

# How to reduce water hammer in multistorey building applications

How to 

**Minimising entrapped air makes all the difference when it comes to regulating water and fire main systems. In this article we consider some of the methods used to keep water hammer at bay.**

## The issue

Water hammer is a pressure surge caused by sudden changes in water flow – this can be due to the closure of a valve or a sudden loss of pressure. Multistorey buildings have complex water supply systems that control hot and cold water to several floors. Additionally, there is a secondary fire main network on all levels of these applications. Water hammer is common, as each level has a variable pressure – whether located at ground level, or at the topmost floor of a high-rise.

## The standard solution

In new buildings, these systems are generally charged with water. In most cases, air is manually released by opening up building taps and valves until the system is fully charged. In a multistorey building, this can be hundreds of different locations – making the process both time consuming and costly. Once the taps have been opened, and air has been released, it is assumed that all air is now gone from the system.

## An automatic alternative

As mentioned previously, the solution to entrapped air is to release the buildup manually. However, depending on building size and complexity, this can take up to several weeks. It's a labour intensive process – requiring multiple visits to release entrapped air.

An alternative to this, is installing automatic air release valves at strategic locations. These valves have the capability to release air automatically.

However, not all valves are created equal. Standard air release valves tend to be unreliable, and can weep water – which are not fit for purpose in building applications. To counter standard air release valves – Europe's leading metallic air valve manufacturer has developed an alternative product.

CSA's Fox-AS-HR valve has the functionality to seal positively at extremely low pressures (less than 10kPa). Many air release valves require greater than 50 -100kPa to seal positively, which is not always possible in multistorey applications.

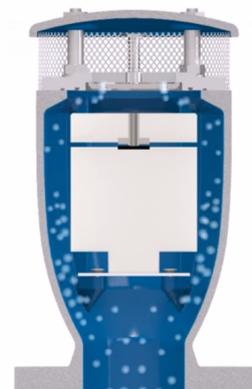
The Fox-AS-HR valve also features an anti-slam function. When filling the pipe network, air is released automatically at a controlled rate of flow.

When the rate of air flow is controlled, air valves will minimise water hammer as the pipes charge – regardless of pipe charge speed.



Another design feature of the CSA valve is the inclusion of a metallic threaded outlet. This threaded outlet allows for the release of small air pockets into a small drain or tundish. The air valve is designed with a large 25mm orifice to allow air to re-enter the pipe network. When draining a system, allowing air to pass through speeds up the process for pipe systems up to 200mm in size.

Entrapped air doesn't have to reduce network performance. By implementing products that assure functionality and form – water hammer can be minimised automatically in your system.



*Images: High rise image for illustration purposes only (left); Fox-AS-HR anti-water hammer air release valves (above).*

*Interested in this solution for your next project? Contact your nearest BWT state office to speak with one of our representatives.*

**Get in touch — BWT can be found Australia-wide.**

For more information or to speak to one of our staff, call the number in your state [www.bermadmeters.com.au](http://www.bermadmeters.com.au) & [www.bermad.com.au](http://www.bermad.com.au)

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Welcome to the latest edition of BWT News. Inside, you'll find news and product information from the BWT team.



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## BWT drives innovation in 2017

News 



The BWT team is excited to begin a new year of developing forward-thinking solutions and products. Innovation and the quality of service we offer to our customers, drives our progress within the industry.



### Smart meters

BWT has successfully won several contracts for smart metering projects within Australia commencing in 2017. We aim to continue taking the latest technology to a new level of clarity and accuracy using remote meter reading solutions.

*Images: 720-x PRV (top); Fire protection PRVs (above).*

### Non-urban metering

BWT are now working towards solutions for metering using non-urban water. This is possible due to our compliance with **NMI pattern approval in Australia**. The NMI standard is one of the latest accreditations applied to Bermad products – and is highly regarded for its independent certification and quality guarantee.

### Fire industry

Within the fire industry, BWT is leading the way in valve technology – providing efficient solutions in deluge control and regulating valves with full fire accreditations.

### Water supply industry

BWT continues to set industry standards with our range of versatile air valves. BWT air valves perform at an optimum level never before seen in Australia. As the control valve market evolves further, we will continue to develop solid products that excel in this field.

### Irrigation market

BWT caters for the irrigation market with an extensive range of control, air release and metering solutions. Our products are considered to go beyond the industry benchmark due to their performance and technical superiority.

# BWT at Ozwater Sydney in May 2017

Events



Ozwater is the Australian Water Association's annual water conference and trade exhibition. It's a premier event for thousands of water and industry professionals around Australia.

This year the trade show heads to Sydney from the 16th to the 18th of May.

Bermad will have both local and national representation of staff at the show. Our showcase will exhibit all our latest valves and metering products – and we hope to see you there to discuss the features and benefits of our 2017 range.

### Brought to you by Bermad Training Academy

Bermad will be presenting two free workshops over the course of Ozwater. Each workshop is

presented by our experienced and knowledgeable staff. The workshops contain a variety of product demonstrations and resources to help answer your questions on application design.

### Surge Mitigation with Colin Kirkland

Water hammer and inadequate surge protection can result in corrosion, noise and pipe collapse. Ensure that your pipeline is performing at its optimum by reducing entrapped air and exercising surge mitigation solutions.

This training session demonstrates innovative and cost effective solutions to minimise the effects of transient water hammer in pipeline networks.

### Hydraulic lockout with Michael Jacobsen

Hydraulic lockout can lead to failure of the downstream pipeline system due to a valve's inability to effectively control and respond to changes in pressure.

This training session will demonstrate how the Bermad 700 series hydraulic control valve retains control under a zero differential pressure hydraulic lock-out scenario.



Image: Bermad Ozwater 2016-Melbourne (above).

Email [michaelj@bermad.com.au](mailto:michaelj@bermad.com.au) to sign up to our workshops. We look forward to seeing you!

# Mullum Mullum Eastlink Road Tunnel – looking back on 10 years

Case Study

## BWT has been designing and working alongside fire protection companies in Australia since 1998.

We have supplied pressure control deluge valves for fire protection in road tunnels throughout most Australian states.

In 2006, the Mullum Mullum twin three-lane road tunnels were constructed – connecting Melbourne's Eastern suburbs from Ringwood to Donvale on the Eastlink freeway system.



Bermad was selected as the successful supplier of pressure control deluge valves, which have been in operation to protect the 1.6km tunnel for over ten years.

### Tunnel and deluge valve design

As the tunnel design was a U shape, with the lowest point in the middle, pressure control deluge valves

were designed to provide consistent pressure throughout.

Consistent pressure, regardless of location, ensures an optimum water profile for the fire spray system. Bermad supplied electric pressure control, 150mm diameter valves. The valves were chosen due to their ability to accurately regulate pressure and supply the flow rates required for the tunnel.

Some valves were supplied with explosion proof solenoids and pressure switches – with all valves being delivered in full and on time.

Bermad was selected for the project for many reasons. Our product performance, customer service and local technical engineering experience were all part of the selection criteria. As was our ability to assist with commissioning. We were able to manufacture a custom design deluge system that met the tight space constraints of the tunnel.

For a visual view of a typical tunnel fire protection deluge system, visit the Fire Protection playlist on our YouTube channel.



Images: Mullum Mullum tunnel Melbourne, Victoria.

If you would like to discuss the design of deluge valve systems, contact your nearest BWT office or visit our website [www.bermad.com.au](http://www.bermad.com.au).

# Featured product: Bermad Torrent Model 400-Y

Product



**The Bermad Torrent 400-Y sets industry benchmarks in flow performance and engineering design within the fire control market.**

Over the years, the Torrent has proven itself as a technical valve that performs under extreme conditions. Its unique design makes for an efficient installation – with the control trim isolated from the cover of the valve.

The high performance of the valve can be attributed to the quality of its design. Important features include the valve’s long stroke and fat belly. This gives the valve flow capabilities and

cavitation resistance 50% greater than other products on the market.

The valves are typically used in deluge or pressure control functions such as: pressure reduction, pressure relief or tank filling.

BWT is compliant with international fire accreditations for products operating up to 25 bars of pressure. The versatility of the design enables connections to be either rolled groove, threaded or flanged.

*If you'd like to watch an animation on the Bermad Torrent valve, visit our YouTube channel <https://www.youtube.com/c/BermadAustralia>.*

*Images: Deluge installation (left); Torrent product assemblies (right).*



## Who's who at BWT

Profile



### MICHAEL JACOBSEN Manager - Western region

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With over 35 years of technical sales experience, and 25 of those years in management – Michael brings knowledge and capability to the BWT team.

His experience in the manufacturing of pipes, valves and fittings across the water, sewage and gas industries is critical knowledge to have on board. This industry skill translates throughout projects in their entirety – from design and supply, to delivery.

His knowledge is supplemented by his administrative and sales skills, acquired through an extensive range of projects and work.

Michael has been part of the Bermad team for nine years. While initially the WA State Manager, he now oversees both WA and SA/NT teams.

Following his move to SA in 2016, Michael was offered the opportunity to play a role in managing the New Zealand market. This provided Bermad Israel an opportunity to relinquish control of the New Zealand market to Bermad Australia.

Due to the distance between New Zealand and Israel, Bermad Australia is better placed to provide active support for our NZ representatives.

Michael's formidable contribution to Bermad continues to grow, and with his wealth of knowledge we expect great success from him in New Zealand and at home.