



**Sioux
Chief**



Water Hammer Arrestors

Technical Manual

Sioux Chief



RWC

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Water Hammer Arrestors

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Introduction

Reliance Worldwide Corporation (Aust.) Pty. Ltd. (RWC) has for many years been a leading exponent in highlighting the detrimental effects water hammer generates within domestic and industrial plumbing systems throughout the country. To combat the consequences of water hammer, RWC is proud to offer the Sioux Chief range of Water Hammer Arrestors.

Water hammer is the term used to define the destructive force produced in a piping system when the water flow is suddenly stopped by the rapid closure of a valve or device. This rapid closure induces an intense pressure wave to travel back and forth through the pipe work, resulting in pipe vibration and a hammering effect. The vibration and hammering can be of such an intensity pipe work may fracture, resulting in flooding and expensive repairs.

The Water Hammer Arrestor works on the principal of compressing air to absorb the induced pressure wave. The arrestor is placed at 90° to the water flow, just upstream from the offending device. When the device closes the pressure wave begins to move back along the pipe. As it reaches the arrestor the force acts against a piston which in turn pushes against a charge of air, the air is compressed, dissipating the wave energy and nullifying the hammering effects.

Sioux Chief Water Hammer Arrestors undergo stringent factory testing (500,000 cycles of actual hammer conditions). All Sioux Chief Water Hammer Arrestors are manufactured from highest quality type L copper tube, are cold rolled and spun closed seamless. BSP threaded DR brass fittings are secured by lead free soldered joints.

Warranty

Reliance Worldwide Corporation reserves the right to modify designs and specifications and to withdraw and introduce products at any time without notice.

Installation is subject to the requirements of the applicable regulatory authority, the National Construction Code Volume Three – Plumbing Code of Australia, associated reference standards as applicable at the time and AS/NZS 3500.

For further Scope of Use, please visit www.rmc.com.au/resources

Reliance Worldwide Corporation (Aust.) Pty. Ltd. (RWC) will either replace or repair any defective goods where the defect arose as a result of manufacture for two (2) years. You may contact RWC at the phone number, address or e-mail shown and will be required to return the goods for evaluation. Should the defect be found to be one of our manufacture we will send you a replacement product to your stated address at our expense. Our goods come with guarantees that cannot be excluded under Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and failure does not amount to a major failure.

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Standards and Product Approvals

QEC Licence

Reliance Worldwide Corporation (Aust.) Pty. Ltd. (RWC) head office and manufacturing facility is located in Brisbane. RWC is accredited as a quality endorsed company, maintaining licence QEC0019 to the international QEC Standard ISO 9001.



Product Approvals

Sioux Chief Water Hammer Arrestors are certified in accordance with the requirements of the Watermark Certification Scheme to AS 5200.007 (Plumbing and Drainage Products – Metal-bodied Water Hammer Arrestors).



Sizing of Arrestors

Sioux Chief Water Hammer Arrestors are sized in accordance with the capacity of the arrestor air chamber. This capacity determines the suitability of the arrestor for any given application and is identified by the corresponding assigned letters eg. 'AA'. A fixture unit is a quantity in terms of which the load producing effects on the plumbing system of different types of fixtures are expressed on an arbitrary scale.

Size	Fixture Units Served
AA	1 – 3
A	4 – 11
B	12 – 32
C	33 – 60
D	61 – 113
E	114 – 154
F	155 – 330

		Fixture Units					
Fixture	Supply Control	Public			Private		
		Total	Cold	Hot	Total	Cold	Hot
WC	Flush Valve	10	10	–	6	6	–
WC	Cistern	5	5	–	3	3	–
Urinal (trough)	Flush Valve	10	10	–	–	–	–
Urinal (wall)	Flush Valve	5	5	–	–	–	–
Urinal (wall)	Cistern	3	3	–	–	–	–
Bath	Tap	5	2	3	3	1.5	1.5
Shower	Mixing Valve	5	2	3	3	1	2
Bathroom (group)	Flush Valve WC	–	–	–	12	9	3
Bathroom (group)	Cistern WC	–	–	–	9	6	3
Service Sink	Tap	6	3	3	–	–	–
Laundry Tubs (1-3)	Tap	–	–	–	6	3	3
Combination	Tap	–	–	–	6	3	3

Washing machines and dishwashers are to be treated as remote installations. RWC recommends utilising 'AA' or 'A' size arrestors at each supply point for these appliances.

Example:

Residence with:	1 x WC (cistern)	3 cold fixture units	0 hot fixture units
	1 x bathroom group (no WC)	3 cold fixture units	3 hot fixture units
	1 x laundry tub	3 cold fixture units	3 hot fixture units
	1 x kitchen (combination)	3 cold fixture units	3 hot fixture units
	Total cold fixture units = 12	'B' size arrestor required on cold supply	
	Total hot fixture units = 9	'A' size arrestor required on hot supply	

Arrestor Size Calculation

$$C = \frac{8880 \times L \times V^2}{D^2 \times (F + 100) \times Y}$$

Where:

C = Arrestor Capacity (cm³)

V = Change in Water Velocity (l/s)

D = Pipe Internal Diameter (cm)

L = Pipe Length of Branch Line (cm)

F = Gauge Pressure (valve open) (kPa)

Y = Chart Intercept of $\frac{M_a}{F_a}$

$$\frac{M_a}{F_a} = \frac{\text{Maximum Allowable Pressure (1035) kPa}}{\text{Absolute Flow Pressure (F + 100) kPa}}$$

Graph of $\frac{M \text{ (absolute)}}{F \text{ (absolute)}}$ Versus Y

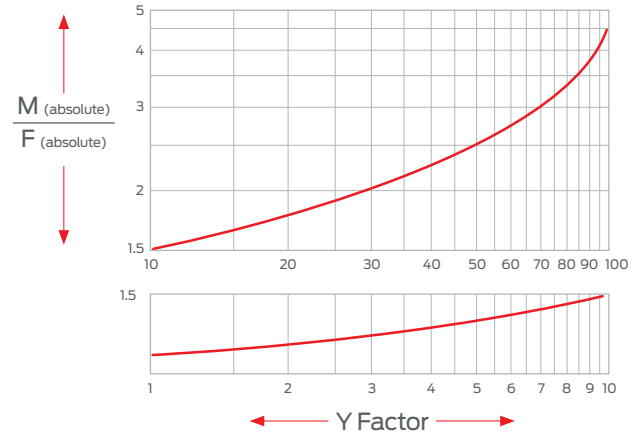


Chart of Arrestor Capacities

Size	AA	A	B	C	D	E	F
Volume (CC)	23	82	115	180	328	475	590

Example:

Length of branch pipe is 15m (1500cm)

Change in water velocity is 3 l/s (3 – 0 = 3)

Gauge Pressure, valve open is 420kPa

Pipe I.D. is 60mm (6cm)

$$\text{Chart Intercept at } \frac{1035}{420 + 100} = 2$$

From the chart Y = 27

$$C = \frac{8880 \times 1500 \times 9}{36 \times (420 + 100) \times 27} = 237\text{cc}$$

From the chart it can be seen that the capacity of 237cc lies between 'C' and 'D' sizes. The arrestor choice must be larger than the calculated volume so the 'D' size is the correct device for this example.

Hydra-Rester

Boxed 15mm – 50mm

Scope of Use / Specification Sheet

The Sioux Chief Hydra-Rester is available in all sizes to ensure the correct capacity may be selected for any application.



Product List

Order Code	Size	Model
7001	A	15mm Hydra-Rester
7002	B	20mm Hydra-Rester
7003	C	25mm Hydra-Rester
7004	D	32mm Hydra-Rester
7005	E	40mm Hydra-Rester
7006	F	50mm Hydra-Rester

Application

The Hydra-Rester is ideal for installation in all domestic, commercial or industrial plumbing systems.

Materials

Body	Type L Copper
Piston	HHPP
O-Rings	EPDM
End Fittings	DR Brass
Thread	BSP

Features and Benefits

- Simple to install
- Maintenance free
- Cost effective
- Seamless shock absorbing chamber
- Multiple choice of sizes

Description

When a shuttering fixture closes, a pressure wave begins to move back along the pipe. As it reaches the arrestor the force acts against the arrestor piston, which, in turn, pushes against a charge of air. The air is then compressed, dissipating the wave energy and nullifying the hammering effects. Water Hammer Arrestors do not compensate for loosely fitted pipe work.

The Hydra-Rester is formed from Type L copper tube and is cold rolled and spun closed seamless. The piston carries two EPDM seals and is lubricated with approved 111 Silicone Compound. System surge pressure can be kept below 1000kPa while the arrestor can operate at a safe working pressure to 2300kPa. The device is easily installed via the versatile BSP male thread and can be fitted in any position 90° to the pipe work.

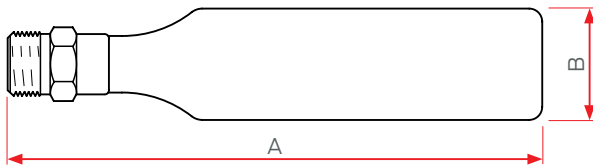
Hydra-Rester

Boxed 15mm – 50mm

Dimensions

Product Code	Length (A)	Diameter (B)	Thread Size	Weight
7001	173	35	R $\frac{1}{2}$ ($\frac{1}{2}$ " BPST)	280g
7002	218	35	R $\frac{3}{4}$ ($\frac{3}{4}$ " BPST)	370g
7003	284	35	R1 (1" BPST)	470g
7004	269	54	R1 (1" BPST)	866g
7005	324	54	R1 (1" BPST)	1020g
7006	324	54	R1 (1" BPST)	1200g

Note: All measurements in mm unless otherwise stated.



Scope of Use

Materials in contact with water	Copper, EPDM, PP, DR Brass
Maximum operating temperature	90°C
Maximum allowable operating pressure	1500kPa

Standards and Approvals



AS 5200.007
WM-020003

Warranty

Reliance Worldwide Corporation (Aust.) Pty. Ltd. (RWC) will either replace or repair any defective goods where the defect arose as a result of manufacture within the warranty period. You may contact RWC at the phone number, address or e-mail shown below for further information or to make a claim.

Visit www.rmc.com.au/warranty to view the warranty statement in full and for further important information.

Connection

The Hydra-Rester can be easily installed at 90° to the pipe work by utilising the appropriate RWC BSP 'T' fitting. Where there is one known offending fixture the arrestor should be located upstream within one metre of this fixture. In a multi-fixture branch line up to six metres, the Hydra-Rester should be placed at the end of the branch between the last two fixtures served.

Inspect for leaks after installing and before concealing.

Installation

Installation is subject to the requirements of the applicable regulatory authority, the National Construction Code Volume Three – Plumbing Code of Australia, associated reference standards as applicable at the time and AS/NZS 3500.1.

Hydra-Rester

Hangsell 15mm – 20mm

Scope of Use / Specification Sheet

The Sioux Chief Hydra-Rester (15-20mm) is available in 'A' size and is ideal for general applications. Arrestors suitable for washing machines and dishwashers are available in a copper or chrome finish.

Product List

Order Code	Size	Model
7000	A	15mm Hydra-Rester
7008	A	15mm Conetite Tee
7010	A	20mm Washing Machine/ Dishwasher – Chrome

Application

The Hydra-Rester 'A' size is ideal for installation on supply lines to washing machines, electronic and clockwork garden water timers, dishwashers and all general domestic and commercial appliances likely to cause water hammer.

Materials

Body	Type L Copper
Piston	HHPP
O-Rings	EPDM
End Fittings	DR Brass
Thread	BSP

Scope of Use

Materials in contact with water	Copper, EPDM, PP, DR Brass
Maximum operating temperature	90°C
Maximum allowable operating pressure	1500kPa



Features and Benefits

- Simple to install
- Maintenance free
- Cost effective
- Seamless shock absorbing chamber
- Suits hot and cold water
- Protects against fixture damage and flooding

Description

When a shuttering fixture closes, a pressure wave begins to move back along the pipe. As it reaches the arrestor the force acts against the arrestor piston, which, in turn, pushes against a charge of air. The air is then compressed, dissipating the wave energy and nullifying the hammering effects. Water Hammer Arrestors do not compensate for loosely fitted pipe work.

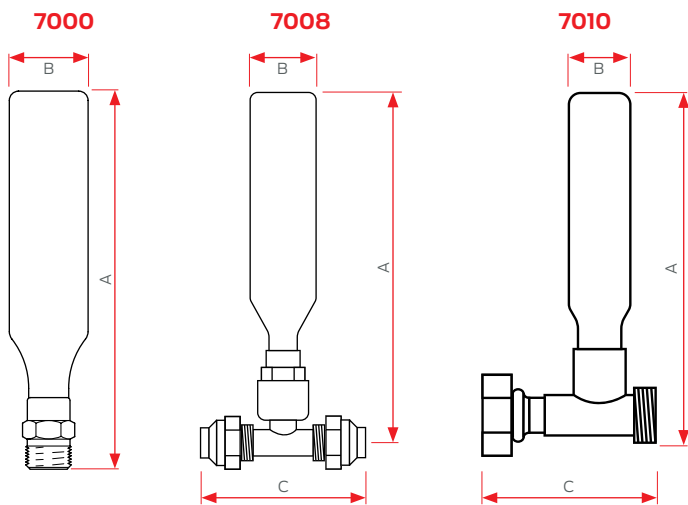
The Hydra-Rester is formed from Type L copper tube and is cold rolled and spun closed seamless. The piston carries two EPDM seals and is lubricated with approved 111 Silicone Compound. System surge pressure can be kept below 1000kPa while the arrestor can operate at a safe working pressure to 2300kPa. The device is easily installed via the various BSP threaded fittings and can be mounted in any position 90° to the water flow.

Hydra-Rester Hangsell 15mm – 20mm

Dimensions

Order Code	Length (A)	Diameter (B)	Tee (C)	Thread Size	Weight
7000	173	35	–	15	290g
7008	188	35	98	15	100g
7010	175	33	64	20	340g

Note: All measurements in mm unless otherwise stated.



Installation

Installation is subject to the requirements of the applicable regulatory authority, the National Construction Code Volume Three – Plumbing Code of Australia, associated reference standards as applicable at the time and AS/NZS 3500.1.

Standards and Approvals



AS 5200.007
WM-020003

Warranty

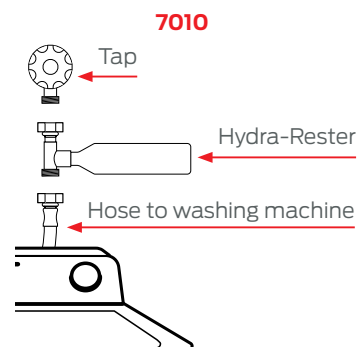
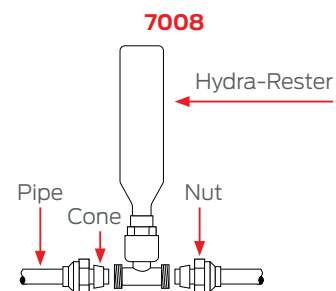
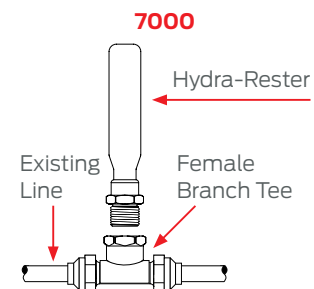
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Visit www.rmc.com.au/warranty to view the warranty statement in full and for further important information.

Connection

The Hydra-Rester can be easily installed at 90° to the water supply with the choice of fittings eliminating the need for special tools.

All plumbing systems must be structured in accordance with AS/NZS 3500.1 and utilise the correct clipping and supports. Inspect for leaks after installing and before concealing.



Mini-Rester

Hangsell 15mm – 20mm

Scope of Use / Specification Sheet

The Sioux Chief Mini-Rester is 'AA' size, ideal for use with dishwashers, and available in a chrome finish.

Product List

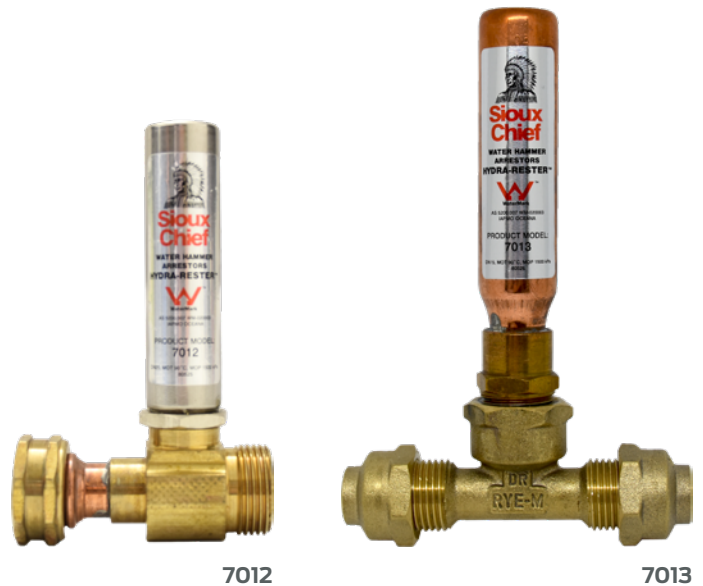
Order Code	Size	Model
7013	AA	15mm Conetite Tee
7012	AA	20mm Dishwasher – Chrome

Application

The Mini-Rester is ideal for installation on washing machine and dishwasher supply lines, single lever taps and all fast action tapware.

Materials

Body	Type L Copper
Piston	HHPP
O-Rings	EPDM
End Fittings	DR Brass
Thread	BSP



Features and Benefits

- Simple to install
- Maintenance free
- Cost effective
- Seamless shock absorbing chamber
- Suits hot and cold water
- Protects against fixture damage and flooding

Description

When a shuttering fixture closes, a pressure wave begins to move back along the pipe. As it reaches the arrestor the force acts against the arrestor piston, which, in turn, pushes against a charge of air. The air is then compressed, dissipating the wave energy and nullifying the hammering effects. Water Hammer Arrestors do not compensate for loosely fitted pipe work.

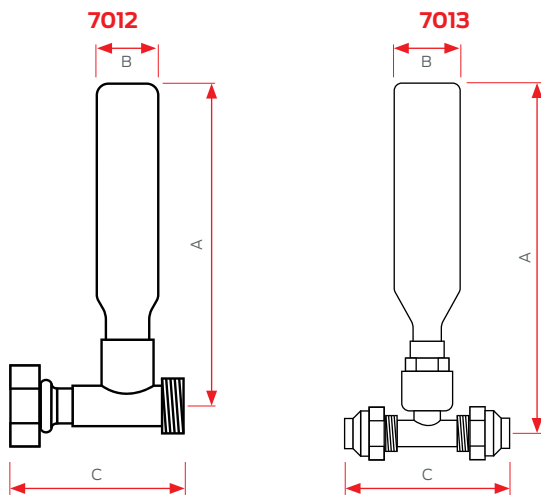
The Mini-Rester is formed from Type L copper tube and is cold rolled and spun closed seamless. The piston carries two EPDM seals and is lubricated with approved 111 Silicone Compound. System surge pressure can be kept below 1000kPa while the arrestor can operate at a safe working pressure to 2300kPa. The device is easily installed via the various BSP threaded fittings and can be mounted in any position 90° to the water flow.

Mini-Rester Hangsell 15mm – 20mm

Dimensions

Order Code	Length (A)	Diameter (B)	Tee (C)	Thread Size	Weight
7012	109	22.5	70	15	200g
7013	138.5	22.5	98	15	360g

Note: All measurements in mm unless otherwise stated.



Scope of Use

Materials in contact with water	Copper, EPDM, PP, DR Brass
Maximum operating temperature	90°C
Maximum allowable operating pressure	1500kPa

Installation

Installation is subject to the requirements of the applicable regulatory authority, the National Construction Code Volume Three – Plumbing Code of Australia, associated reference standards as applicable at the time and AS/NZS 3500.1.

Standards and Approvals

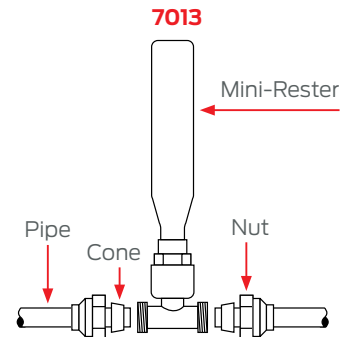
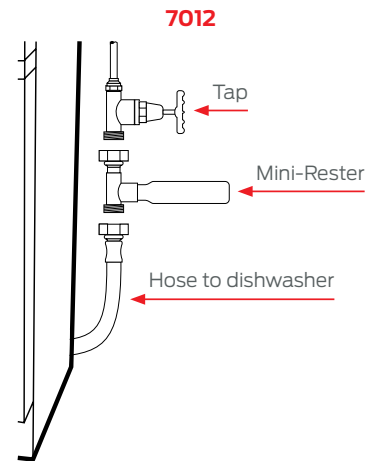


AS 5200.007
WM-020003

Connection

The Mini-Rester can be easily installed at 90° to the water supply with the choice of fittings eliminating the need for special tools.

All plumbing systems must be structured in accordance with AS/NZS 3500.1 and utilise the correct clipping and supports.



Warranty

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