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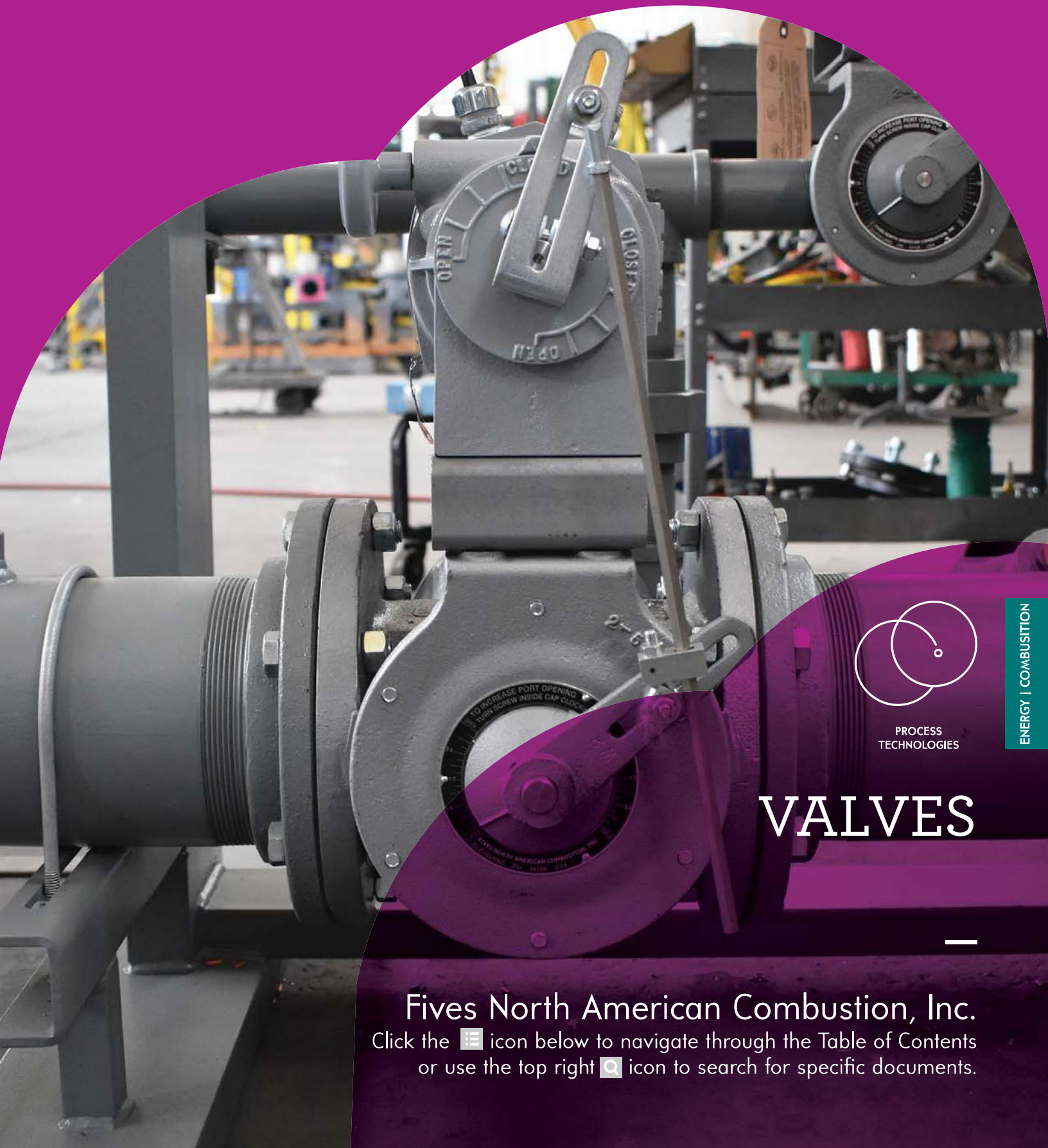

PROCESS
TECHNOLOGIES

ENERGY | COMBUSITION

VALVES

Fives North American Combustion, Inc.

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or use the top right 🔍 icon to search for specific documents.

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PROCESS TECHNOLOGIES

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North American Control Valves
Data on Leakage

Sheet 1000-3

The table below lists leak rates through various models and sizes of Adjustable Port Valves in the overlap closed position and Butterfly and Wafer Valves in the full closed position.

Wide variations in observed leak rates are due to machining tolerances and amount of lubricant (where used) on valve internals. Curtain position of Adjustable Port Valves dœs not affect leakage. Because leakage varies from one valve to another, exercise caution when using this data to determine leakage for valve sizes and pressure drops other than those shown.

Valve Designation and Pipe Size	Fluid	Pressure, osi	Leak Rate, cfh
1008A or 1010A-1 (1")	nat'l gas	8	6.5-14
1008A or 1010A-3 (1½")	nat'l gas	8	19
1008A or 1010A-7 (4")	nat'l gas	8	less than 4
1008A or 1010A-01 (½")	nat'l gas	8	less than 4
1008A or 1010A-01 (½")	comp. air	320 (20 psi)	less than 30
1004-3-B (1½")	air	20	140 past shaft only 405 past port only
1004-6-C (3")	air	28	90-115 past shaft only 145-475 past port only
1004-6-D (3")	air	27	20-25 past shaft only 370-900 past port only
1004-8-E (6")	air	20	10 past shaft only 1910 past port only
1004-9-F (8")	air	20	50 past shaft only 3520 past port only
1122 or 1124-4 (2")	air	24	25
1126-1 (1")	air	24	160
1126-3 (1½")	air	24	334
1126-4 (2")	air	24	564-670
1126-7 (4")	air	24 26	1125-1565 213-236
1136-7 (4")	air	24	645

Valve Designation and Pipe Size	Fluid	Pressure, osi	Maximum Leak Rate, cfh
1145 or 1146-9 (8")	air	4	5 000
1145 or 1146-12 (12")	air	4	6 450
1145 or 1146-16 (16")	air	4	10 500
1145 or 1146-24 (24")	air	4	36 950
1155 or 1156-6 (3")	air	4	250
		24	690
1155 or 1156-7 (4")	air	4	450
		24	950
1155 or 1156-8 (6")	air	4	775
1155 or 1156-9 (8")	air	4	1 100
1155 or 1156-10 (10")	air	4	1 425
1155 or 1156-12 (12")	air	4	1 775
1155 or 1156-14 (14")	air	4	2 125
1155 or 1156-16 (16")	air	4	2 425
1155 or 1156-18 (18")	air	4	2 750
1155 or 1156-20 (20")	air	4	3 100
1155 or 1156-24 (24")	air	4	3 775
1155 or 1156-30 (30")	air	4	4 675

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PROCESS TECHNOLOGIES

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North American Valves C_V Coefficients

The lack of a uniform method of sizing control valves led the Fluid Controls Institute to develop a valve capacity rating system which could be applied to all types of control valves, regardless of manufacturer. The heart of this system is the C_V valve coefficient, which is a valve's capacity, in gpm of 60°F water, for 1 psi pressure drop. For flows of other fluids, refer to the appropriate North American valve bulletins.

The table below lists C_V coefficients for most of North American's valves.

Shutoff Valve Coefficients (Cv)

Valve Cœfficient, C_V		1821B (wide open)	1821B CS/SST (wide open)	1821B-F (wide open)	1842K (wide open)	1857 (wide open)	1599 single (wide open)	1599 double (wide open)	R950-3690-_-_	R950-3690-_-DV
-03	(¼")	7.7								
-02	(⅜")	7.8								
-01	(½")	16.8	31.58		5.2	19	6.5		5.5	
-0	(¾")	34.8	68.32		8.0	31	11.7		1098	6.94
-1	(1")	52.2	110.68		53	48	17		13.87	8.09
-2	(1¼")	112.5	177.63		66				25.43	24.84
-3	(1½")	174.0	262.58		98	130	40.5	33.2	33.52	28.10
-4	(2")	255.2	492.34	486	155	220	60.7	40.5	46.24	31.67
-5	(2½")	350.3		843	270	310	89	73.2	75.14	68.20
-6	(3")	563.7		1277	340	510	113.3	110.5	92.48	70.52
-7	(4")			2055	520	870		171.6	171.09	
-8	(6")			4923	740			324.9	364.14	

Valve size-code (pipe size)

Control Valve Coefficients (Cv)

Valve size-code (pipe size)

Valve Cœfficient, C_v	1008A (wide open)	1004 1014 (wide open)	1122 1123 1124 1126 70° open	1136 70° open	1146 1156 70° open	1807 (wide open)	1813 @#10 pos.
-03 (¼")							0.030
-02 (⅜")	2.0						
-02-A (⅜")							0.078
-02-B (⅜")							0.17
-02-C (⅜")							0.32
-02-D (⅜")							0.52
-01 (½")	2.0					3.57	1.32
-0 (¾")	7.9		5.9			5.06	
-1 (1")	12.5		15.6			9.27	
-2 (1¼")	19.7		26			13.5	
-3 (1½")	28	(B) 77	33			17.2	
-4 (2")	49	(B) 77 / (C) 122	66			41	
-5 (2½")	71	(C) 122	105			62	
-6 (3")	111	(C) 122 / (D) 355	173	N/A	221	108	
-7 (4")	191	(D) 355	348	221	328	N/A	
-8 (6")	433	(D) 355 / (E) 585	1050	328	802		
-9 (8")		(F) 1679	1516	802	1284		
-10 (10")		(F) 1679 / (G) 4272	2454	1284	2029		
-12 (12")		(G) 4272	3715	2029	3142		
-14 (14")		(G) 4272	4793	3142	4471		
-16 (16")			6215		5825		
-18 (18")					7338		
-20 (20")					9265		
-22 (22")					11420		
-24 (24")					13759 (obsolete)*		
-30 (30")					18919 (obsolete)*		
-36 (36")					28665 (obsolete)		
-42 (42")					40360 (obsolete)		
*R948-1156-24					18800		
*R948-1156-30					31010		

C_V INTERACTIVE CALCULATOR

Option 1: Solve for ΔP

P inlet		psig
G		
Temp		°F
Flow		scfh
Cv		
ΔP =	NaN	inWC

Option 2: Solve for Cv

P inlet		psig
G		
Temp		°F
Flow		scfh
ΔP (acceptable)		inWC
Cv =	NaN	

INSTRUCTION for USE

For Option 1 Calculator

Step 1: Select the Cv from page 1 for the valve you want to use in the application.
Step 2: Enter all the data in the Option 1 calculator above.
Step 3: Review the resulting ΔP. Repeat calculations as required for different Cv values until you obtain the desired ΔP.

For Option 2 Calcuator

Step 1: Determine the ΔP you can afford to take across the valve.
Step 2: Enter all the data in Option 2 calculator above.
Step 3: Review the resulting Cv.
Step 4: Enter the chart on page 1 and select the next larger Cv from what was calculated.
Optional Step 5: Enter the the selected Cv in the Option 1 calculator to determine the ΔP for the selected valve.

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PROCESS TECHNOLOGIES

ENERGY | COMBUSTION

Sheet1000-6

North American Slam-shut Valves

Slam-shut valves are used for the protection against high pressure for all valves connected downstream of a gas regulator. The gas supply is shut off if the downstream pressure exceeds the spring set point of the slam-shut valve.

FEATURES

- Senses excess pressure downstream of pressure regulator
- Broad adjusting range for the response pressure
- Low pressure loss

SPECIFICATIONS

Maximum inlet pressure: 60 psig (4 bar)

Operating temperatures: 5°F to 140°F (-15°C to 60°C)

Available spring ranges: 8"w.c. to 8.0 psig (18 to 550 mbar)

Body material: Aluminum

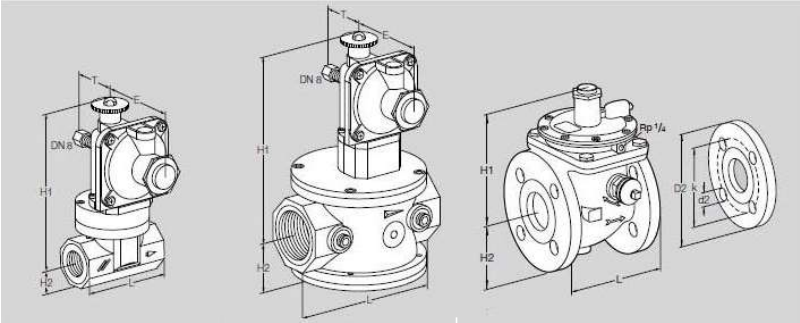
End connections: 1", 1½" NPT, 2" - 4" ANSI flanged

Downstream sensing line required (⅛" NPT connection on 1" and 1½" sizes, Rp ¼" on 2", 3" and 4" sizes).

When used upstream of a regulator install sensing line ≥ 5 pipe diameter downstream of regulator.

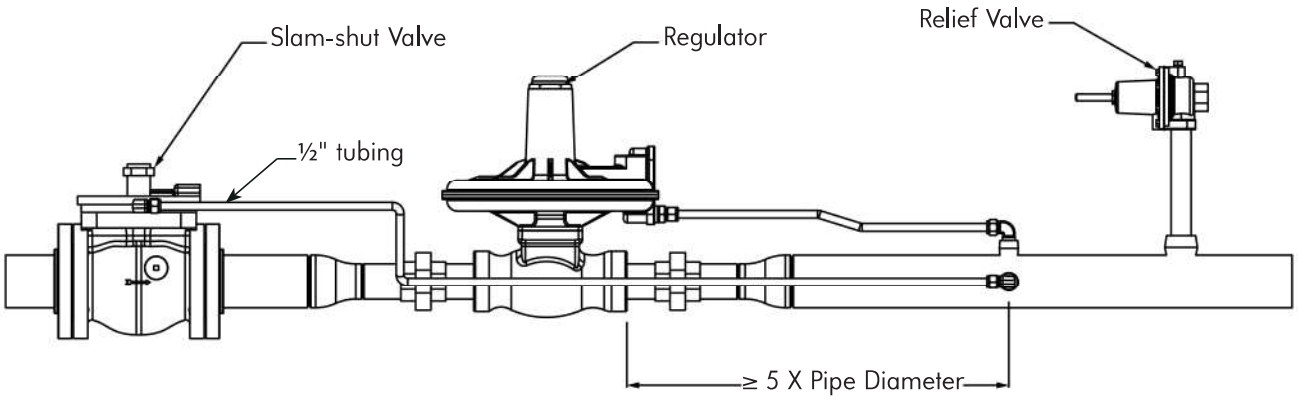
Vent connection: ¼" Rp (vent to an approved location)

DIMENSIONS



Connection	Dimensions in. (mm) L	H1	H2	T	E	Flange in. (mm) D2	K	Drilling in. (mm) d2	No. holes	Weight lbs(kg)
NPT 1"	3.58 (91)	6.56 (159)	0.91 (23)	1.69 (143)	3.43 (87)	— —	— —	— —	— —	2.2 (1)
NPT 1½"	5.91 (1500	8.11 (206)	2.01 (51)	1.69 (43)	3.43 (87)	— —	— —	— —	— —	5.07 (2.3)
ANSI 2"	7.09 (180)	7.28 (185)	3.27 (83)	— —	— —	6.49 (165)	4.92 (125)	0.71 (18)	4	26.5 (12)
ANSI 3"	8.66 (220)	7.68 (195)	3.94 (100)	— —	— —	7.87 (200)	7.87 (160)	0.71 (18)	8	35.3 (16)
ANSI 4"	10.6 (270)	8.86 (225)	4.33 (110)	— —	— —	8.66 (220)	8.66 (180)	0.71 (18)	8	48.5 (22)

RECOMMENDED INSTALLALTION



PART NUMBERS

Part Number	Description
2-11727-1-1.6	1" NPT slam-shut valve 0.9-1.6 psi spring aluminum body
2-11727-1-3.0	1" NPT slam-shut valve 1.5-3.0 psi aluminum body
2-11727-1-5.1	1" NPT slam-shut valve 2.9-5.1 psi spring aluminum body
2-11727-1-7.3	1" NPT slam-shut valve 4.1-7.3 psi spring aluminum body
2-11727-3-1.6	1½" NPT slam-shut valve 0.9-1.6 psi spring aluminum body
2-11727-3-3.0	1½" NPT slam-shut valve 1.5-3.0 psi spring aluminum body
2-11727-3-5.1	1½" NPT slam-shut valve 2.9-5.1 psi spring aluminum body
2-11727-3-7.3	1½" NPT slam-shut valve 4.1-7.3 psi spring aluminum body
2-11727-4-2.5	2" ANSI flanged slam-shut valve 0.9-2.5 psi spring ductile iron body
2-11727-4-3.2	2" ANSI flanged slam-shut valve 1.7-3.2 psi spring ductile iron body
2-11727-4-5.8	2" ANSI flanged slam-shut valve 2.8-5.8 psi spring ductile iron body
2-11727-4-8.0	2" ANSI flanged slam-shut valve 4.4-8.0 psi spring ductile iron body
2-11727-6-2.5	3" ANSI flanged slam-shut valve 0.9-2.5 psi spring ductile iron body
2-11727-6-3.2	3" ANSI flanged slam-shut valve 1.7-3.2 psi spring ductile iron body
2-11727-6-5.8	3" ANSI flanged slam-shut valve 2.8-5.8 psi spring ductile iron body
2-11727-6-8.0	3" ANSI flanged slam-shut valve 4.4-8.0 psi spring ductile iron body
2-11727-7-2.5	4" ANSI flanged slam-shut valve 0.9-2.5 psi spring ductile iron body
2-11727-7-3.2	4" ANSI flanged slam-shut valve 1.7-3.2 psi spring ductile iron body
2-11727-7-5.8	4" ANSI flanged slam-shut valve 2.8-5.8 psi spring ductile iron body
2-11727-7-8.0	4" ANSI flanged slam-shut valve 4.4-8.0 psi spring ductile iron body

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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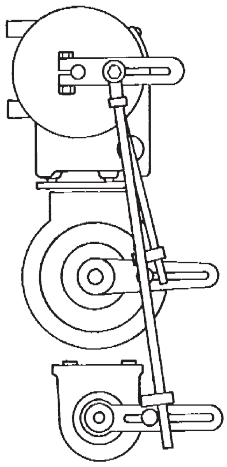
Linkage Options for North American Valve Combinations

All North American 1003 two-high swivel valve combinations are furnished standard with a two-high swivel assembly on the motor arm.

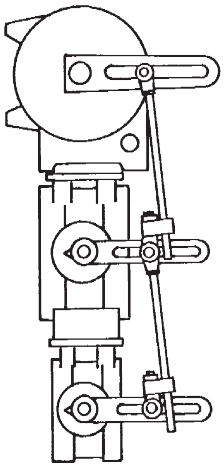
A special option is offered. For a two valve side-by-side combination, you can specify a side-by-side assembly on the motor arm.

You can also specify a three-high swivel assembly on the motor arm.

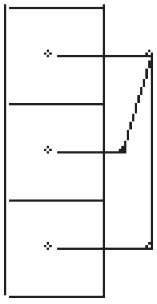
Consult North American for part number, price, and delivery.



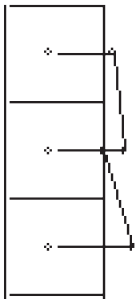
Standard Two-High Swivel Arrangement



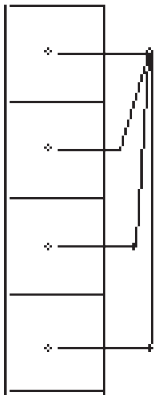
Special Valve Swivel Arrangement



Two-High Swivel



Special Valve Swivel



Three-High Swivel

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PROCESS
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North American Adjustable Port
Process Air Control Valves

1004/1014 Adjustable Port Valve for Air Service

- Pressure drop adjustable for best flow characteristics
- Usable for air temperatures up to 300°F (1004) or 900°F (1014)
- Direct acting or linkage designs

CORRECT VALVE SIZING

Made Easy

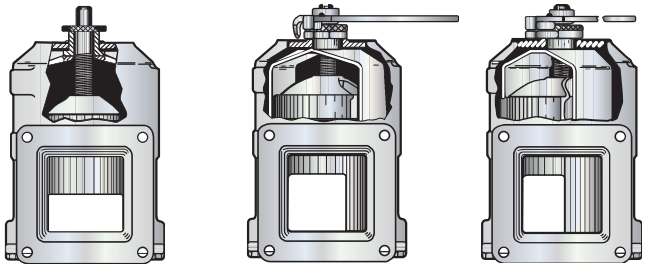


Figure A. Turning curtain adjusting knob changes port opening so valve can constitute optimum resistance in the system for good control.

For a furnace operated by a modulating type air control valve, either a linear or an equal percentage characteristic is preferred for most applications. These characteristics are shown in Figure B, together with two other 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 in some cases.

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

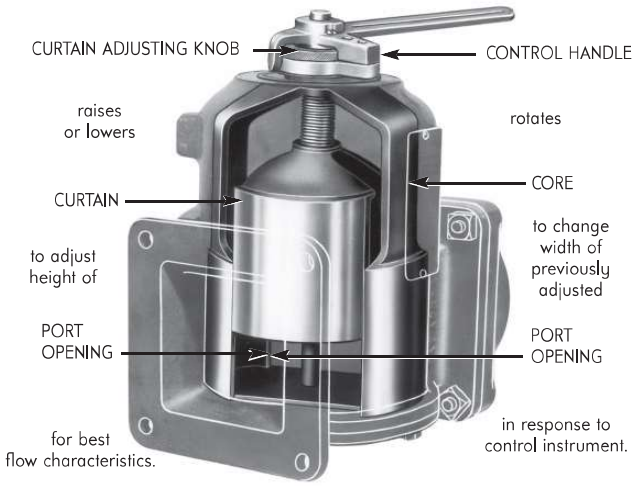


Figure C. Adjustable Port Valve (APV) for cold or hot air, 3 psi or less. All APVs have sliding gate action and rotary plug action.

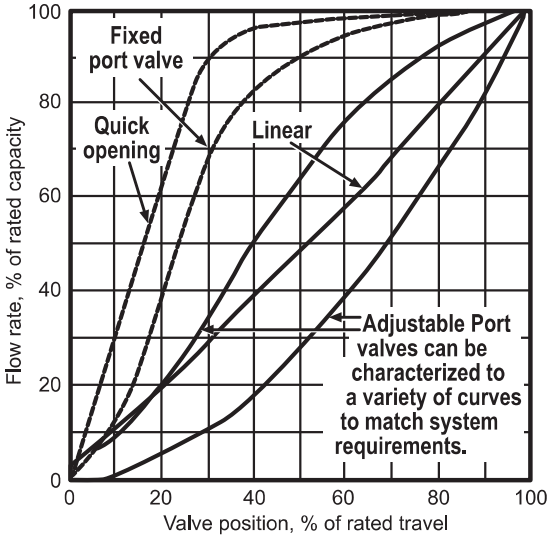


Figure B. Flow characteristics of valves installed in systems with downstream resistance. The three solid linesrepresent characterizable adjustable port valves.

Recommended procedure is to fully open valve control handle and valve curtain, then close curtain until a change in pressure is noted downstream of the valve. 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.

PACKAGING

The adjustable port valve can be sold alone or with a bracket and linkage to be mounted to an actuator in the field. They are also available pre-packaged with an actuator mounted and linked from North American. See Bulletin 1020 for standard llinked motors. The valve can also be direct coupled to an actuator. See Bulletin 1199.

Capacities | Valve

Valves are designed for control of combustion air at line pressures up to 3 psi. Due to their non-airtight nature, they are not for tight shutoff and cannot be used for fuel gases. This is because they just have a metal to metal sealing surface on the shaft. See Bulletin 1008A for adjustable port valves designed for fuel gas use.

Maximum air temperatures:
1004 (formerly Fig. 4).....300°F
1014 (formerly Fig. 14) .....900°F
Minimum ambient temperature .....-20°F

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, 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 1½" 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.

Table A.

Pipe Size	Valve/Body Sizes
1½"	-3-B
2"	-4-B, -4-C
2½"	-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

* Size "G" has been discontinued.

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

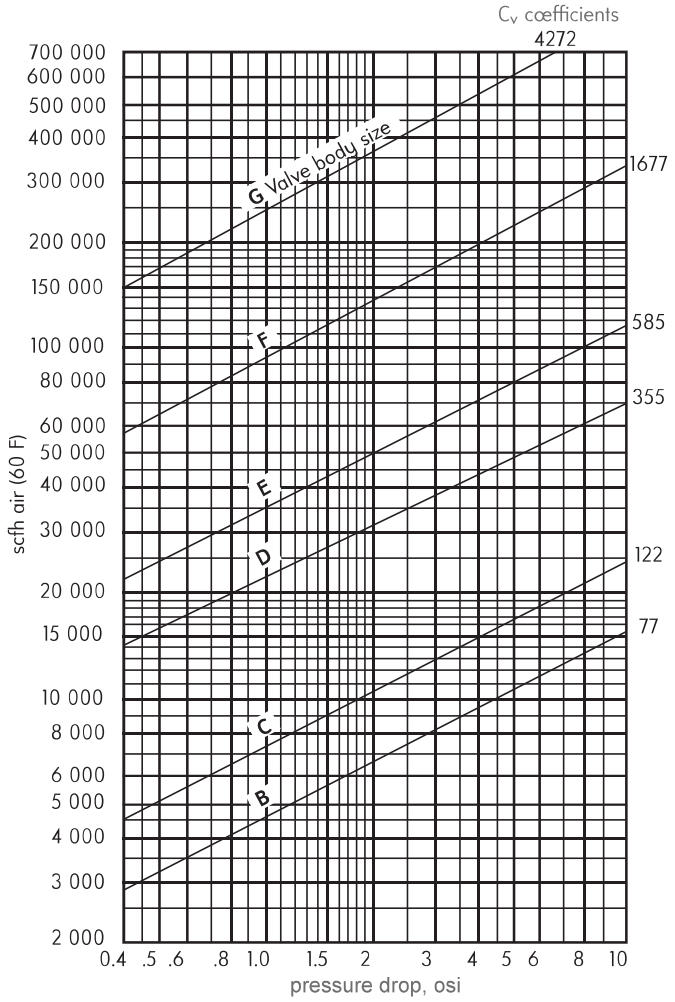


Table B. Air temperature correction factors

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 3,000,0000 Btu/h HHV input using 600°F air, with available hot air pressure 10 osi or more:

3,000,000 Btu/h HHV 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).

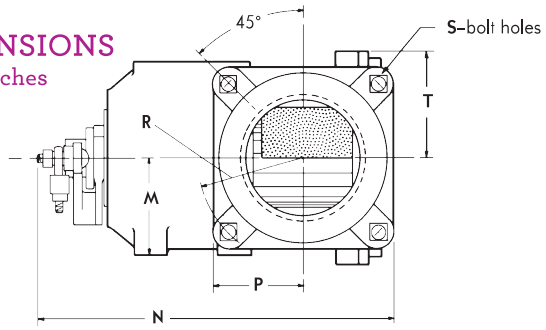
Dimensions | Valve

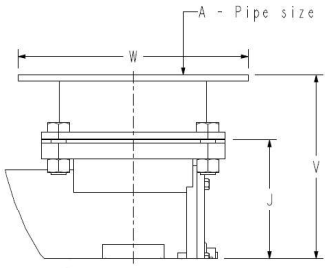
Valve	MATERIALS body	internals	shaft
1004	cast iron	aluminum	CRS electroless nickel plated
1014	cast iron	cast iron	stainless steel

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

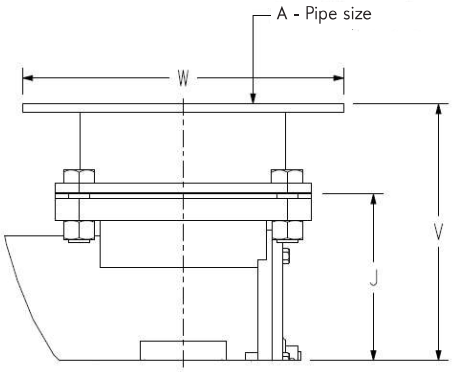
Valve size	B	C	D	E	F	G
torque	1.5	4.0	10.0	15.0	20.0	25.0

DIMENSIONS
inches

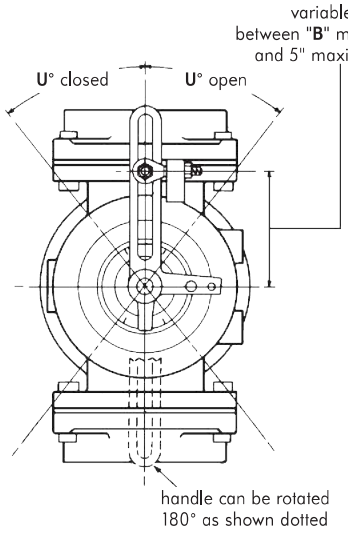


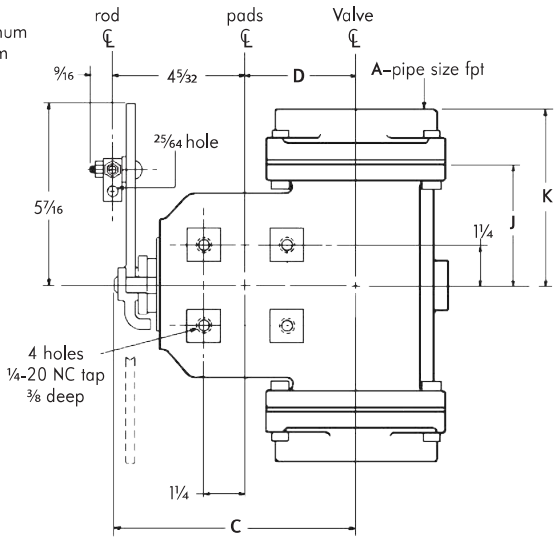


flange used on
-8-D Valve

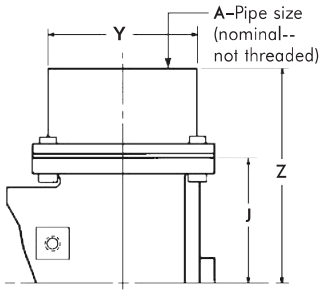


ANSI companion flange adapter





Valves include threaded companion flanges unless suffix "**W**" is used, which means welding type companion adapter or suffix "**ANSI**" is used, which means ANSI companion flange adapter.



welding adapter used on
-9-FW, -10-FW, -10-GW,
-12-GW, and -14-GW Valves

Valve size	dimensions in inches A	B	C	D	J	K	M	N	P	R	T	U°	S	V	W	X	Y	Z	wt, lb 1004	1014
-3 or -4-B	1½ 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	6 2/32	5 or 6	—	—	—	14	17
-4 or -5-C	2 or 2½	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	6 16/32	6 or 7	—	—	—	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	6 16/32	7.5	—	—	—	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	7 16/32	7.5 or 9	—	—	—	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 16/32	11	7½	—	—	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	8 22/32	11	—	—	—	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	10 13/32	13.5	—	8 5/8	10 7/8	165	200
-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 26/32	16	—	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	13 22/32	16	—	10 3/4	14 5/16	410	—
-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	13 22/32	19	—	12 3/4	14 5/16	410	—
-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	13 22/32	21	—	14	14 5/16	490	—

* Discontinued

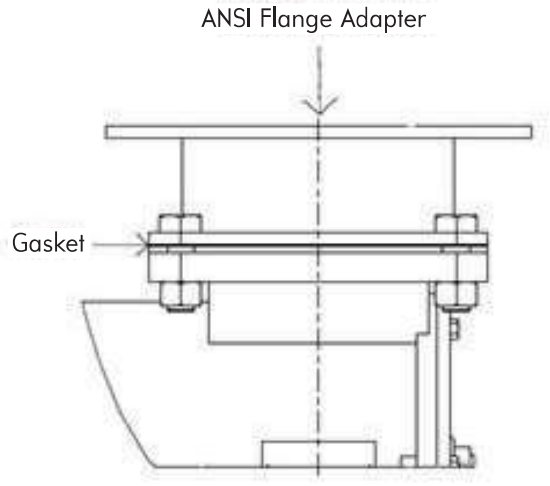
Ordering Information | Valve

ORDERING INSTRUCTIONS

Valve Type	Body Size*	
1004: air valve (300°F) 1014: air valve (900°F)	-3-B	= 1½"
	-4-B	= 2"
	-4-C	= 2"
	-5-C	= 2½"
	-6-C	= 3"
	-6-D	= 3"
	-7-D	= 4"
	-8-D	= 6"
	-8-E	= 6"
	-9-F	= 8"
	-9-W	= 8"
	-10-FW	= 10"

Valve Type	Body Size*	
1004: air valve (300°F) 1014: air valve (900°F)	-3-B-ANSI	= 1½"
	-4-B-ANSI	= 2"
	-4-C-ANSI	= 2"
	-5-C-ANSI	= 2½"
	-6-C-ANSI	= 3"
	-6-D-ANSI	= 3"
	-7-D-ANSI	= 4"
	-8-D-ANSI	= 6"
	-8-E-ANSI	= 6"
	-9-F-ANSI	= 8"
	-10-F-ANSI	= 10"

* Valves include threaded NPT companion flanges, except for valves ending in "W" and "ANSI".
Valves ending in "W" have a welding type companion adapter.
Valves ending in "ANSI" have an ANSI Class 125 bolt pattern, companion flange adapter.



To order ANSI Flange Adapter and Installation Gaskets Separately:

Valve Size	ANSI Flange Adapter	Gasket
3-B	2-12120-1	4-5371-1
4-B	2-12120-2	4-5371-1
4-C	2-12120-3	4-5371-2
5-C	2-12120-12	4-5371-2
6-C	2-12120-13	4-5371-2
6-D	2-12120-4	4-5371-3
7-D	2-12120-5	4-5371-3
8-D	2-12127	4-5371-3
8-E	2-12120-6	4-5371-4
9-F	2-1210-7	4-5371-5
10-F	2-12120-8	4-5371-5

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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PROCESS TECHNOLOGIES

ENERGY | COMBUSTION

North American Adjustable Port Valves

Instructions & Parts List 1004/14

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.

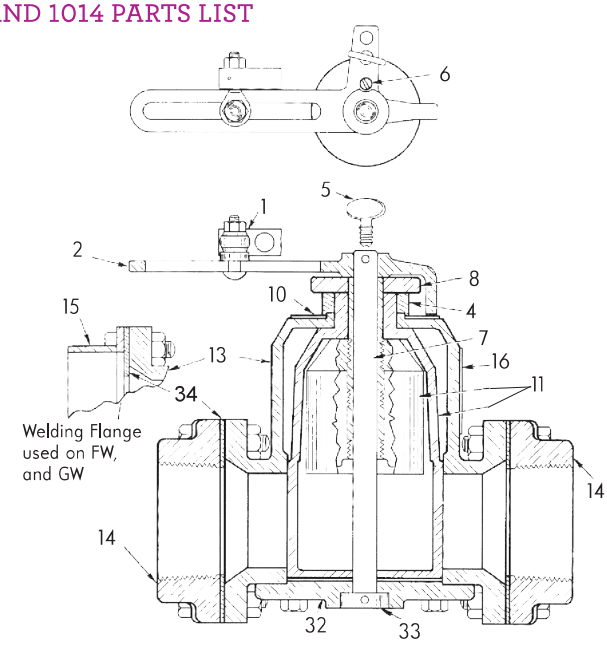
The following table shows the number of turns required for adjusting the curtain height from full open to fully closed.

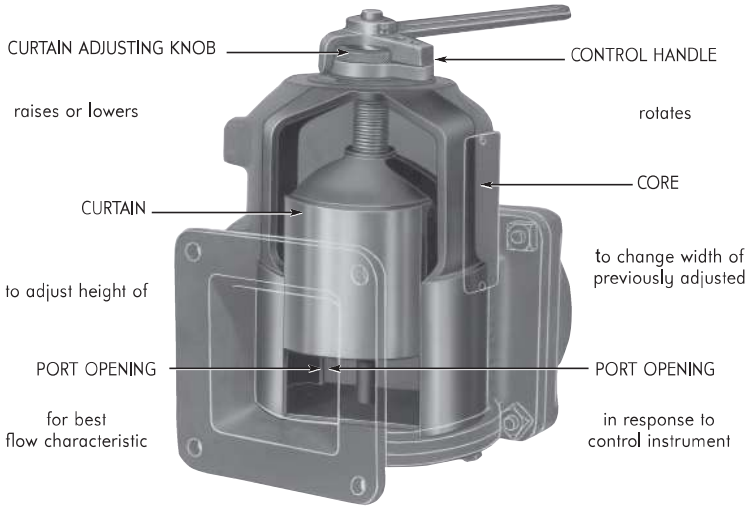
1004 and 1014 Valves

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

* Discontinued

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 —
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 —
13	Body	4 14	2-1626-1	2-0371-1	2-0410-1	2-0405-1	2-0424-1	— 2-0354-1○ 2-0355-2A△ —
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.
△ Upper Half of Body. ○ Lower Half of Body. * Discontinued

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