve wide open

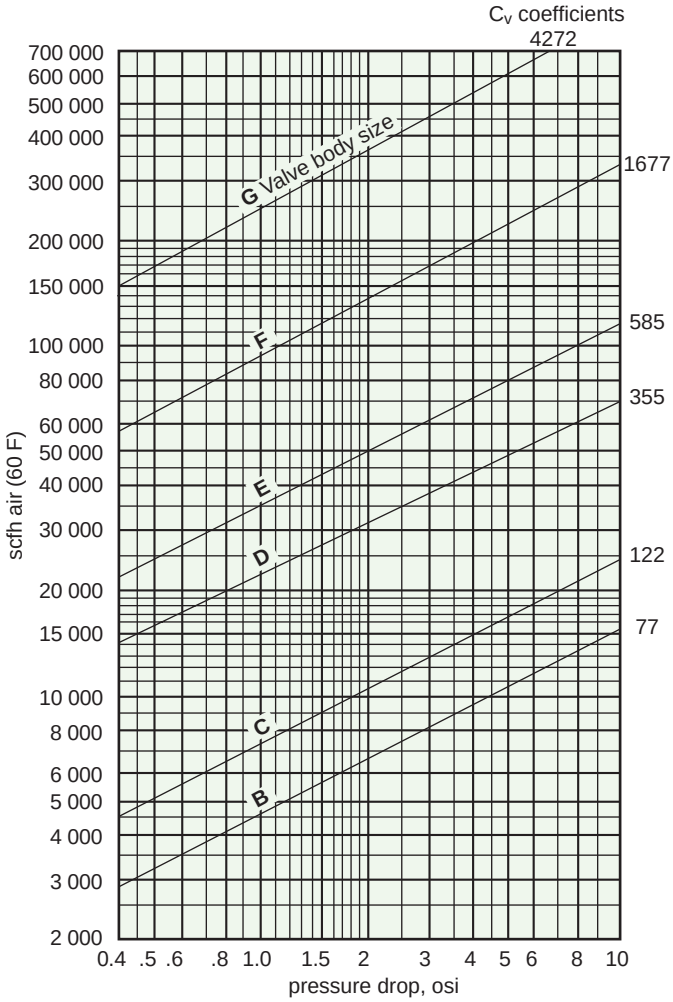


Table A.

Pipe Size	Valve/Body Sizes
1 1/2"	-3-B
2"	-4-B, -4-C
2 1/2"	-5-C
3"	-6-C, -6-D
4"	-7-D
6"	-8-D, -8-E
8"	-9-F, -9-FW
10"	-10-FW, -10-GW
12"	-12-GW
14"	-14-GW

Table B. Air temperature correction factors

Temp. (F)	300	400	500	600	700	800	900
Factor	1.21	1.29	1.36	1.43	1.49	1.56	1.62

Example: Select Adjustable Port Valve for application requiring 3 000 000 Btu/hr input using 600 F air, with available hot air pressure 10 osi or more:

3 000 000 Btu/hr requires 30 000* scfh air.

600 F factor is 1.43: 30 000 × 1.43 = 42 900 (equivalent 60 F air).

Graph 1 indicates an E body would have a 1.5 osi pressure drop or a D body a 4 osi pressure drop. Usual selection would be an E body which is available in only a 6" pipe size.

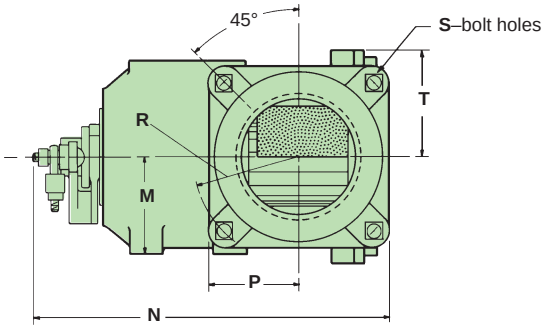
*Excess air requires an additional multiplier (1.1 for 10% XSAir).

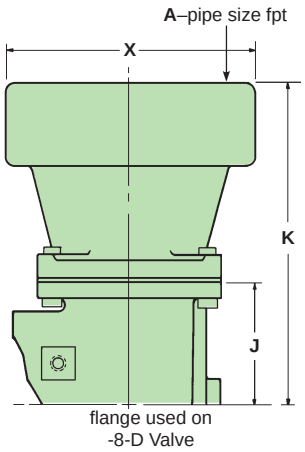
Valve	MATERIALS body	internals	shaft
1004	cast iron	aluminum	CRS electroless nickel plated
1014	cast iron	cast iron	stainless steel

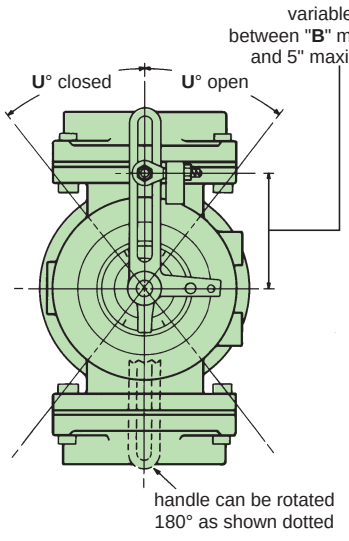
torque requirements
(inch-pounds with 3 psi pressure drop through valve)

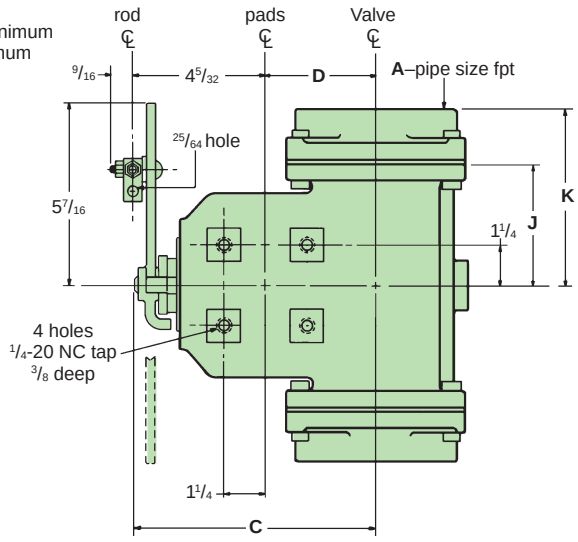
Valve size	B	C	D	E	F	G
torque	1.5	4.0	10.0	15.0	20.0	25.0

DIMENSIONS
inches









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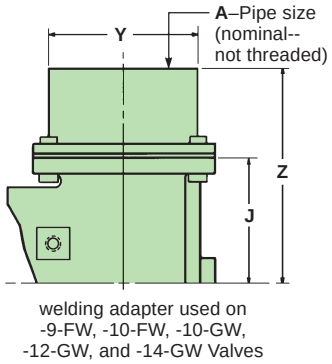

Valve size	dimensions in inches A	B	C	D	J	K	M	N	P	R	T	U°	S	X	Y	Z	wt, lb 1004	1014
-3 or -4-B	1 1/2 or 2	1	4 5/8	11/16	2 1/4	3 5/16	1 13/16	7 1/32	1 5/8	1 25/32	1 3/4	37	9/32	—	—	—	14	17
-4 or -5-C	2 or 2 1/2	1	5 9/16	1 9/16	2 11/16	3 7/8	2 3/32	8 9/32	2	2 9/32	2 1/4	36	11/32	—	—	—	20	24
-6-C	3	1	5 9/16	1 9/16	2 11/16	4 5/16	2 3/32	8 9/32	2	2 9/32	2 1/4	36	11/32	—	—	—	20	24
-6 or -7-D	3 or 4	1	7 5/16	3 5/16	3 11/16	5 1/4	2 29/32	10 25/32	2 3/4	3 3/16	3 1/8	38	13/32	—	—	—	36	43
-8-D	6	1	7 5/16	3 5/16	3 11/16	9 1/16	2 29/32	10 25/32	2 3/4	3 3/16	3 1/8	38	13/32	7 1/2	—	—	62	69
-8-E	6	1 3/8	9 7/16	5 7/16	4 7/8	6 11/16	3 25/32	14 9/32	4 1/8	4 5/8	4 1/16	38	17/32	—	—	—	75	90
-9-F or -FW	8	1 3/8	13 1/2	9 1/2	7	8 13/16	5 3/8	19 19/32	5 3/8	6 3/16	5 1/2	40	1	—	8 5/8	10 7/8	258	310
-10-FW	10	1 3/8	13 1/2	9 1/2	7	—	5 3/8	19 19/32	5 3/8	6 3/16	5 1/2	40	1	—	10 3/4	10 3/8	333	383
-10-GW	10	1 7/8	19 3/16	15 3/16	9 7/8	—	8 1/4	27 9/32	7 3/8	8 27/32	8 1/2	40	1 1/32	—	10 3/4	14 5/16	410	490
-12-GW	12	1 7/8	19 3/16	15 3/16	9 7/8	—	8 1/4	27 9/32	7 3/8	8 27/32	8 1/2	40	1 1/32	—	12 3/4	14 5/16	410	490
-14-GW	14	1 7/8	19 3/16	15 3/16	9 7/8	—	8 1/4	27 9/32	7 3/8	8 27/32	8 1/2	40	1 1/32	—	14	14 5/16	490	570

DIMENSIONS SHOWN ARE SUBJECT TO CHANGE. PLEASE OBTAIN CERTIFIED PRINTS FROM FIVES NORTH AMERICAN COMBUSTION, INC. IF SPACE LIMITATIONS OR OTHER CONSIDERATIONS MAKE EXACT DIMENSION(S) CRITICAL.

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