



## **Installation & Operating Manual**



### **ART 1325 Stainless Steel Water Hammer Arrestor**

**Albion Valves (UK) Ltd**  
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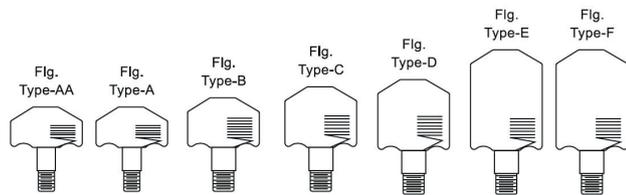


Albion Valves (UK) Ltd's Water Hammer Arrestors provide complete protection against water hammer in common pipe diameters for varying pipe lengths wherever flow velocity is subject to sudden change-in quick closing , solenoid-actuated valves used with lavatories and sinks, dishwashers, and residential automatic washers ; in improperly adjusted water closet flush valves; in pumping systems, and in drinking fountains or similar installations where water flow is valved for intermittent operation.

Each Water Hammer Arrestor has its shock-absorbing air cushion hermetically sealed within the unit. Consequently, there is no loss of air from the Water Hammer Arrestor due to leakage past worn elastomeric sealing surfaces nor due to permeation through elastomeric features.

In addition, the Water Hammer Arrestor's TYPE 304, SS316(18-8) stainless steel construction makes it virtually immune to attack and degradation by high levels of chloramine and other common waterborne chemicals which quickly degrade elastomeric components.

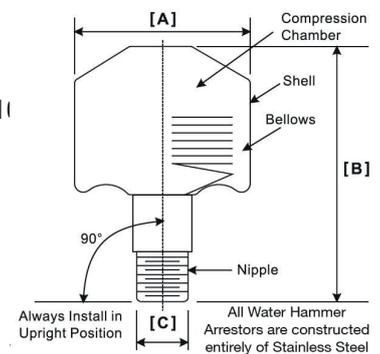
Water Hammer Arrestors are pre-charged and permanently sealed at the factory. Water Hammer Arrestors Type-AA to Type-F inclusive conforms to ASSE Standard #1 Certificate of compliance available upon request.



Approve by:

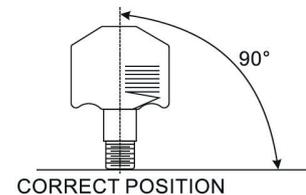


Water Hammer Arrestors Type-AA to Type-F inclusive have been tested and certified in accordance with the Plumbing and Drainage Institute "Standard P.D.I. WH-201"



**ALWAYS INSTALL IN UPRIGHT POSITION**

Water Hammer Arrestor should be placed at location denoted on engineer's plans. Unit must be installed in a vertical (upright) position to insure proper operation of the internal bellows. When installing, place wrench on nipple only. \* Never tighten by gripping shell.



**SIZING AND PLACEMENT OF WATER HAMMER ARRESTORS**

All sizing and placement data is in accordance with the Plumbing and Drainage Institute Standard P.D.I. WH-201. In an effort to arrive at a uniform method of sizing water hammer arrestors, members of the Plumbing and Drainage Institute sponsored a comprehensive testing program which lasted four years. As a result, there is now an industry-wide standard, P.D.1.-WH201, and the all-stainless-steel Albion Valves (UK) Ltd Water Hammer Arrestor conforms with every aspect of this newly-available information.

**SIZING-SINGLE and MULTIPLE FIXTURE BRANCH LINES**

Standard P.D.I.-WH201 bases its sizing data upon the well known fixture-unit formula. Since most engineers and specifiers utilize fixture-units in their daily calculations , it was appropriate to employ this method for quick, concise water hammer arrestor sizing.

Using [Table 1], determine the "weight in fixture-units" for cold and hot water branch lines serving a group of fixtures, either for public or private installations . When the "weight in" has been established the data is then applied to the selection [Table 2]

Using the "weight in fixture-units" obtained from [Table 1], select the properly sized Water Hammer Arrestor from [Table2]. If the water pressure in the line exceeds 65 psig, select the next larger size Water Hammer Arrestor. If the fixture unit total contains "1/2" fraction, "round-it-up" to the next larger or whole number. (Example : If total is 11-1/2 fixture-units change it to 12 fixture-units).

[ Table 1 ]

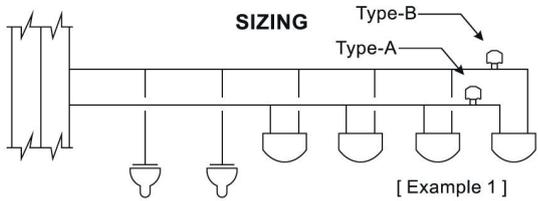
FIXTURE	TYPE OF SUPPLY CONTROL	WEIGHT IN FIXTURE UNITS			
		PUBLIC		PRIVATE	
		C.W	H.W	C.W	H.W
WATER CLOSET	FLUSH VALVE	10	-	6	-
WATER CLOSET	FLUSH TANK	5	-	3	-
PEDESTAL URINAL	FLUSH VALVE	10	-	-	-
STALL OR WALL URINAL	FLUSH VALVE	5	-	-	-
STALL OR WALL URINAL	FLUSH TANK	3	-	-	-
LAVATORY	FAUCET	1 1/2	1 1/2	1	1
BATHTUB	FAUCET	2	3	1 1/2	1 1/2
SHOWER HEAD	MIXING VALVE	2	3	1	2
BATHROOM GROUP	FLUSH VALVE CLOSET	-	-	8	3
BATHROOM GROUP	FLUSH TANK CLOSET	-	-	6	3
SEPARATE SHOWER	MIXING VALVE	-	-	1	2
SERVICE SINK	FAUCET	3	3	-	-
LAUNDRY TUBS(1-3)	FAUCET	-	-	3	3
COMBINATION FIXTURE	FAUCET	-	-	3	3

[ Table 2 ]

FIG. NO.	P.D.I. SYMBOL	FIXTURE UNIT RATING	DIAMETER [ A ]	LENGTH [ B ]	CONNECTION [ C ]
Type-AA	AA	1-3	3 1/4"	2 13/16"	1/2"
Type-A	A	1-11	3 1/4"	3 1/4"	1/2"
Type-A	A	1-11	3 1/4"	3 1/4"	3/4"
Type-B	B	12-32	3 1/4"	4 1/16"	1"
Type-C	C	33-60	3 1/4"	4 3/8"	1"
Type-D	D	61-113	3 1/4"	5 1/4"	1"
Type-E	E	114-154	3 1/4"	7"	1"
Type-F	F	155-330	3 1/4"	7"	1"

NOTE : W HEN WATER PRESSURE IN LINE EXCEEDS 65 PSI, SPECIFY THE NEXT LARGER SURCETROL

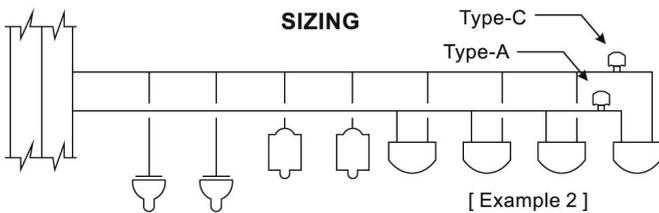
**SIZING AND PLACEMENT OF WATER HAMMER ARRESTORS**



Find fixture unit weight of each fixture using Table 1. Total weights for both hot and cold branches

Cold Water Branch		Hot Water Branch	
2 W.C. at 10 F.U.	ea.= 20	4 Lav. at 11/2 F.U	ea. = 6
4 Lav. at 1 1/2 F.U.	ea. = 6		
	<b>Total 26</b>		<b>Total 6</b>

Select P.D.I. "B" Unit Cold Water Branch Type-B  
 Select P.D.I. "A" Unit Hot Water Branch Type-A  
 Select correct size Water Hammer Arrestor using Table 2.



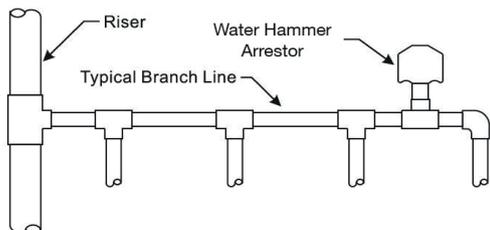
Find fixture unit weight of each fixture using Table 1. Total weights for both hot and cold branches.

Cold Water Branch		Hot Water Branch	
2 W.C. at 10 F.U.	ea.= 20	4 Lav. at 11/2 F.U	ea. = 6
2 Ur. at 5 F.U	ea.= 10		
4 Lav. at 1 1/2 F.U.	ea.= 6		
	<b>Total 36</b>		<b>Total 16</b>

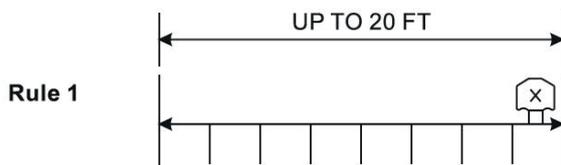
Select P.D.I. "C" Unit Cold Water Branch Type-C  
 Select P.D.I. "A" Unit Hot Water Branch Type-A  
 Select correct size Water Hammer Arrestor using Table 2.

**PLACEMENT**

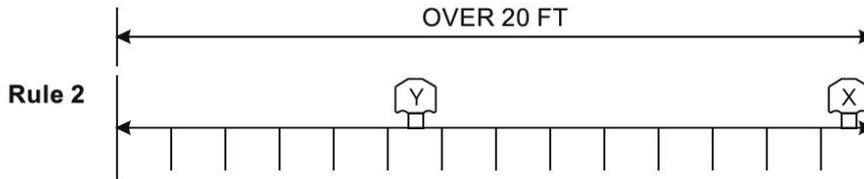
It has been established that the preferred location for the water hammer arrestor is at the end of the branch line between the last two fixtures served.



Two basic rules were established one for branches up to 20' in length, and another for branches over 20' in length.



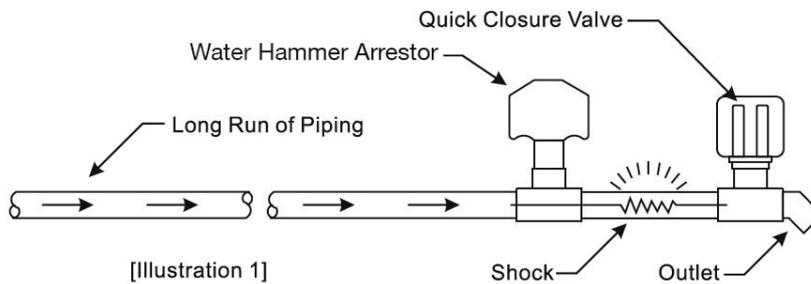
Rule 1, covers multiple fixture branch lines which do not exceed 20ft. in length. Water Hammer Arrestor Table 3-A (below) is used to select the required unit.



Rule 2, covers multiple fixture branch lines which do exceed 20ft. in length. Water Hammer Arrestor Table 3-B (Right) is used to select the required unit. The Sum of the Fixture Unit Ratings of units X and Y shall be equal to or greater than the demand of the branches.

**LONG RUNS OF PIPING TO SINGLE FIXTURE, APPLIANCES OR EQUIPMENT**

Table 3 indicates the size Water Hammer Arrestor required for long runs of piping which feed a single remote fixture of appliance. Water Hammer Arrestor unit should be sized by using Table 3 and located as close to the point of quick closure as possible.



When a unit of equipment is located at the remote end of a long run of piping, the Albion Valves (UK) Ltd Water Hammer Arrestor should be placed as close to the point of valve closure as possible. At this location, the Water Hammer Arrestor will control any developed energy and prevent shock waves from surging through the piping system (Illustration 1).

Properly sized Water Hammer Arrestors should be selected for such installations using Tables 3-A and 3-B below and right.

**Table 3 Water Hammer Arrestor Selection Chart**

Table 3-A for pressure up to 65 psig (Length Unit:ft)

Length of Pipe	Nominal Pipe Size					
	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
25	One Type-A	One Type-A	One Type-B	One Type-C	One Type-D	One Type-E
50	One Type-A	One Type-B	One Type-C	One Type-D	One Type-E	One Type-F
75	One Type-B	One Type-C	One Type-D	One Type-A & One Type-E	One Type-F	One Type-E & One Type-F
100	One Type-C	One Type-D	One Type-E	One Type-F	One Type-C & One Type-F	Two Type-F
125	One Type-C	One Type-D	One Type-F	One Type-A & One Type-F	One Type-E & One Type-F	One Type-E & Two Type-F
150	One Type-D	One Type-E	One Type-F	One Type-D & One Type-F	Two Type-F	Three Type-F

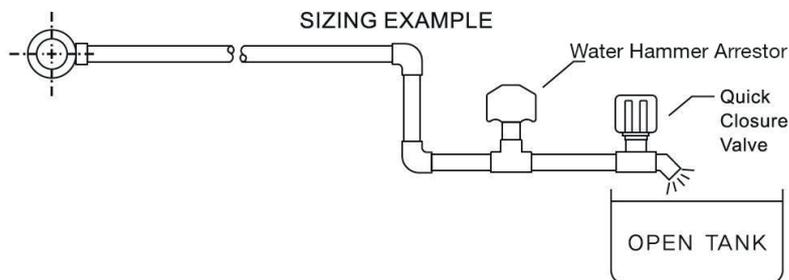
Table 3-B for pressures 65 psig to 85 psig (Length Unit:ft)

Length of Pipe	Nominal Pipe Size					
	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
25	One Type-B	One Type-B	One Type-C	One Type-D	One Type-E	One Type-F
50	One Type-B	One Type-C	One Type-D	One Type-E	One Type-F	One Type-C & One Type-F
75	One Type-C	One Type-D	One Type-E	One Type-F	One Type-C & One Type-F	Two Type-F
100	One Type-D	One Type-E	One Type-F	One Type-C & One Type-F	One Type-E & One Type-F	One Type-E & Two Type-F
125	One Type-D	One Type-E	One Type-C & One Type-F	One Type-D & One Type-F	Two Type-F	One Type-B & Three Type-F
150	One Type-E	One Type-F	One Type-C & One Type-F	Two Type-F	One Type-D & Two Type-F	Four Type-F

For further sizing information, see “Plumbing & Drainage Institute Standard WH-20 I”.

Note: Table 3 shows lengths of run of branch piping. The length of run used should be the length of the pipe from point of valve closure to a point of relief. Such as a large pipe riser twice the size of the branch line, main line or water tank.

All sizing recommendations shown in Table 3 are based on an operation water pressure of 65 PSI or under and an average velocity between 5 and 10 feet per second. If operating pressures are over 65 PSI use the next larger Water Hammer Arrestor unit. Where pressures are anticipated above 85 PSI a pressure reducing valve is recommended .



**CONDITIONS**

Pipe size 1 1/4  
 Length of Run 100ft.  
 Flow pressure 53 P.S.I.G.  
 Velocity 8ft./sec

**RECOMMENDATION:**

Albion Valves (UK) Ltd Fig. Type-F Water Hammer Arrestor installed as shown.



## **About Albion Valves (UK) Ltd**

Albion has been supplying valves and fittings to the building services and industrial markets for the past 40 years.

Albion was created with the sole purpose of providing quality products at an affordable price. With a growing reputation for quality and reliability, Albion is now an established brand providing the industry with a trusted alternative to premium-priced products.

Our commitment to setting the highest standards in all areas of our business means, if you're looking for quality, service, delivery and choice — you'll find it's all at Albion.

### **Quality**

Whatever you need, you can rest assured that if it comes from Albion it has been designed and manufactured to deliver optimum performance and is accredited with the necessary approvals. Our in-house quality department are always on hand too!

### **Service**

We pride ourselves on our customer service – we have even won awards for it! Our cradle to grave approach means you will never be on your own!

### **Delivery**

We know that time is money, and when a priority project depends on a part you can trust Albion to deliver – next day for all orders placed before 4:00PM.

### **Choice**

We may have started out with a single brass ball valve, but our range has grown substantially since and we now consider ourselves to be a 'One Stop Shop' with our comprehensive range. It is becoming more and more apparent to the industry, that it really is all at Albion.