ASAHI AV VALVE AND PIPING SYSTEMS

ASAHI AV TECHNICAL DATA

The specifications in this brochure are subject to change without prior notice due to improvements and modifications.

TECHNICAL DATA FLOW CHARACTERISTICS

1. CAPACITY COEFFICIENT

1. 1 Cv VALUE

The Cv value is a coefficient that expresses quantitatively (in a numerical value) how much fluid flows through a specific value. The concept of the Cv value was first developed by the Fluid Control Institution, USA, in 1958. There are other coefficients (absolute numbers) based on a concept similar to that of the Cv value. They are the Av value and the Kv value. On the mainstream in Japan is the Cv value. Since the Kv value was announced in Germany in 1960, there have been trends toward the international unification of these values into a single one. The Cv value is becoming part of the mainstream not only in Japan but internationally as well, at ISO international conferences.

The concept of the capacity coefficient can be expressed by the following equation :

[General Equation] $C = Q\sqrt{\rho / \triangle P}$ ·····(1)

C;Capacity coefficient
Q;Flow rate
△P;Differential pressure
ρ ,G;Specific gravity

Cv value = 1 means that:
The differential pressure (pressure loss) across the valve is 1PSI{1lb/in^2}(about 0.07kgf/cm^2) and clean water (concentration ρ = 1) at 60° F (about 15.5℃) flows at a flowrate of 1USgal/min (about 0.2271m^3/hr). That is,the relationship between flow rate and differential pressure (pressure loss) is determined by the Cv value.
In Japan, differential pressure (pressure loss) is expressed in kgf/cm^2 instead of PSI. When the flowrate is expressed in m^3/hr, Equation (1) for the capacity coefficient becomes something like the following :

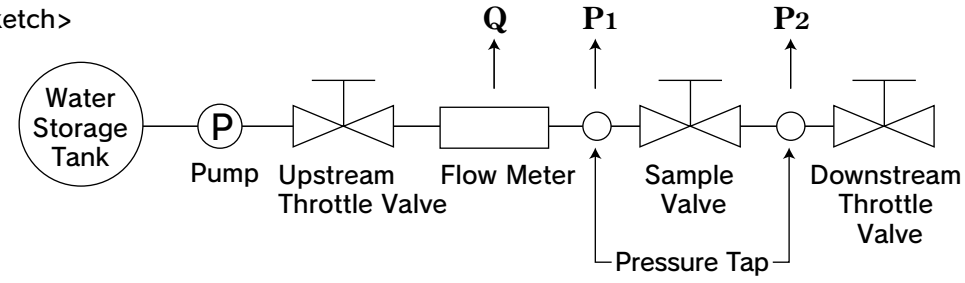
$Cv = 1.17Q\sqrt{G/\triangle P}$ ·····(2)

Cv ; Capacity coefficient
Q ; Flowrate (m^3/hr)
△P ; Differential pressure (kgf/cm^2)
G ; Specific gravity

1. 2 HOW TO MEASURE Cv VALUE

A method of measurement is now available as the standard applicable in JIS B 2005 and IEC 534. An example is outlined below.

<Descriptive sketch>



Set the differential pressure across the sample valve to 0.75kgf/cm^2 and measure the rate of flow at that time. Then, adjust the differential pressure in step from 0.75kgf/cm^2 to 0.07kgf/cm^2 (= 1PSI = 1lbf/in^2), and measure the flow rate(in m^3/hr). For large – diameter valves, it is very difficult (impossible) to set their differential pressure to 0.75kgf/cm^2 *^{2}, begin at the point where the pressure is adjusted progressively, and take measurements up to 0.07kgf/cm^2. Substitute the value at that time in equation (2) shown on the last page, then determine the Cv value.
This is a "table of Cv values when Asahi AV valves are fully open" Also shown is a "table of Cv values by flow qty% us valve opening to" (and subsequent pages), which presents data necessary for valves used for control. The Cv value represent the flow characteristics of each valve.

1. 3 TABLE　Cv VALUE OF "ASAHI AV VALVE" FULLY OPEN

Valve	Nominal Size mm (inch)																			
	13[10] (3/8)	15 (1/2)	20 (3/4)	25 (1)	30[32] (1 1/4)	40 (1 1/2)	50 (2)	65 (2 1/2)	80 (3)	100 (4)	125 (5)	150 (6)	200 (8)	250 (10)	300 (12)	350 (14)	400 (16)	450 (18)	500 (20)	600 (24)
DIAPHRAGM VALVE TYPE 72 and 15											300	400	700	1000						
DIAPHRAGM VALVE TYPE 14		4.8	5.3	8.5	11	26	43	85	115	185										
BALL VALVE TYPE 21	7.7	14	29	47	72	155	190	365	410	680										
3-WAY BALL VALVE (L-port)		7.4	10	23		43	59		130	260										
3-WAY BALL VALVE (Double-L-port)		6.3	8.5	20		36	45		99	200										
3-WAY BALL VALVE (Closs-port)		7.8	13	23		65	98													
COMPACT BALL VALVE	7.7	14	29	47	72	140	185		410											
BUTTERFLY VALVE TYPE 57, 56 and 75						71	120	250	300	470	830	1100	2500	3860	5700	6440	8340	10890	14060	18500
BUTTERFLY VALVE TYPE 57L (Lug Style)									300	470		1100								
BUTTERFLY VALVE TYPE 55							100		285	600	940	1500	2500	4200						
STOP VALVE "GLOVE VALVE"		4.1	6.4	9.7	18	22	29	57	78	115										
STOP VALVE "GLOVE VALVE"(needle type)		3.3	5.2	7.5		19	28	58	85	109										
GATE VALVE (P-type)						130	180	415	470	690	1000	1400	2900	3700	5200	7000				
GATE VALVE (S-type)						130	180	415	470	690	1000	1400	2900	3700						
BALL CHECK VALVE		6.5	17	25		86	130		280	500										
SWING CHECK VALVE			14	24		81	140	250	280	510	750	1100	1900							
STRAINER (Y)		5.2	7.5	14		34	50		110	165										
BALL FOOT VALVE		6.5	17	25		86	130		280	500										

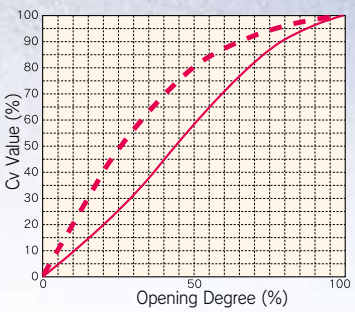
Valve	Nominal Size (mm)						
	1/4, 1/2, 3/8	15 (6mm)	15 (15mm)	20 (6mm)	20 (15mm)	25 (6mm)	25 (15mm)
LAB COCK	1.6	–	–	–	–	–	–
NEEDLE VALVE	–	0.7	4.5	0.7	4.5	0.7	6

PDCPD BUTTERFLY VALVE

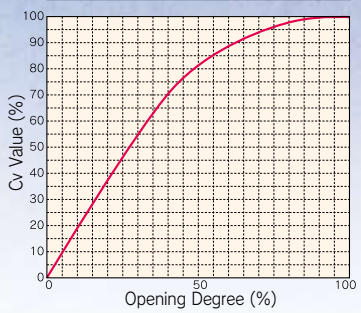
Valve (inch)	700(28)	800(32)	900(36)	1,000(40)	1,100(44)	1,200(48)
Cv Value	32,000	43,000	55,000	70,000	86,000	100,000

Diaphragm Valve

DIAPHRAGM VALVE TYPE 14

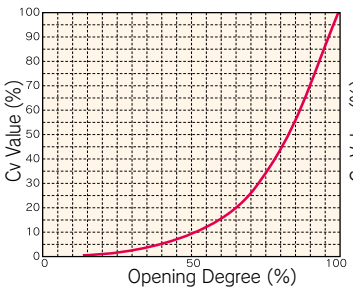


DIAPHRAGM VALVE TYPE 15,72

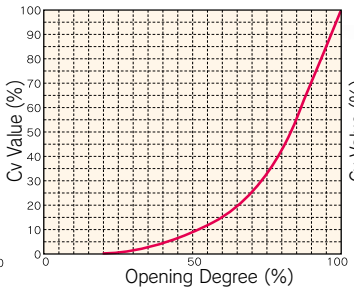


Ball Valve

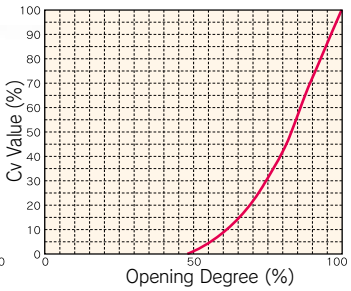
BALL VALVE TYPE 21



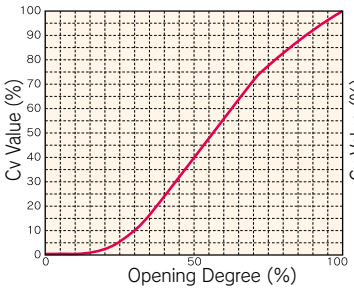
COMPACT BALL VALVE



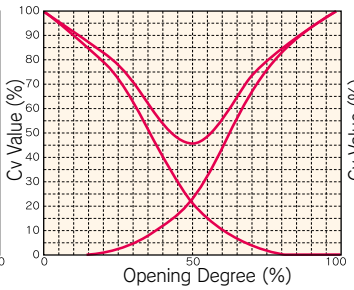
LAB COCK



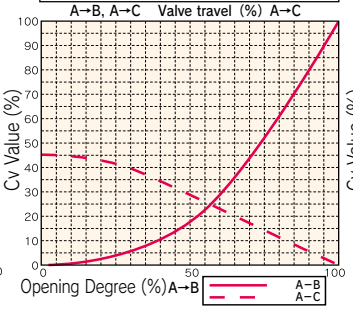
3-WAY BALL VALVE TYPE 23 (L-port)



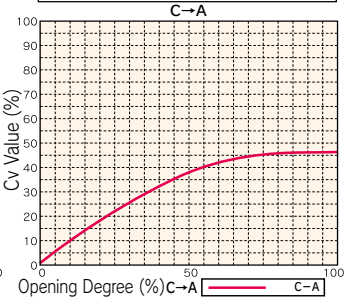
3-WAY BALL VALVE TYPE 23 (Double-L-port)

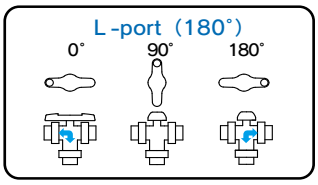


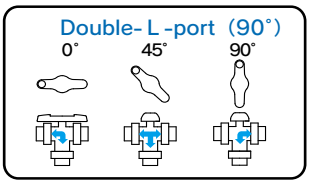
3-WAY BALL VALVE TYPE 23 (Closs-port)

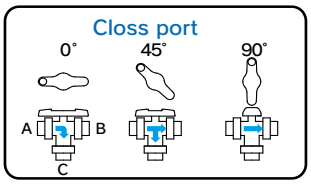


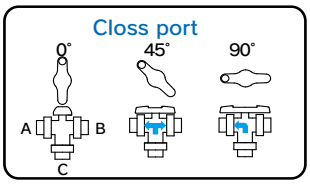
3-WAY BALL VALVE TYPE 23 (Closs-port)





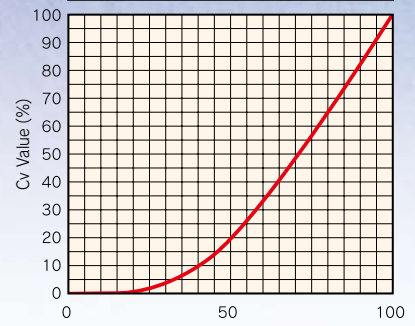




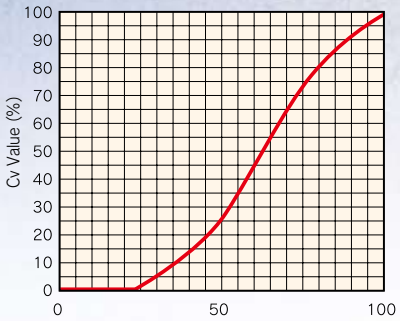


Butterfly Valve

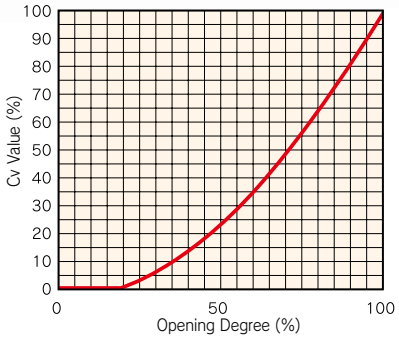
BUTTERFLY VALVE TYPE 57, TYPE 57L (Lug Style)



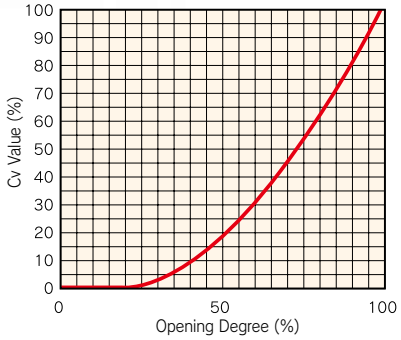
BUTTERFLY VALVE TYPE 56, 75



PDCPD BUTTERFLY VALVE

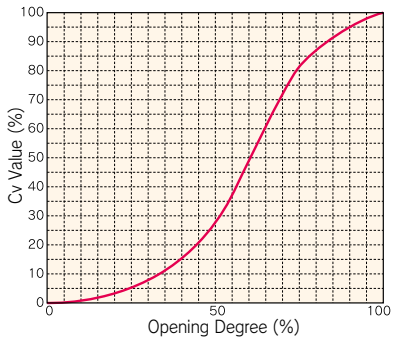


BUTTERFLY VALVE TYPE 55

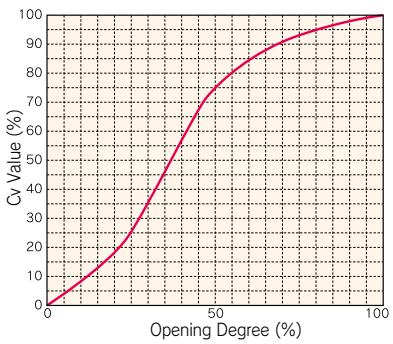


Gate Valve

GATE VALVE (P-Type)



GATE VALVE (S-Type)



TECHNICAL DATA WEIGHT LIST

DIAPHRAGM VALVE

Flanged

Unit:kg, Lb

Body			PVC		C-PVC		PP		PVDF		PVDF		Type
Bonnet			PVC		PP		PP		PPG		PVDF		
Unit			kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	
Nominal Size	15 mm	1/2 inch	0.7	1.5	0.7	1.5	0.6	1.3	0.8	1.8	0.8	1.8	14
	20	3/4	0.8	1.8	0.8	1.8	0.6	1.3	0.9	2.0	0.9	2.0	
	25	1	1.1	2.4	1.1	2.4	0.8	1.8	1.2	2.6	1.3	2.9	
	32	1 1/4	1.4	3.1	1.4	3.1	1.0	2.2	1.5	3.3	1.6	3.5	
	40	1 1/2	2.8	6.2	2.7	6.0	2.2	4.9	2.9	6.4	3.1	6.8	
	50	2	3.6	7.9	3.5	7.7	2.8	6.2	3.9	8.6	4.1	9.0	
	65	2 1/2	5.6	12.3	5.3	11.7	4.2	9.3	6.0	13.2	6.5	14.3	
	80	3	7.4	16.3	7.2	15.9	5.4	11.9	7.4	16.3	8.4	18.5	
	100	4	11.5	25.4	11.0	24.3	8.7	19.2	10.8	23.8	12.5	27.6	
	125	5	22.0	48.5	—	—	19.5	43.0	23.5	51.8	26.3	58.0	15
	150	6	34.5	76.1	—	—	30.5	67.3	35.5	78.3	40.7	89.7	
	200	8	52.6	116.0	—	—	45.0	99.2	57.3	126.3	62.3	137.4	72
	250	12	93.3	205.7	—	—	77.3	170.4	97.6	215.2	110.2	243.0	

True Union (Socket)

Unit:kg, Lb

Body			PVC		C-PVC		PP		PVDF		PVDF		Type
Bonnet			PVC		PP		PP		PPG		PPG		
Unit			kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	
Nominal Size	15 mm	1/2 inch	0.5	1.1	0.5	1.1	0.4	0.9	0.6	1.3	0.6	1.3	True Union 14
	20	3/4	0.6	1.3	0.6	1.3	0.5	1.1	0.7	1.5	0.7	1.5	
	25	1	0.9	2.0	0.9	2.0	0.7	1.5	1.0	2.2	1.1	2.4	
	32	1 1/4	1.1	2.4	1.1	2.4	0.8	1.8	1.2	2.6	1.3	2.9	
	40	1 1/2	2.6	5.7	2.5	5.5	2.0	4.4	2.7	6.0	2.9	6.4	
	50	2	2.9	6.4	2.8	6.2	2.3	5.1	3.1	6.8	3.3	7.3	

●The Number of Turns open/close

DIAPHRAGM VALVE				Type
Nominal Size	15 mm	1/2 inch	5	14
	20	3/4	5	
	25	1	6	
	32	1 1/4	6	
	40	1 1/2	5	
	50	2	6	
	65	2 1/2	8	
	80	3	10	
	100	4	10	

DIAPHRAGM VALVE				Type
Nominal Size	125 mm	5 inch	10	15
	150	6	11	
	200	8	19	72
	250	12	25	

BALL VALVE

Type 21

Unit:kg, Lb

Type		Flanged								Threaded								Socket·Spigot							
Nominal Size \ Material Unit		PVC		C-PVC		PP		PVDF		PVC		C-PVC		PP		PVDF		PVC		C-PVC		PP		PVDF	
		kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb
15mm	1/2 inch	0.4	0.9	0.4	0.9	0.3	0.7	0.5	1.1	0.2	0.4	0.2	0.4	0.2	0.4	0.2	0.4	0.2	0.4	0.2	0.4	0.2	0.4	0.2	0.4
20	3/4	0.6	1.3	0.7	1.5	0.5	1.1	0.7	1.5	0.3	0.7	0.3	0.7	0.3	0.7	0.4	0.9	0.3	0.7	0.3	0.7	0.3	0.7	0.3	0.7
25	1	0.8	1.8	0.9	2.0	0.7	1.5	1.0	2.2	0.4	0.9	0.5	1.1	0.4	0.9	0.5	1.1	0.4	0.9	0.5	1.1	0.4	0.9	0.5	1.1
32	1 1/4	1.2	2.6	1.3	2.9	0.9	2.0	1.5	3.3	0.7	1.5	0.7	1.5	0.6	1.3	0.8	1.8	0.6	1.3	0.7	1.5	0.5	1.1	0.7	1.5
40	1 1/2	1.7	3.7	1.8	4.0	1.2	2.6	2.0	4.4	1.1	2.4	1.2	2.6	0.7	1.5	1.3	2.9	1.0	2.2	1.0	2.2	0.8	1.8	1.2	2.6
50	2	2.5	5.5	2.7	6.0	1.8	4.0	3.7	8.2	1.8	4.0	2.0	4.4	1.2	2.6	2.2	4.9	1.7	3.7	1.8	4.0	1.2	2.6	2.0	4.4
65	2 1/2	3.3	7.3	3.5	7.7	2.4	5.3	4.0	8.8	2.3	5.1	2.5	5.5	1.7	3.7	2.8	6.2	2.4	5.3	2.6	5.7	1.7	3.7	2.8	6.2
80	3	4.9	10.8	5.5	12.1	3.4	7.5	5.7	12.6	3.7	8.2	4.0	8.8	2.5	5.5	4.5	9.9	3.8	8.4	4.1	9.0	2.4	5.3	4.4	9.7
100	4	10.5	23.2	11.0	24.3	7.0	15.4	12.1	26.7	8.8	19.4	9.9	21.8	6.0	13.2	11.3	24.9	9.2	20.3	9.9	21.8	6.0	13.2	10.8	23.8

3-Way Ball Valve Type 23

Unit:kg, Lb

Type		Flanged								Socket								Threaded							
Nominal Size \ Material Unit		PVC		C-PVC		PP		PVDF		PVC		C-PVC		PP		PVDF		PVC		C-PVC		PP		PVDF	
		kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb
15mm	1/2 inch	0.5	1.1	0.5	1.1	0.3	0.7	0.6	1.3	0.2	0.4	0.2	0.4	0.1	0.2	0.2	0.4	0.2	0.4	0.3	0.7	0.2	0.4	0.4	0.9
20	3/4	0.8	1.8	0.9	2.0	0.5	1.1	0.9	2.0	0.4	0.9	0.4	0.9	0.2	0.4	0.4	0.9	0.4	0.9	0.4	0.9	0.2	0.4	0.4	0.9
25	1	1.3	2.9	1.4	3.1	0.8	1.8	1.5	3.3	0.6	1.3	0.6	1.3	0.4	0.9	0.7	1.5	0.6	1.3	0.6	1.3	0.4	0.9	0.7	1.5
40	1 1/2	2.2	4.9	2.4	5.3	1.4	3.1	2.6	5.7	1.3	2.9	1.4	3.1	0.8	1.8	1.5	3.3	1.4	3.1	1.5	3.3	0.9	2.0	1.7	3.7
50	2	3.5	7.7	3.7	8.2	2.2	4.9	4.0	8.8	2.5	5.5	2.7	6.0	1.6	3.5	2.9	6.4	2.6	5.7	2.8	6.2	1.7	3.7	3.1	6.8
80	3	7.0	15.4	7.5	16.5	4.4	9.7	8.5	18.7	6.0	13.2	6.0	13.2	3.6	7.9	7.0	15.4	5.5	12.1	6.0	13.2	3.5	7.7	6.5	14.3
100	4	14.0	30.9	15.0	33.1	9.0	19.8	16.5	36.4	13.5	29.8	14.0	30.9	8.5	18.7	15.5	34.2	13.0	28.7	14.0	30.9	8.5	18.7	15.5	34.2

Compact Ball Valve

Unit:kg, Lb

Type		Socket·Threaded			
Nominal Size \ Material Unit		PVC		C-PVC	
		kg	Lb	kg	Lb
13 mm	1/2 inch	0.10	0.2	0.10	0.2
15	1/2	0.12	0.3	0.15	0.3
20	3/4	0.21	0.5	0.25	0.6
25	1	0.32	0.7	0.40	0.9
32	1 1/4	0.50	1.1	0.55	1.2
40	1 1/2	0.57	1.3	0.60	1.3
50	2	0.86	1.9	1.00	2.2
80	3	2.50	5.5	2.50	5.5

Lab Cock

Unit:g, Lb

Material / Connection Standard \ Unit	PVC	
	g	Lb
1/4inch Male Thread×1/4inch Male Thread	25	0.06
1/2inch Male Thread×1/2inch Male Thread	30	0.07
1/4inch Female Thread×1/4inch Female Thread	30	0.07
3/8inch Female Thread×3/8inch Female Thread	30	0.07
1/4inch Hose×1/4inch Hose	25	0.06
1/2inch Male Thread×Elbow 16mm	55	0.12

BUTTERFLY VALVE

LEVER TYPE/GEAR TYPE

Unit:kg, Lb

Nominal Size mm	inch	Type 57, 56, 75												Type 57L(Lug Style)				Type 55				Damper Style									
		PVC/PP				PP/PP				PVDF/PVDF				PDCPD				FCD-S				PVC/PP				PP/PP				PVDF/PVDF			
		LEVER		GEAR		LEVER		GEAR		LEVER		GEAR		LEVER		GEAR		LEVER		GEAR		LEVER		GEAR		LEVER		GEAR		LEVER		GEAR	
	Unit	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb
40	1 1/2	1.3	2.9	3.4	7.5	1.1	2.4	3.1	6.8	1.4	3.1	3.5	7.7	–	–	–	–	–				1.1	2.4	2.8	6.2	0.9	2.0	2.6	5.7	1.3	2.9	3.0	6.6
50	2	1.5	3.3	3.5	7.7	1.2	2.6	3.3	7.3	1.7	3.7	3.8	8.4	–	–	–	–	3.0	6.6	5.0	11.0	1.3	2.9	3.0	6.6	1.0	2.2	2.7	6.0	1.5	3.3	3.2	7.1
65	2 1/2	1.7	3.7	3.8	8.4	1.4	3.1	3.4	7.5	1.9	4.2	4.0	8.8	–	–	–	–	–				1.5	3.3	3.2	7.1	1.2	2.6	2.9	6.4	1.8	4.0	3.5	7.7
80	3	1.9	4.2	3.9	8.6	1.6	3.5	3.6	7.9	2.2	4.9	4.2	9.3	2.2	4.8	4.2	9.2	4.5	9.9	6.5	14.3	1.7	3.7	3.3	7.3	1.3	2.9	2.9	6.4	2.0	4.4	3.6	7.9
100	4	2.5	5.5	4.5	9.9	2.0	4.4	4.0	8.8	2.9	6.4	4.9	10.8	2.9	6.3	4.9	10.7	6.0	13.2	8.0	17.6	2.2	4.9	3.8	8.4	1.7	3.7	3.3	7.3	2.7	6.0	4.3	9.5
125	5	4.9	10.8	6.5	14.3	4.0	8.8	5.6	12.3	5.7	12.6	7.3	16.1	–	–	–	–	10.5	23.2	11.5	25.4	4.0	8.8	5.1	11.2	3.1	6.8	4.2	9.3	5.0	11.0	6.1	13.5
150	6	5.8	12.8	7.4	16.3	4.6	10.1	6.2	13.7	6.9	15.2	8.5	18.7	6.2	13.5	7.7	16.8	–		14.5	32.0	4.9	10.8	6.0	13.2	3.7	8.2	4.8	10.6	6.1	13.5	7.2	15.9
200	8	9.3	20.5	10.7	23.6	7.4	16.3	8.9	19.6	11.0	24.3	12.5	27.6	–	–	–	–	–		23.0	50.7	4.5	9.9	8.5	18.7	5.6	12.3	6.6	14.6	9.7	21.4	10.7	23.6
250	10	–		14.7	32.4	–		12.2	26.9	–		18.6	41.0	–	–	–	–	–		33.5	73.9	11.2	24.7	13.7	30.2	8.0	17.6	10.5	23.2	22.5	49.6	25.0	55.1
300	12	–		28.0	61.7	–		24.0	52.9	–		34.5	76.1	–	–	–	–	–				17.0	37.5	22.5	49.6	15.0	33.1	20.5	45.2	32.7	72.1	38.2	84.2
350	14	–		30.2	66.6	–		26.3	58.0	–		36.8	81.1	–	–	–	–	–				19.0	41.9	24.5	54.0	16.0	35.3	21.5	47.4	35.2	77.6	40.7	89.7
400	16	–				–		36.0	79.4	–		46.0	101.4	–	–	–	–	–				–				22.0	48.5	27.5	60.6	48.5	106.9	54.0	119.1
450	18	–				–		63.5	140.0	–		103.0	227.1	–	–	–	–	–				–				28.0	61.7	33.5	73.9	50.0	110.3	55.5	122.4
500	20	–				–		77.0	169.8	–		124.0	273.1	–	–	–	–	–				–				36.0	79.4	41.5	91.5	57.5	126.8	63.0	138.9
600	24	–				–		114.0	251.4	–		157.0	346.2	–	–	–	–	–				–				66.0	145.5	71.5	157.7	79.0	174.2	84.5	186.3

Unit:kg, Lb

Name \ Nominal Size mm(inch)	700(28)		800(32)		900(36)		1000(40)		1100(44)		1200(48)	
Unit	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb
PDCPD(Manual)	384	847	468	1030	570	1257	829	1828	1005	2216	1270	2800

GATE VALVE

Flanged

Unit:kg, Lb

Type			40mm (1 1/2inch)		50mm (2inch)		65mm (2 1/2inch)		80mm (3inch)		100mm (4inch)		125mm (5inch)		150mm (6inch)		200mm (8inch)		250mm (10inch)		300mm (12inch)		350mm (14inch)	
Unit			kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb
TYPE-P	Non-Rising	Hand Wheel	2.5	5.5	3.5	7.7	5.5	12.1	7.0	15.4	8.5	18.7	13.5	29.8	19.5	43.0	29.5	65.0	42.0	92.6	68.0	149.9	81.5	179.7
		Cap	3.5	7.7	4.5	9.9	6.0	13.2	8.0	17.6	9.5	20.9	14.5	32.0	20.0	44.1	30.0	66.2	43.0	94.8	68.5	151.0	82.0	180.8
TYPE-S	Non-Rising	Hand Wheel	3.0	6.6	4.0	8.8	5.5	12.1	8.0	17.6	12.5	27.6	15.0	33.1	22.5	49.6	31.5	69.5	–		–		–	
		Cap	4.0	8.8	5.0	11.0	6.0	13.2	9.0	19.8	13.0	28.7	15.5	34.2	23.0	50.7	32.0	70.6	–		–		–	
	Rising	Hand Wheel	3.2	7.1	4.5	9.9	7.5	16.5	8.3	18.3	12.6	27.8	24.0	52.9	24.8	54.7	44.5	98.1	71.0	156.6	–		–	
		Cap	–		–		–		–		13.0	28.7	–		25.7	56.7	35.0	77.2	60.0	132.3	–		–	

TECHNICAL DATA AUTOMATIC VALVES WEIGHT LIST

BALL VALVE

Type 21

Unit:kg, Lb

Driving Method		Electric Actuator																							
Actuator Type		Type T																							
Type of Connection		Flanged End								Threaded End								Socket End							
Body Material		PVC		C-PVC		PP		PVDF		PVC		C-PVC		PP		PVDF		PVC		C-PVC		PP		PVDF	
Unit		kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb
Nominal Size (mm)	15	2.5	5.5	2.5	5.5	2.5	5.5	2.5	5.5	2.5	5.5	2.5	5.5	2.5	5.5	2.5	5.5	2.5	5.5	2.5	5.5	2.5	5.5	2.5	5.5
	20	3.0	6.6	3.0	6.6	2.5	5.5	3.0	6.6	2.5	5.5	2.5	5.5	2.5	5.5	2.5	5.5	2.5	5.5	2.5	5.5	2.5	5.5	2.5	5.5
	25	3.0	6.6	3.0	6.6	3.0	6.6	3.0	6.6	2.5	5.5	2.5	5.5	2.5	5.5	3.0	6.6	2.5	5.5	2.5	5.5	2.5	5.5	3.0	6.6
	32	3.0	6.6	3.5	7.7	3.0	6.6	3.5	7.7	3.0	6.6	3.0	6.6	—	—	3.0	6.6	3.0	6.6	3.0	6.6	2.5	5.5	3.0	6.6
	40	3.5	7.7	3.5	7.7	3.0	6.6	4.0	8.8	3.0	6.6	3.5	7.7	3.0	6.6	3.5	7.7	3.0	6.6	3.5	7.7	3.0	6.6	3.5	7.7
	50	4.0	8.8	4.5	9.9	3.5	7.7	4.5	9.9	4.0	8.8	4.0	8.8	3.5	7.7	4.0	8.8	4.0	8.8	4.0	8.8	3.5	7.7	4.0	8.8
	65	7.0	15.4	7.0	15.4	6.0	13.2	7.5	16.5	6.0	13.2	6.5	15.4	6.0	13.2	6.5	14.3	6.0	13.2	6.5	14.3	6.0	13.2	6.5	14.3
	80	8.0	17.6	8.0	17.6	6.5	14.3	8.5	18.7	7.0	15.4	7.5	19.8	6.0	13.2	7.5	16.5	7.0	15.4	7.5	16.5	6.5	14.3	7.5	16.5
	100	11.5	25.4	12.0	26.5	9.0	19.8	12.5	27.6	11.0	24.3	11.0	33.1	8.5	18.7	12.0	26.5	11.0	24.3	11.0	24.3	8.5	18.7	12.0	26.5

Type 21

Unit:kg, Lb

Driving Method		Pneumatic Actuator																							
Actuator Type		Type TA																							
		Double Acting																							
Type of Connection		Flanged End								Threaded End								Socket End							
Body Material		PVC		C-PVC		PP		PVDF		PVC		C-PVC		PP		PVDF		PVC		C-PVC		PP		PVDF	
Unit		kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb
Nominal Size (mm)	15	2.0	4.4	2.0	4.4	1.5	3.3	2.0	4.4	1.5	3.3	1.5	3.3	1.5	3.3	1.5	3.3	1.5	3.3	1.5	3.3	1.5	3.3	1.5	3.3
	20	2.0	4.4	2.0	4.4	2.0	4.4	2.0	4.4	1.5	3.3	1.5	3.3	1.5	3.3	2.0	4.4	2.0	4.4	1.5	3.3	1.5	3.3	1.5	3.3
	25	2.5	5.5	2.5	5.5	2.0	4.4	2.5	5.5	2.0	4.4	2.0	4.4	1.5	3.3	2.0	4.4	2.0	4.4	2.0	4.4	1.5	3.3	2.0	4.4
	32	2.5	5.5	3.0	6.6	2.0	4.4	3.0	6.6	2.0	4.4	2.0	4.4	2.0	4.4	2.5	5.5	2.0	4.4	2.0	4.4	—		2.0	4.4
	40	3.5	7.7	3.5	7.7	3.0	6.6	3.5	7.7	3.0	6.6	3.0	6.6	2.5	5.5	3.0	6.6	3.0	6.6	3.0	6.6	2.5	5.5	3.0	6.6
	50	4.5	9.9	4.5	9.9	3.5	7.7	4.5	9.9	3.5	7.7	3.5	7.7	3.0	6.6	4.0	8.8	3.5	7.7	3.5	7.7	3.0	6.6	3.5	7.7
	65	6.5	14.3	6.5	14.3	5.5	12.1	7.0	15.4	5.5	12.1	5.5	12.1	5.0	11.0	6.0	13.2	5.5	12.1	5.5	12.1	5.0	11.0	6.0	13.2
	80	9.5	20.9	10.0	22.1	8.0	17.6	10.5	23.2	8.5	18.7	9.0	19.8	7.0	15.4	9.5	20.9	8.5	18.7	9.0	19.8	7.5	16.5	9.5	20.9
	100	15.0	33.1	16.0	35.3	12.0	26.5	17.0	37.5	14.5	32.0	15.0	33.1	12.0	26.5	16.0	35.3	14.5	32.0	15.0	33.1	12.0	26.5	16.0	35.3

Type 21

Unit:kg, Lb

Driving Method		Pneumatic Actuator																							
Actuator Type		Type TA																							
		Air to Open, Air to Close																							
Type of Connection		Flanged End								Threaded End								Socket End							
Body Material		PVC		C-PVC		PP		PVDF		PVC		C-PVC		PP		PVDF		PVC		C-PVC		PP		PVDF	
Unit		kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb
Nominal Size (mm)	15	3.5	7.7	3.5	7.7	3.5	7.7	3.5	7.7	3.5	7.7	3.5	7.7	3.5	7.7	3.5	7.7	3.5	7.7	3.5	7.7	3.5	7.7	3.5	7.7
	20	4.0	8.8	4.0	8.8	3.5	7.7	4.0	8..8	3.5	7.7	3.5	7.7	3.5	7.7	3.5	7.7	3.5	7.7	3.5	7.7	3.5	7.7	3.5	7.7
	25	4.0	8.8	4.0	8.8	4.0	8.8	4.0	8.8	3.5	7.7	3.5	7.7	3.5	7.7	3.5	7.7	3.5	7.7	4.0	8.8	3.5	7.7	3.5	7.7
	32	4.5	9.9	4.5	9.9	4.0	8.8	4.5	9.9	4.0	8.8	4.0	8.8	3.5	7.7	4.0	8.8	4.0	8.8	4.0	8.8	—		4.0	8.8
	40	5.0	11.0	5.5	12.1	4.5	9.9	5.5	12.1	4.5	9.9	4.5	9.9	4.0	8.8	5.0	11.0	4.5	9.9	4.5	9.9	4.0	8.8	4.5	9.9
	50	6.0	13.2	6.0	13.2	5.0	11.0	6.0	13.2	5.5	12.1	5.5	12.1	4.5	9.9	5.5	12.1	5.0	11.0	5.0	11.0	4.5	9.9	5.5	12.1
	65	9.5	20.9	9.5	20.9	8.5	18.7	10.0	22.1	8.5	18.7	8.5	18.7	8.0	17.6	9.0	19.8	8.5	18.7	8.5	18.7	8.0	17.6	9.0	19.8
	80	14.5	32.0	15.0	33.1	13.0	28.7	15.5	34.2	13.5	29.8	14.0	30.9	12.0	26.5	14.5	32.0	14.0	30.9	14.0	30.9	12.5	27.6	14.5	32.0
	100	20.0	44.1	21.0	46.3	17.0	37.5	22.0	48.5	19.5	43.0	20.0	44.1	16.5	36.4	21.0	46.3	20.0	44.1	20.0	44.1	16.5	36.4	21.0	46.3

Type 21

Unit:kg, Lb

Driving Method		Pneumatic Actuator																							
Actuator Type		Type AA																							
		Double Acting																							
Type of Connection		Flanged End								Threaded End								Socket End							
Body Material		PVC		C-PVC		PP		PVDF		PVC		C-PVC		PP		PVDF		PVC		C-PVC		PP		PVDF	
Unit		kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb
Nominal Size (mm)	15	1.0	2.2	1.0	2.2	0.9	2.0	1.1	2.4	0.8	1.8	0.8	1.8	0.7	1.5	0.8	1.8	0.8	1.8	0.8	1.8	0.7	1.5	0.7	1.5
	20	1.2	2.6	1.2	2.6	1.0	2.2	1.2	2.6	0.9	2.0	0.9	2.0	0.9	2.0	1.0	2.2	1.1	2.4	0.9	2.0	0.7	1.5	0.9	2.0
	25	1.5	3.3	1.6	3.5	1.2	2.6	1.5	3.3	1.0	2.2	1.1	2.4	0.9	2.0	1.1	2.4	1.3	2.9	1.2	2.6	0.8	1.8	1.0	2.2
	32	1.9	4.2	2.0	4.4	1.4	3.1	2.0	4.4	1.3	2.9	1.3	2.9	1.0	2.2	1.5	3.3	2.0	4.4	1.3	2.9	—		1.2	2.6
	40	2.6	5.7	2.7	6.0	2.0	4.4	2.7	6.0	1.9	4.2	2.0	4.4	1.6	3.5	2.2	4.9	2.5	5.5	1.9	4.2	1.5	3.3	2.0	4.4
	50	3.4	7.5	3.6	7.9	2.5	5.5	3.6	7.9	2.7	6.0	2.8	6.2	2.0	4.4	3.1	6.8	2.8	6.2	2.6	5.7	1.9	4.2	2.8	6.2

BALL VALVE

Type 21

Unit:kg, Lb

Driving Method		Pneumatic Actuator																							
Actuator Type		Type AA Air to Open, Air to Close																							
Type of Connection		Flanged End								Threaded End								Socket End							
Body Material		PVC		C-PVC		PP		PVDF		PVC		C-PVC		PP		PVDF		PVC		C-PVC		PP		PVDF	
Unit		kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb
Nominal Size (mm)	15	1.6	3.5	1.6	3.5	1.5	3.3	1.7	3.7	1.4	3.1	1.4	3.1	1.3	2.9	1.4	3.1	1.4	3.1	1.4	3.1	1.3	2.9	1.4	3.1
	20	1.8	4.0	1.8	4.0	1.6	3.5	1.8	4.0	1.5	3.3	1.5	3.3	1.5	3.3	1.6	3.5	1.7	3.7	1.5	3.3	1.4	3.1	1.5	3.3
	25	2.1	4.6	2.2	4.9	1.8	4.0	2.1	4.6	1.6	3.5	1.7	3.7	1.5	3.3	1.7	3.7	1.7	3.7	1.8	4.0	1.5	3.3	1.7	3.7
	32	2.5	5.5	2.6	5.7	2.0	4.4	2.6	5.7	1.9	4.2	1.9	4.2	1.6	3.5	2.1	4.6	1.9	4.2	1.9	4.2	—		1.9	4.2
	40	4.0	8.8	4.1	9.0	3.4	7.5	4.1	9.0	3.3	7.3	3.4	7.5	3.0	6.6	3.6	7.9	3.3	7.3	3.3	7.3	2.9	6.4	3.4	7.5
	50	4.8	10.6	5.0	11.0	3.9	8.6	5.0	11.0	4.1	9.0	4.2	9.3	3.4	7.5	4.5	9.9	3.9	8.6	4.0	8.8	3.3	7.3	4.2	9.3

3-Way Ball Valve

Unit:kg, Lb

Driving Method		Electric Actuator																							
Actuator Type		Type T																							
Type of Connection		Flanged End								Threaded End								Socket End							
Body Material		PVC		C-PVC		PP		PVDF		PVC		C-PVC		PP		PVDF		PVC		C-PVC		PP		PVDF	
Unit		kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb
Nominal Size (mm)	15	3.0	6.6	3.0	6.6	2.5	5.5	3.0	6.6	2.5	5.5	2.5	5.5	2.5	5.5	3.0	6.6	2.5	5.5	2.0	4.4	2.5	5.5	2.5	5.5
	20	3.0	6.6	3.5	7.7	3.0	6.6	3.5	7.7	3.0	6.6	3.0	6.6	2.5	5.5	3.0	6.6	3.0	6.6	3.0	6.6	2.5	5.5	3.0	6.6
	25	3.5	7.7	4.0	8.8	3.0	6.6	4.0	8.8	3.0	6.6	3.0	6.6	3.0	6.6	3.0	6.6	3.0	6.6	3.0	6.6	3.0	6.6	3.0	6.6
	40	4.5	9.9	5.0	11.0	4.0	8.8	5.0	11.0	4.0	8.8	4.0	8.8	3.5	7.7	4.0	8.8	3.5	7.7	4.0	8.8	3.0	6.6	4.0	8.8
	50	6.0	13.2	6.0	13.2	4.5	9.9	6.5	14.3	5.0	11.0	5.0	11.0	4.0	8.8	5.5	12.1	5.0	11.0	5.0	11.0	4.0	8.8	5.5	12.1
	80	11.5	25.4	12.0	26.5	9.0	19.8	13.0	28.7	10.0	22.1	10.5	23.2	8.0	17.6	11.0	24.3	10.5	23.2	10.5	23.2	8.0	17.6	11.5	25.4
	100	18.5	40.8	19.5	43.0	13.5	29.8	21.0	46.3	17.5	38.6	18.5	40.8	13.0	28.7	20.0	44.1	18.0	39.7	18.5	40.8	13.0	28.7	20.0	44.1

3-Way Ball Valve

Unit:kg, Lb

Driving Method		Pneumatic Actuator																							
Actuator Type		Type TA Double Acting																							
Type of Connection		Flanged End								Threaded End								Socket End							
Body Material		PVC		C-PVC		PP		PVDF		PVC		C-PVC		PP		PVDF		PVC		C-PVC		PP		PVDF	
Unit		kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb
Nominal Size (mm)	15	2.0	4.4	2.0	4.4	2.0	4.4	2.0	4.4	2.0	4.4	2.0	4.4	2.0	4.4	2.0	4.4	2.0	4.4	2.0	4.4	2.0	4.4	2.0	4.4
	20	2.5	5.5	2.5	5.5	2.0	4.4	2.5	5.5	2.0	4.4	2.0	4.4	2.0	4.4	2.0	4.4	2.0	4.4	2.0	4.4	2.0	4.4	2.0	4.4
	25	3.0	6.6	3.0	6.6	3.0	6.6	3.0	6.6	2.0	4.4	2.0	4.4	2.0	4.4	2.5	5.5	2.0	4.4	2.0	4.4	2.0	4.4	2.5	5.5
	40	4.0	8.8	4.5	9.9	3.0	6.6	5.0	11.0	3.5	7.7	3.5	7.7	2.0	4.4	3.5	7.7	3.5	7.7	3.5	7.7	2.0	4.4	3.5	7.7
	50	5.0	11.0	5.5	12.1	3.5	7.7	5.5	12.1	4.0	8.8	4.0	8.8	3.0	6.6	4.5	9.9	4.0	8.8	4.5	9.9	2.5	5.5	4.5	9.9
	80	12.0	26.5	12.5	27.6	7.0	15.4	13.5	29.8	10.5	23.2	11.0	24.3	5.0	11.0	12.0	26.5	11.0	24.3	11.0	24.3	6.5	14.3	11.5	25.4
	100	20.0	44.1	21.0	46.3	12.0	26.5	23.0	50.7	19.0	41.9	19.5	43.0	9.0	19.8	21.5	47.4	19.0	41.9	19.5	43.0	9.0	19.8	21.0	46.3

Unit:kg, Lb

Driving Method		Pneumatic Actuator																							
Actuator Type		Type TA Air to Open, Air to Close																							
Type of Connection		Flanged End								Threaded End								Socket End							
Body Material		PVC		C-PVC		PP		PVDF		PVC		C-PVC		PP		PVDF		PVC		C-PVC		PP		PVDF	
Unit		kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb
Nominal Size (mm)	15	4.0	8.8	4.0	8.8	—		4.0	8.8	3.5	7.7	3.5	7.7	3.5	7.7	3.5	7.7	3.5	7.7	3.5	7.7	3.5	7.7	3.5	7.7
	20	4.0	8.8	4.5	9.9	—		4.5	9.9	4.0	8.8	4.0	8.8	3.7	8.2	4.0	8.8	4.0	8.8	4.0	8.8	3.5	7.7	4.0	8.8
	25	4.5	9.9	5.0	11.0	—		5.0	11.0	4.0	8.8	4.0	8.8	4.0	8.8	4.0	8.8	4.0	8.8	4.0	8.8	3.5	7.7	4.0	8.8
	40	6.0	13.2	6.0	13.2	—		6.5	14.3	5.0	11.0	5.0	11.0	4.0	8.8	5.5	12.1	5.0	11.0	5.0	11.0	4.0	8.8	5.5	12.1
	50	6.5	14.3	7.0	15.4	—		7.5	16.5	5.5	12.1	6.0	13.2	4.0	8.8	6.0	13.2	5.5	12.1	6.0	13.2	5.0	11.0	6.0	13.2
	80	17.0	37.5	17.5	38.6	—		18.5	40.8	15.5	34.2	16.0	35.3	14.5	32.0	17.0	37.5	16.0	35.3	16.0	35.3	13.5	29.8	16.5	36.4
	100	25.0	55.1	26.0	57.3	—		28.0	61.7	24.0	52.9	24.5	54.0	20.5	45.2	26.5	58.4	24.0	52.9	24.5	54.0	20.5	45.2	26.0	57.3

DIAPHRAGM VALVE

Diaphragm Valve Type 14

Unit:kg, Lb

Driving Method		Electric Actuator								Pneumatic Actuator															
Actuator Type		Type H								Type AN, Type AV															
										Double Acting								Air to Open							
Body Material		PVC		C-PVC		PP		PVDF		PVC		C-PVC		PP		PVDF		PVC		C-PVC		PP		PVDF	
Unit		kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb
Nominal Size (mm)	15	8.0	17.6	8.0	17.6	7.5	16.5	8.0	17.6	2.5	5.5	2.5	5.5	2.0	4.4	2.5	5.5	3.0	6.6	3.0	6.6	2.5	5.5	3.0	6.6
	20	8.0	17.6	8.0	17.6	7.5	16.5	8.0	17.6	2.5	5.5	2.5	5.5	2.0	4.4	2.5	5.5	3.0	6.6	3.0	6.6	2.5	5.5	3.0	6.6
	25	8.0	17.6	8.0	17.6	8.0	17.6	8.5	18.7	2.5	5.5	2.5	5.5	2.5	5.5	3.0	6.6	3.0	6.6	3.0	6.6	3.0	6.6	3.5	7.7
	32	8.5	18.7	8.5	18.7	8.0	17.6	8.5	18.7	3.0	6.6	3.0	6.6	2.5	5.5	3.0	6.6	3.5	7.7	3.5	7.7	3.0	6.6	3.5	7.7
	40	9.5	20.9	9.5	20.9	9.0	19.8	9.5	20.9	5.5	12.1	5.5	12.1	5.0	11.0	5.5	12.1	7.0	15.4	7.0	15.4	6.5	14.3	7.0	15.4
	50	10.5	23.2	10.5	23.2	9.5	20.9	10.5	23.2	6.5	14.3	6.5	14.3	5.5	12.1	6.5	14.3	8.0	17.6	8.0	17.6	7.0	15.4	8.0	17.6
	65	15.0	33.1	15.0	33.1	14.0	30.9	15.5	34.2	10.0	22.1	10.0	22.1	9.0	19.8	10.5	23.2	22.5	49.6	22.5	49.6	21.5	47.4	23.0	50.7
	80	16.5	36.4	16.5	36.4	15.0	33.1	17.0	37.5	12.0	26.5	12.0	26.5	10.5	23.2	12.5	27.6	34.5	76.1	34.5	76.1	33.0	72.8	35.0	77.2
	100	19.5	43.0	19.5	43.0	17.0	37.5	20.0	44.1	19.0	41.9	19.0	41.9	16.5	36.4	19.5	43.0	61.0	134.5	61.0	134.5	58.5	129.0	61.5	135.6

Unit:kg, Lb

Driving Method		Pneumatic Actuator							
Actuator Type		Type AN, Type AV							
		Air to Close							
Body Material		PVC		C-PVC		PP		PVDF	
Unit		kg	Lb	kg	Lb	kg	Lb	kg	Lb
Nominal Size (mm)	15	2.6	5.7	2.6	5.7	2.1	4.6	2.6	5.7
	20	2.6	5.7	2.6	5.7	2.1	4.6	2.6	5.7
	25	2.6	5.7	2.6	5.7	2.6	5.7	3.1	6.8
	32	3.1	6.8	3.1	6.8	2.6	5.7	3.1	6.8
	40	5.7	12.6	5.7	12.6	5.2	11.5	5.7	12.6
	50	6.7	14.8	6.7	14.8	5.7	12.6	6.7	14.8
	65	17.0	37.5	17.0	37.5	16.0	35.3	17.5	38.6
	80	24.5	54.0	24.5	54.0	23.0	50.7	25.0	55.1
	100	45.5	100.3	45.5	100.3	43.0	94.8	46.0	101.4

* 15mm - 50mm(1/2inch - 2inch) for Type-AN, 65mm - 100mm for Type-AV

True Union Diaphragm Valve Type 14

Unit:kg, Lb

Driving Method		Electric Actuator								Pneumatic Actuator															
Actuator Type		Type H								Type AN															
										Double Acting								Air to Open							
Body Material		PVC		C-PVC		PP		PVDF		PVC		C-PVC		PP		PVDF		PVC		C-PVC		PP		PVDF	
Unit		kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb
Nominal Size (mm)	15	8.0	17.6	8.0	17.6	7.5	17.6	8.0	18.0	2.3	5.1	2.3	5.1	1.8	4.0	2.3	5.1	2.3	5.1	2.8	6.2	2.3	5.1	2.8	6.2
	20	8.0	17.6	8.0	17.6	7.5	17.6	8.0	18.0	2.3	5.1	2.3	5.1	1.9	4.2	2.3	5.1	2.8	6.2	2.8	6.2	2.4	5.3	2.8	6.2
	25	8.0	17.6	8.0	17.6	8.0	17.6	8.5	19.0	2.3	5.1	2.3	5.1	2.4	5.3	2.8	6.2	2.8	6.2	2.8	6.2	2.9	6.4	2.8	6.2
	32	8.5	18.7	8.5	18.7	8.0	18.7	8.5	19.0	2.7	6.0	2.7	6.0	2.4	5.3	2.8	6.2	3.2	7.1	3.2	7.1	2.9	6.4	3.2	7.1
	40	9.5	20.9	9.5	20.9	9.0	20.0	9.5	20.0	5.3	11.7	5.3	11.7	4.8	10.6	5.3	11.7	6.3	13.9	6.8	15.0	6.3	13.9	6.8	15.0
	50	10.5	23.2	10.5	23.2	9.5	21.0	10.5	21.0	5.8	12.8	5.8	12.8	5.0	11.0	5.7	12.6	6.8	15.0	6.8	15.0	6.5	14.3	7.2	15.9

Unit:kg, Lb

Driving Method		Pneumatic Actuator							
Actuator Type		Type AN							
		Air to Close							
Body Material		PVC		C-PVC		PP		PVDF	
Unit		kg	Lb	kg	Lb	kg	Lb	kg	Lb
Nominal Size (mm)	15	2.3	5.1	2.4	5.3	1.9	4.2	2.4	5.3
	20	2.3	5.1	2.4	5.3	2.0	4.4	2.4	5.3
	25	2.3	5.1	2.4	5.3	2.5	5.5	2.9	6.4
	32	2.7	6.0	2.7	6.0	2.5	5.5	2.9	6.4
	40	5.5	12.1	5.5	12.1	5.0	11.0	5.5	12.1
	50	6.0	13.2	6.0	13.2	5.2	11.5	5.9	13.0

DIAPHRAGM VALVE

Diaphragm Valve Type 15, Type 72

Unit:kg, Lb

Driving Method		Electric Actuator												Pneumatic Actuator									
Actuator Type		Type H						Type S						Type AV									
														Double Acting						Air to Open			
Body Material		PVC		PP		PVDF		PVC		PP		PVDF		PVC		PP		PVDF		PVC		PP		PVDF	
Unit		kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb
Nominal Size (mm)	125	45.0	99.2	42.5	93.7	47.0	103.6	62.5	137.8	60.0	132.3	64.5	142.2	31.0	68.4	28.5	62.8	33.0	72.8	138.0	304.3	136.0	299.9	141.0	310.9
	150	54.5	120.2	50.5	111.4	57.0	125.7	94.5	208.4	90.5	199.6	97.5	215.0	82.5	181.9	78.5	173.1	85.0	187.4	158.0	348.4	154.0	339.6	160.0	352.8
	200	—		—		—		118.0	—	113.0	—	123.0	—	113.0	249.2	107.0	235.9	118.0	260.2	—		—		—	
	250	—		—		—		177.0	—	167.0	—	185.0	—	183.0	403.5	173.0	381.5	190.0	419.0	—		—		—	

Unit:kg, Lb

Driving Method		Pneumatic Actuator					
Actuator Type		Type AV					
		Air to Close					
Body Material		PVC		PP		PVDF	
Unit		kg	Lb	kg	Lb	kg	Lb
Nominal Size (mm)	*1 125	73.0	161.0	70.5	155.5	75.0	165.4
	*1 150	87.5	192.9	83.5	184.1	90.0	198.5
	*2 200	—		—		—	
	*2 250	—		—		—	

*1 Type 15
*2 Type 72

CONTROL VALVE

Control Valve

Unit:kg, Lb

Driving Method		Electric Actuator				Pneumatic Actuator							
						Double Acting				Air to Open			
Body Material		PVC		PVDF		PVC		PVDF		PVC		PVDF	
Unit		kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb
Nominal Size (mm)	15	4.5	9.9	6.3	13.9	6.1	13.5	7.5	16.5	7.9	17.4	9.8	21.6
	25	5.5	12.1	7.4	16.3	7.3	16.1	8.7	19.2	9.8	21.6	12.2	26.9
	50	16.0	35.3	—		10.0	22.1	—		14.0	30.9	—	
	80	19.0	41.9	—		14.0	30.9	—		24.0	52.9	—	
	100	22.0	48.5	—		19.0	41.9	—		34.0	75.0	—	

BUTTERFLY VALVE

Butterfly Valve

Unit:kg, Lb

Valve Type		Type 57																					
Driving Method		Electric Actuator												Pneumatic Actuator									
Actuator Type		Type T						Type S						Type TA									
														Double Acting						Air to Open, Air to Close			
Body Material		PVC		PP		PVDF		PVC		P P		PVDF		PVC		PP		PVDF		PVC		PP		PVDF	
Unit		kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb
Nominal Size (mm)	40	5.7	12.6	5.5	12.1	5.9	13.0	12.5	27.6	12.3	27.1	12.7	28.0	2.8	6.2	2.6	5.7	3.0	6.6	4.5	9.9	4.3	9.5	4.7	10.4
	50	5.9	13.0	5.6	12.3	6.1	13.5	12.7	28.0	12.4	27.3	12.9	28.4	3.0	6.6	2.7	6.0	3.2	7.1	4.7	10.4	4.4	9.7	4.9	10.8
	65	6.1	13.5	5.8	12.8	6.4	14.1	12.9	28.4	12.6	27.8	13.2	29.1	4.0	8.8	3.7	8.2	4.3	9.5	6.8	15.0	6.5	14.3	7.1	15.7
	80	6.3	13.9	6.0	13.2	6.6	14.6	13.1	28.9	12.8	28.2	13.4	29.5	4.2	9.3	3.9	8.6	4.5	9.9	7.0	15.4	6.7	14.8	7.3	16.1
	100	6.9	15.2	6.4	14.1	7.4	16.3	13.7	30.2	13.2	29.1	14.2	31.3	6.1	13.5	5.6	12.3	6.6	14.6	11.2	24.7	10.7	23.6	11.7	25.8
	125	11.0	24.3	10.2	22.5	12.1	26.7	15.6	34.4	14.8	32.6	16.7	36.8	8.4	18.5	7.6	16.8	9.5	20.9	13.1	28.9	12.3	27.1	14.2	31.3
	150	16.6	36.6	15.7	34.6	18.0	39.7	16.4	36.2	15.5	34.2	17.8	39.2	11.9	26.2	11.0	24.3	13.3	29.3	20.7	45.6	19.8	43.7	22.1	48.7
	200	20.0	44.1	18.4	40.6	22.5	49.6	25.8	56.9	24.2	53.4	28.3	62.4	18.6	41.0	17.0	37.5	21.1	46.5	35.2	77.6	33.6	74.1	37.7	83.1
	250	38.5	84.9	35.9	79.2	42.1	92.8	32.5	71.7	29.9	65.9	36.1	79.6	32.5	71.7	29.9	65.9	36.1	79.6	64.5	142.2	62.9	138.7	69.1	152.4
	300	47.2	104.1	43.0	94.8	53.0	116.9	94.3	207.9	90.1	198.7	100.1	220.7	41.7	91.9	37.5	82.7	47.5	104.7	74.7	164.7	70.5	155.5	80.5	177.5
	350	49.9	110.0	45.4	100.1	57.0	125.7	97.0	213.9	92.5	204.0	104.1	229.5	96.1	211.9	91.6	202.0	103.2	227.6	196.1	432.4	191.6	422.5	203.2	448.1
	400	—		—		—		—		—		—		—		—		—		—		—		—	
	450	—		—		—		—		—		—		—		—		—		—		—		—	
	500	—		—		—		—		—		—		—		—		—		—		—		—	
	600	—		—		—		—		—		—		—		—		—		—		—		—	

Unit:kg, Lb

Valve Type		Type 56																					
Driving Method		Electric Actuator												Pneumatic Actuator									
Actuator Type		Type H						Type S						Type TA									
														Double Acting						Air to Open, Air to Close			
Body Material		PVC		PP		PVDF		PVC		P P		PVDF		PVC		PP		PVDF		PVC		PP		PVDF	
Unit		kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb
Nominal Size (mm)	40	—		—		—		—		—		—		—		—		—		—		—		—	
	50	—		—		—		—		—		—		—		—		—		—		—		—	
	65	—		—		—		—		—		—		—		—		—		—		—		—	
	80	—		—		—		—		—		—		—		—		—		—		—		—	
	100	—		—		—		—		—		—		—		—		—		—		—		—	
	125	—		—		—		—		—		—		—		—		—		—		—		—	
	150	—		—		—		—		—		—		—		—		—		—		—		—	
	200	—		—		—		—		—		—		—		—		—		—		—		—	
	250	44.5	98.1	42.5	93.7	52.5	115.8	30.0	66.2	28.5	62.8	38.0	83.8	34.5	76.1	33.0	72.8	42.5	93.7	65.0	143.3	63.5	140.0	73.0	161.0
	300	—		—		—		102.0	224.9	99.5	219.4	115.0	253.6	41.5	91.5	39.0	86.0	54.5	120.2	72.0	158.8	69.5	153.2	85.0	187.4
	350	—		—		—		107.0	235.9	105.0	231.5	125.0	275.6	94.5	208.4	93.0	205.1	113.0	249.2	195.0	430.0	193.0	425.6	213.0	469.7
	400	—		—		—		—		122.0	269.0	154.0	339.6	—		106.0	233.7	138.0	304.3	—		206.0	454.2	238.0	524.8
	450	—		—		—		—		—		—		—		—		—		—		—		—	
	500	—		—		—		—		—		—		—		—		—		—		—		—	
	600	—		—		—		—		—		—		—		—		—		—		—		—	

Unit:kg, Lb

Valve Type		Type 75								Type 55							
Driving Method		Electric Actuator				Pneumatic Actuator				Electric Actuator				Pneumatic Actuator			
Actuator Type		Type S				Type TW				Type H		Type S		Type TA			
						Double Acting								Double Acting		Air to Open, Air to Close	
Body Material		PP		PVDF		PP		PVDF		FCD-S		FCD-S		FCD-S		FCD-S	
Unit		kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb
Nominal Size (mm)	40	—		—		—		—		—		—		—		—	
	50	—		—		—		—		7.5	16.5	16.0	35.3	4.5	9.9	6.0	13.2
	65	—		—		—		—		—		—		—		—	
	80	—		—		—		—		9.0	19.8	17.5	38.6	7.0	15.4	9.5	20.9
	100	—		—		—		—		10.7	23.6	19.0	41.9	10.0	22.1	15.0	33.1
	125	—		—		—		—		17.0	37.5	23.5	51.8	14.0	30.9	19.0	41.9
	150	—		—		—		—		26.2	57.8	27.0	59.5	20.5	45.2	30.1	66.4
	200	—		—		—		—		34.1	75.2	41.5	91.5	33.5	73.9	50.6	111.6
	250	—		—		—		—		55.7	122.8	49.5	109.1	52.0	114.7	84.7	186.8
	300	—		—		—		—		—		—		—		—	
	350	—		—		—		—		—		—		—		—	
	400	—		—		—		—		—		—		—		—	
	450	137.0	302.1	177.0	390.3	146.0	321.9	185.0	407.9	—		—		—		—	
	500	150.0	330.8	201.0	443.2	158.0	348.4	209.0	460.8	—		—		—		—	
	600	178.0	392.5	254.0	560.1	186.0	410.1	263.0	579.9	—		—		—		—	

BUTTERFLY VALVE

Rotary Damper

Unit:kg, Lb

Valve Type		Rotary Damper																					
Driving Method		Electric Actuator												Pneumatic Actuator									
Actuator Type		Type T						Type S						Type TA									
														Double Acting						Air to Open, Air to Close			
Body Material		PVC		PP		PVDF		PVC		PP		PVDF		PVC		PP		PVDF		PVC		PP		PVDF	
Unit		kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb	kg	Lb
Nominal Size (mm)	40	5.6	12.3	5.1	11.2	5.5	12.1	15.4	34.0	15.2	33.5	15.6	34.4	2.4	5.3	2.1	4.6	2.5	5.5	4.1	9.0	3.8	8.4	4.2	9.3
	50	5.7	12.6	5.2	11.5	5.6	12.3	15.6	34.4	15.3	33.7	15.8	34.8	2.5	5.5	2.2	4.9	2.7	6.0	4.2	9.3	3.9	8.6	4.4	9.7
	65	6.0	13.2	5.3	11.7	5.9	13.0	15.8	34.8	15.5	34.2	16.1	35.5	2.8	6.2	2.4	5.3	3.0	6.6	4.5	9.9	4.1	9.0	4.7	10.4
	80	6.1	13.5	5.4	11.9	6.0	13.2	15.9	35.1	15.6	34.4	16.2	35.7	2.9	6.4	2.6	5.7	3.2	7.1	4.6	10.1	4.3	9.5	4.9	10.8
	100	6.7	14.8	5.8	12.8	6.8	15.0	16.4	36.2	15.9	35.1	16.9	37.3	3.5	7.7	3.0	6.6	4.0	8.8	5.2	11.5	4.7	10.4	5.7	12.6
	125	9.0	19.8	7.1	15.7	9.0	19.8	18.2	40.1	17.4	38.4	19.3	42.6	7.2	15.9	6.3	13.9	4.2	9.3	12.3	27.1	11.4	25.1	13.3	29.3
	150	10.5	23.2	8.3	18.3	10.7	23.6	18.8	41.5	17.9	39.5	20.2	44.5	8.2	18.1	6.9	15.2	9.3	20.5	13.3	29.3	12.0	26.5	14.4	31.8
	200	21.1	46.5	17.3	38.1	21.4	47.2	28.0	61.7	26.4	58.2	30.5	67.3	13.8	30.4	11.9	26.2	16.0	35.3	24.1	53.1	22.2	49.0	26.3	58.0
	250	26.9	59.3	21.9	48.3	29.7	65.5	29.8	65.7	27.2	60.0	33.4	73.6	21.4	47.2	18.1	39.9	26.0	57.3	31.7	69.9	28.4	62.6	36.3	80.0
	300	35.6	78.5	25.9	57.1	37.8	83.3	39.2	86.4	65.5	78.3	39.5	87.1	26.1	57.6	21.7	47.8	33.6	74.1	36.4	80.3	32.0	70.6	43.9	96.8
	350	38.3	84.5	27.9	61.5	41.9	92.4	44.6	98.3	42.6	93.9	42.2	93.1	32.7	72.1	27.8	61.3	41.8	92.2	50.5	111.4	45.6	100.5	59.6	131.4
	400	—		46.5	102.5	64.7	142.7	—		49.0	108.0	59.0		—		51.8	114.2	83.8	184.8	—		84.8	187.0	116.8	257.5
	450	—		—		—		—		61.1	134.7	100.1		—		59.3	130.8	98.3	216.8	—		97.2	214.3	136.2	300.3
	500	—		—		—		—		72.1	159.0	123.1		—		70.3	155.0	121.3	267.5	—		109.2	240.8	160.2	353.2
	600	—		—		—		—		99.2	218.7	176.2		—		97.4	214.8	174.4	384.6	—		137.2	302.5	214.2	472.3

PDCPD Butterfly Valve

Unit:kg, Lb

Driving Method		Electric Actuator	
Actuator Type		Type S	
Body Material		PDCPD	
Unit		kg	Lb
Nominal Size (mm)	700	439	968
	800	570	1257
	900	664	1464
	1000	913	2013
	1100	1145	2525
	1200	1411	3111

TECHNICAL DATA TS Method of "Asahi AV" PVC Pipes

Solvent Welding for PVC, HI-PVC and C-PVC

Ⅰ. Principle

TS method has been widely used in Japan for joining PVC pipes with TS fittings, which utilizes the elasticity of PVC wall and the swelling of PVC surface by solvent cement.

Refer to **Appendix (A)** for details of principle.

Ⅱ. Attention Required During Installation

(1) The worker should use clean tools and wear clean gloves when handling PVC pipe and fittings so as to prevent from sticking foreign materials, such as dust and oils, on both internal and external surfaces.

(2) "Asahi AV" Solvent Cement should be used for joining Asahi AV PVC pipes with TS fittings. Also, it's type should be properly selected depend on surrounding condition (Temperature etc.), material (PVC, HI-PVC or C-PVC) and Nominal Size (refer to **Ⅲ. Preparation of Tools**).

(3) To prevent the solvent cement from coming out onto both external and internal surfaces of pipes and fittings, the worker should strictly follow the procedures described below.

(4) If the solvent cement is not applied directly on PVC surfaces of the joining part, the adhesion of pipes and fittings shall not be attained properly. Therefore, the joining portion should be cleaned with acetone-impregnated gauze, and chips/dust of cutting and chamfering (beveling) should be removed completely prior to applying the solvent cement.

Ⅲ. Preparation of Tools

Tools	Uses
Pipe-Cutter	Cutting of pipe
Chamfering Tool or Knife	Chamfering of pipe edge
Felt-Tipped Pen (Tapered)	Marking of guideline, cutting line etc.
Tape	Scribing of cutting line
Ruler	Measuring of dimensions
Gauze	Cleaning
Acetone	Cleaning
Solvent cement - AV #32 - AV #52 - AV #62 - AV #90 - AV #88	Cementing - Low Viscosity, Quick Dry, for PVC, in Blue Can - High Viscosity, Quick Dry, for PVC, in Red Can - High Viscosity, Slow Dry, for PVC, in Yellow Can - for HI-PVC, in Dark Blue Can - for C-PVC, in Brown Can
Brush	Applying solvent cement
Gloves	Protection of hands, prevention sticking of oil on pipe and fitting
Waste Cloth	Wiping off of solvent cement
Insertion Tool	Insertion of pipe (For Size of 65㎜ and above, Puller or Lever-Block is required)

Ⅳ. Solvent Welding Procedures

<table>
<tr><th>Name of Operation</th><th>Description of Operation</th><th>Notes</th></tr>
<tr><td>1)
Cutting of Pipe</td><td>Winding the tape around the pipe at right angle to the central axis of the pipe, and draw a cutting line along the tape with the felt-tipped pen.
 
Cut the pipe along the cutting line.</td><td>It is necessary for cutting the pipe at right angle to the central axis of the pipe and also without irregularity.</td></tr>
<tr><td>2)
Chamfering
(Beveling)</td><td>Chamfer the edge of outer surface (at the end of the pipe to be inserted) appropriately in a small R.
  </td><td>Be sure to keep chips out both inside and outside the pipe.</td></tr>
<tr><td>3)
Confirming Insertion Length
(a)</td><td>Insert the pipe lightly into the socket of the fitting and mark a zero point (Lo : from the end of pipe).
Confirm that Lo is within a range of 1/3 - 2/3 of total socket-length (socket-depth) (Ls).</td><td>For the size of 40A and below: go next step.</td></tr>
<tr><td>4)
Confirming of Insertion Length
(b)</td><td>Measure the socket-length and draw the guide line (L) on the pipe with the felt-tipped pen.
 
Socket-Length of TS Fittings Unit: mm
<table><tr><td>Size</td><td>13</td><td>16</td><td>20</td><td>25</td><td>30</td><td>40</td></tr><tr><td>Ls</td><td>26</td><td>30</td><td>35</td><td>40</td><td>44</td><td>55</td></tr><tr><td>Size</td><td>50</td><td>65</td><td>75</td><td>100</td><td>125</td><td>150</td></tr><tr><td>Ls</td><td>63</td><td>61</td><td>64</td><td>84</td><td>104</td><td>132</td></tr></table></td><td>For the size of 13A to 40A, L is same as Ls.
L = Ls
For the size of 50A and above, please add following figures (Li) on the Lo.
L = Lo + Li
Length to be added on Lo.

Unit: mm
<table><tr><td>Size</td><td>50</td><td>65</td><td>75</td><td>100</td><td>125</td><td>150</td></tr><tr><td>Li</td><td>20</td><td>20</td><td>25</td><td>30</td><td>35</td><td>45</td></tr></table></td></tr>
</table>

Name of Operation	Description of Operation	Notes
5) Cleaning	In case any foreign materials are stuck on both internal and external surface of the pipe, remove them with acetone-impregnated gauze.  Clean the cementing surfaces. (The external surface of the pipe and internal surface of the socket of the fitting). [Wipe off dust, foreign materials etc. with acetone-impregnated gauze.]	Be sure not to cause any secondary contamination. Clean surfaces thoroughly and remove any water, foreign materials etc. if on the surfaces, where solvent is applied, prior to proceeding to the next step.
6) Applying Solvent Cement (Socket of Fitting)	Applying the solvent cement on the internal surface of the socket of the fitting.	Apply the solvent cement on the surface a little thin and uniformly so that no excess solvent cement flows onto the portion where media contact.
7) Applying Solvent Cement (Pipe)	Then, applying the solvent cement on external surface of the pipe from the end to the uideline direction.  Select type of solvent cement (#32, #52, 62, #90 & #88) properly depending on Temperature, Nom. Size and Material.	Quantity of solvent cement applied on the pipe and on the fitting: Standard Ratio = 7 : 3 Refer to **Appendix (B)** for the standard quantity of the solvent cement per each joint and by each Nom. Size.

Name of Operation	Description of Operation	Notes
8) Insertion / Holding	Immediately after applying the solvent cement, insert the pipe into the socket in a stroke.  After complete insertion, hold the pipe and fitting to prevent from coming out. ＊ In case of the Nom. Size of 65A and above, use the insertion tool such as Puller, Lever-Block etc.	Insert watching the guideline as a guide. Don' t strike the pipe into the socket with a hammer, or the like. Don' t twist but insert the pipe straight. Hold the pipe for 1 minute and more in summer, or for 2 minutes and more in winter, because the taper of socket may cause the pipe coming out from the socket.
9) Wiping Off	Wipe off the excess solvent cement pressed out from the joined portion. 	Use waste cloth.
10) Curing	Cure the piping for 24 hours and more in the summer or 72 hours and more in the winter without loading on the joined portion.	Good ventilation on the welded portion is desirable for complete evaporation of the solvent in the solvent cement [to avoid ossible solvent cracking].

Cautions

【Precaution for use】

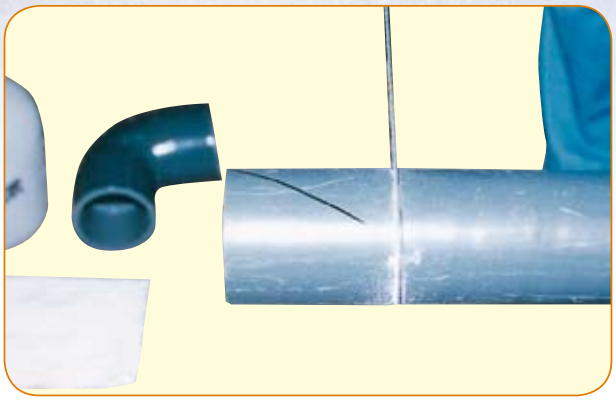
- Solvent cements for pipes and fittings are flammable. Extinguish all flames or other ignition sources in working or storage areas.
- Be sure to work only in a well-ventilated space.
- Avoid any contact with all types of solvent cements on eye and skin. Ingestion or intentional inhalation of solvent vapors can be harmful or fatal to your health.
- For best results, installation should not be done at the temperature 5oC or lower.
- Be sure to use only Asahi AV adhesive.
- Apply adhesive equally with proper amount otherwise evaporation of solvent vapors cause attack internal components.
- After insertion, surfaces of the pipe and fitting should be cleaned by rag.
- After finishing installation of piping, inlet and outlet of piping should be free and open to release evaporation of solvent vapors.
- Don' t move the pipe and fitting just after jointing. Please leave them free from any stress or impact at least 15 minutes after the installation.
- Any extraordinary stress must be removed from the pipe and fitting when they are installed.
- The piping must be cured more than 24 hours prior to actual operation.

【Precaution for use (only C-PVC products)】

- Be sure that the laying depth under concrete is less than 1m.
- The surface of the pipe will be whitened slightly after long time service under the working temperature range of 80℃ to 90℃ . This phenomenon does not cause any fail of the performance in mechanically.

TECHNICAL DATA FOR AV PIPES

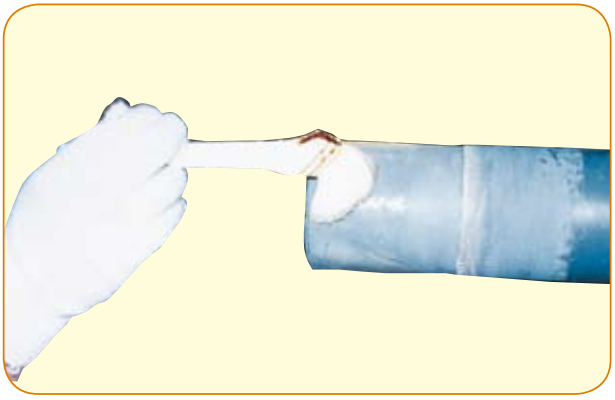
Installation Method



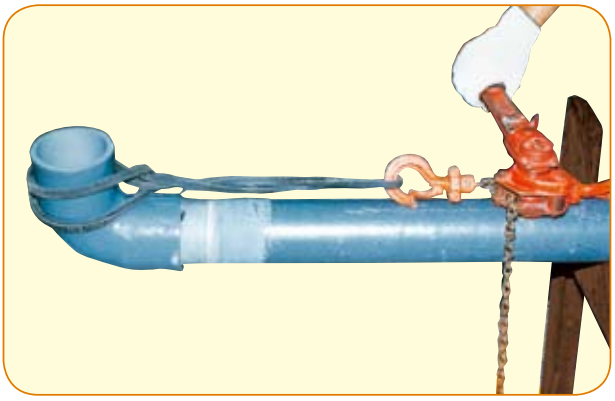
1 Cut the pipe to the required length, mark the external surface of the pipe with reference lines, and cut circumferential and helical notches with a saw or the like.

2 Heat the pipe uniformly with a propane gas burner until the FRP layer softens a little.

3 Peel off the FRP layer by pinching it with pliers or the like.



4 Finish the stripped surface with sand paper or the like, chamfer the end to 45° , and apply adhesive uniformly to the mating surfaces of the pipe and fitting.



5 Insert the pipe into the fitting with a lever block or the like.

6 Wipe off any adhesie sticking out, and weld the parts.

7 Mix polyester resin and filler at a ratio of 1 to 2.5, add a curing agent, knead the resulting putty, and apply it to the junction to a smooth finish with spatula.

8 Add a curing agent to polyester resin, apply them to the junction with a spatula or roller, and build a lamination of glass fiber impregnated with polyester resin.

Mixing Ratios and Setting Times

(Volume ratios to 100 of polyester resin)

Outside air temperature	Curing agent		
	0.5%	1%	2%
10℃	–	42min	14min
20℃	45min	20min	7min
30℃	20min	7min	–
40℃	5min	–	–

Intervals between Supports for AV PIPE Type SU and Type GU

It is recommended that piping supports are installed in the straight runs. Refer to the table below to determine the proper spacing distance.

AV Pipe - Type SU

Unit : m

Size / Temperature	13mm～25mm	30mm～50mm	65mm～100mm	125mm～150mm	200mm～300mm	350mm～400mm	450mm～500mm	600mm～700mm
20℃	1.0	1.5	2.0	2.25	2.5	2.75	3.0	3.5
50℃	1.0	1.5	1.75	2.0	2.25	2.5	2.75	3.0
80℃	1.0	1.25	1.5	1.75	2.0	2.25	2.5	2.75

AV Pipe - Type GU

Unit : m

Size / Temperature	13mm～25mm	30mm～40mm	50mm～65mm	80mm～125mm	150mm～250mm	300mm～350mm	400mm～500mm	600mm～700mm
20℃	1.0	1.5	2.0	2.25	2.75	2.75	3.0	3.5
60℃	1.0	1.25	1.75	2.0	2.5	2.5	2.75	3.25
95℃	1.0	1.25	1.5	1.75	2.0	2.0	2.75	3.0

Conversion Table for Pressure Units

Units	MPa	KPa	Kgf/cm^2	bar	psi (Lbf/in^2)	mmH_2O	mmHg (Torr)	atm
1MPa		1000 KPa	1.0197×10 kgf/cm^2	10 bar	145.04 psi	1.0197×10^5 mmH_2O	7.5006×10^3 mmHg	9.8692 atm
1KPa	1.0×10^{-3} MPa		1.0197×10^{-3} kgf/cm^2	1.0×10^{-2} bar	0.14504 psi	1.0197×10^2 mmH_2O	7.5006 mmHg	9.8692×10^{-3} atm
$1Kgf/cm^2$	9.8067×10^{-2} MPa	98.067 KPa		0.98067 bar	14.223 psi	1×10^4 mmH_2O	7.3556×10^2 mmHg	9.6784×10^{-1} atm
1bar	0.1 MPa	100 KPa	1.0197 kgf/cm^2		14.504 psi	1.0197×10^4 mmH_2O	7.5006×10^2 mmHg	0.98692 atm
1psi (Lbf/in^2)	6.8948×10^{-3} MPa	6.8948 KPa	7.0307×10^{-2} kgf/cm^2	6.8948×10^{-2} bar		7.0306×10^2 mmH_2O	51.715 mmHg	6.8046×10^{-2} atm
1mmH_2O	9.8067×10^{-6} MPa	9.8067×10^{-3} KPa	1×10^{-5} kgf/cm^2	9.8067×10^{-5} bar	1.4224 psi		7.3556×10^{-2} mmHg	9.6784×10^{-5} atm
1mmHg (Torr)	1.3332×10^{-4} MPa	1.3332×10^{-1} KPa	1.3595×10^{-3} kgf/cm^2	1.3332×10^{-3} bar	1.9337×10^{-2} psi	13.595 mmH_2O		1.3158×10^{-3} atm
1atm	1.0133×10^{-1} MPa	1.0133×10^{-2} KPa	1.0333 kgf/cm^2	1.0133 bar	14.697 psi	1.0333×10^4 mmH_2O	7.6004×10^2 mmHg	

The parameters shown in the table are approximate values for only reference.

PRODUCT WARRANTY

Be sure to read the following description of our product warranty

- Always observe the specifications of and the precautions and instructions on using our product.
- We always strive to improve product quality and reliability, but cannot guarantee perfection. Therefore, should you intend to use this product with any equipment or machinery that may pose the risk of serious or even fatal injury, or property damage, ensure an appropriate safety design or take other measures with sufficient consideration given to possible problems. We shall assume no responsibility for any inconvenience stemming from any action on your part without our written consent in the form of specifications or other documented approval.
- The related technical documents, operation manuals, and/or other documentation prescribe precautions on selecting, constructing, installing, operating, maintaining, and servicing our products. For details, consult with our nearest distributor or agent.
- Our product warranty extends for one and a half years after the product is shipped from our factory or one year after the product is installed, whichever comes first. Any product abnormality that occurs during the warranty period or which is reported to us will be investigated immediately to identify its cause. Should our product be deemed defective, we shall assume the responsibility to repair or replace it free of charge.
- Any repair or replacement needed after the warranty period ends shall be charged to the customer.
- The warranty does not cover the following cases:
  (1) Using our product under any condition not covered by our defined scope of warranty.
  (2) Failure to observe our defined precautions or instructions regarding the construction, installation, handling, maintenance, or servicing of our product.
  (3) Any inconvenience caused by any product other than ours.
  (4) Remodeling or otherwise modifying our product by anyone other than us.
  (5) Using any part of our product for anything other than the intended use of the product.
  (6) Any abnormality that occurs due to a natural disaster, accident, or other incident not stemming from something inside our product.

【Precautions】

*Using a positive-pressure gas with our plastic piping may pose a dangerous condition due to the repellent force peculiar to compressed fluids, even when the gas is under the same pressure as water. Therefore, be sure to take the necessary safety precautions such as covering the piping with protective material. For inquiries, please contact us.

For conducting a leak test on newly installed piping, be sure to check for leaks under water pressure.
If absolutely necessary to use gas in testing, please consult your nearest service station beforehand.

*Wrap the threaded joints on our plastic piping with sealing tape.
Using a liquid sealing agent or liquid gasket may cause stress cracks (environmental stress cracking). Our product warranty shall not apply in case of said use, even when said use is unavoidable.

【Export Control】

In an effort to remain compliant with international agreements on security, many countries have instituted export controls for advanced goods and technologies which may be used for the proliferation of weapons of mass destruction. Even in japan we are sanctioned by the International Export Control Regime and the Chemical Wwapons Convention to meet current regulations at home and in countries where we sell our goods and technologies.
In meeting this social and legal obligation , we are asking for your cooperation in providing us information relating to the intended use of our products. Information such as copies of agreements, company organization chart and affidavits of end-use may berequired for export permission.
Your cooperation in this endeavor is greatly appreciated and our sales or Asahi distributor people are committed to working with you to continue to provide the best products and services Asahi has to offer.

PRECAUTIONS FOR USE

- For installation and maintenance procedure refer to the appropriate manual for the product being used.
- Do not drop or toss pipe and fitting material.
- Do not step on a valve.
- Do not put anything heavy on a valve.
- Do not put anything burning or hot near a valve.
- Do not scratch or thrust a valve with anything sharp (such as a knife and a hanger).
- Avoid contacting with any coal tar creosote (antiseptic for wood), termite insecticide, vermicides, or paint.
- Secure sufficient space for maintenance and inspection.
- Select pipe and fitting material suitable for your specific needs, using "Chemical Resistance On Asahi AV Valve," as a guide. If you have any questions, please feel free to contach your nearest Asahi dealer.
- Be sure to use water pressure when testing a pipeline including AV pipe and fitting material.
  It is extremely dangerous to use air pressure for testing the pipeline.
- The pressure limit includes water hammer pressure. Do not exceed the limit.
- In discarding a valve, be sure to ask a waste service company.
- Valve should not be used with compressed air or gas.

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ISO9001:2000
VALVE & PIPING SYSTEMS ADMINISTRATION is complying with the requirements of the above Quality Management system standard.

ISO14001:2004
Nobeoka Head Office,Nobeoka Works,Engineering Development, Kitakata Factory, Phisical Distribution Control Department(Otake Warehouse), Aichi Plant, Tochigi Plant and Hiroshima Plant are complying with the requirements of the above Environmental Management System Standard.

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