



**1146 or 1156 Motorized  
Wafer Valve**



**1145 or 1155 Manual  
Wafer Valve**

Fives North American Wafer Butterfly Valves are rugged, lightweight, and used for controlling low pressure combustion air\* flow. They sandwich between companion flanges with two locating holes on the valve body (ANSI Class 150 style for 3" to 14" ; RPM style for 16" to 42"). All wafer valves have stainless steel shafts; bodies and discs are heat-resistant cast iron. All are suitable for inlet pressures up to 10 psig, provided differential pressures across valves, at high fire flow rate, are limited to 1 psi for 1145 and 1146 Valves, 2 psi for all others. No lubrication is required on 1145/46 and 1155/56. Seven types are available.

**1136 Motorized Reduced Port Valves**, for air or coke oven gas to 250 F, have a port diameter one size less than line size to facilitate proper valve sizing without the expense of reducing pipes at the valve. These valves feature self-cleaning discs and fittings for lubrication to clean and prevent sticking of internals with coke oven gas. 1136 Valves are available with bracket and linkage for most standard control motors. Available in 3" to 14" sizes. 1136 valves are not available for manual operation.

**1145 (Manual) and 1146 (Motorized) Hot Air Valves**, for combustion air\* at temperatures from 250 F to 700 F, have adequate clearance to prevent binding due to thermal expansion. Clearance changes with temperature, so cold valves leak through the body/disc gap noticeably. To minimize leakage, the valves are not recommended for service below 250 F. 1145 Valves have locking handles for manual operation. 1146 Valves for motorized control are available (through 30") with bracket and linkage for most standard control motors. Larger valves require remote mounted operators. Available in 3" to 42" pipe sizes.

**1145-H (Manual) and 1146-H (Motorized) High Temperature Air Valves:** Identical to the 1145/1146 valves except for combustion air\* at the temperature range of (700-1200 F), these valves have larger clearance to prevent binding due to thermal expansion at much higher temperatures. Clearance changes with temperature, so valves will leak noticeably through the body/disc gap at lower temperatures. To minimize leakage, the valves are not recommended for service below 700 F. Available with all options that are offered with the 1145/1146.

**1155 (Manual) and 1156 (Motorized) Valves**, for combustion air\* up to 250 F, are available in 3" to 42" pipe sizes. Available with all options that are offered with the 1145/1146.

**Sizing.** Full port wafer valves in lines of the same pipe size give increasing flow for a fixed pressure drop until they are about 60° or 70° open. At greater openings, flow does not increase appreciably, although pressure drop across the valve falls off rapidly--downstream piping or burners, not the valve, become the limiting resistance in the system. At 90° open, the valve's flow resistance is negligible--its pressure drop is practically zero, and it can be ignored in pressure drop calculations. For control sensitivity, wafer valves should be selected for maximum flow at not more than 70° open.

\* Not for use with fuel gases.

## WAFER VALVE CAPACITIES

scfh at 1"wc pressure drop (70 F air) and 0.25 PSIG, upstream pressure

Pipe size inches	1146, 1156		1136	
	wide open	70° open	wide open	70° open
3	18 500	9 650	9 500	4 940
4	27 200	14 300	18 500	9 650
6	60 000	35 000	27 200	14 300
8	125 000	56 000	60 000	35 000
10	202 000	88 500	125 000	56 000
12	303 000	137 000	202 000	88 500
14	400 000	195 000	303 000	137 000
16	530 000	254 000	-	-
18	670 000	320 000	-	-
20	845 000	404 000	-	-
22	1 040 000	498 000	-	-
24	1 260 000	600 000	-	-
30	1 720 000	825 000	-	-
36	2 610 000	1 250 000	-	-
42	3 680 000	1 760 000	-	-

## WAFER VALVE LEAK RATES

All leak rates evaluated with valve in closed position, and 0.25 PSIG pressure upstream. 1136/55/56 leak rates are evaluated at 70 F, those for 1145/1146 are at 250 F, while those for 1145/1146-H are at 700 F.

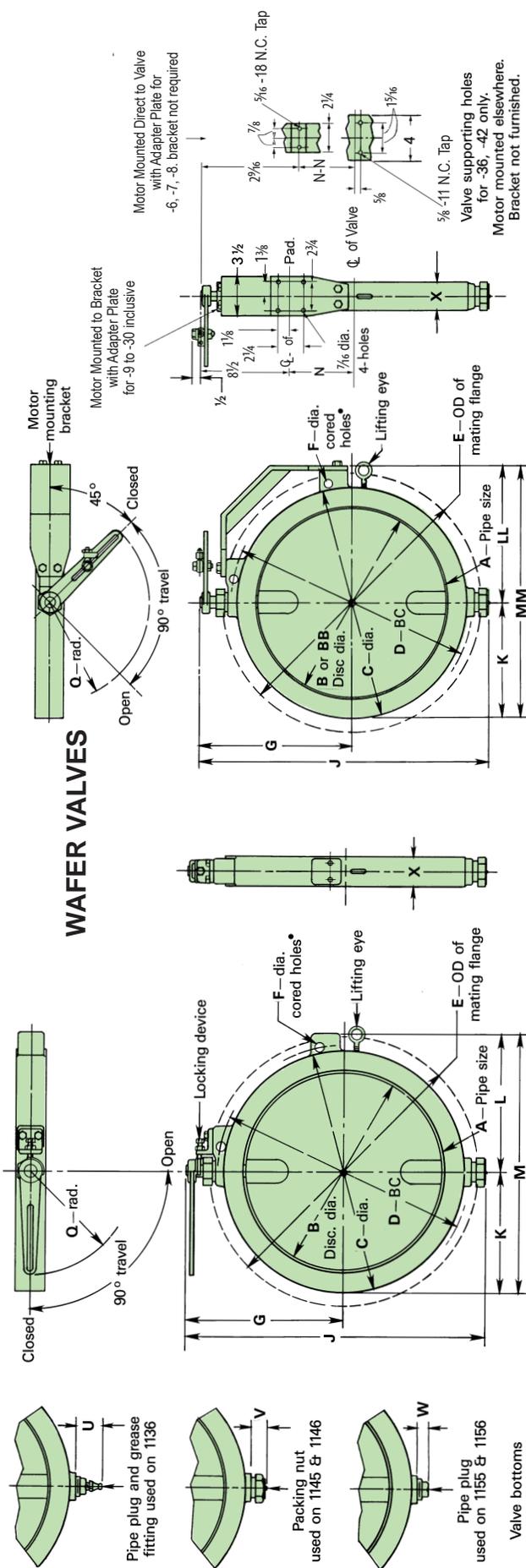
Pipe Size	1136	1155/1156	1145/1146	1145/1146-H
-6 (3")	165	341	369	376
-7 (4")	213	373	600	578
-8 (6")	694	672	1300	1259
-9 (8")	791	943	2268	2202
-10 (10")	996	1159	3460	3364
-12 (12")	1224	1410	5087	4940
-14 (14")	1410	1929	7005	6855
-16 (16")	—	2494	9000	8735
-18 (18")	—	3337	10961	10688
-20 (20")	—	3349	13722	13451
-22 (22")	—	5276	16913	16431
-24 (24")	—	5784	20302	19709
-30 (30")	—	7245	30210	29339
-36 (36")	—	15221	44128	42832
-42 (42")	—	21203	61430	59702

## SPECIFICATIONS / CONSTRUCTION

Valve designation	Maximum inlet pressure, psi	Maximum temperature, F	Body	Disc	Shaft
1155/1156 1136	25	250	heat-resistant cast iron	heat-resistant cast iron	stainless steel
1145/1146	25	700	"	"	"
1145/1146-H <sup>①</sup>	25	1200	"	"	"

<sup>①</sup> For 1146-H Valves, consider specifying "1232 B & L" (for additional charge) with standoff bracket to help protect control motor from heat.

# WAFER VALVES



Manually operated  
1145 for hot air. 1155 for cold air, gas.

Motor operated  
1136 reduced port. 1146 for hot air. 1156 for cold air, gas.

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.

dimensions in inches

Valve designation	A	B*	BB†	C	D	E	F*	G	J	K	L	LL	M	MM	N	NN	Q	U	V	W	X	Wt, lb.	To fit flange	No. of flange bolts*	Flange bolt dia.
-6	3	3 $\frac{3}{8}$	2 $\frac{1}{8}$	5 $\frac{1}{4}$	6	7 $\frac{1}{2}$	3 $\frac{1}{4}$	5 $\frac{1}{8}$	10 $\frac{1}{8}$	2 $\frac{1}{2}$	4	4	6 $\frac{1}{8}$	6 $\frac{1}{8}$	-	3 $\frac{1}{8}$	6 $\frac{1}{8}$	1 $\frac{3}{8}$	1 $\frac{1}{2}$	2 $\frac{1}{2}$	17	ANSI	4	5 $\frac{1}{8}$	
-7	4	3 $\frac{3}{8}$	3 $\frac{1}{8}$	6 $\frac{1}{4}$	7 $\frac{1}{2}$	9	3 $\frac{3}{4}$	6 $\frac{1}{8}$	11 $\frac{1}{8}$	3 $\frac{3}{8}$	4 $\frac{1}{8}$	4 $\frac{1}{8}$	8	8	-	3 $\frac{3}{8}$	6 $\frac{1}{8}$	1 $\frac{3}{8}$	1 $\frac{1}{2}$	2 $\frac{1}{2}$	24	ANSI	8	5 $\frac{1}{8}$	
-8	6	5 $\frac{3}{4}$	3 $\frac{3}{8}$	8 $\frac{1}{2}$	9 $\frac{1}{2}$	11	7 $\frac{1}{8}$	7 $\frac{1}{8}$	13 $\frac{5}{8}$	4 $\frac{5}{8}$	5 $\frac{1}{8}$	5 $\frac{1}{8}$	9 $\frac{1}{8}$	9 $\frac{1}{8}$	-	4 $\frac{3}{8}$	6 $\frac{1}{8}$	1 $\frac{3}{8}$	1 $\frac{1}{2}$	2 $\frac{1}{2}$	31	ANSI	8	3 $\frac{1}{4}$	
-9	8	7 $\frac{5}{8}$	5 $\frac{3}{4}$	10 $\frac{1}{2}$	11 $\frac{3}{4}$	13 $\frac{1}{2}$	1	9 $\frac{1}{8}$	17 $\frac{3}{8}$	5 $\frac{1}{4}$	7 $\frac{3}{4}$	8 $\frac{1}{2}$	13	13 $\frac{3}{8}$	1 $\frac{1}{8}$	-	8 $\frac{3}{4}$	1 $\frac{3}{8}$	1 $\frac{1}{2}$	2 $\frac{1}{2}$	55	ANSI	8	3 $\frac{1}{4}$	
-10	10	9 $\frac{3}{8}$	7 $\frac{5}{8}$	13	14 $\frac{1}{4}$	16	1 $\frac{1}{8}$	11	20	6 $\frac{1}{2}$	9 $\frac{1}{8}$	9 $\frac{1}{2}$	15 $\frac{1}{2}$	16	2 $\frac{3}{4}$	-	8 $\frac{3}{4}$	1 $\frac{5}{8}$	1 $\frac{1}{2}$	2 $\frac{1}{2}$	65	ANSI	12	7 $\frac{1}{8}$	
-12	12	11 $\frac{3}{8}$	9 $\frac{3}{8}$	15 $\frac{1}{2}$	17	19	1 $\frac{1}{8}$	12 $\frac{1}{8}$	22 $\frac{1}{8}$	7 $\frac{5}{8}$	10 $\frac{1}{4}$	10 $\frac{3}{8}$	18 $\frac{3}{8}$	18 $\frac{3}{8}$	3 $\frac{3}{8}$	-	8 $\frac{3}{4}$	1 $\frac{5}{8}$	1 $\frac{1}{2}$	2 $\frac{1}{2}$	95	ANSI	12	7 $\frac{1}{8}$	
-14	14	13 $\frac{3}{8}$	11 $\frac{3}{8}$	17 $\frac{1}{2}$	18 $\frac{3}{4}$	21	1 $\frac{1}{4}$	13	24	8 $\frac{3}{4}$	10 $\frac{3}{8}$	11	19 $\frac{3}{8}$	19 $\frac{3}{8}$	4 $\frac{3}{4}$	-	8 $\frac{3}{4}$	1 $\frac{5}{8}$	1 $\frac{1}{2}$	2 $\frac{1}{2}$	100	ANSI	12	1	
-16	16	15 $\frac{1}{8}$	-	18 $\frac{3}{4}$	19 $\frac{1}{4}$	21 $\frac{1}{4}$	7 $\frac{1}{8}$	13 $\frac{3}{8}$	24 $\frac{1}{4}$	9 $\frac{1}{8}$	10 $\frac{1}{8}$	11	19 $\frac{3}{8}$	20 $\frac{3}{8}$	4 $\frac{7}{8}$	-	8 $\frac{3}{4}$	1 $\frac{5}{8}$	1 $\frac{1}{2}$	2 $\frac{1}{2}$	95	RPM	16	5 $\frac{1}{8}$	
-18	18	16 $\frac{3}{4}$	-	20 $\frac{3}{8}$	21 $\frac{1}{4}$	23 $\frac{1}{4}$	7 $\frac{1}{8}$	14 $\frac{1}{8}$	26	10 $\frac{3}{8}$	11 $\frac{1}{8}$	12	21 $\frac{3}{8}$	22 $\frac{3}{8}$	5 $\frac{1}{8}$	-	8 $\frac{3}{4}$	1 $\frac{5}{8}$	1 $\frac{1}{2}$	2 $\frac{1}{2}$	110	RPM	16	5 $\frac{1}{8}$	
-20	20	18 $\frac{3}{4}$	-	22 $\frac{1}{4}$	23 $\frac{1}{4}$	25 $\frac{1}{4}$	7 $\frac{1}{8}$	16	30	11 $\frac{1}{8}$	12 $\frac{1}{8}$	13	23 $\frac{3}{4}$	24 $\frac{1}{8}$	7 $\frac{3}{4}$	-	8 $\frac{3}{4}$	1 $\frac{5}{8}$	1 $\frac{1}{2}$	2 $\frac{1}{2}$	130	RPM	20	5 $\frac{1}{8}$	
-22	22	20 $\frac{3}{4}$	-	25 $\frac{1}{4}$	26	28 $\frac{1}{4}$	7 $\frac{1}{8}$	17	32	12 $\frac{1}{8}$	14	14 $\frac{3}{8}$	26 $\frac{1}{8}$	26 $\frac{1}{8}$	8 $\frac{3}{4}$	-	8 $\frac{3}{4}$	1 $\frac{5}{8}$	1 $\frac{1}{2}$	2 $\frac{1}{2}$	140	RPM	20	5 $\frac{1}{8}$	
-24	24	22 $\frac{3}{4}$	-	26 $\frac{1}{4}$	27 $\frac{3}{4}$	30	7 $\frac{1}{8}$	18	34	13 $\frac{1}{8}$	15	15 $\frac{3}{8}$	28 $\frac{1}{8}$	28 $\frac{1}{8}$	9 $\frac{3}{4}$	-	8 $\frac{3}{4}$	1 $\frac{5}{8}$	1 $\frac{1}{2}$	2 $\frac{1}{2}$	155	RPM	20	5 $\frac{1}{8}$	
-30	30	27 $\frac{3}{4}$	-	32 $\frac{3}{4}$	33 $\frac{3}{4}$	36	1	21 $\frac{1}{8}$	40 $\frac{1}{8}$	16 $\frac{1}{8}$	18	18 $\frac{1}{2}$	34 $\frac{3}{8}$	34 $\frac{3}{8}$	13 $\frac{1}{2}$	-	8 $\frac{3}{4}$	1 $\frac{5}{8}$	3	3	300	RPM	28	3 $\frac{1}{4}$	
-36	36	33 $\frac{1}{2}$	-	38 $\frac{3}{4}$	39 $\frac{3}{4}$	42	1	27 $\frac{1}{4}$	51 $\frac{1}{8}$	19 $\frac{1}{8}$	21 $\frac{1}{2}$	21 $\frac{1}{2}$	40 $\frac{7}{8}$	40 $\frac{7}{8}$	-	-	13 $\frac{3}{8}$	1 $\frac{1}{2}$	4	4	535	RPM	32	3 $\frac{1}{4}$	
-42	42	39 $\frac{1}{2}$	-	44 $\frac{3}{4}$	45 $\frac{3}{4}$	48	1	30 $\frac{1}{4}$	57 $\frac{1}{8}$	22 $\frac{1}{8}$	24 $\frac{1}{2}$	24 $\frac{1}{2}$	46 $\frac{7}{8}$	46 $\frac{7}{8}$	-	-	13 $\frac{3}{8}$	1 $\frac{1}{2}$	4	4	660	RPM	36	3 $\frac{1}{4}$	

\* All, except 1136. † 1136 only. ‡ 1136 only. ANSI = American National Standards Institute (formerly ASA) pipe flange size. RPM = Rivet Pipe Manufacturers' flange sizes.  $\blacktriangle$  J = 12 $\frac{1}{16}$  for 1136-8.  $\blacksquare$  J = 16 $\frac{3}{16}$  for 1136-9. \* Cored holes for flange bolts straddle centerline.

**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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