

<b>FIGURE NUMBER</b>	<b>5005 To 5050</b>	DRAWN BY: <b>CM</b>	CHECKED BY: <b>KG</b>	APPROVED BY: <b>TD</b>	DATE: <b>2-12-86</b>	SCALE: <b>NONE</b>	SIZE <b>A</b>	DRAWING NUMBER <b>S5005</b>	F	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 30%;"> <b>SMITH® JAY R. SMITH MFG. CO.®</b>            DIVISION OF SMITH INDUSTRIES, INC.            POST OFFICE BOX 3237            MONTGOMERY, ALABAMA 36109-0237 (USA)            TEL: 334-277-8520 FAX: 334-272-7396 www.jrsmith.com         </div> <div style="width: 30%; text-align: center;">   <b>ASPE</b>  <small>MEMBER OF:</small> </div> <div style="width: 30%; text-align: center;">   <b>PDI</b>  <small>MEMBER OF:</small> </div> </div> <div style="text-align: right; padding-top: 5px;"> <b>LOCATION</b> </div>
		<h1 style="margin: 0;">HYDROTROLS</h1> <h2 style="margin: 0;">ENGINEERED WATER HAMMER ARRESTERS</h2>								
		<p><b>FUNCTION:</b> 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.</p>								
		<div style="display: flex; justify-content: space-around;"> <div style="width: 45%; text-align: center;">   <b>Units: A, B, C, &amp; D</b> </div> <div style="width: 45%; text-align: center;">   <b>Units: E &amp; F</b> </div> </div> <p style="text-align: right; margin-top: 10px;">Hydrotrols are pre-charged and permanently sealed at the factory. All hydrotrols are constructed entirely of stainless steel.</p>								

  

PCN/ Fig. No.	P.D.I. Symbol	Fixture Unit Rating	A SIZE	B	C	D
5005	A	1-11	3/4 (19)	2.62 (67)	3.25 (83)	1.40 (36)
5010	B	12-32	1 (25)	2.97 (75)	3.25 (83)	1.69 (43)
5020	C	33-60	1 (25)	3.59 (91)	3.25 (83)	2.19 (56)
5030	D	61-113	1 (25)	5.14 (131)	3.25 (83)	3.24 (82)
5040	E	114-154	1 (25)	5.52 (140)	3.25 (83)	4.12 (105)
5050	F	155-330	1 (25)	6.67 (169)	3.25 (83)	5.28 (134)

**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:** Dimensions shown in parentheses are in millimeters.

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"

Hydrotrols Fig. 5005 to 5050 inclusive conforms to ASSE Standard #1010.

Certificate of compliance available upon request.

F	1-4-06	Revised Drawing	RN	CL	WEIGHT	VOLUME	FIGURE NUMBER
E	10-24-05	Revised Note	TBW	JM	POUNDS	CUBIC FEET	5005 To 5050
D	1-19-00	Revised Dimensions	SA	JMcD			
C	6-18-98	Changed Geometry	ASL	JMcD			
REV.	DATE	DESCRIPTION	BY	CKD. BY			

FIGURE NUMBER

5005BS

DRAWN BY:

CM

CHECKED BY:

KG

APPROVED BY:

TD

DATE:

2-12-86

SCALE:

NONE

SIZE

A

DRAWING NUMBER

S5005BS

B

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PLUMBING AND DRAINAGE INSTITUTE

ASPE

MEMBER OF:

LOCATION

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 of 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 -

0 20 40 60 80 100 120 140 160 180 200 220 240

100 80 60 40 20 0

SUPPLY DEMAND G.P.M.

CURVE NO 1 FOR SYSTEMS USING FLUSH VALVES PREDOMINANTLY

CURVE NO 2 FOR SYSTEMS USING FLUSH TANKS PREDOMINANTLY

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.

5TH FL.

4TH FL.

3rd

2nd

1st FL.

BRANCH F.U. HYDROTROL

C.W. 36 5020

H.W. 6 5005

BRANCH F.U. HYDROTROL

C.W. 47 1/2 5020

H.W. 7 1/2 5005

BRANCH F.U. HYDROTROL

C.W. 64 2-5010

H.W. 9 2-5005

BRANCH F.U. HYDROTROL

C.W. 65 2-5020

H.W. 15 2-5005

BRANCH F.U. HYDROTROL

C.W. 110 2-5020

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.

2. PIPE SIZE.

3. WATER PRESSURE.

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.

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	5050	1-5040 1-5050
100	5020	5030	5040	5050	1-5020 1-5050	2-5050
125	5020	5030	5050	1-5005 1-5050	1-5040 1-5050	1-5040 2-5050
150	5030	5040	5050	1-5030 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.

B

A

4-16-97  
1-23-95

Added Millimeters  
Submittal Update

EMB  
EMB

BS  
BS

REV.

DATE

DESCRIPTION

BY

CKD. BY