

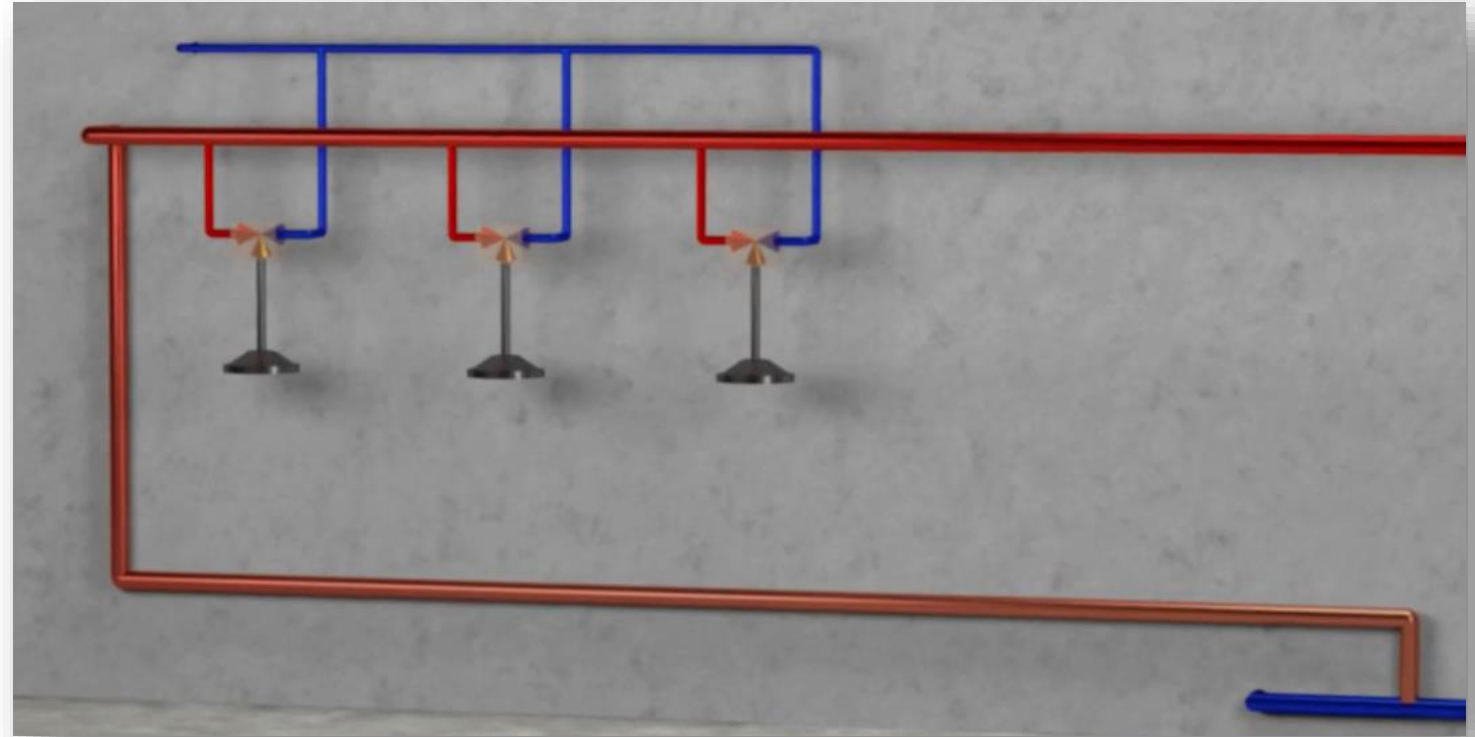
# Warm Water Systems A Practical Guide

Based on over 24 years experience



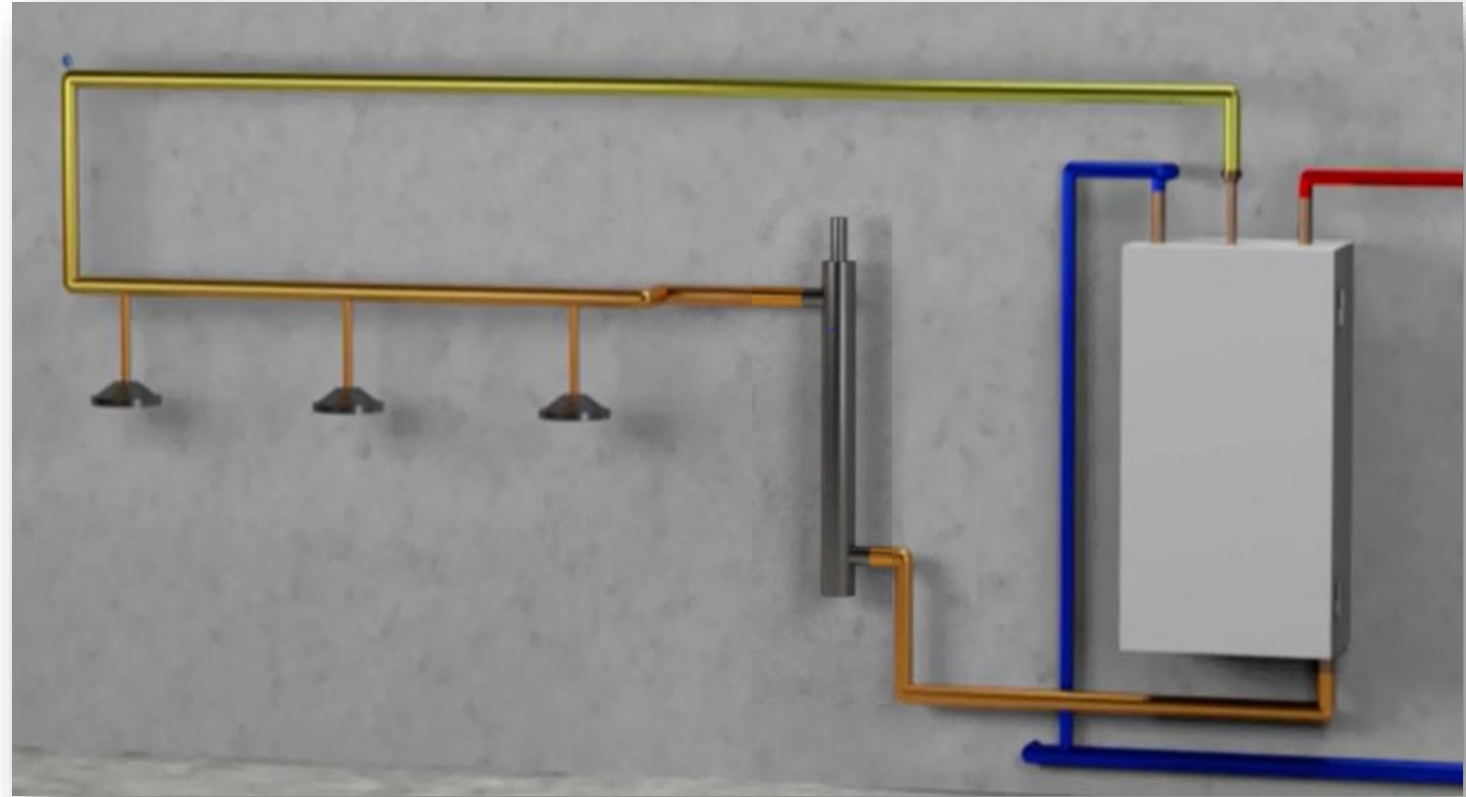
# TMV Systems

- Circulate hot water
- Use TMVs at POU to lower temperature of water



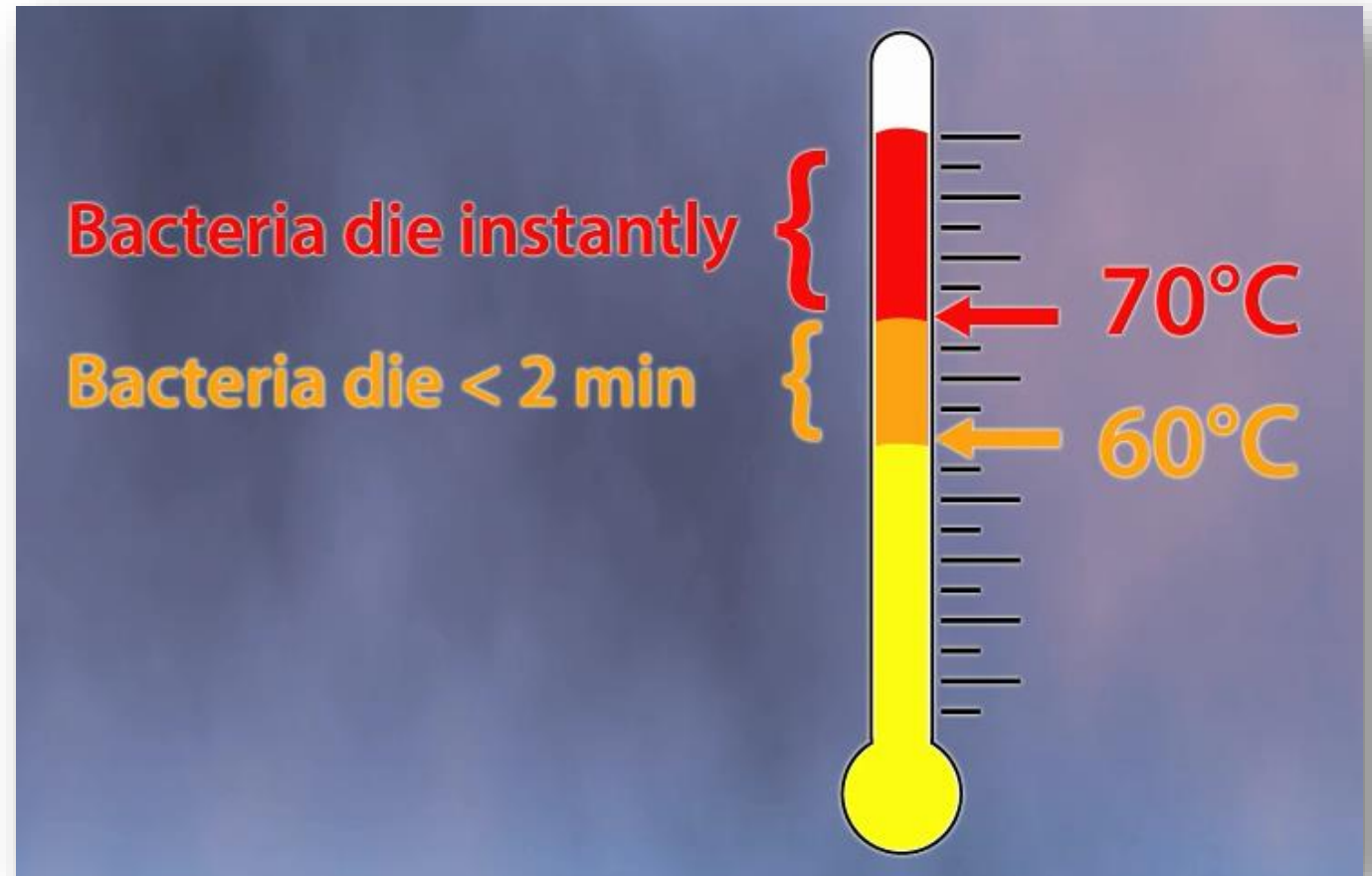
# Centralised Systems

- Generate warm water in the plant room
- Circulate warm water throughout the installation

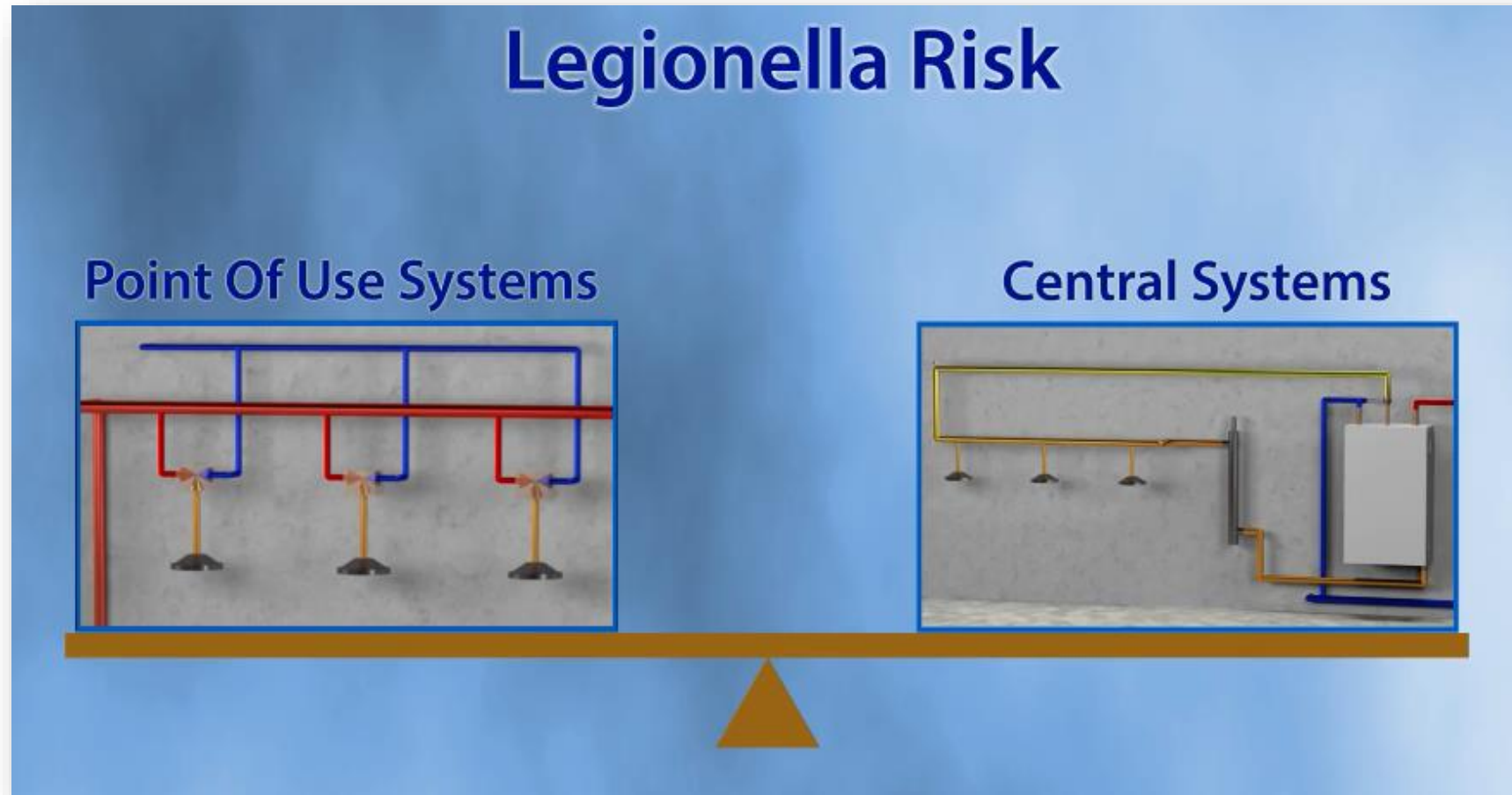


# Preventing Legionella

- Scald Prevention
- Legionella Prevention



# Real World Systems



# Legionnaires Outbreaks

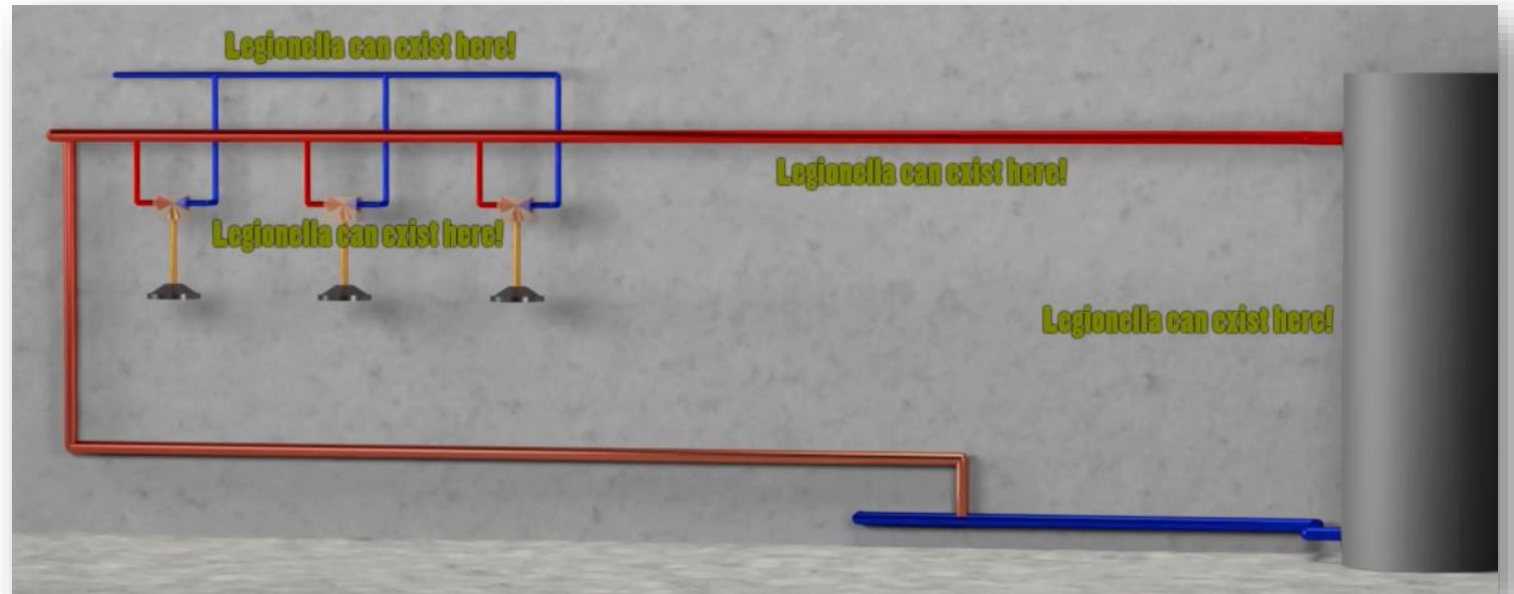
- Balance of recent contracted cases of Legionnaires disease leans towards TMV systems
- Not centralised systems
- TMV systems provide users with a false sense of security
- Centralised systems require treatment and monitoring





# Legionella Proliferation

- Legionella can exist in tanks, pipe work, fixtures
- Can sit for extended periods
- True of all warm water systems



# Water Pipe Design

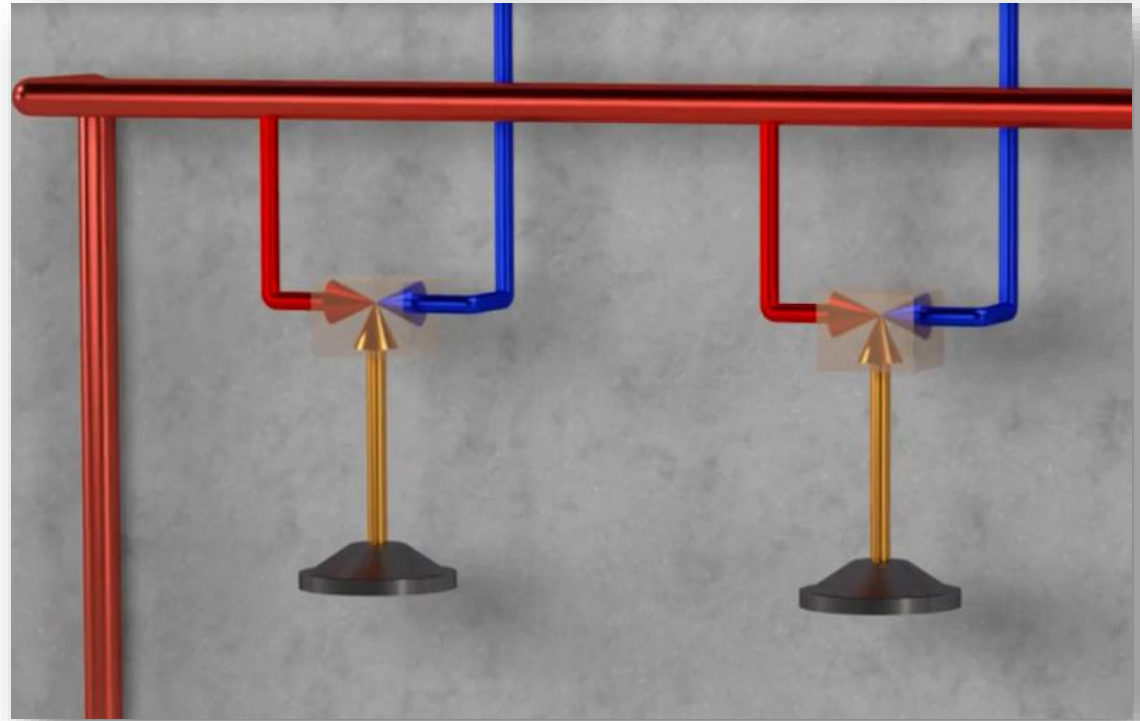
- Long dead legs
- Running cold water through roof
- Running cold and hot water too close together
- Ideal growth temperatures in both cold and hot water lines





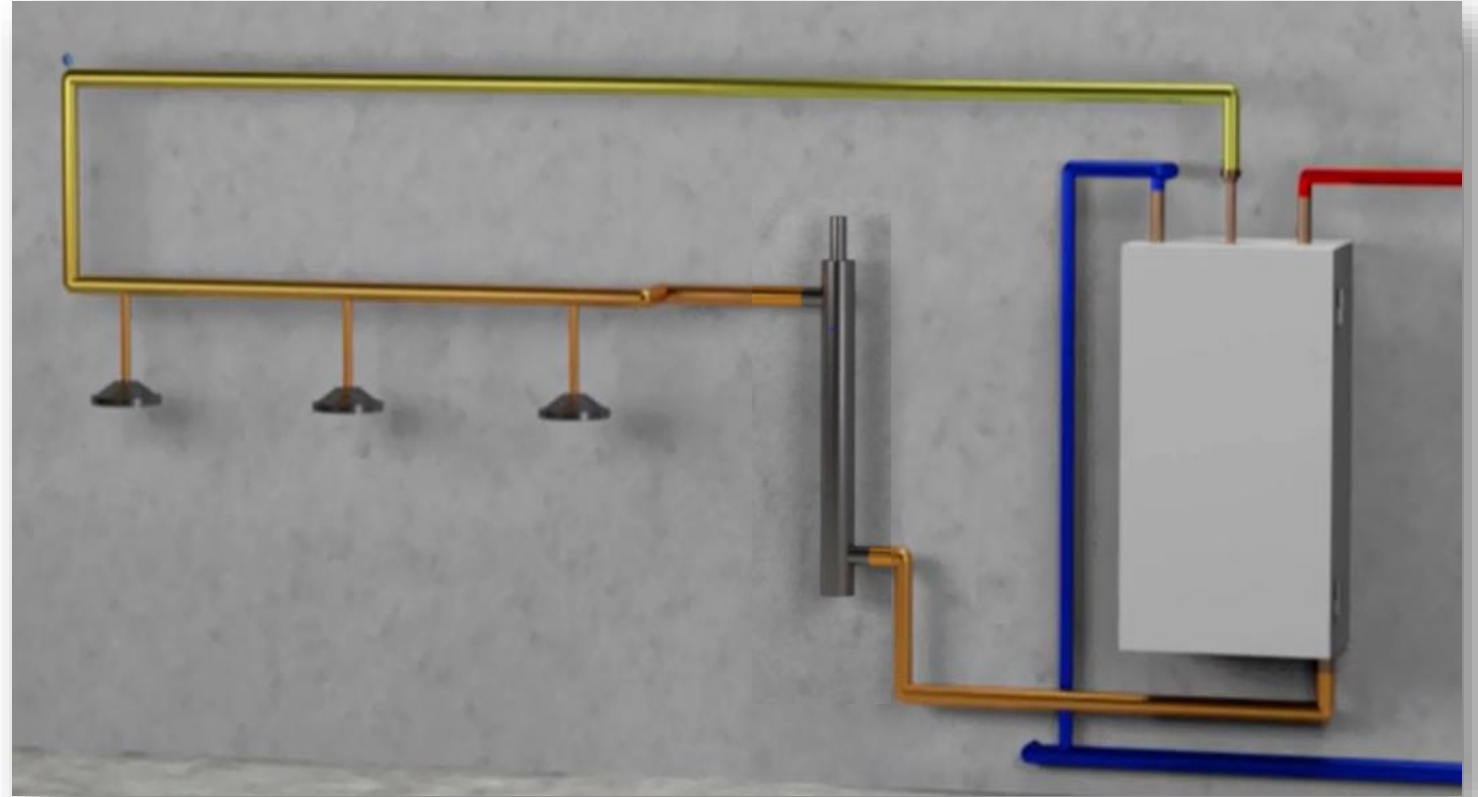
# Flushing of Taps

- Infrequently flushed taps allow heated water to remain stagnant off the ring main
- Good design and effective maintenance regimes is the key



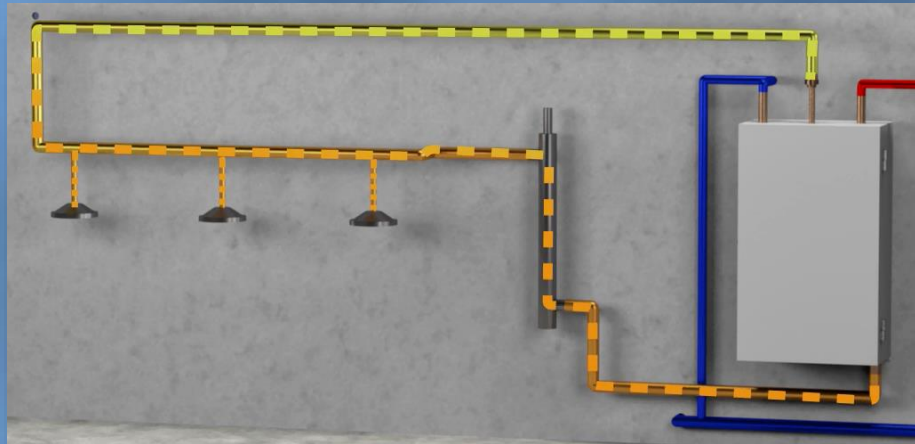
# Warm Water Disinfection

- Chlorination
- Copper Silver Ionisation
- Ultra Violet Disinfection



# Chlorination

✓ Simple to set up



? Handling of chemicals

? Localised corrosion

↳ if dosage not mixed well

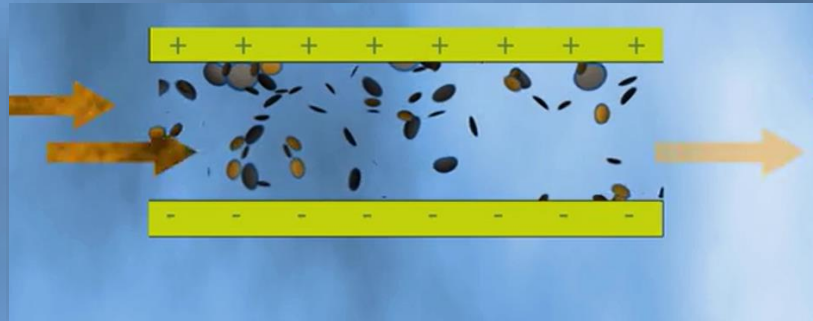
↳ if levels not maintained

?  $\text{pH} \geq 7.6$

↳  $++\text{CO}_2$

# Copper Silver Ionisation

✓ **New to Australia**



? **Safety and efficacy not fully established**

? **Monitoring required**

↳ difficult, costly

↳ not real time

? **Efficacy reduced with chlorides**

? **Can affect colour, taste, odour, staining**



# Ultra Violet Disinfection

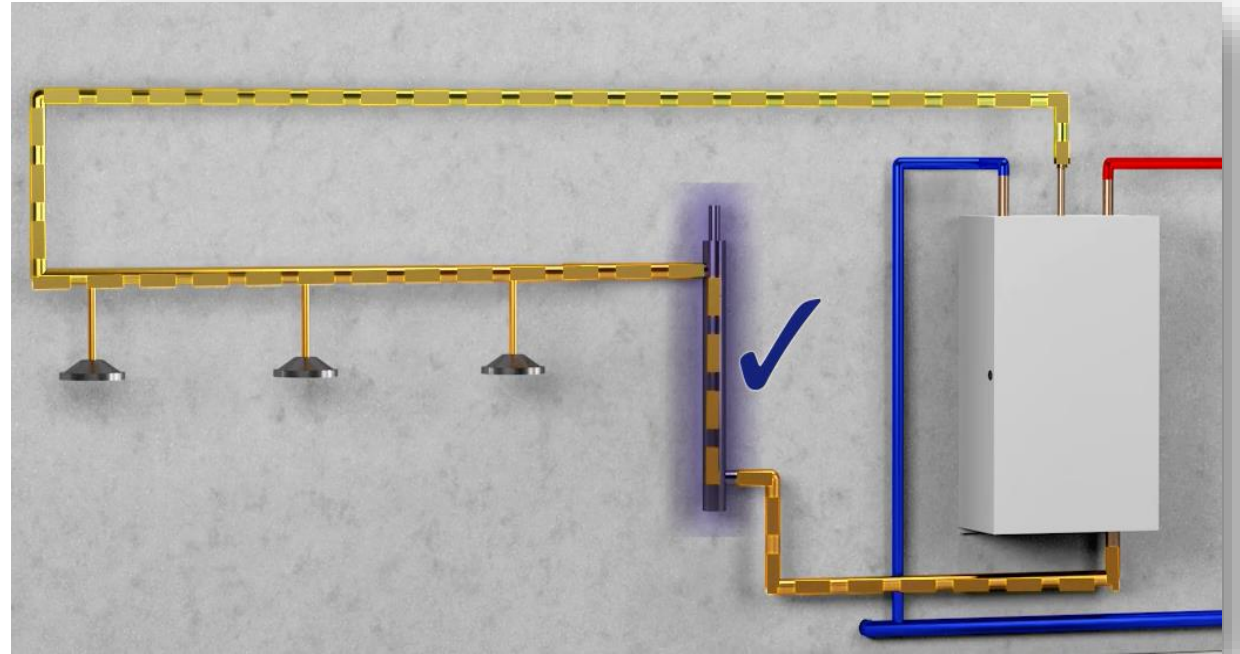
- ✓ Chemical free
- ✓ Highly effective



- ? Need to be specified correctly
- ? Water turbidity reduces effectiveness
- ? UV lamps need to be replaced annually

# Ultra Violet Disinfection

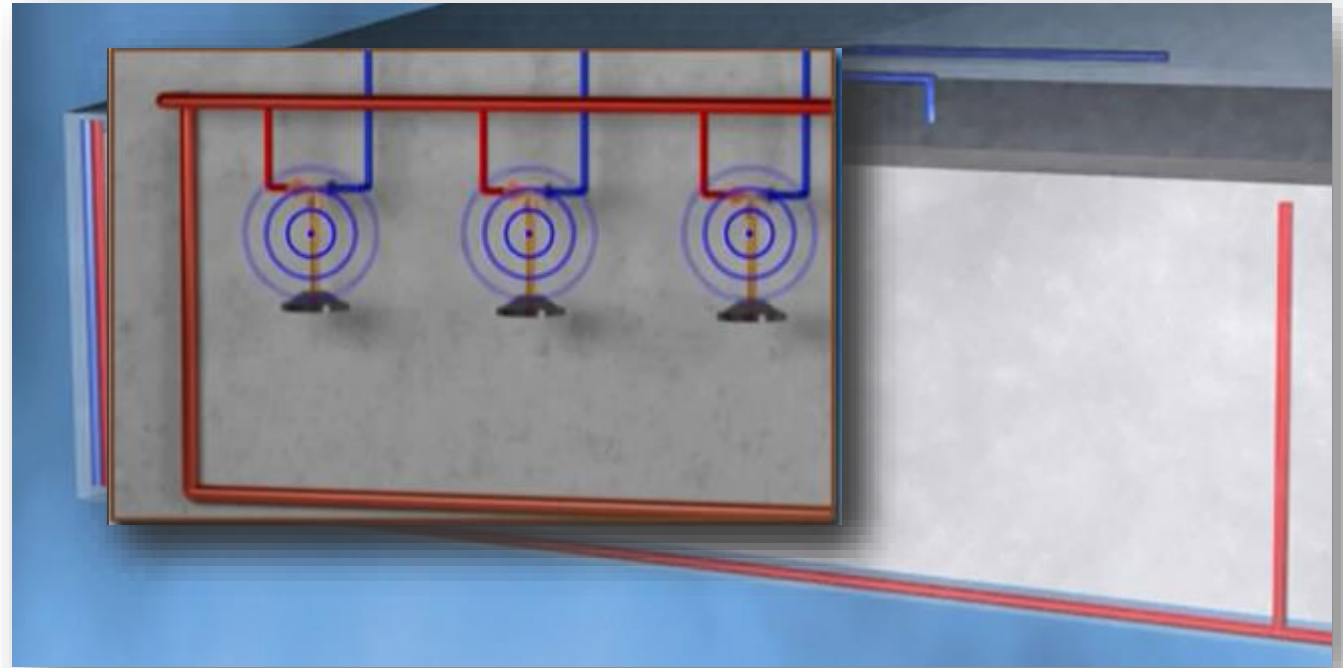
- Position in flow, not return
- All warm water is treated BEFORE entering the system
- Maintenance is important





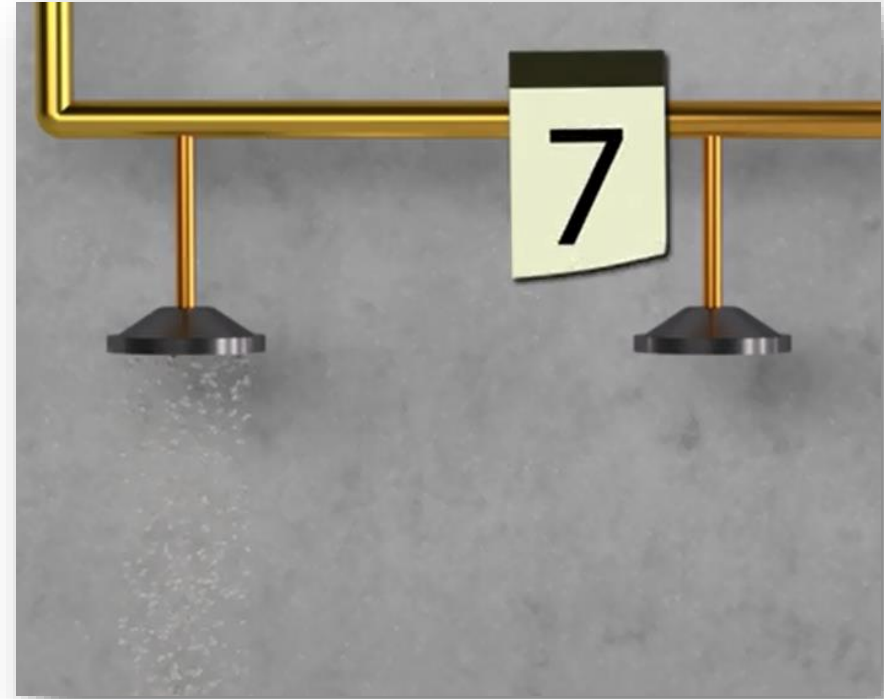
# Maintenance is the Key

- Key Maintenance activities:
  - Flushing of taps
  - Plant and Equipment
  - Monitoring



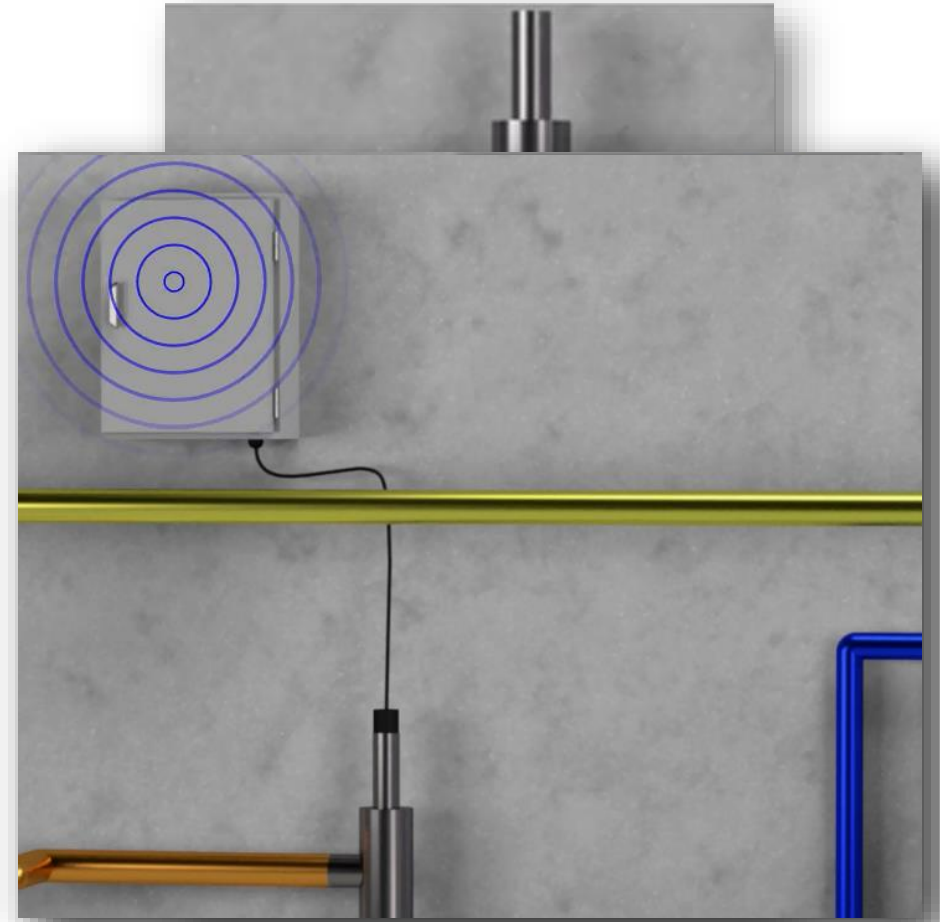
# Flushing of Taps

- Regular flushing is IMPORTANT
- Legionella most commonly detected in unused taps
- Best managed locally



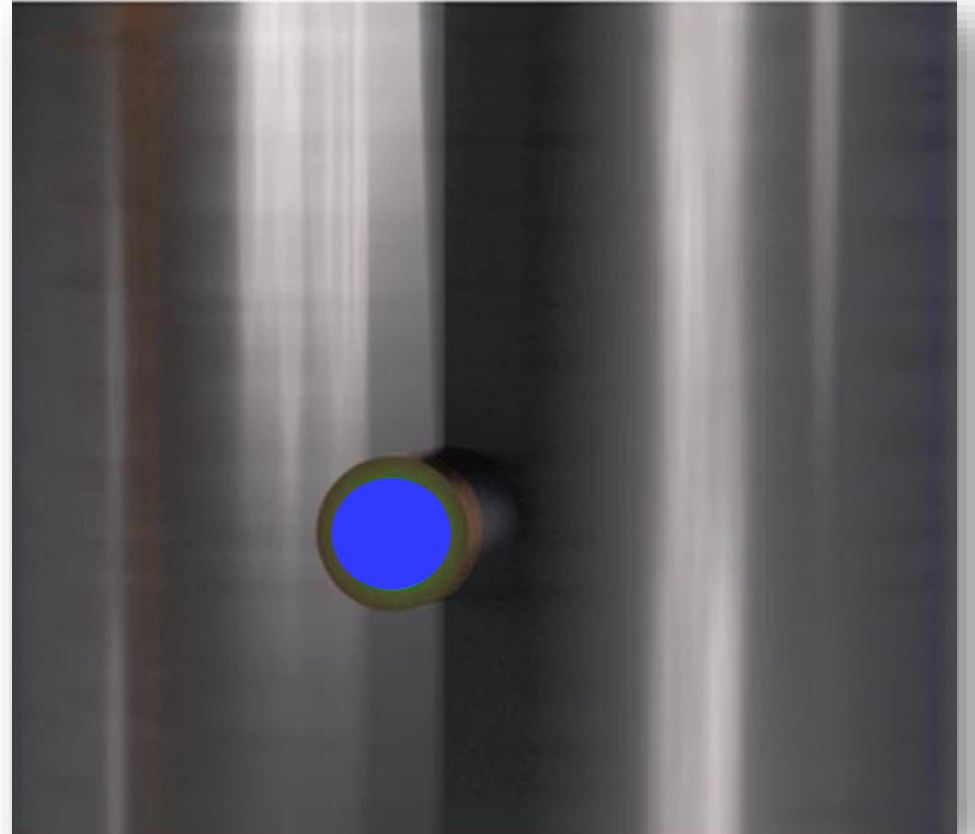
# Plant and Equipment

- Ensure UV lamp is operating and quartz thimble is clean
- Audible lamp fail alarm
- BMS – voltage free contacts
- Replace lamp yearly
  - Designed dosage is at end of lamp life



# UV Lamp Cleanliness

- Filtered viewing window
- Blue light = tube is clean
- Green light = requires cleaning



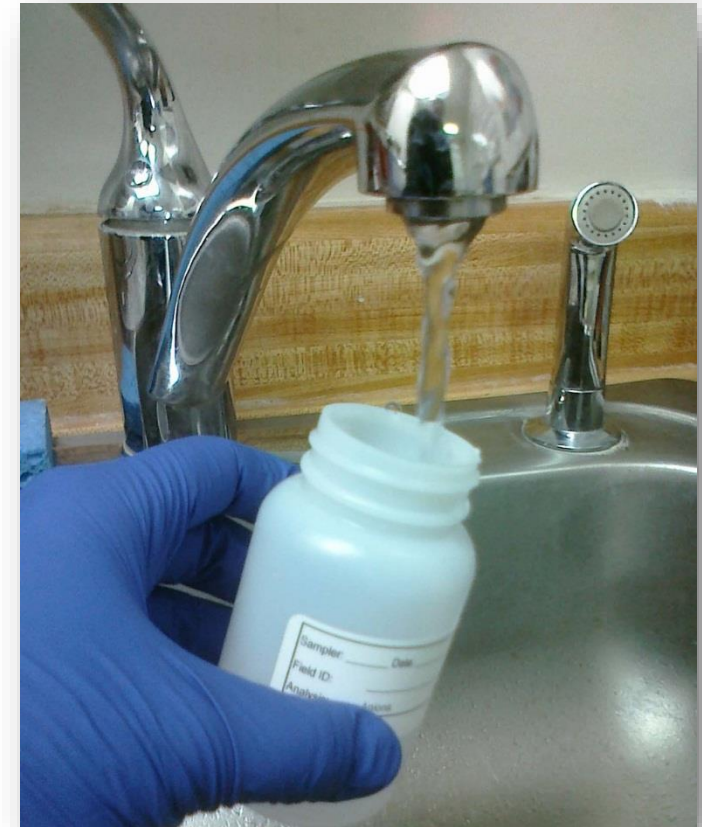
# Monitoring - Temperature

- Recording temperatures is required monthly
- Centralised system:
  - Flow, return, each valve (up to 3)
- TMV system:
  - Each TMV



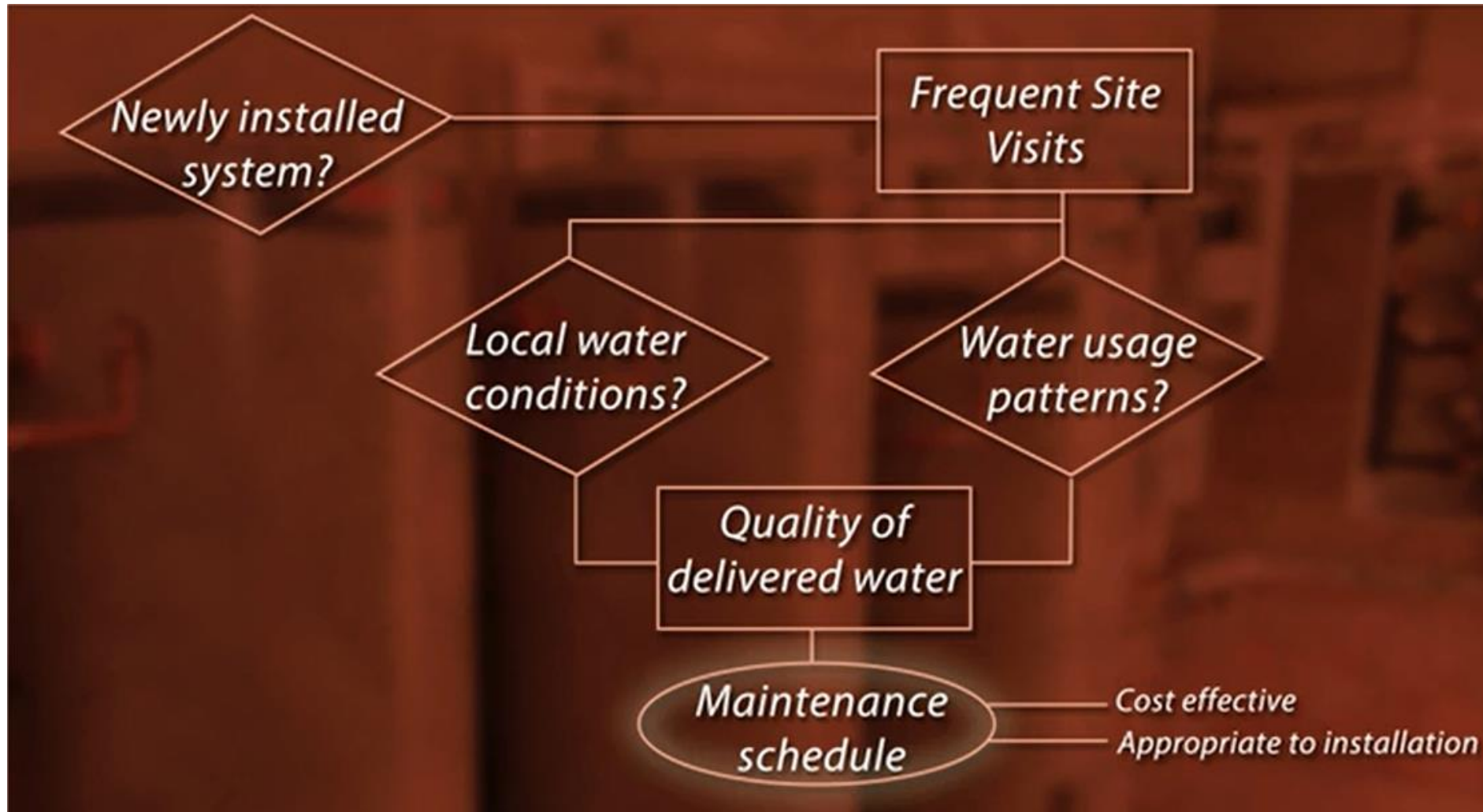
# Monitoring - Legionella

- Monitoring water quality is not a primary method of prevention
- Each state has specific requirements re sampling and reporting of Legionella
- Minimum 2 samples from different taps
- Rotate to build a picture
- Labs may provide sample jars and eskies
- Regular heat or chemical sanitisation is not required (SA excepted)





# Rheem Service



# Legionella Control is a Partnership



RHEEM COMMERCIAL

INSTALL A



# Commissioning

- Flush all lines in accordance with AS/NZS3500.4
- Heat sanitise in accordance with AS/NZS3500.4
- Clean line strainers
- Flush hot water out of system
- Exercise TMV thermostats
- Set TMV temperatures individually
- Check combined flow and return temperatures and adjust as necessary
- Conduct cold water failure test
- Fill in Commissioning Log

COMMISSIONING LOG			
Rheem Guardian Warm Water			
Model Number: _____			
Serial Number: _____			
Date of Manufacture: _____			
Item	Result		Comments
Date Commissioned			
All lines flushed <ul style="list-style-type: none"><li>• With cold water</li><li>• With hot water</li></ul>			
Line strainers cleaned			
Cold water: (5-25 °C) <ul style="list-style-type: none"><li>• Supply pressure</li><li>• Temperature</li></ul>			
Hot water: (60-85 °C) <ul style="list-style-type: none"><li>• Supply pressure</li><li>• Temperature</li></ul>			
Warm Water: <ul style="list-style-type: none"><li>• Valves exercised</li></ul>			
Test point temperature: <ul style="list-style-type: none"><li>• Valve 1</li><li>• Valve 2</li><li>• Valve 3</li><li>• Combined valves</li></ul>	@ Full Flow	@ Min Flow	
<ul style="list-style-type: none"><li>• Return temperature</li><li>• Pump speed setting</li></ul>			
First outlet temperature			
Last outlet temperature			
Cold Water Failure Test <ul style="list-style-type: none"><li>• Max temp recorded</li><li>• Stabilised temp</li></ul>	Test Point	First Outlet	
UV System operating			
Commissioned by (name): _____			
Company Name: _____			
Signature: _____			
Date: _____			

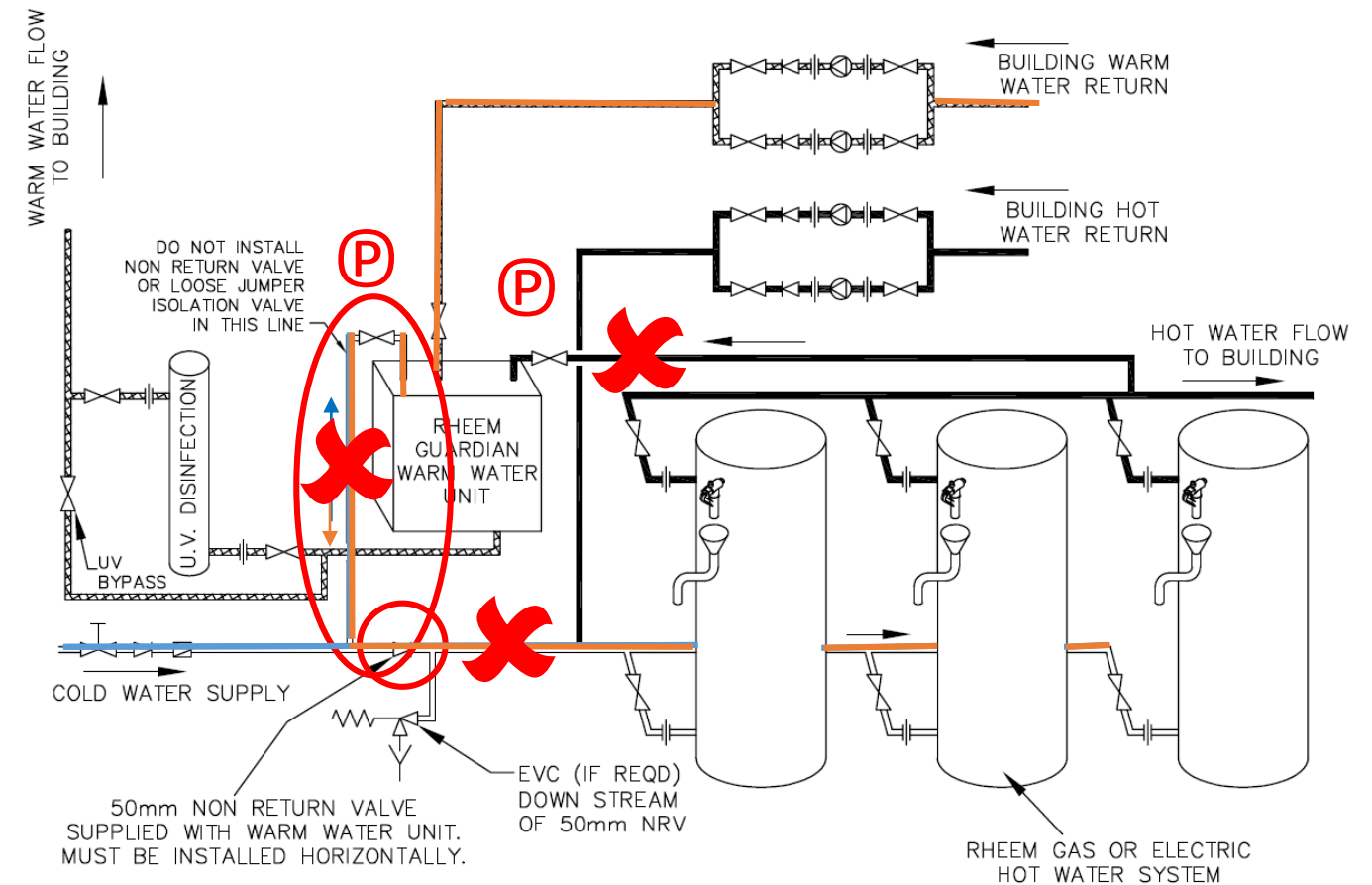
# Maintenance

- Monthly:
  - Record system temperatures at system outlet, return, and each TMV individually
  - Check UV lamp cleanliness
  - Legionella sampling requirements is state driven
- Initial 8 and 12 weeks
  - In-service test
- 6 monthly:
  - Check operation of TMV non-return valves
  - Check and clean line strainers
  - Check pressure balance between hot and cold
  - Conduct a cold water failure test
  - Remove and clean UV quartz thimble (may be a more frequent occurrence)
- Yearly:
  - Replace UV lamp
  - Yearly TMV maintenance is NOT required on Guardian

MAINTENANCE CHECK LOG – RHEEM GUARDIAN WARM WATER									
MODEL NUMBER _____		SERIAL NUMBER _____							
Signature									
Comments									
UV tube cleaned									
UV hours run									
Shut off test									
max									
Return test point temp									
Nearest outlet temp									
Valve 3 test point temp									
Valve 2 test point temp									
Valve 1 test point temp									
System test point temp									
Date									

# Installation

- Same cold water supply is required for warm water and hot water plant
  - Ensures balanced cold water and hot water pressure
  - Intrinsic cold water failure safety shut off
  - Required for effective performance in recirculation mode
- Do not install non-return valve or loose jumper valve in the cold water branch line to the Guardian
- Supplied non-return valve is to be placed in cold water line down stream of Guardian cold water supply





Thank You  
Questions?  
Please visit our stand

