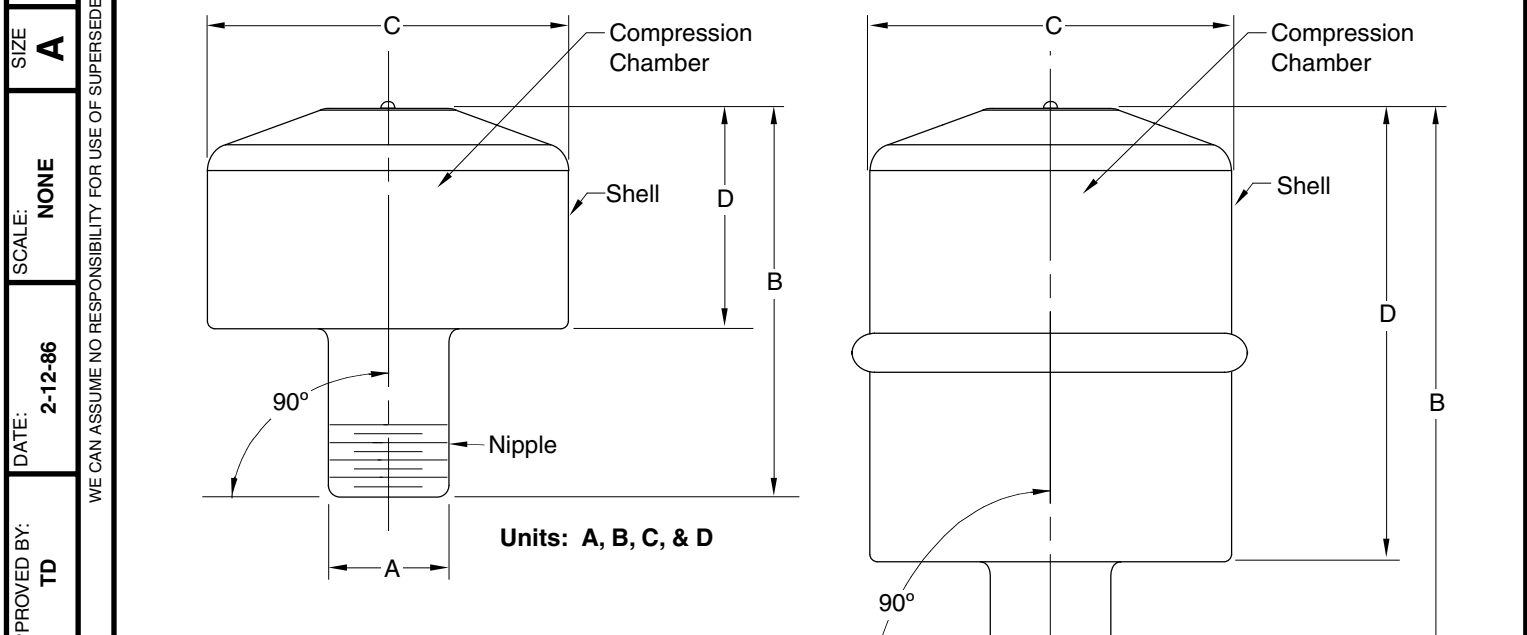


HYDROTROLS

ENGINEERED WATER HAMMER ARRESTERS

FUNCTION: Quick closing electrical, pneumatic, spring loaded valves or devices, and the quick hand closure of fixture trim can cause destructive "water hammer". Engineered water hammer arresters ("Hydrotrols") employ a permanently sealed cushion of air or gas which absorbs the energy of water hammer and reduces pressure rise in the piping system to a safe level. Hydrotrol units correctly sized and placed at specific locations in the water piping system, will control the destructive shock of water hammer.



Hydrotrols are pre-charged and permanently sealed at the factory. All hydrotrols are constructed entirely of stainless steel.

PCN/ Fig. No.	P.D.I. Symbol	Fixture Unit Rating	A SIZE	B	C	D
5005	A	1-11	3/4 (19)	3.18 (81)	3.25 (83)	1.80 (46)
5010	B	12-32	1 (25)	3.93 (100)	3.25 (83)	2.13 (54)
5020	C	33-60	1 (25)	4.30 (109)	3.25 (83)	2.42 (61)
5030	D	61-113	1 (25)	5.25 (133)	3.25 (83)	3.38 (86)
5040	E	114-154	1 (25)	5.57 (141)	3.25 (83)	3.57 (91)
5050	F	155-330	1 (25)	6.53 (166)	3.25 (83)	4.50 (114)



Hydrotrols Fig. 5005 to 5050 inclusive have been tested and certified in accordance with the Plumbing and Drainage Institute "Standard P.D.I. WH-201"

RECOMMENDED SPECIFICATION FOR HYDROSTATIC SHOCK CONTROL
 Smith series 5000 "Hydrotrol" all stainless steel shock absorbers shall be installed at all solenoid, remote operated or quick closing valves and at each plumbing fixture or battery of plumbing fixtures. Install on both hot and cold water branch lines in an upright position as close as possible to the valve or valves being served. Sizes and locations as indicated on drawings.

NOTE: Sizing information on reverse side.
NOTE: Stainless steel units are lead-free.

NOTE: Dimensions shown in parentheses are in millimeters.

5005 To 5050	DRAWN BY: CM	CHECKED BY: KG	APPROVED BY: TD	DATE: 2-12-86	SCALE: NONE	SIZE A	DRAWING NUMBER S5005	
	DIMENSIONS ARE SUBJECT TO MANUFACTURERS TOLERANCE AND CHANGE WITHOUT NOTICE							
	M L K	11-2-11 01/20/11 02/16/10	Rev. "B" & "D" Dim., Drawing Updated Logo Revised "B" & "D" Dimensions	TBW JJ JJ	JM TW CL	WEIGHT POUNDS	VOLUME CUBIC FEET	FIGURE NUMBER 5005 To 5050
REV.	DATE	DESCRIPTION	BY	CKD. BY				



HYDROTROLS

SIMPLIFIED SIZING METHOD

The selection and specification for the correct size Hydrotrol for each piping run may be easily accomplished by the following procedure which incorporates length of piping run, water pressure and other pertinent data into the Sizing Chart.

The Hydrotrol Sizing Chart shows the number of fixture units that may be accommodated by each size Hydrotrol. The U.S. Bureau of Standards "Fixture Unit Rating Table" designates the fixture unit rating for each plumbing fixture when installed in public or private buildings. Referring to the "Fixture Unit Rating Table", determine the fixture unit rating of each plumbing fixture on the line. Add the total number of fixture units on the line, and use this figure to select and specify the size Hydrotrol required as indicated on the Hydrotrol Sizing Chart.

EXAMPLE:

PLACEMENT OF HYDROTROLS

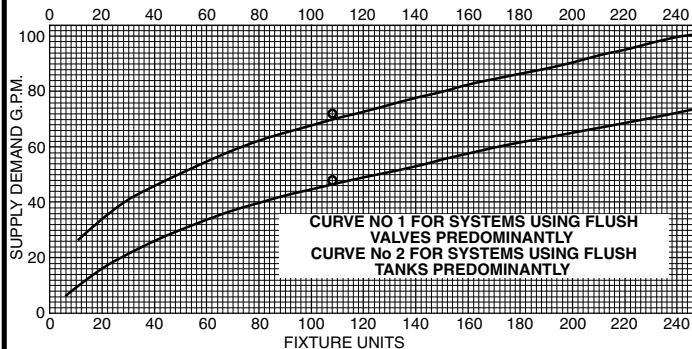
The drawing shows plumbing fixtures installed on a typical piping layout. The figures to the right of each fixture run are the total fixture units for the run based on the fixture unit rating table. The total number of fixture units for each plumbing fixture on the line has been added and is shown for both hot and cold water lines. The total number of fixture units for each run determines the size of Hydrotrol required. If the fixture unit total ends up in a 1/2 number, round up to the next larger whole number.

The additional Hydrotrols shown on batteries of over 20'(6096) in length are the same size as those specified in the chart ... shown for each floor.

The following general rules are applicable to proper placement of "Hydrotrols". The locations shown in the installation layout are recommended to give the maximum in water hammer arresting effectiveness:

1. Single fixtures or appliances -- Locate Hydrotrol just before fixture or valve.
2. Battery of fixtures -- Length of battery 20'(6096) or less. Locate Hydrotrol between the last and next to last fixtures. (See 5th Floor Examples.)
3. For a battery of fixtures having a branch line over 20 (6096) ft. in length, two Hydrotrols should be installed. The two Hydrotrols selected should have combined fixture unit rating equal to or greater than the total fixture unit demand of the plumbing fixtures on the entire branch line. Locate one Hydrotrol between the last and next-to-the-last fixture on the branch line. The other Hydrotrol to be located at a point equal to half the length of the branch line. (See first floor example).
4. On hot water branch lines over 20 (6096) ft. in length, where plumbing fixtures are installed on a portion of the line, the second Hydrotrol should be located at a point half the distance of the plumbing fixtures installed. (See second and third floor examples).
5. For special or unique battery arrangements or piping layouts, please consult the Smith Engineering Dept. for the proper specification on sizing and placement.

FOR APPLICATIONS NOT COVERED BY THE FIXTURE UNIT RATING TABLE -



The Graph Chart is based on the U.S. Bureau of Standards Sizing Table and may be used to determine the fixture unit rating based on GPM supplied to the fixture in question.

HYDROTROL SIZING CHART

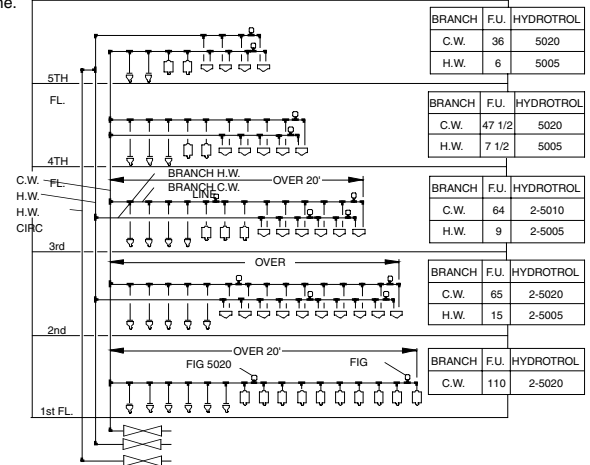
P.D.I. SYMBOLS	A	B	C	D	E	F
HYDROTROL	5005	5010	5020	5030	5040	5050
Fixture Unit Rating	1-11	12-32	33-60	61-113	114-154	155-330

NOTE: When Water Pressure in line exceeds 65 psi, specify the next larger Hydrotrol.

FIXTURE UNIT RATING TABLE GENERAL BUILDING AREAS

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

NOTE: This Fixture Unit Rating Table is established in accordance with the Plumbing and Drainage Institute "Standard - WH-201" and is based upon information offered in the National Plumbing Code. It takes into consideration all design factors, including simultaneous usage, pipe size, length, flow pressure and velocity. This table, therefore, provides an easy, accurate method for sizing Hydrotrols on each multiple fixture branch line.



ALTERNATE SIZING METHOD

The simplified sizing method covers 90% of most applications encountered. Where fixture unit ratings are not available or where water is piped to remote items of equipment, the following method of Hydrotrol selection should be used:

- INFORMATION REQUIRED TO USE CHART:**
1. LENGTH OF PIPE RUN. Length of pipe run should be determined from the 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.
 2. PIPE SIZE.
 3. WATER PRESSURE.

HYDROTROL SELECTION CHART

LENGTH OF PIPE	NOMINAL PIPE SIZE					
	1/2"(13)	3/4"(19)	1"(25)	1 1/4"(32)	1 1/2"(38)	2"(51)
25	5005	5005	5010	5020	5030	5040
50	5005	5010	5020	5030	5040	5050
75	5010	5020	5030	1-5005	1-5040	1-5040
100	5020	5030	5040	1-5040	5050	1-5050
125	5020	5030	5050	1-5020	1-5050	2-5050
150	5030	5040	5050	1-5050	1-5030	1-5050
				1-5050	2-5050	3-5050

NOTE: Data in table is based on a maximum operating water pressure of 65 psi, and an average velocity between 5 to 10 feet per second. If operating pressures are over 65 psi, use next larger Hydrotrol unit.

DRAWING NUMBER: S5005BS
 SIZE: A
 SCALE: NONE
 DATE: 2-12-86
 APPROVED BY: TD
 CHECKED BY: KG
 DRAWN BY: CM
 FIGURE NUMBER: 5005BS

WE CAN ASSUME NO RESPONSIBILITY FOR USE OF SUPERSEDED OR VOID DATA

REV.	DATE	DESCRIPTION	BY	CKD. BY
C	01/20/11	Updated Logo	JJ	TW
B	4-16-97	Added Millimeters	EMB	BS

WEIGHT POUNDS	VOLUME CUBIC FEET	FIGURE NUMBER
		5005BS