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SMARTSCAN

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Automist Smartscan Hydra® Design, Installation, Operation and Maintenance (DIOM) Manual

Version 1.10.0 US

The Smartscan Hydra DIOM Manual is designed to provide stakeholders with essential information regarding specification, installation, maintenance and commissioning of the Automist fire protection device.

Contents

INTRODUCTION TO SMARTSCAN

Introduction

- READ ALL OF THESE INSTRUCTIONS.
- Retain this guide for later use.
- The content in this manual may differ from the product and is subject to change without prior notice.
- Follow all warnings, cautions and instructions contained in this manual.
- This device not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction (excluding children).
- Automist Smartscan Hydra requires recommissioning at least annually to provide effective protection.
- When this product has reached the end of its serviceable life, it should be disposed of in a safe manner.

IMPORTANT: Once installed, complete and submit an installation and commissioning form to Plumis.

WARNING:

The system operates with high voltage and high pressure. Pay attention to the hazards during the installation. Suitable PPE shall be used if necessary!

To avoid hazards, all installation procedures and maintenance must be supervised by an Accredited Automist Smartscan Installer (with a valid accreditation certificate).

Automist Smartscan Hydra Operation

When triggered by an Apollo multi-sensor wireless detector or a wired detector, all the linked spray heads will begin scanning. They start measuring the temperatures within the room using an infrared (IR thermopile) sensor. The scan is looking for an exceptionally high temperature reading, or a differential increase between scans. Once the temperature exceeds a threshold that head is deemed to have successfully located a fire. All heads which locate a fire during a scan are then compared to see which has the best view.

The selected spray head will lock onto the selected location, and activate the high pressure pump, driving domestic water through the unique nozzle unit, quickly directing a dense fog into the location of the fire. The high momentum vertical spray orientation with a horizontal trajectory is designed so even shielded fires are saturated with a turbulent flow of mist, suppressing the fire.

Automist Smartscan Hydra can be stopped manually by pressing a button on the controller's front panel.

Water mist has a different principle of firefighting to sprinklers which suppress fires by wetting surfaces and directly cooling the flames with large water drops, helped by gravity. Water mist uses fine droplets that evaporate at the base of the fire to extract heat (cool) the fire and displaces oxygen from the fire zone, resulting in fire control, suppression or extinguishment. Thus, water mist works best when placed closer to the ground avoiding ineffective evaporation in the hot layer in the ceiling and the upward flow of hot combustion products. Automist leverages this phenomenon by placing the spray head halfway up the wall (around light switch height): between the hot layer and furniture. This allows increased fire suppression performance with the same amount of water. Automist is a member of the International Water Mist Association's (IWMA) "Archimedes Club" for the products which utilize the optimum deployment of water mist technology.

The Automist Smartscan Hydra System

1. Approved isolation valve
2. Automist Smartscan supply label & cable tie (within AC11)
3. ¾" single check valve (within AC11)
4. Filter (within AC11 or AC14)
5. ¾" Stainless Steel Inlet Hose (within AC11)
6. Automist Smartscan Hydra Pump Unit (AP08)
7. Automist Smartscan Hydra Controller (CT01)
8. Quick connect with test point for pressure gauge (within AC11)
9. High pressure Outlet Hose (or High pressure stainless steel pipe)
10. Assembled Automist Smartscan Hydra head(s) (SH11)
11. Apollo wireless multi-sensor detector(s) (DT01)
12. Sticker set (not shown) (within AC11)

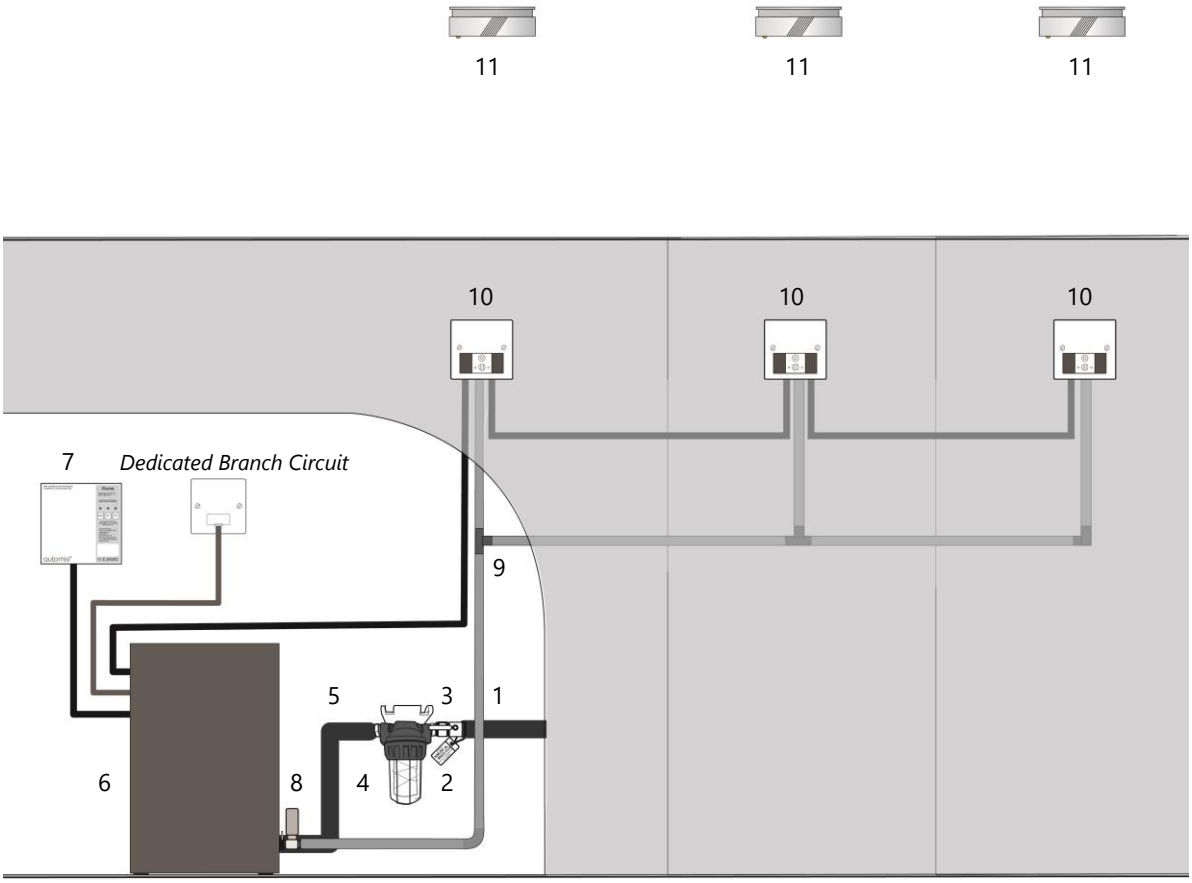


Figure 1: Automist Smartscan Hydra System Diagram

Automist Smartscan Compliance and Fire Performance

Automist Smartscan Hydra was independently tested by Exova Warringtonfire and was able to demonstrate full compliance with the fire performance criteria of the BS 8458:2015. In short, Automist Smartscan Hydra is performance compliant with BS 8458:2015 despite not being fully prescriptively compliant, which is the essence of innovations: a smarter approach to reach the same end goal: suppression performance.

The full report "BS 8458: 2015: Method for Measuring the Capability of a Watermist System to Control a Fire - "Room Fire Test for Watermist Systems with Automatic Nozzles" Document Reference 396489" can be downloaded from the Plumis website.

For more details on the descriptive and performance requirements of the International Building and Fire codes please see Roadmap for compliance in Appendix A**.**

Household and similar electrical appliances – Safety: Smartscan System Clarifications

- **The Smartscan system is a Class I appliance, meaning the system provides additional electric shock protection in the form of a fully earthed pump enclosure**
- **The Automist pump and controller unit is a stationary device**
- **The Smartscan head is a fixed appliance**
- **The Automist pump unit uses a power supply cord compliant with National electrical codes and must meet UL Standards 62 and 817. – if the cord is damaged, it must be replaced by Plumis to avoid a hazard**

Plumis' Quality Assurance

Concept

- Independently tested by Exova Warrington Fire and demonstrated to meet the fire performance standards of BS 8458:2015 and BS 9252:2011, the most up to date residential watermist and sprinkler, respectively. Smartscan has a BSi Verification Certificate (VC 656504).

- Developed in collaboration with the University of Greenwich Fire Safety Group, carrying our analysis and computer fluid models of spray patterns and fire behavior.

- CE marked – Tested to meet EU consumer safety, health & environmental requirements.

- When correctly installed, The Automist Smartscan fire suppression system complies with the requirements of local jurisdictional codes.

Company

- Third Party Certification by BRE Global have established Plumis Limited have complied with the Quality Management Systems requirements of ISO 9001:2015 for the design, manufacture and supply of water mist fire suppression systems.

HOW TO SPECIFY SMARTSCAN

Use and Specification of Automist Smartscan Hydra

Automist Smartscan Hydra is intended to be used as an alternative to domestic/residential fire sprinklers or water mist system as it has been shown to have equivalent fire performance. Where guidance or fire engineering principles indicate that suppression should be deployed in a particular part or parts of a property, Automist Smartscan Hydra should be installed to protect exactly the same areas, whether the purpose is to compensate for means of egress problems or to extend the available time for firefighters to arrive. Installation and can only be carried out by trained and Authorized Automist Installers.

Room Compatibility

Summary

A single Automist Smartscan Hydra spray head kit can protect an area within a 19.7 ft (6m) radius from the spray head location. The spray head should therefore have approximate line of sight of any possible fire hazards within this range. The spray head must be positioned at least:

- 4.9 ft (1.5m) away from any kitchen stove/range
- 9.8 ft (3m) away from any log burners or small fireplaces

Visibility extends radially from each mist head and ends wherever there is an obstruction. The default radius is 90 degrees as shown below, to mitigate the potential of obstructions either side of the spray head. Annual commissioning includes a verification that the system is not being obstructed inadvertently. Customers are made aware of the need not to block the view of the spray head through a warning, engraved on the face plate.

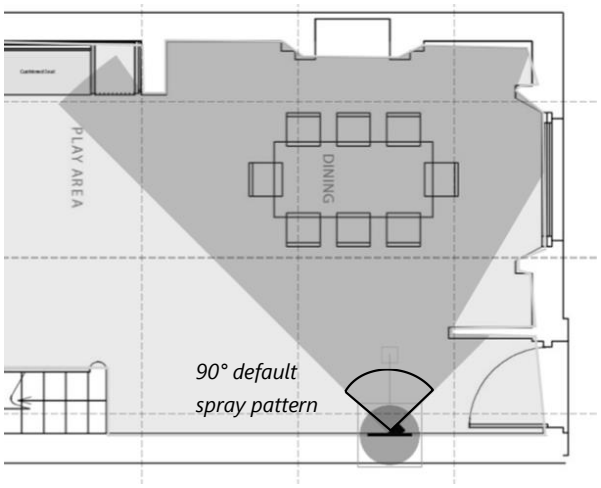
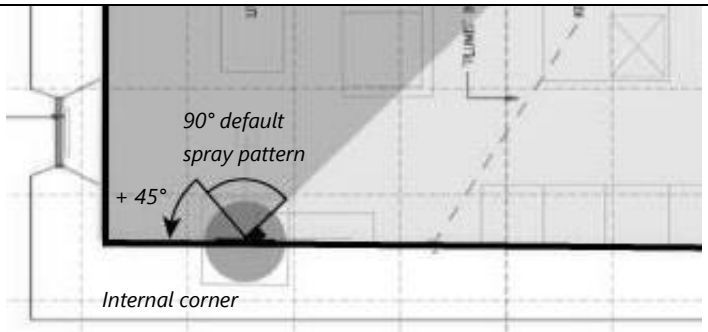
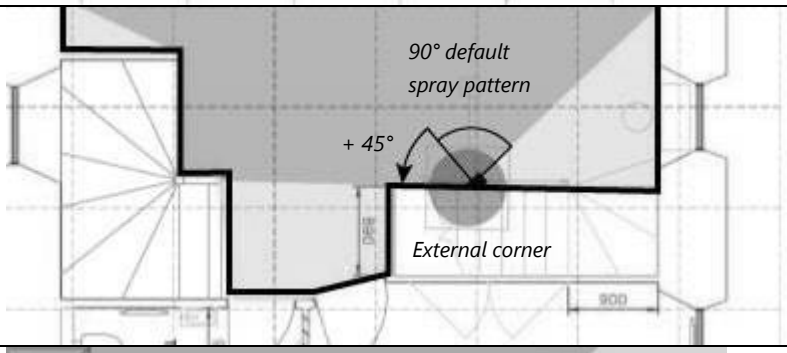
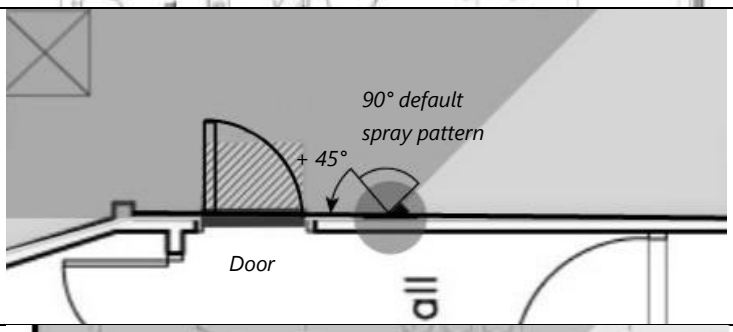
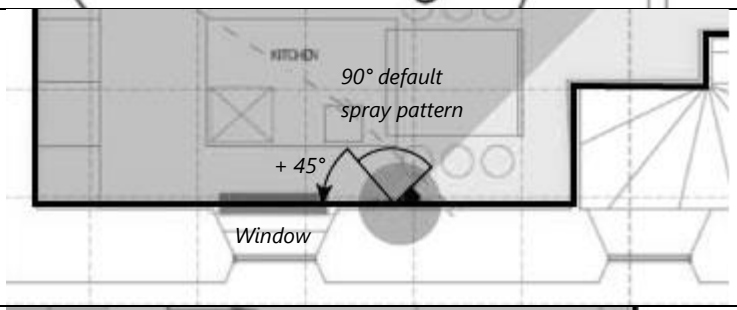
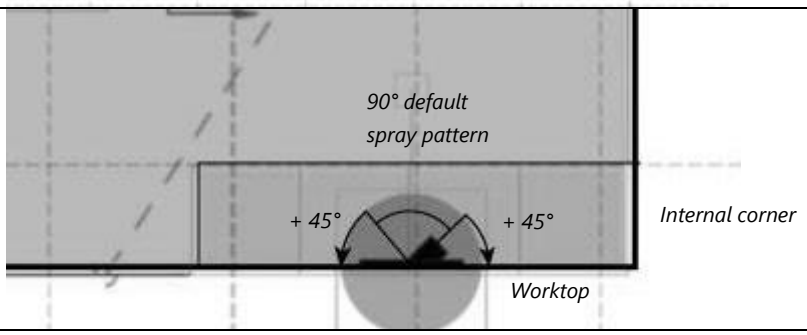
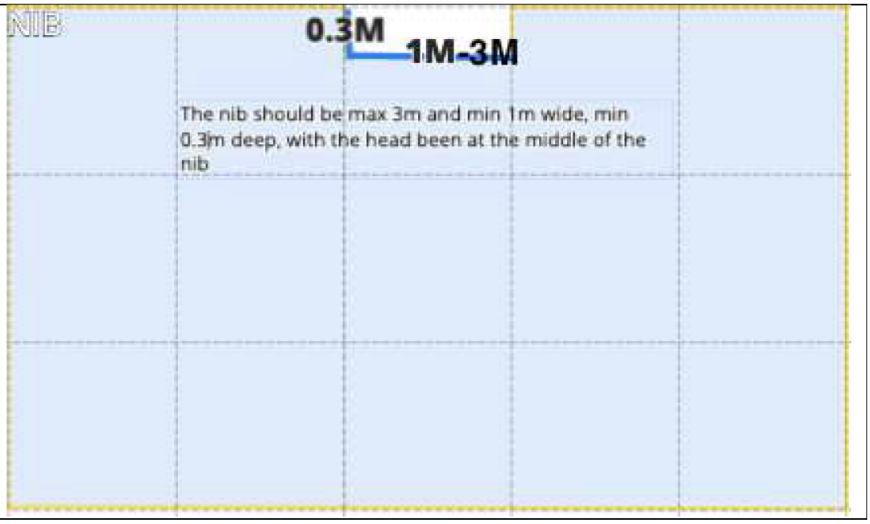


Figure 2: A spray head with a default 90 degree line of sight spray pattern
Note: this is not a complete layout – additional spray heads would be required to complete the scheme.

If an obstruction is more than 3.9 ft (1.2m) high, it should be regarded as blocking the line of sight from any spray head positioned within 9.8 ft (3m). Obstructions higher than 4.9 ft (1.5m) and wider than 0.9 ft (0.3m) should be regarded as blocking the line of sight at any distance. This does not relate to a homeowner deciding to disable the suppression system; full obstruction of the spray head or the creation of de facto room partitions with bookcases are akin to wilfully removing fire doors or removing smoke detectors and are beyond the scope of this recommendation.

When the spray head is located in a preferred position the coverage pattern can be increased by 45 degrees on the effected side because the location mitigates the introduction of obstructions.

Between 1.6 – 4.9 ft (0.5 – 1.5m) from an internal corner	
Up to 3.3 ft (1m) away from the edge of an external corner	
Up to 3.3 ft (1m) from the edge of a door (N.B. Please be aware which way the door(s) opens and do not install behind a door. It is advisable to install self-closers when a door can potentially obstruct the spray pattern)	
Up to 3.3 ft (1m) from the edge of a window (N.B. Please be aware of curtains)	
Above a worktop when over 4.9 ft (1.5m) from the edge (N.B. changes to 1.6 ft – 4.9 ft (0.5 – 1.5m) if the worktop edge is an internal corner) *The height of the spray head must be above 1.3 ft (0.4m) and 0.3 ft (0.1m) below the bottom surface of the cabinet*	

When the spray head is placed on the nib, it shall be located at the middle of the nib to give a 180 deg coverage. See required size of the nib on the picture on right side.	

Nib is a protrusion into the living space.

The overall objective of a layout plan is to ensure the coverage pattern covers all the square footage within the property. The allowable shadow area (unprotected space) is:

- 11.84 ft^2 (1.1m^2) per room
- 30.14 ft^2 (2.8m^2) per dwelling unit (property)

Automist Smartscan Hydra supports up to 6 spray heads per pump and controller pair, and a maximum of 8 alarms per pump and controller pair. If in doubt it is always advisable to add another head to your scheme.

IMPORTANT: Do not install Automist Smartscan Hydra outside Plumis guidelines without first discussing with engineers at Plumis Inc. Installing Automist Smartscan Hydra outside these guidelines without properly documenting and agreeing such variations could make you responsible for deaths or injuries.

Preferred Positions

Example: At Front of Built-in Cupboard

Where a spray head is in line with the front of a built-in cupboard, access to the cupboard prevents obstruction.

Figure 3: In line with front of built-in cupboard. The distance from the corner to the spray head is greater than 1.6 ft (0.5m)

Example: Adjacent to an Opening

A spray head placed next to an opening ensures that unknown obstructions will not be placed obstructing the spray pattern.

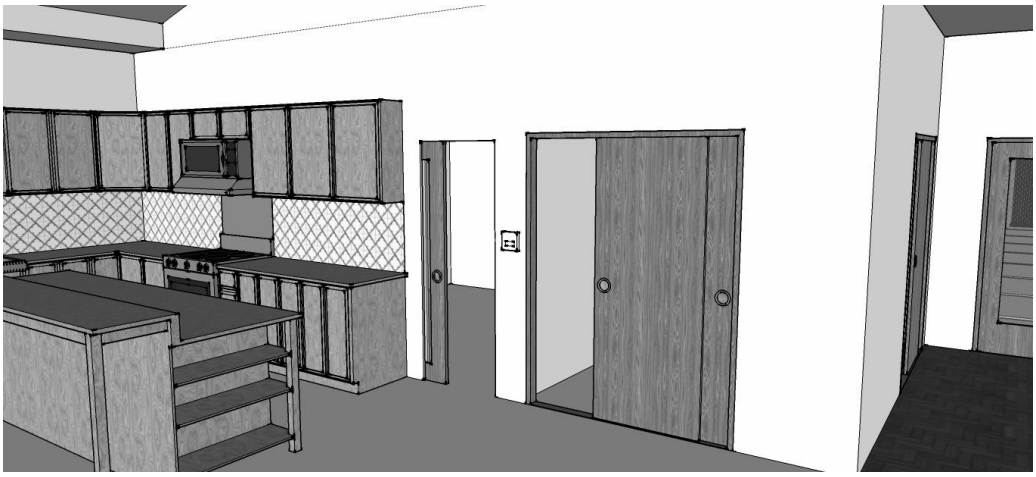


Figure 4: Preferred Position for spray head near openings.
The head is assumed unobstructed between the kitchen units and the right-hand end of the sliding doors.

Example: Close to a Wall

Figure 5 shows a spray head less than 4.9 ft (1.5m) from a wall, and greater than 1.6 ft (0.5m). In such cases the area between the head and the wall can be assumed unobstructed.

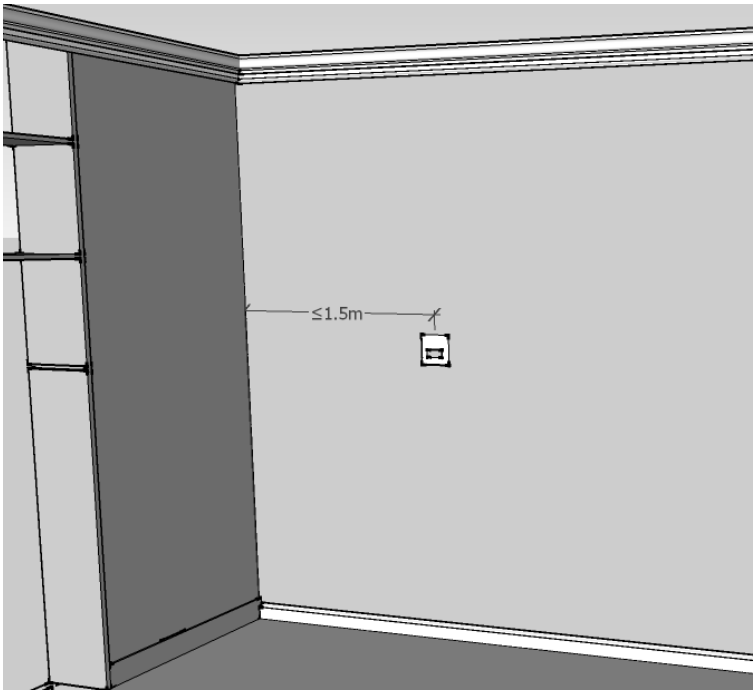


Figure 5: Spray head close to a wall. Any object to the (viewer's) left of the spray head cannot obstruct other objects due to the limited space between the spray head and the wall.

Example: Over Worktop

Provided that the worktop and cupboard heights are suitable, the need to access a kitchen worktop guarantees its freedom from unplanned obstructions.

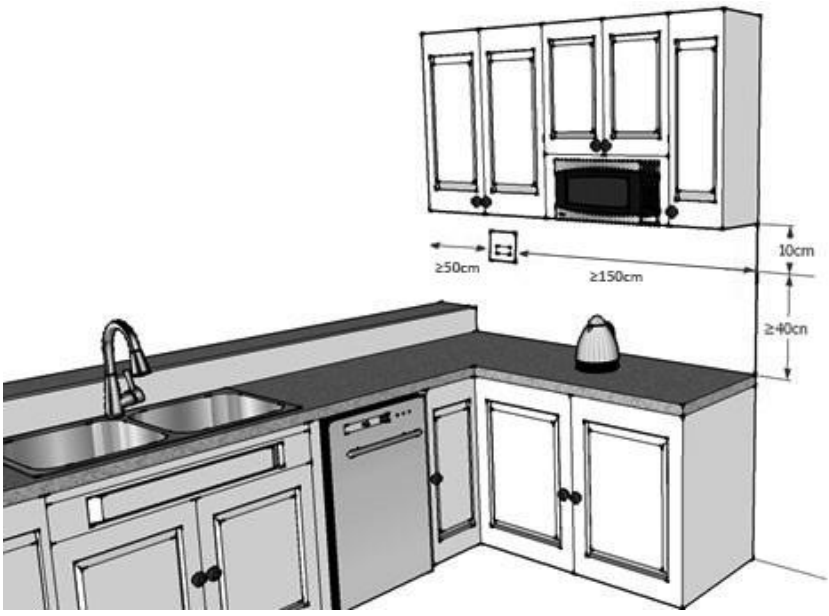


Figure 6: Automist Smartscan head Preferred Position above kitchen worktop

Installation requirements

- Before installing, ensure that the following have been provided at the installation site:
- Sufficient space to install the pump in accordance with these installation instructions. The pump is 14.37 inches (365 mm) (height) by 9.45 inches (240 mm) (depth) by 7.13 inches (181 mm) (width) and weighs 15.43 pounds (7.0 kg). Pump shall be placed on a flat smoth level surface. Pump is Type 1 automatic operation and specified for Pollution Degree 3 (dust damp conditions). The rated impulse intake voltage is 1500V. Data port connections are 24 VDC and classed as PLEV (protected extra low voltage circuit) system.
- The pump should be installed in one of the following locations with clearance of 3.94 inches (100 mm) at front and rear:
    - In a room or cupboard with volume of at least 4.38 ft^3 (0.124m^3) or,
    - In a cupboard with volume of at least 4.38 ft^3 (0.124m^3), within a room that the pump serves, with the top of the pump less than 2.62 ft (80cm) above finished floor level.
    - The pump located such that it is: a) unlikely to be affected by a fire b) protected in the event of fire; c) unlikely to be affected by flooding.

- Additional clearance at the front and the rear of the pump should also be provided to accommodate the connections.
- Sufficient space to install the controller in accordance with these installation instructions. The controller is 6.1 inches (155 mm) (height) by 1.6 inches (42 mm) (depth) by 6.1 inches (155 mm) (width).
- Ceiling heights are limited to 11.5 ft (3.5m) based on testing. Higher ceiling applications require the involvement of a professional fire protection engineer at Plumis Inc.
- It is recommended that the controller is positioned near or next to the consumer unit. The controller should also be installed in a location that is: a) unlikely to be affected by a fire b) protected in the event of fire; c) unlikely to be affected by flooding.
- A 3/4" water supply (connection) with an approved isolation valve located inside the cupboard and positioned so that the connection point will not be obstructed when the pump is installed.
- A cold water supply which can deliver 1.6 gallons (6 litres) per minute flow at a minimum of 14.50 psi (1 bar) (100kPa) and a maximum of 87.02 psi (6 bar) (0.6 MPa) static pressure. In case that pressure is too high, a Plumis approved pressure reduction valve (pre-set to 43.51 psi (3 bar), maximum 232.06 psi (16 bar input) shall be installed upstream of system water supply (available at the Plumis ordering shop). It is responsibility of the installer to ensure the water supply to the Automist pumps is adequate. An outside pipe diameter of less than 1.1 inches (28mm) is a good indicator that a survey is required.
- A dedicated electrical branch circuit. This should be on a listed and approved Overcurrent Protection Device (Circuit Breaker) rated for 20 amps. This circuit breaker should protect only the Automist Smartscan Hydra system and not be incorporated with any other circuit.
- All wiring and electrical safety shall comply with the National Electric Code and all local requirements.
- **Important!** If power cable can come into contact with parts having a temperature rise exceeding 122 F (50C), the wiring insulation must be protected, for example, by insulating sleeving having an appropriate temperature rating i.e. near boiler or hot water pipes.
- **Important!** The maximum allowable total data cable length for the spray heads daisy chain is 196.85 ft (60m).
- **Important!** The maximum allowable total data cable length for the pump to the controller is 98.43 ft (30m).
- **Important!** The maximum allowable alarm cable length from spray head to the furthest connected wired alarm is 98.43 ft (30m).
- Flexible high pressure hoses should be mounted as close to the ground as possible and within the wall. For cases where the hose is exposed, conduit sleeves must be used. Where the hose is surface mounted more than 3.93 ft (1.2m) from the floor in a protected room, or where the hose passes above/within the ceiling of a protected room, a suitable thermally insulating sleeve may be required.

- **Note:** When installing flexible high pressure hose behind plasterboard walls, Plumis advises the hose is left free and unconstrained. This is because mounting the hose in a conduit or narrow groove within joists makes it more susceptible to perforation when subsequent building works are carried out.
- **Important!** Before installation ensure the hoses are in line with Plumis guidelines. See Appendix B for high pressure hose specification. **The maximum total length of high pressure hoses is 196.85 ft (60m). The maximum allowable hose with a nominal diameter of ¼" is 65.62 ft (20m), and maximum allowable hose with a nominal diameter of 3/8" is 131.23 ft (40m) when used in combination. The two hose types can be used in combination if the total length does not exceed the 196.85 ft (60m) limit. If a 3/8" only installation is made, the maximum hose length is of 164.04 ft (50m).**
- **Important!** Operating ambient temperature: above 40°F (4°C). Do not install Plumis equipment in location which are likely to drop below this minimum temperature requirement.

Spray Head Placement

The Automist Smartscan Head is designed to be affixed into a rectangular hole 3.5 inches wide x 4.6 inches high (89+/-2mm wide x 117mm high) that is at least 2.2 inches (57mm) deep when using the "renovation" clips provided.
If you are installing Smartscan using a Backbox, the hole dimensions are as following: 3.70 inches (94 millimeter) wide x 4.69 inches (119 millimeter) high and 2.36 inches (60 millimeter) deep.

IMPORTANT: The Automist Smartscan head must be located where the spray pattern will not be obstructed and 59.1 inches (1500mm) clearance is provided around the spray head. The spray head must be installed at a height of 55.1 – 57.1 inches (1400 - 1450mm) from the finish floor level.

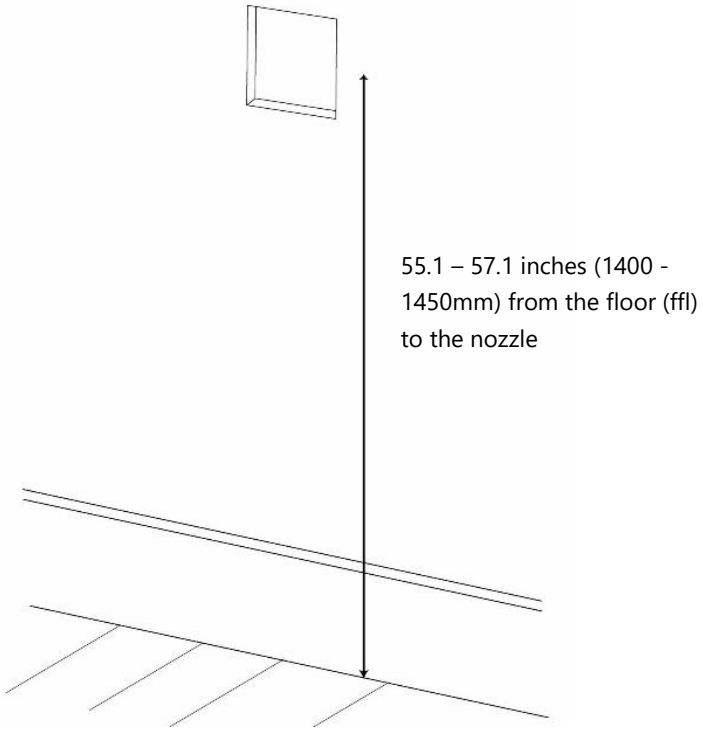


Figure 7: Automist Smartscan spray head mounting hole

Detection System

Automist Smartscan's reliability is partially dependent on the detection system. The system is designed to be triggered by a correctly installed and positioned Apollo wireless multi-sensor detector or a compatible hardwired smoke detector (see page 25).

- In its default setting, Automist Smartscan is programmed to run continuously for 30 minutes on activation (with one second pause after 10 seconds and 30 seconds as a safety feature. This is designed to prevent interruption of mist even if a heat alarm is damaged by extended exposure to fire.
- Placement of detectors should be in accordance with NFPA 72 and the manufacturer's instructions.
- Automist Smartscan's use of multi-sensor detector(s) or smoke detector(s) does not affect or reduce any requirements for the use of smoke detection in the property. Smoke detection provides a critical independent early warning, especially with slow-growing fires.

DO NOT install detectors:

- Directly over a sink, cooker, stove or oven
- Do not locate a detector within 4.9 ft (1.5m) of any cooking appliance
- Do not locate a spray head within 3.28 ft (1m) of any oven if in direct line of sight
- Next to a door or window that would be affected by drafts i.e. extractor fan or air vent
- Outside
- In or below a cupboard
- Where air flow would be obstructed by curtains or furniture
- Where dirt or dust could collect or block the sensor
- Where it could be knocked, damaged or inadvertently removed
- Adjacent to, or directly above, heaters, air-conditioning vents or ceiling fans
- In an area where the temperature may fall below 40°F (4°C) or rise above 98°F (37°C)
- In such a position that it is difficult or dangerous to reach for testing or maintenance or where children can easily tamper with the alarm
- In an area where water or other liquids may enter the alarm, except in the extremely unlikely case that the alarm and its connections are waterproof (e.g. bathrooms)
- On surfaces subject to significant vibration

IMPORTANT: This version of Automist Smartscan may not function correctly if activated by a detector not sanctioned (see page 24) by Plumis. Use with other types of detection could lead to death or injury.

Ensure Automist Smartscan Hydra is only paired to the desired detector(s) in the volume it protects. You can check these interconnections using the product's ALARM TEST MODE (see page 45). In this mode, alarms may be triggered which will cause their linked heads to perform two scans and then return to an idle state. Ensure that Automist Smartscan has been successfully returned to the System OK state following this test, and that the water supply remains open, and that nozzles are unobstructed.

INSTALLER GUIDELINES

Installation Procedure

A) First Fix - Preparing the site
B) Second Fix - Installing the controller
C) Second Fix - Installing the spray head(s)
D) Second Fix - Connecting the water supply
E) The Automist Smartscan Hydra Controls
F) Commissioning and maintenance

Notice!

Equipment you will need:

- A suitable tool for tightening BSP hoses
- A set of screwdrivers including Torx bits
- A suitable electric drill
- Electrical cable
- A pressure gauge kit
- A commissioning kit

A) First Fix - Preparing the site

Important! Connecting the system to the mains requires a competent electrician. The Automist Smartscan circuit should be clearly labelled (a sticker is provided for this purpose). Automist Smartscan requires an independent 240V a.c. / 60Hz electrical supply or a 120V a.c. / 60 Hz electrical supply, depending on the version of pump that was specified, not shared with other unrelated devices. Components of the fire detection and alarm system may use this circuit, which must remain powered in the event of a fire. Power to Automist Smartscan must be provided via an unswitched electrical branch circuit with an Overcurrent Protection Device (Circuit Breaker) rated for 20 Amps.

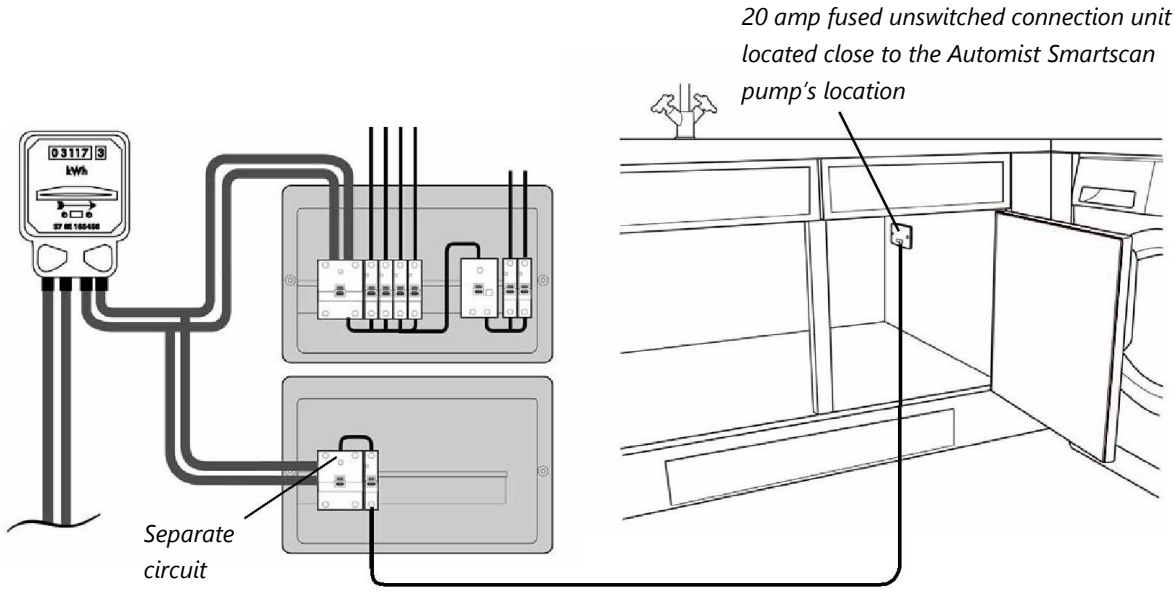


Figure 8: Split load board power supply

IMPORTANT! Switch off electricity at the mains before working on existing circuits.

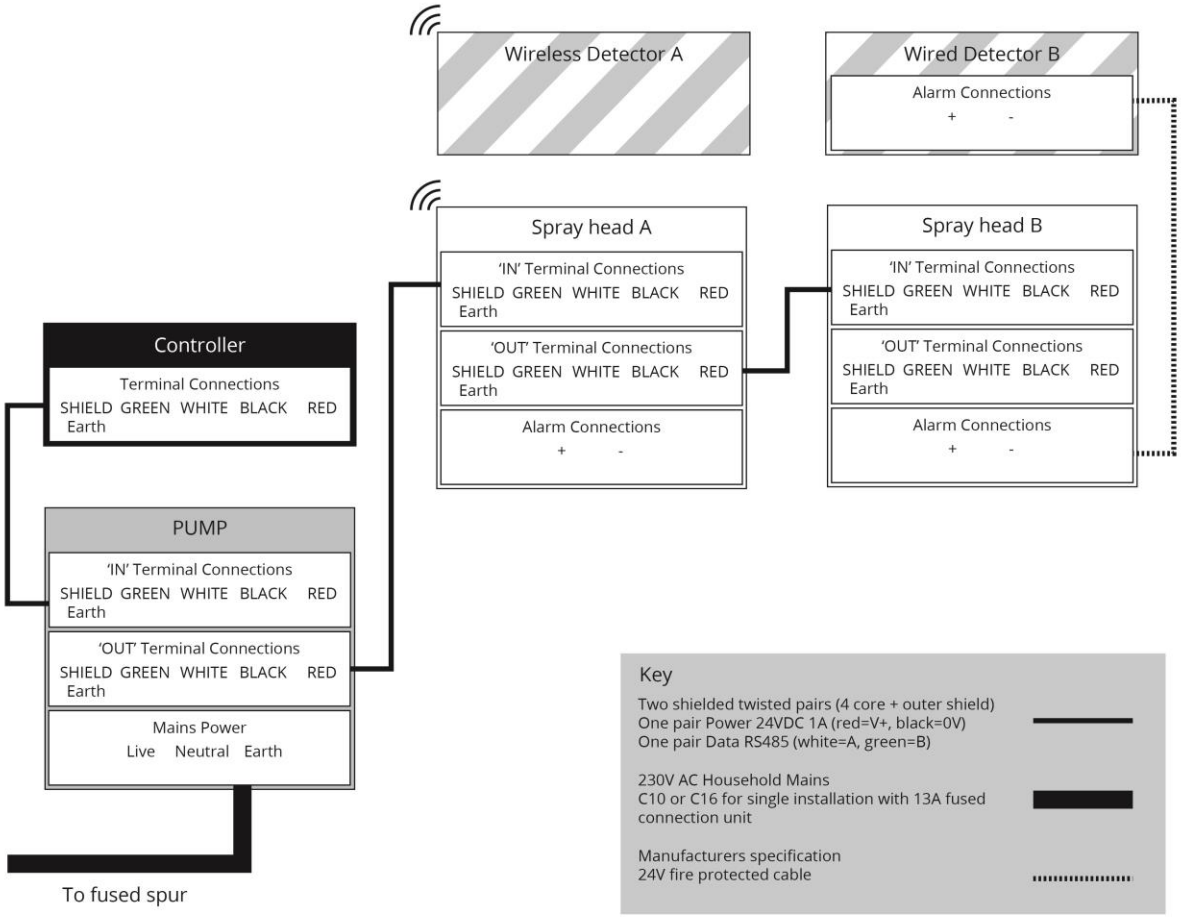


Figure 9: Electrical Connection Diagram - 2 spray head system with a wireless and wired detector

The intention of the first fix is to set up the high pressure hose(s) and the electrical cables, following the layout plan which has been preapproved with the Authority Having Jurisdiction, so the installation and commissioning can be completed with the system set up as it would be in service.

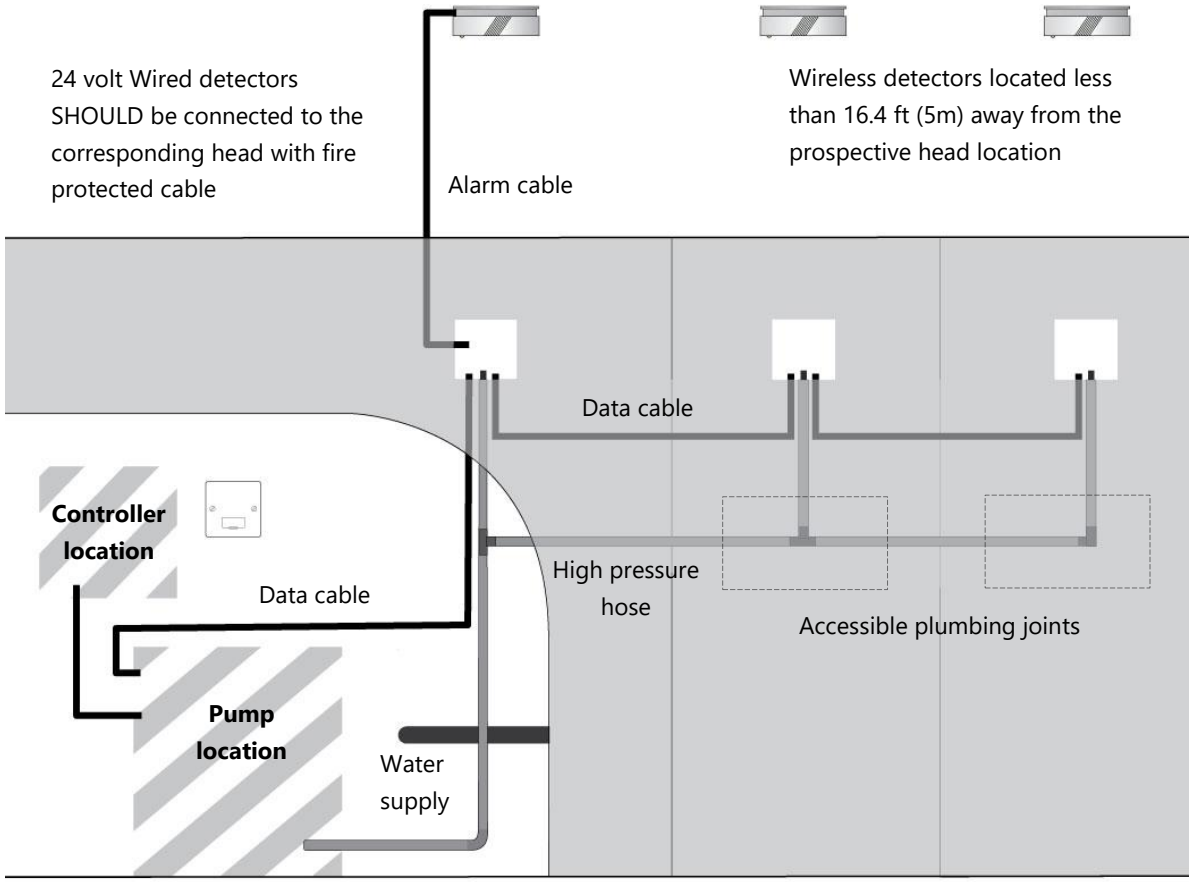


Figure 10: First Fix Setup

Important! Before installation ensure the hoses are in line with Plumis guidelines. See Appendix B for high pressure hose specification. The maximum total length of high pressure hoses is 196.85 ft (60m). The maximum allowable hose with a nominal diameter of ¼" is 65.6 ft (20m) and maximum allowable hose with a nominal diameter of 3/8" is 131.23 ft (40m) when the two hose types are used in combination, with the total length not exceeding the 196.85 ft (60m) limit. A 3/8" only installation may have a maximum length of 164.04 ft (50m).

High pressure hoses can be connected in a star or a daisy chain configuration. Any plumbing joint or fittings, e.g. t-connectors, should be housed in an accessible area so they can be checked for leaks during the commissioning procedure. If the hoses are going to be left unattended until the second fix, they should be closed with caps to prevent building products from contaminating the water path.

It is recommended to carry out the following leak checks on the high pressure hoses / pipes after installation.

Pneumatic Test

High pressure hoses / pipes should be tested pneumatically to a pressure of not less than 36.3 PSI (2.5 bar) for not less than 24 h. Any leakage that results in a loss of pressure greater than 2.2 PSI (0.15 bar) for the 24 h should be corrected.

Hydrostatic Test

This test should be carried out immediately after the pneumatic test, or as soon afterwards as climatic conditions permit. High pressure hoses / pipes should be hydrostatically tested for not less than 2 h, to a pressure of 1.5 times the maximum pressure to which the system will be subjected. For the Automist system, it is recommended to use 2393.1 PSI (165 bar) as test pressure (1.5 x 1595.4 PSI (1.5 x 110 bar)). If the system fails to maintain the

test pressure, the fault (such as permanent distortion, rupture or leakage) should be found, corrected and the test repeated. Users should ensure all air is removed from the hoses / pipes network before undertaking a hydrostatic test. Following testing hoses / pipes should be drained and dried to remove any moisture in the network.

It is recommended that the hose is installed 1.6 inches (40mm) from the surface of the wall.

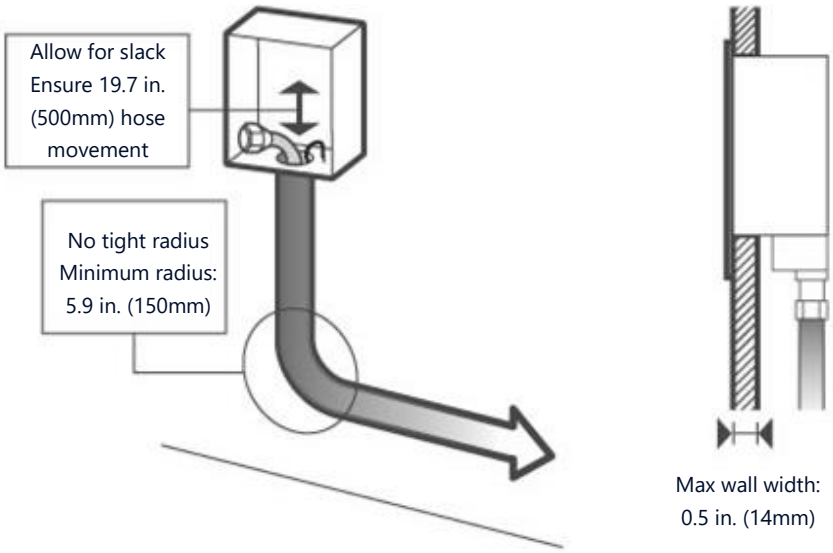


Figure 11: Mounting the Back Box

Important! When installing into solid walls, solid metal conduit should be installed to allow for movement of the hose (19.7 in. (500mm) slack) for future servicing and replacement of the hose. Solid metal protection should also be used when the hose is restricted of lateral movement. This is necessary because when the hose is not free to move it is more susceptible to being punctured accidentally.

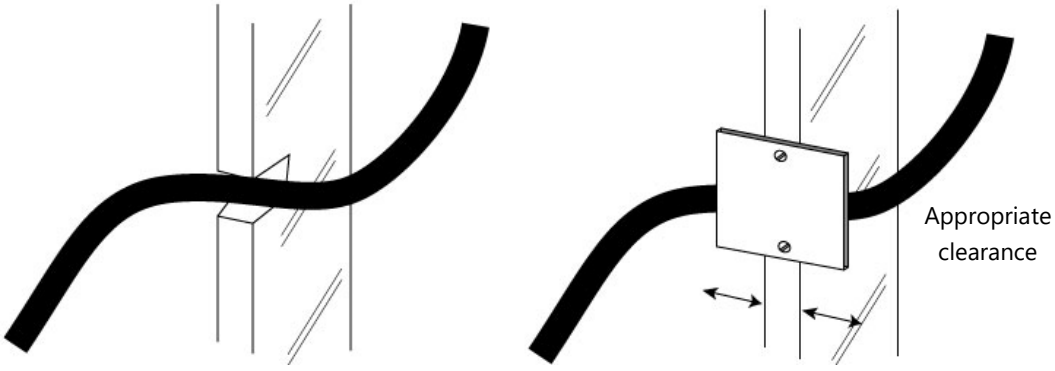


Figure 12: Example of mechanical protection within a joist

The spray heads must be set up in a daisy chain configuration (see page 28) and **data cables should be labelled IN and OUT**, so they can be correctly installed when connecting the spray heads during the second fix. It is recommended that the data cable(s), where possible, is bound to the high pressure hose. Ferrules should be crimped onto the bare wires in preparation to connecting them to the relevant terminals.

Plumis wireless multi-sensor detector

Important! – These detectors should only be installed by a competent engineer/technician. This device should not be used with a guard.

Important! - Caps must stay on detectors until occupant moves in!

Important! – The maximum quantity of wireless alarms in one Hydra system is 16. In case that there is also wired detector(s) in the system, the maximum quantity of wireless alarms shall be deducted by the number of wired detector(s).

Once a suitable location is found, mount the detector as follows:

1. Refer to the diagram below and install the mounting base on the ceiling or on the wall (if permitted for the application) using the screw location as required. Use the two screws and anchors provided. Maneuver the base so the screws are at the elbow of the screw slots and secure.
2. Fit the detector inside the base aligning it over the base as shown (detector alignment notch should be slightly offset from mounting base tamper release tab), then turn the detector in a clockwise direction until it clicks into place.

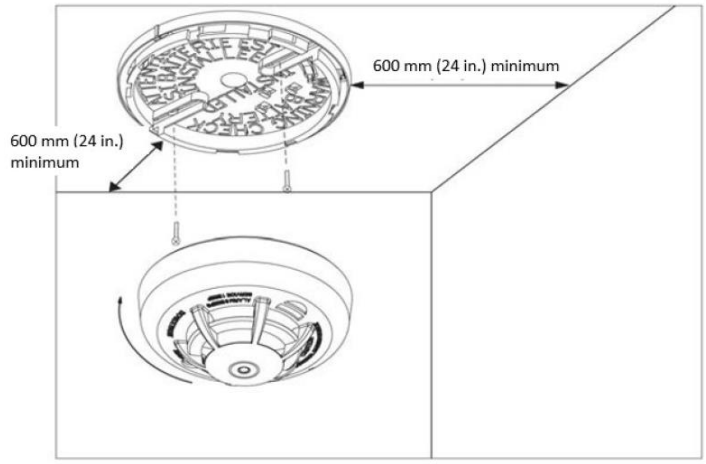


Figure 13a: Mounting the detector

Compatible wired detector

Important! – The total number of wired detectors in a system must be 6 or less! The number of wired detectors in a series chain must be 3 or less! All the wired alarms in one series will be considered "one alarm" in the system.

Important! - Caps must stay on detectors until occupant moves in!

Important! - Always follow the manufacturer's instructions when installing wired detectors. A 24 volt wired connection shall be made between the detector and the spray head location using fire protected cable. ONLY the following wired alarms are compatible with the Automist system:

- Apollo Orbis ORB-OH-13001-APO Multi-sensor detector, various mounting bases also available. https://www.apollo-fire.co.uk/products/range/orbis/smoke-heat-detectors/orb-oh-13001-apo-orbis-multisensor-detector

ONLY the following wired alarm bases are compatible with the Automist system:

- Apollo Orbis TimeSaver Base ORB-MB-00001-APO.
  https://www.apollo-fire.co.uk/products/range/orbis/mounting-bases/orb-mb-00001-apo-orbistimesaver-base-with-continuity-switch

- Apollo Orbis TimeSaver LX Base ORB-MB-00002-APO.
  https://www.apollo-fire.co.uk/products/range/orbis/mounting-bases/orb-mb-00002-apo-orbistimesaver-base-lx-without-continuity-switch

Important! For wired alarms you must fit an End of Line (EOL) resistor across alarm terminals. Resistors should be 4.7k ohm, 0.5W, 1%, such as Multi-comp MF50 4K7. EOL resistor must only be added to the last detector in the chain.
http://uk.farnell.com/multicomp/mf50-4k7/resistor-0-5w-1-4k7/dp/9340629

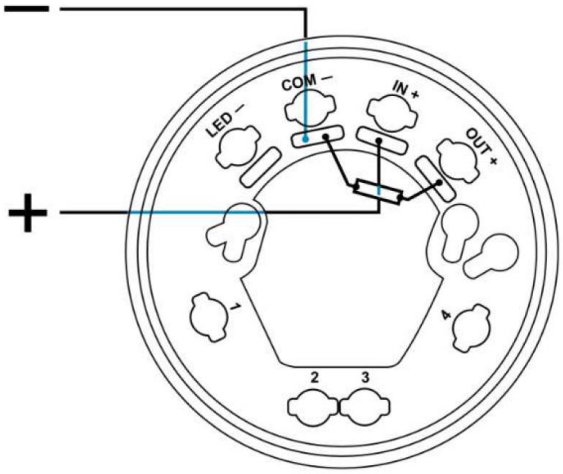


Figure 13b: Mounting the resistor on a single wired detector

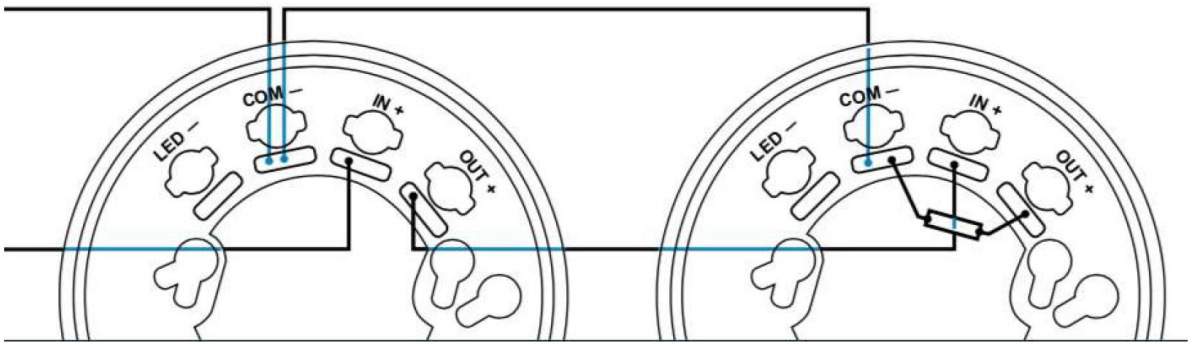


Figure 13c: Mounting the resistor on wired detectors in chain

Power Loss Alarm

It is possible to fit a power loss alarm to the system, to alert the user if power is cut. Because the alarm is installed to detect a loss of power, it must be installed on a separate spur of the same circuit as the Automist system.

Many options for such an alarm are available and Plumis recommends the purchase of an inexpensive alarm from Amazon, using the following link:

LED Power Cut Failure Outage Alert Automatic Alarm Warning Siren Indicator for Incubator Egg Hatching Breeding (ASIN - B01GE3NDB4)

https://www.amazon.co.uk/gp/product/B01GE3NDB4/ref=pd_cp_107_1?ie=UTF8&psc=1&refRID=REA5Y9F0RC54QWVN72WM

B) Second Fix - Installing the controller

IMPORTANT! The controller should be positioned in a safe and dry location where it is easily accessible, the button will not be pushed accidentally, and the front panel remains visible.

Mount the controller in the selected location. It is recommended to install the controller next to the electrical distribution panel. Take care to avoid any cables and pipes that may be buried in the walls.

IMPORTANT! Connecting the power requires a suitably qualified & competent person. Switch off electricity at the mains before working on existing circuits.

Carefully Remove the lid of the control unit enclosure and fix the back plate which holds the electronic printed circuit boards (PCBs) with the 2 screws included in the kit. There is a ribbon connector between the front and back enclosure panels, which can be gently slid off from its pin header connector.

IMPORTANT! Take care not to touch the PCB. Do not over tighten the terminals.

Feed the wires through the gland provided on the bottom of the controller, or through the rear entry hole on the same surface as where the PCB is mounted. The gland also provides strain relief. Grommets are provided and shall be placed to fill the cable entry holes which you do not use.

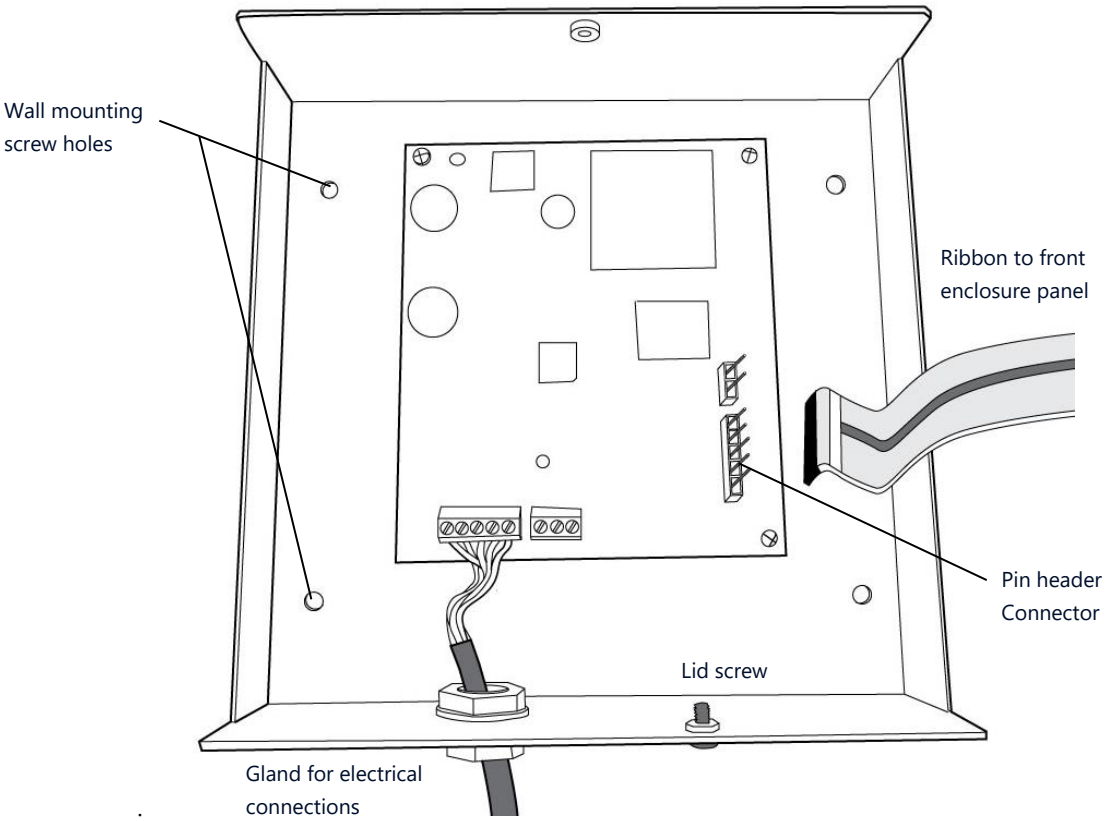


Figure 14: Connecting the controller

Connect the wiring to the terminals as per the drawing (see page 21). Use a torque wrench on the following setting: minimum 0.22Nm, maximum 0.25Nm (Phoenix Contact MKDS 1/5-3,5). This includes the power input wires, the Plumis specification data cable to the first spray head and the wiring output to the pump. **(see Appendix C for how to make cable connection)**

Reconnect the ribbon to the pin header connector. Place the control unit enclosure lid over the base and fix the lid with the 2 screws included.

C) Second Fix - Installing the spray head(s)

Place the **first spray head** loosely in the mounting hole and connect the data cable between the terminals on the pump to the incoming terminals on the spray head.

Tighten the wires of the Smartscan Head Cable into the screw terminals. Use a torque wrench on the following setting: minimum 0.22Nm, maximum 0.25Nm (Phoenix Contact MKDS 1/5-3,5). **(see Appendix C for how to make cable connection)**

IMPORTANT! Tighten the cable strain relief gland to ensure that any movement of the cable does not result in movement or tension at the terminal block. Do not over tighten the terminals.

Connect labelled data cables to corresponding IN and OUT Terminals

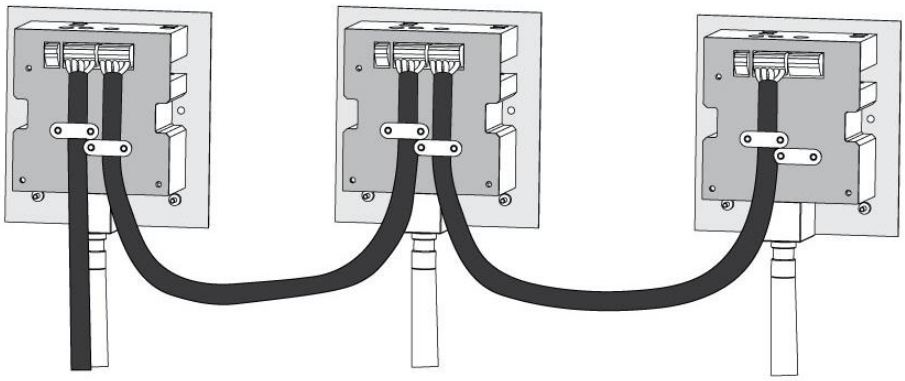
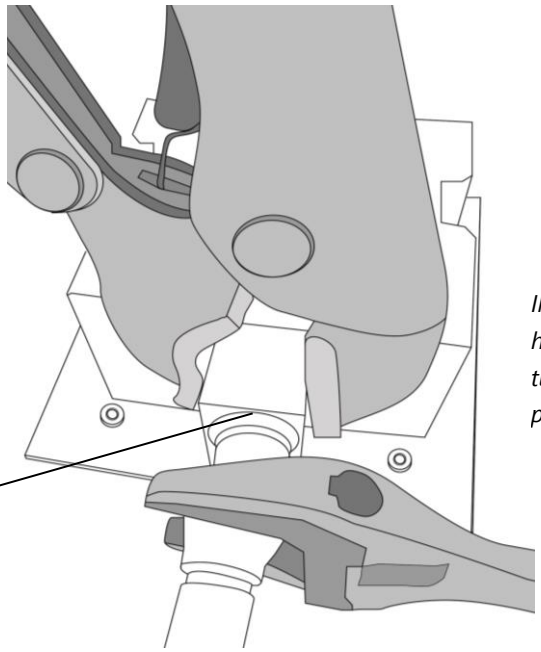


Figure 15: Spray head daisy chain connection

If you are using a hardwired alarm connect the detector to the spray head with a 24v fire protected cable.

Connect the ¼" BSP high pressure hose to the spray head assembly.



IMPORTANT: Always hold the pivot base whilst tightening the high pressure hose

Figure 16: Spray head water path connection

Position the pump unit as closely as possible to the domestic water supply pipes. Open the front panel and connect the wiring to the terminals as per the drawing (see page 21). The large gland near the top of the unit is used to supply the power.

IMPORTANT! Tighten the cable strain relief glands to ensure that any movement of the cable does not result in movement or tension at the terminal block. Do not over tighten the terminals. Use a torque wrench on the following setting: minimum 0.5Nm, maximum 0.6Nm (Phoenix Contact SMKDSN 1, 5/ 5-5, 08). **(see Appendix C for how to make cable connection)**

Once you have successfully connected the controller to the pump, connect the pump to the first spray head and to the dedicated branch circuit. Once you have finished with the wiring close the front panel, now you are ready to test the first head.

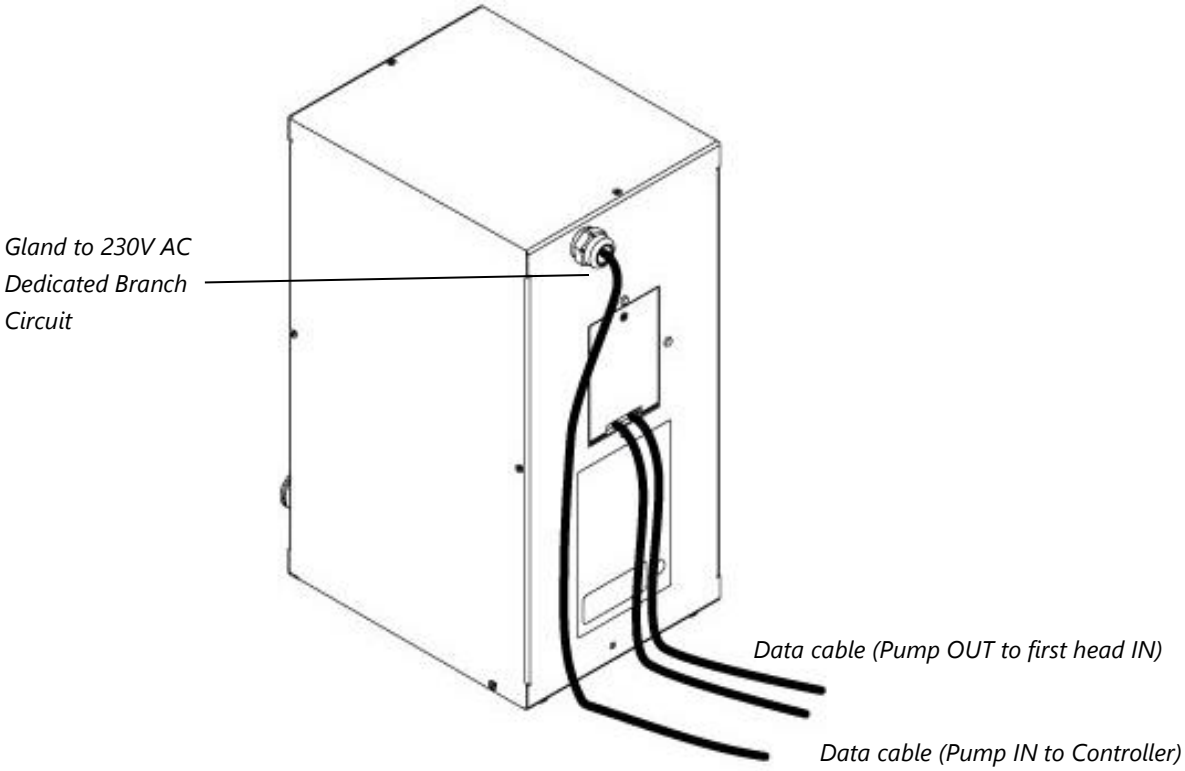


Figure 17: The pump front panel

IMPORTANT! Ensure the live connections are correctly installed and not exposed before switching on the system for the first time. If you have configured the wiring correctly for the first head the controller will chirp and display solid yellow. All connected heads will light yellow. This indicates that the wiring is correct, and the units are in an uncommissioned state.

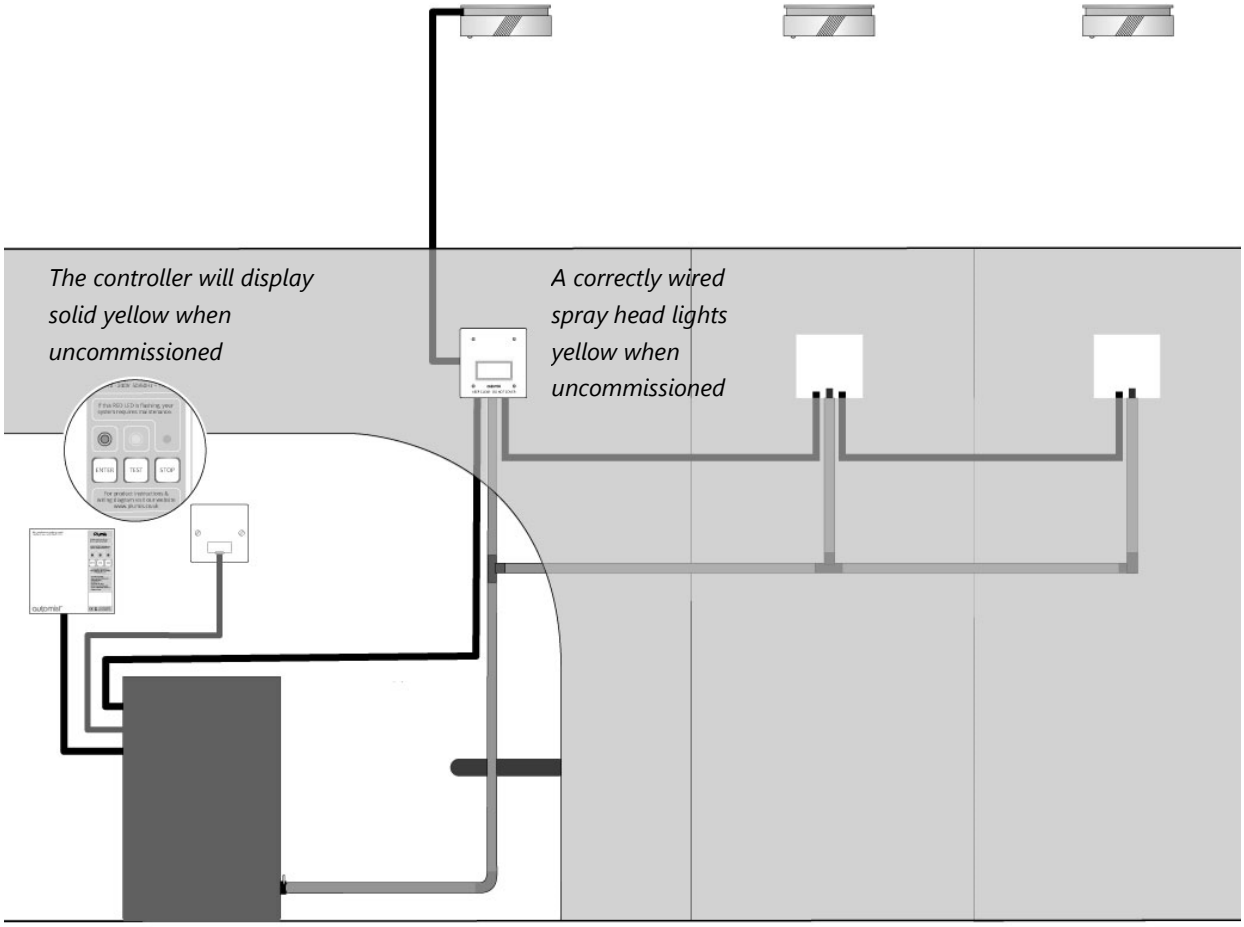


Figure 18: Testing the initial setup

Power down the system and connect the next head. Repeat the process above for each additional head. Installing the system in this way will ensure you can identify if one of the heads has been wired incorrectly. If you are confident that your system is wired correctly, you can wire all the heads at the same time and verify them at the end.

D) Connecting the Water Supply

IMPORTANT: The flow to a fire suppression device must be ensured when using a domestic water supply. This can be assumed when there is only a single pump connected because of its very low 1.6 gpm (6 lpm) flow requirement. However, a survey needs to be carried out to ensure that there will be water supply available for the Automist pumps and the normal domestic supply in its worst condition. Otherwise a priority valve or a booster pump may need to be used to provide the required flow and pressure. It is responsibility of the installer to ensure the water supply to the Automist pumps is adequate. An outside pipe diameter of less than 1.1 in. (28mm) is a good indicator that a survey is required.

The water supply should comply as follows:

- A check valve must be installed to ensure back flow protection to the domestic water (supplied in kit).
- An approved isolation valves (or equivalent) are required so that the Automist Smartscan system can be shut off from the domestic water. All such valves should be labelled with the included warranty void anti-tamper sticker. This enables clear identification of any tampering with the water valve (note: spare stickers can be ordered from Plumis)

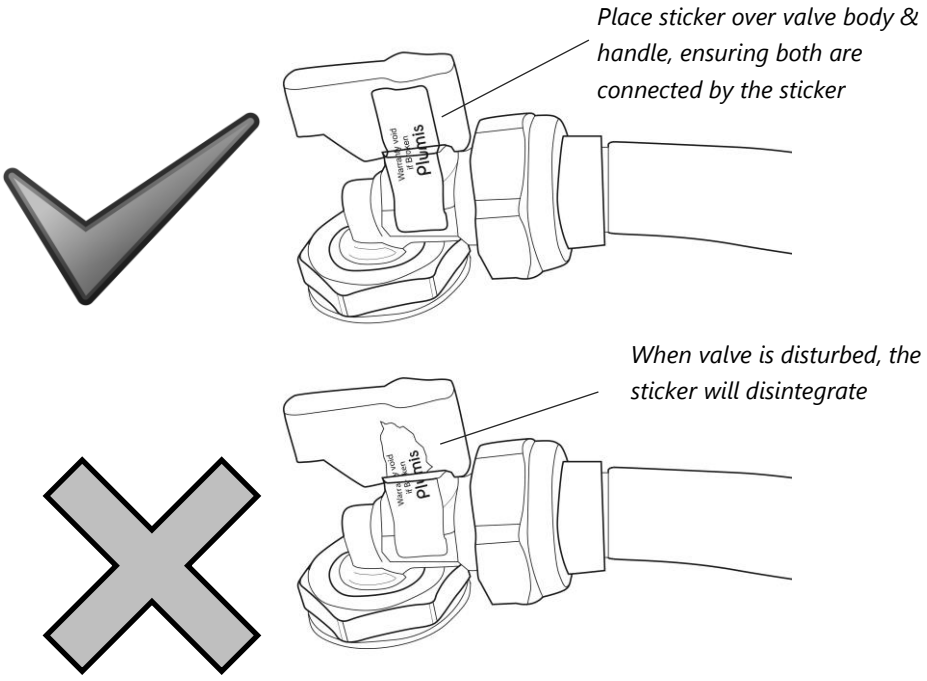


Figure 19: Water valve tamper sticker

- Priority valves are not normally required but should be used in circumstances where the water supply may otherwise be inadequate.

Important! If new pipe has been fitted, remember to flush out any contaminants before connecting to Automist Smartscan, to avoid clogging the nozzle.

Important! Before planning and installation, it is recommended to carry out a study on hose routing regarding minimum hose length for the connecting multiple heads to the Automist pump. The maximum length of high pressure hoses is 196.85 ft (60m). See Appendix B for high pressure hose specification. Connect the high pressure hose from the assembled head to the outlet on the pump.

High pressure hoses left exposed in the protected volume, particularly at height, could be compromised in a fire. Hoses should therefore be encased in the wall whenever possible. Where possible, hoses should be run low in the room, all other factors being equal, and in any case the locations of hoses must be chosen so that they will not be exposed to temperatures above 212°F (100°C).

A Quick Connect with Test Point and locking pin are supplied to connect the high pressure side of the pump to the spray head. A small O-ring is included and already attached to the Quick Connect with Test Point. The locking pin retains the quick connector in the pump outlet but can be easily removed, for example in order to drain water from the high pressure hose. The Test Point adaptor is required as part of the commissioning procedure (see page 35).

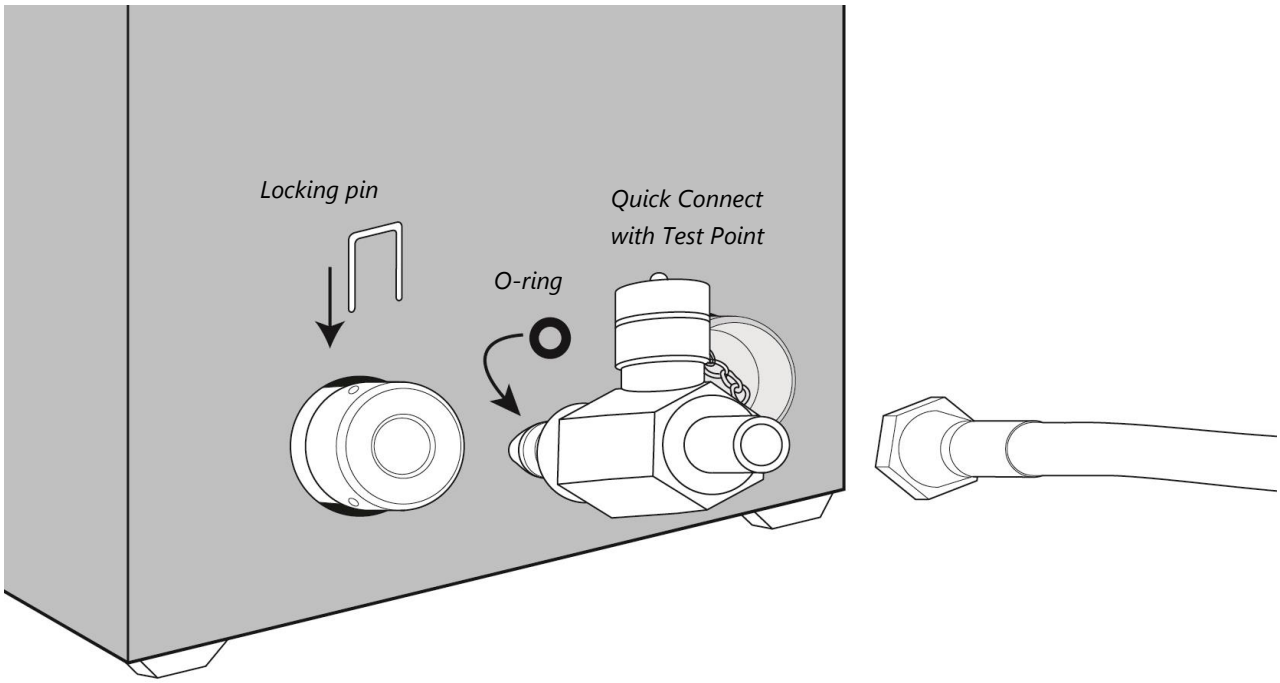


Figure 20: Connecting the Quick Test Point

IMPORTANT! Do not attempt to operate the pump without the quick connector O-ring. Always properly replace the quick connector, O-ring and locking pin after removal.

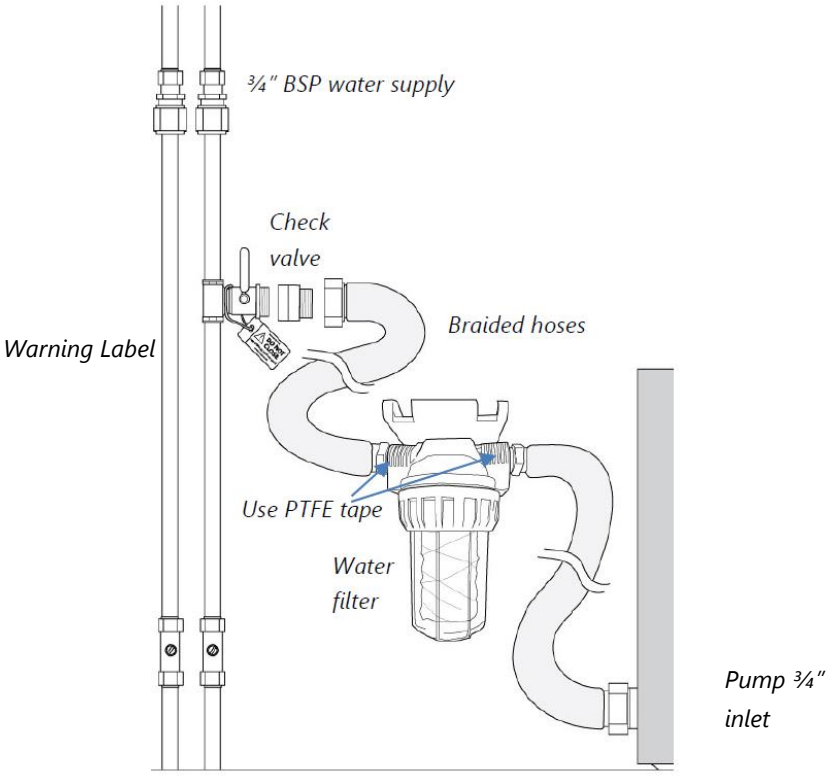


Figure 21: Connecting to the domestic water

The Automist Smartscan pump unit should be housed close to a 3/4" BSP water supply with an approved isolation valve to the check valve. A synthetic rubber washer is supplied with each device to facilitate fitting to the flat-faced outlet.

IMPORTANT! An additional provided filter is required for each installation within the low pressure water path (domestic water). The filter is pre-assembled by Plumis. Do not disassemble the filter. The whole filter assembly shall be replaced in case that replacement is required during lifetime.

Use PTFE tape between the filter body and the plastic connection as shown in Figure 21. Screw the plastic connector to the threaded until the black O-ring is squeezed between the mating surfaces. This will provide additional sealing between the O-ring.

Close the bleed port on top of the filter as shown in Figure 21.1 by screwing clockwise until the rubber washer is properly squeezed. Mount the filter to the wall/board in the vertical position. Do not place the filter on the floor or hang the filter on the flexible hoses.

Figure 21.1: filter air bleed port

IMPORTANT! The new hose-sets supplied with the appliance are to be used and that old hose-sets should not be reused.

IMPORTANT! To enable a consistent pressure and seal for all low pressure water interface washers, the correct amount of torque should be applied to each low pressure connection. This can be accomplished in 2 ways (with the washers and mating surfaces kept dry):

i) Apply 6Nm using a calibrated torque wrench

OR

ii) Hand tighten the hose. Using a conventional wrench, apply another 1/2 turn clockwise to guarantee a reliable seal.

IMPORTANT! Switch on the water supply. Bleed the air in the filter via the bleed air port as shown in Figure 21.1. Check and verify that there is no leak at any component between the domestic water supply port and pump inlet port when the water supply is switched on. Switch on & off any water tap nearby several times to simulate water hammer effect and verify that there is no leak at any component.

E) The Automist Smartscan Hydra Controls

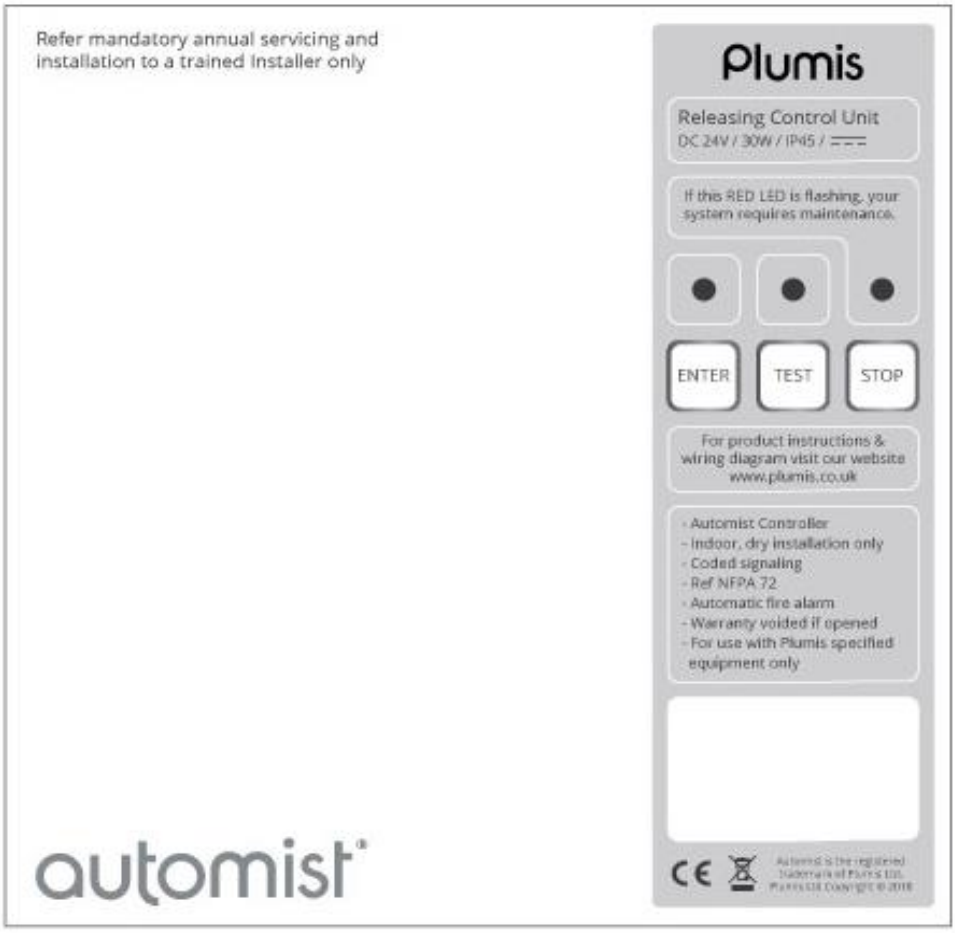


Figure 22 : The Automist Controller

STOP Button: Pressing the STOP button during a fire condition will stop the Automist Smartscan pump for 2 minutes. If at the end of 2 minutes, an alarm input remains active for up to 10 minutes after, Automist Smartscan will recommence mist operation. If the alarm condition has ended, Automist Smartscan will return to an uncommissioned state and requires service.

In error conditions, pressing the STOP button temporarily hushes the error sounds for 12 hours.

In the SYSTEM OK stand-by, pressing and holding the TEST button may be used to enter ALARM TEST MODE. The YELLOW LED will then start flashing – this indicates that ALARM TEST MODE is activated. In this mode you have 15 minutes to press the test button on a wireless alarm, or trigger a wired alarm with heat or smoke, causing the heads paired to said alarm to begin scanning and flashing red and yellow. ALARM TEST MODE is deactivated by pushing the ENTER or STOP button; this will be confirmed by the GREEN LED returning to constantly lit. Note: Testing the alarms outside of this mode by pushing the button on the wireless detector will make it beep and the Automist system will do nothing.

GREEN AND YELLOW FLASHING: Indicate an ALARM condition.

RED FLASHING: Indicates a fault where the flashes indicate the error code. Please refer to the troubleshooting guide. N.B. When Automist Smartscan is powered up for the first time the YELLOW LED with remain solid to indicate the system has not been commissioned.

SYSTEM OK LED: Lit green when the system is OK and on stand-by.

F) Commissioning and maintenance

IMPORTANT! Commissioning is required:

- Once all the components of the system have been installed and the system is powered.
- As part of a yearly maintenance cycle.
- If plumbing or construction work takes places, new alarms are installed or maintenance work occurs which could affect the system.
- Commissioning must be performed annually by an Accredited Automist Smartscan Installer.
- Commissioning should only take place when the system is in its 'ready for service' state.

Important! The controller lid must be screwed closed when performing this procedure.

When Automist Smartscan is powered up for the first time the YELLOW LED will remain solid to indicate that the system has not been commissioned. Commissioning is a simple programmed procedure which allows Automist Smartscan to be tested. During commissioning, the pump runs for 60 seconds and the output pressure is monitored.

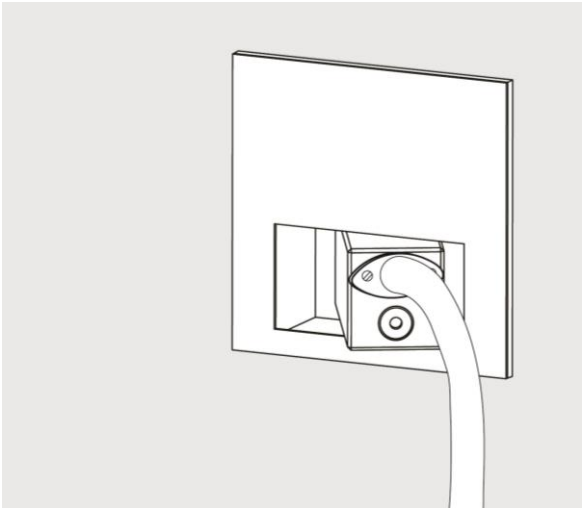
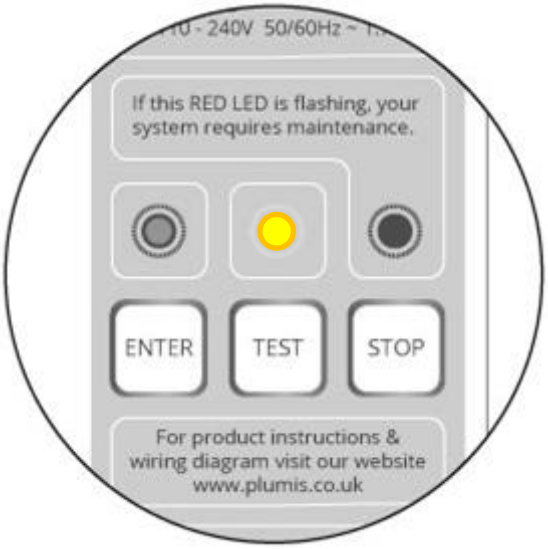


Figure 23: The spray head connected to the commissioning tool

Use the Automist Smartscan commissioning tool during the procedure to prevent mist being sprayed into the room. The spray nozzle and the screws holes to affix it are only exposed during the commissioning procedure. Use the provided screws and rubber gasket to fasten the tool in place and put a bucket under the hose during the test procedure.

Commissioning Procedure

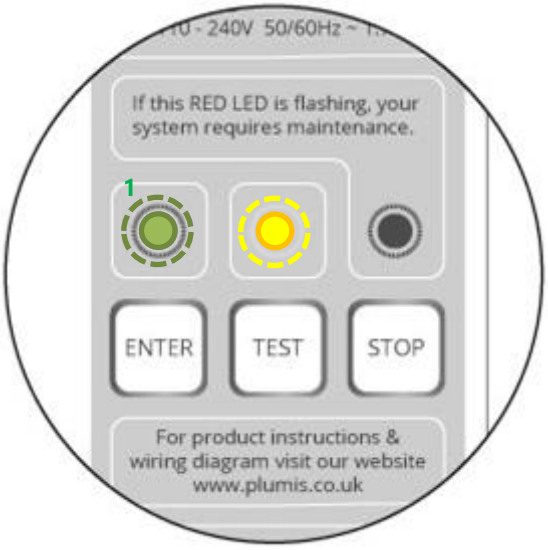
1. **Uncommissioned state** - Press and hold the TEST and ENTER button for 5 seconds to enter commissioning mode.



YELLOW LED solid

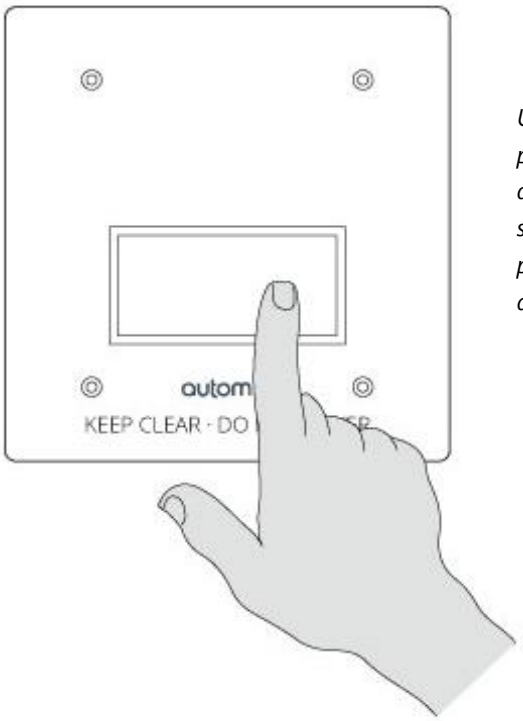
Figure 24: Uncommissioned state

2. **Commissioning address state** – The single flash of the GREEN LED on the controller indicates commission process one. The number of flashes of the YELLOW LED on the controller indicate the number of addressed heads. Press the spray heads to address and un-address them, a pulsing yellow spray head is un-addressed and a solid green head is addressed. Long press TEST for 10 seconds to clear the commissioning, if required. Press ENTER on the controller to go to the next stage. Short hold STOP to go back to the previous state, if required.



GREEN LED flashing once, YELLOW LED flashing the number of addressed heads

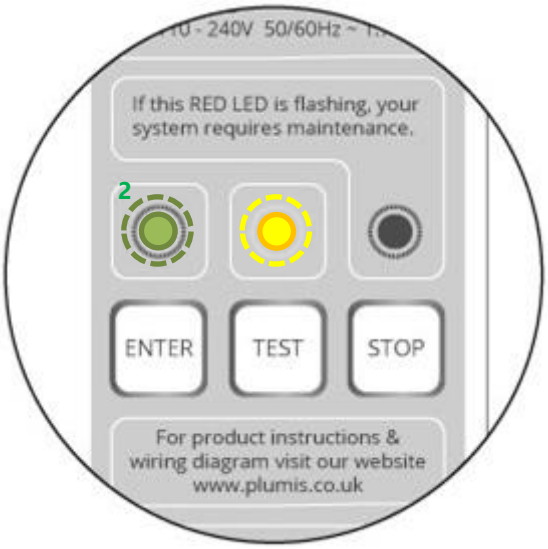
Figure 25: Commissioning mode – commissioning address state



Unaddressed heads pulse yellow and addressed heads are solid green. Gently press the head to address it

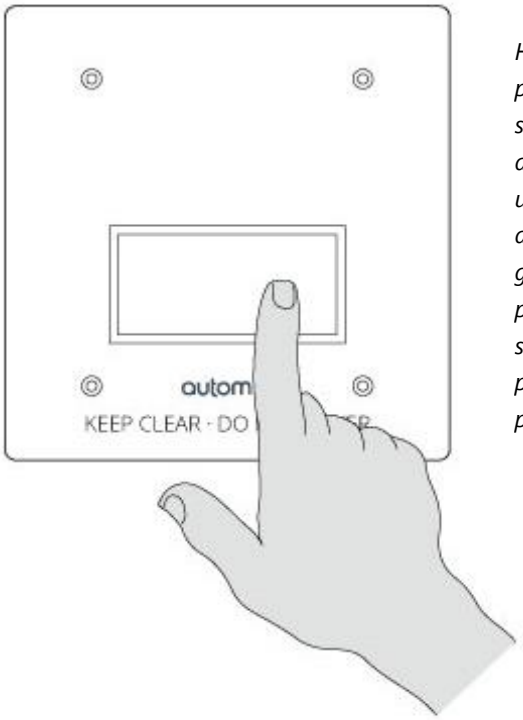
Figure 26: Gently press the outside surface of the spray head with your finger to address it

3. **Commissioning alarm state** – The two flashes of the GREEN LED on the controller indicates commission process two. The spray heads will remain SOLID yellow pending alarm selection. Press the button on a wireless alarm or use a heat gun on a wired alarm to produce an alarm signal. all the unbound spray heads will turn red, while paired spray heads will turn green. Gently press the spray heads to bind and unbind them to the selected alarm, where the GREEN pulses indicate number of paired heads to the selected alarm. Press TEST to complete commissioning for the selected alarm. Repeat the process for each of the alarms. Press ENTER on the controller to go to the next stage only when all the alarms are paired. Short hold STOP to go back to the previous state, if required.
   Note: When pairing spray heads to multiple wired alarm in a series, only the alarm at the end of the series shall be triggered at alarm commissioning state. But the rest of the alarm(s) in the series shall be tested with "Alarm Test Mode" after commissioning.



GREEN LED flashing twice, YELLOW LED flashing the number of heads paired to the selected alarm

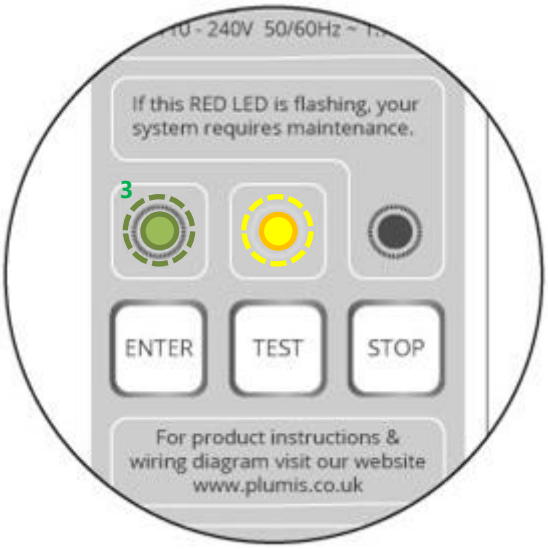
Figure 27: Commissioning mode – commissioning alarm state



Heads remain yellow pending alarm selection. Once an alarm is selected unpair heads turn red, and paired heads flash green the number of paired heads to the selected alarm. Gently press the head to pair/unpair it.

Figure 28: Gently press the outside surface of the spray head with your finger to pair it

4. **Commissioning flow state** – The three flashes of the GREEN LED on the controller indicates commission process three.
Important! Always select the lowest spray head and nearest to the pump first for flow testing first before progressively moving higher and further away from the pump. This considers the most effective way to drain the hoses.
Important! During flow test and draining process, small amount of water will possibly come out of the drain hole on top of the spray main body block (drain hole not visible as covered by servo motor shaft). Check all spray heads during each flow test or draining step. Dry the parts if water is visible.



GREEN LED flashing three times, YELLOW LED flashing the number of flow tested heads

Figure 29: Commissioning mode – commissioning flow state

The spray heads will glow red and lock pending head selection. Press the first spray head and initiate a scan test. The head will scan once and point to the warmest position that it observes which should be your hand. It will then rest in an approximately 90 degree position and turn solid yellow if scan test was successful. If unsuccessful, the head will remain solid red. Visibly check the sensor is clean of any dust or water, then gently push the head 45 degrees to retry the scan test. The sensor must see a temperature difference during the scan for the test to pass.

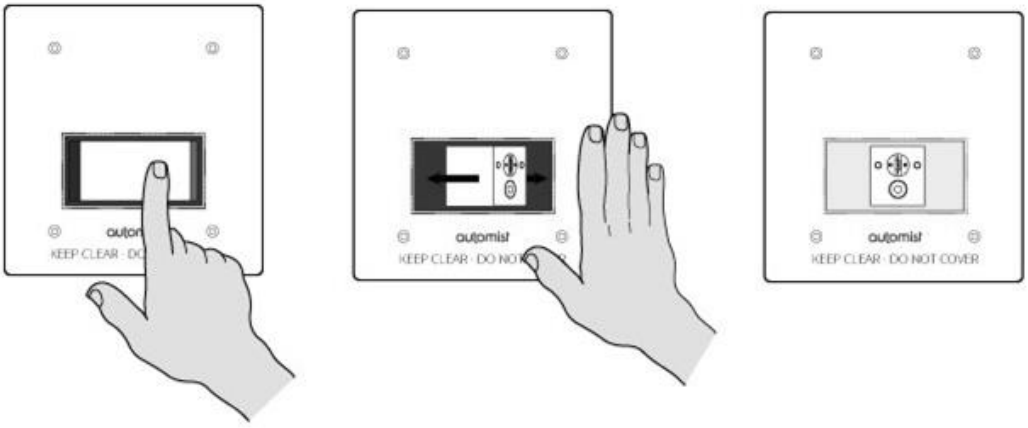
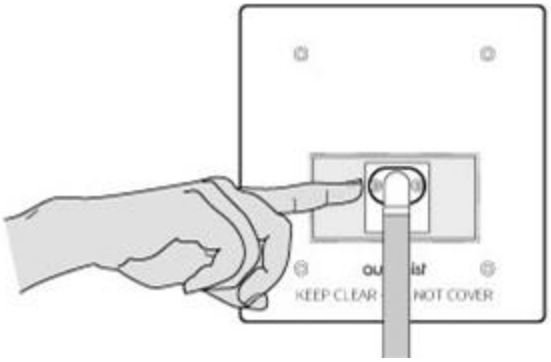


Figure 30: Testing the IR sensor and selecting the head for flow testing

Unscrew the cap on the quick connect test point (see page 32) and connect the test hose and gauge to the test point adapter. Connect the commissioning kit to the selected spray head and place a bucket on the floor to collect the water.

The next step of commission is testing the water path. Gently push the head 45 degrees to initiate flow test. The head will begin to flash yellow to indicate water is about to flow, during this period the head may be pressed again to cancel. Once flow begins the head will light blue. At this point the water must be stopped by pressing the stop button on the pump if required.



Yellow flashing means water flow is coming. Solid blue means water is flowing. Solid green means successful flow test complete.

Figure 31: Attach flow test tool and gently push the head 45 degrees to initiate flow test.

Once the flow test is successfully complete the spray head will turn solid green. Check the gauge and ensure that the output pressure has reached a stable 1160.3 to 1595.4 psi (80 to 110 bar.)
Note: The system has one second pause after 10 seconds and 30 seconds from activation of pump as a safety feature. Read the pressure after the second pause.

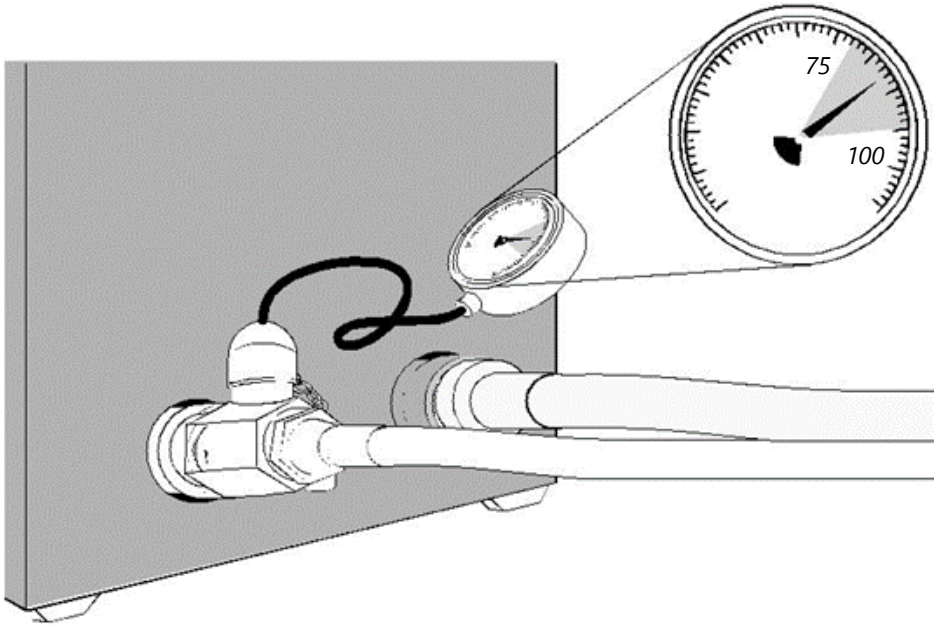


Figure 32: The pressure gauge during commissioning.

Important! The pump features a cut-out which will disable it if the pressure becomes excessive, so it is critically important not to leave an installed system with a high out-of-spec pressure. By leaving an installed system with pressures outside the specified range, you might become liable for deaths or injuries. If the achieved output pressure is outside the specified range, refer to the commissioning troubleshooting guide (see page 50) and contact Plumis if the situation cannot be resolved.

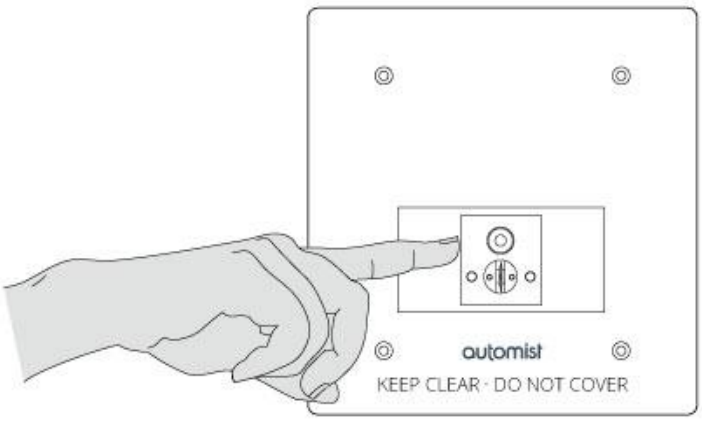
Important! Check that there are no leaks behind the head, at the pump or along the hoses.

Important! A very small amount of water underneath the pump after commissioning is acceptable. This lead comes from the pump gasket only when the pump is switched on. In this case dry the pump base and wait for 5 minutes. Verify that there is no more leak coming from the pump when the pump is off.

Important! The commissioning tool and other aids obstructing the spray head should be promptly removed.

Important! Wipe the head IR sensor dry with a dry cloth, to ensure that there is no water left on the IR sensor.

Important! With the commissioning tool disconnected, gently push the head 45 degrees to complete the flow commissioning and lock the head.



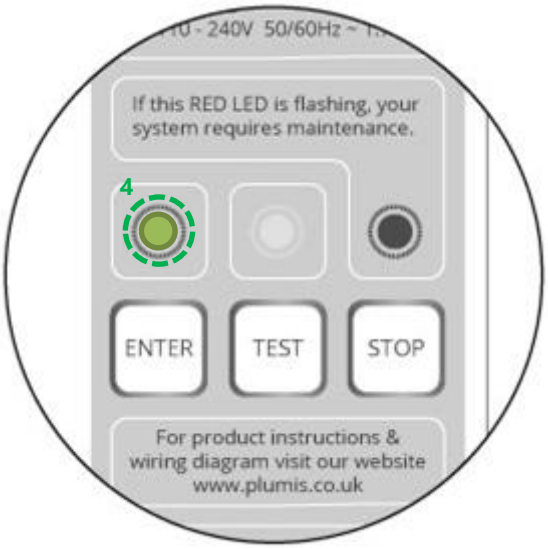
Flow tested and locked head will glow green.

Figure 33: Remove flow test kit and gently tap to close head and lock

Important! Repeat the process for every spray head. Always select the lowest spray head and nearest to the pump first for flow testing first before progressively moving higher and further away from the pump. This order considers the most effective way to drain the hoses. Once all the heads in the system have been flow tested and are glowing green. Press ENTER on the controller to go to the next stage only when all the heads are flow tested. Short hold STOP to go back to the previous state, if required.

5. **Pipe draining state** – The four flashes of the GREEN LED on the controller indicates commission process four. Remove the quick connect test point with the pin and allow any remaining water to be drained into a bucket. During this state all the spray heads flash rainbow colours and are locked, they can be selected individually to connect a commissioning tool if additional water needs to be pumped out. The high pressure hose shall be cleared of water by connecting a bicycle pump or a suitable compressor pump (see page 45) to the Plumis supplied attachment that is connected to the test point.

Important! Leaving water in high pressure hoses following the commissioning/servicing process can lead to dripping nozzles, particularly if any part of the hose passes above the nozzles. In order to prevent this, the water should be expelled after commissioning.

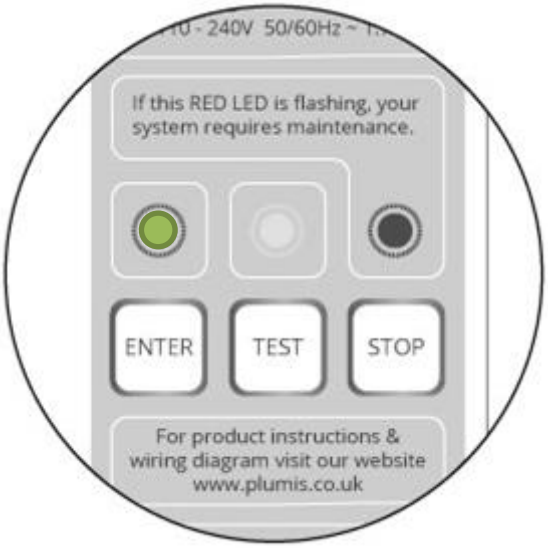


GREEN LED flashing four times

Figure 34: Commissioning mode – commissioning pipes state

Press ENTER on the controller to complete the commissioning process. Short hold STOP to go back to the previous state, if required.

6. **System ok**



GREEN LED solid

Figure 35: System ok

Slide the heads into the rectangular hole 3.5 inches wide x 4.6 inches high (89+/-2mm wide x 117 mm high) and fasten in place using the box "renovation" mounting clips provided. The clips lock the spray head tightly to wall plaster, dry wall of any thickness up to ¾", concrete block, brick or concrete wall.

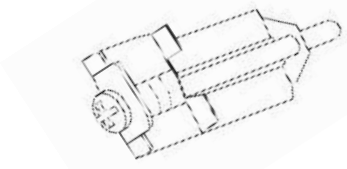


Figure 36: "renovation" mounting clips

Attach and fasten the front plate to the intermediate plate and align, ensuring parallelism to floor and wall. You can align the Front Plate in reference to the floor at this stage.

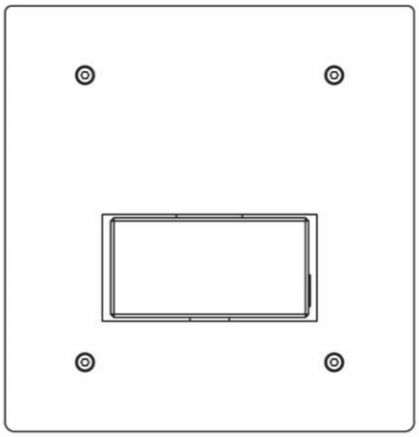


Figure 37: Front plate

Please ensure there is good clearance around the rotating head and the front plate. It is recommended to perform a final alarm test mode (see page 45) to ensure the heads has the freedom to rotate.

Once you have successfully commissioned your unit, complete the online commissioning form and attach a layout diagram and photos.

Place the two warning stickers and the commissioning label:

- Label the separate circuit on the distribution board
- Label the heat alarm that triggers Automist Smartscan, preferably near the test button
- Complete the installer commissioning label and affix to your Automist Smartscan pump.

IMPORTANT! Record the output pressure from the commissioning gauge on the Installer Label (as shown above) and keep a note of the details for the online commissioning form.

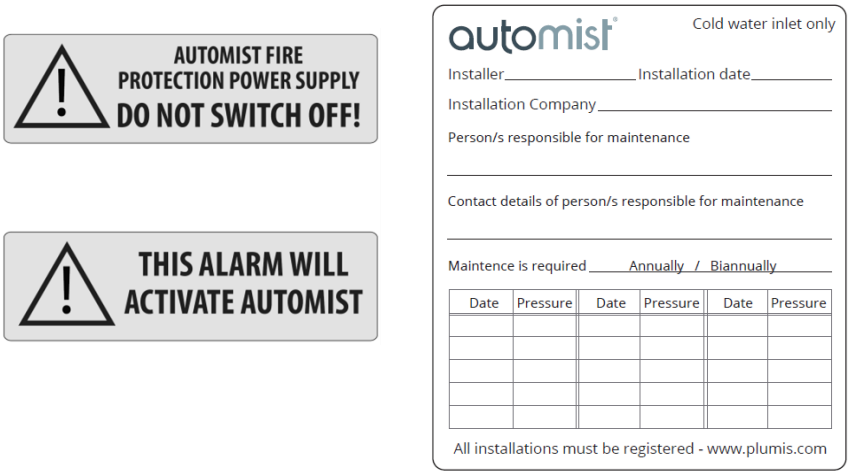


Figure 38: Stickers

IMPORTANT! Fill out the user instructions one pager and leave for the homeowner in an appropriate place. Also available for download on the partner page.

About your Automist Smartscan System

In the event of a large fire, Automist will spray a fine mist of water. It is set off by a multi-criteria alarm, so won't go off due to just smoke.

If it does go off and you need to stop it, there is a **STOP button** on the controller.

DON'T put objects in the way of the spray nozzles. Automist will only operate at its maximum effectiveness when spray heads are kept clear.

And in the event of a serious fire, **DO leave the property and call 999**

If the **RED LED** on the controller, or the heads are **flashing RED**, your system requires maintenance. Contact your Accredited Automist Installer.

Do not attempt to repair your Automist system. Doing so will invalidate your warranty (details on your Automist warranty certificate).

The pump is located	
The controller and therefore the **STOP button** is located	
If the Automist system is making sounds, flashing red, or leaking water, call	

Registration

Register your Automist fire sprinkler online at **www.plumis.co.uk/register**

- Ensure you can take full advantage of the manufacturer's warranty
- For Product update or essential bulletins
- Learn key information about how your system works
- Optional maintenance reminders to ensure your life safety system is working

Waste electrical products should not be disposed of with household waste. Please contact the organisation who provided Automist for recycling/disposal advice as regional variations apply.

Plumis

Figure 39: User Instructions

Hose Draining

The high pressure hose shall be cleared of water by connecting a bicycle pump or a compressor pump with a maximum pressure of 116 psi (8 bar) for draining of water.

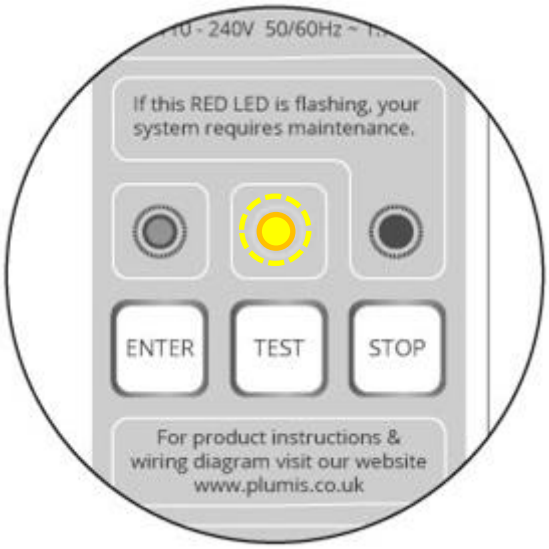
Re-enter Commissioning Mode After Successful Commissioning

The system will be locked on hour after it is successfully commissioned. To re-enter the commissioning mode in the locked status, please power cycle the system and then long hold "ENTER" & "STOP" buttons for up to one minute.

Alarm Test Mode

Once the system is commissioned ALARM TEST MODE allows you to test the alarms in the home without activating Automist Smartscan, by causing the paired heads to begin scanning. Alarm testing is a normal part of detector maintenance as part of the manufacturer's guidelines (see page 50). If the detector is a combination heat and smoke alarm both elements should be tested independently with a heat gun and then a smoke detector tester aerosol:

- In the SYSTEM OK stand-by, pressing and holding the TEST button may be used to enter ALARM TEST MODE. The YELLOW LED will then start flashing – this indicates that ALARM TEST MODE is activated.



YELLOW LED flashing

Figure 40: ALARM TEST MODE

- In this mode you have a short time to test the alarms either by pressing the alarms test button, with a smoke gun, or a heat gun. All paired heads flash yellow then red and scan, non-paired heads flash yellow then red but remain closed
- ALARM TEST MODE is deactivated by pushing the ENTER or STOP button; this will be confirmed by the GREEN LED returning to constantly lit.

Post-installation checklist – Key points for installers and Building Control

Power supply

- The Automist Smartscan circuit should be clearly labelled (a sticker is provided for this purpose).
- Power to Automist Smartscan must be provided via an unswitched, dedicated branch circuit rated for 20 amps.
- Automist Smartscan should be supplied inside conduit or protected 2 inches (50mm) deep within a wall.

Water Supply

- Check valve and filter must be installed to ensure back flow protection to the domestic water and debris into the pump (supplied in kit).
- Inlet water must be connected, and the valve left open.
- Isolation valves (or equivalent) are required so that the Automist Smartscan system can be shut off from the domestic water. All such valves should be labelled with the included supply warning labels.
- Priority valves are not normally required but should be used in circumstances where the water supply may otherwise be inadequate.
- Ensure the property has a water supply sufficient for the system operation in a worst case scenario.

Pump & spray head placement

- All Automist Smartscan units should have been successfully commissioned using heat/smoke detectors, with both thermal scan and outlet pressure verified.
- Minimum ventilation requirements met (4.4 cubic feet or 124 litres)
- In a room or cupboard that is separated by a fire resisting partition from the mist-protected room(s) that it serves, or the pump located such that it is: a) unlikely to be affected by a fire b) protected in the event of fire; c) unlikely to be affected by flooding.
- All Automist Smartscan controllers should show "System OK" (green LED), indicating it has been successfully commissioned.
- The data cable total length should not exceed 196.85 ft (60m).

Head Placement

- Between 4.6 ft (1.40m) and 4.75 ft (1.45m) high for Smartscan.
- In a "preferred position" where it is not susceptible to furniture obstruction
- Head placement matches the layout drawing supplied with the commissioning form.

High Pressure Hose

- High pressure hose should have been flushed with air to remove water, avoid dripping and Legionella.
- High pressure hose should be protected by a fire resisting barrier, and a fire resisting sleeve if exposed.
- It is critically important that the high pressure hose locking pin (behind the pump) is in position so that the quick connector and O-ring are firmly retained after any operations that required disconnection of the high pressure line.
- See Appendix B for high pressure hose specification. The maximum total length of high pressure hoses is 196.85 ft (60m). The maximum allowable hose with a nominal diameter of ¼" is 65.6 ft (20m) and maximum allowable hose with a nominal diameter of 3/8" is 164 ft (50m). The two hose types can be used in combination if the total length does not exceed the 196.85 ft (60m) limit.

Stainless Steel Piping (alternative to high pressure hose)

- Material: Stainless Steel
- Stainless steel pipes and fittings should conform to:
  UK (BS 8458:2015): ASTM A269-10 and ASTM A312
  US (NFPA 750): ASTM A269 or ASTM A632 or ASTM A778 or ASTM A789/ A789M
- Internal diameter: 5/16" (8 mm)
- Working pressure at least: 2175.57 PSI (150 bar)
- Maximum total length: 164 ft (50m)

Coverage

- If protecting the means of escape only, ensure all adjacent rooms which are not separated by a fire resisting door are covered. Covering only the stairs will not suppress fires in non-separated adjacent rooms, negatively impacting tenability on the escape route.

Documentation

- Installer sign-off details (including pump pressure) are noted on pump
- An occupant information sheet should have been provided to the property
- The Installer Commissioning form should have been provided (can be obtained from Plumis or the installer) with a matching layout drawing

The Plumis Warranty Certificate is provided (can be obtained from Plumis) once the layout has been submitted and approved by Plumis.

SMARTSCAN CARE

Maintenance

Automist Smartscan requires an annual service by a Plumis-authorized person. The annual service consists of a full recommissioning of the system (alarm & discharge), as detailed in this Technical Handbook.

It is recommended that the homeowner test the alarm in ALARM TEST MODE (see page 45) once a week! This mode allows you to test the alarms causing the paired heads to begin scanning. During this test the homeowner should check to see if the spray heads are clear from any obstructions.

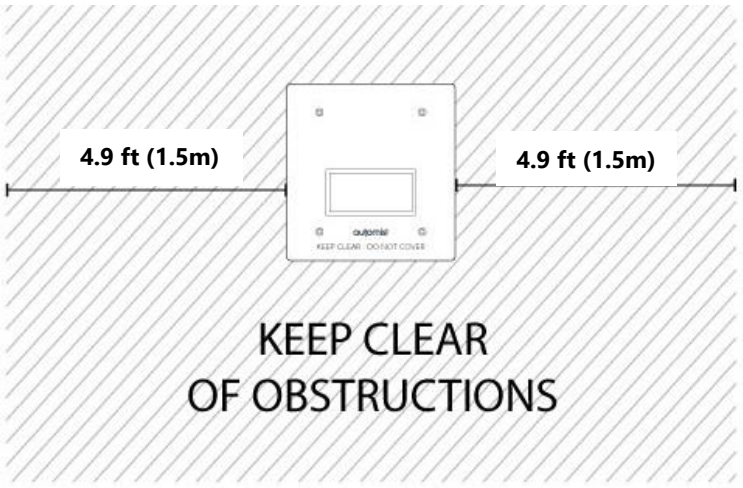


Figure 41: Keep clear of obstructions zone (min. 4.9 ft (1.5m))

Important – only use batteries specified. Use of different batteries may have a detrimental effect on the smoke alarm.

Your smoke detector should be cleaned at least once a year.

The wireless smoke detector is powered by a 3 AAA Duracell Procell or 3 AAA Energizer E92 batteries (included). If the detectors are flashing a low battery warning flashing yellow every 12 seconds. Be sure to replace the batteries with fresh ones.

Cleaning

The Automist Smartscan wall-mounted head should be wiped clean with a damp cloth. Do not attempt to clean with any other chemical cleaners or abrasives

To clean your alarm, remove it from the mounting base. N.B. This will trigger a tamper error on the controller. You can clean the interior of the alarm by using compressed air or a vacuum cleaner hose and blowing or vacuuming through the openings around the perimeter of the detector. The outside of the detector can be wiped with a damp cloth.

After cleaning reinstall and test your alarm by using. If cleaning does not restore the alarm to normal operation the alarm should be replaced.

Repair

CAUTION! Do not attempt to repair the Automist Smartscan wall head or pump unit. Doing so will invalidate your warranty.

Automist Smartscan should be serviced or replaced if any part of the system, including any heat alarms, has been exposed to fire conditions.

Troubleshooting

Problem	Probable Cause	Recommended Action
Pressure does not consistently reach correct range (too low) during commissioning procedure	Leakage between pump and Automist Smartscan head	Check for leakage on the high pressure water path, for example the quick-fit connector may not be secured or its O-ring may not have been fitted. Re-run commissioning.
	Blockage at the pump inlet	Close off the water with the isolation valve. Disconnect the hose at the pump inlet and check for blockages on the pump strainer and within the inlet hose.
	Domestic water pressure or flow is too low	Close off the water with the isolation valve and disconnect the hose. Verify that the domestic water connection can supply at least 1.6 gallons per minute (gpm) (6 litres per minute (lpm)) of flow and if possible, check that the static inlet pressure is at least 14.5 psi (1 bar). If the flow is close to or below 1.6 gpm (6 lpm), the domestic water pressure may be too low for Automist Smartscan to operate correctly, or there may be constrictions in the water supply. A plumber should be called to resolve the issue.
	Pump not providing enough flow	Re-run the commissioning procedure with the high pressure hose outlet placed inside a container with volume markings. If the volume of water is less than 1.5 gallons (5.6 litres), there may be an inadequate water supply or a damaged pump. Please contact Plumis technical support.

Controller persistently produces a warbling sound and shows a red LED flashing. The head will also flash the error code.	Pump not yet commissioned Incorrect wiring to pump, controller or spray head Pump or spray head damaged in transit	The number of beeps (or trills) and flashes that the controller sounds when in fault mode is intended as a diagnostic. Please count the beeps: One beep - Remove the head from the wall with the connections remaining. Ensuring no items are jamming the head. Turn off and on the system. If the error condition remains, follow the returns procedure (see page 54) Two beeps – Turn off the system. Gently clean the sensor with a clean cloth to ensure there is no dirt on the glass. Power on the system. If the error condition remains, follow the returns procedure (see page 54). Three beeps – Turn off the system. Ensure the connections between the pump and the controller are the right sequence. Ensure the cable is not damaged. Important! Ensure the mains is off when disconnecting and making connections. Turn on the system. If the error condition remains, follow the four beep procedure. Four beeps – Turn off the system. Inspect the wiring and check the continuity of the connections to the head. Power on to verify the error message is no longer present. Important! Ensure the mains is off when disconnecting and making connections. If the error condition remains follow the returns procedure (see page 54). This error can also be caused by removing a head or moving a commissioned head from another system into this one, outside of the commissioning process. Five beeps – Contact Plumis. Six beeps – Verify the detector is powered and in a normal state (Green flash every 12 seconds). If the detector is off you may need to change the batteries. If the error is still present your detector may be out of range from the head(s). Remove the detector and move closer to the head(s). If the error condition remains, follow the returns procedure (see page 54). Seven beeps – This indicates an alarm fault. If it is a wired alarm you have a wiring problem (open or short circuit), please examine the connections. Also verify that you have added a correctly wired resistor to the connection end (see page 20). For a wireless alarm please refer to the alarm failure modes in the next row. Eight beeps – Verify that the wireless alarms are in their bracket.

Problem	Probable Cause	Recommended Action
		Nine beeps - Turn off the system. Wait for 2 minutes. Power on the system. If the error condition remains, follow the returns procedure (see page 54). Ten beeps – Follow the returns procedure (see page 54). Twelve beeps – A button is stuck on the controller. Check no objects are forcing the buttons to be pressed. If not follow the returns procedure (see page 53).
Apollo wireless alarm flashing yellow	Apollo wireless alarm error	When the detector has a general fault, the yellow LED blinks once every four seconds and there is a chirp every 48 seconds. The Controller will go into fault mode if the error state (detector trouble or a dirty detector fault) can affect the operation of Automist: 3 yellow flashes every 4 seconds – Freeze warning Yellow flashes every 4 seconds – Detector Trouble Yellow flashes every 12 seconds – Low Battery, please refer to the maintenance section on page 49. Yellow flashes every 8 seconds – Detector Dirty, please refer to the maintenance section on page 49.
Pump does not run during commissioning although there is power to Automist Smartscan unit	Trigger alarm not connected to Automist Smartscan Pump damaged in transit	Check that you have connected the alarm to the spray head using ALARM TEST MODE (see page 45). Perform the commissioning procedure with the appropriate head to pair the alarm. Please contact Plumis technical support.
Power circuit trips out as soon as pump starts	Circuit breaker not sized appropriately for Automist Smartscan circuit	Please refer to page 21.
After commissioning, water continues to flow from the head even if pump is stopped for over 1 minute	Dirt ingress to solenoid valve stopping it from closing	Shut off water. Remove pump inlet. Flow water into waste to ensure it is clean. Reconnect the pump inlet hose. Run the pump for 30 seconds (activating alarm) to allow solenoid valve to be cleaned. Stop pump. Flow should stop as intended.

Problem	Probable Cause	Recommended Action
No mist is produced, although pump runs during commissioning test	Loose high pressure hose, leakage between pump and Automist Smartscan head Water supply is interrupted	Check for gross leakage on the high pressure water path, for example the quick-fit connector may not be secured or its O-ring may not have been fitted. Re-run commissioning. Verify that the isolation valve is open and that there is a water supply to Automist Smartscan.
	Severe blockage at the pump inlet	Close off the water with the isolation valve. Disconnect the inlet hose and check for blockages on the pump strainer and within the hose.
	Pump damaged in transit	Disconnect the high pressure hose from the Automist Smartscan head and re-run the commissioning procedure with the high pressure hose outlet placed inside a container with volume markings. If volume of water is less than 0.4 gallons, the pump is not providing the correct flow. Please contact Plumis technical support.
Either the pressure is above the correct range, or the pump pulses or temporarily cuts out during the commissioning test	High pressure blockage	Disconnect high pressure hose between the Automist Smartscan head and the pump and check for blockages in the high pressure line or around the inlet to the spray head. Shut off water. Remove pump inlet. Flow water into waste to ensure it is clean. Reconnect the pump inlet hose. Run the pump for 30 seconds (activating alarm) to allow solenoid valve to be cleaned. Stop pump. Flow should stop as intended. If the problem persists, contact Plumis technical support.

Returning equipment to Plumis - TGWs

Before sending equipment to Plumis please conduct an A-B-A test. This process allows you to identify the root cause of the failure mode by removing and replacing one element of the system. Gather evidence (photos & video) that the error can be stopped by introducing one new part, and reconfirm the problem comes back by reintroducing it.

The installer must contact Plumis Inc via email at info@plumis.com so that a field issue report can be submitted. Please attach all evidence to an email before sending the equipment back to Plumis Inc. Plumis will not accept any products that are returned without a field issue report and approval prior to receipt.

Important! Field Issue reports are necessary so Plumis can replicate and identify the failure mode. They are a fundamental part of an insurance and/or warranty claim.

Warranty

Plumis Ltd warrants its products to be free from defects in materials and workmanship under normal residential use for a period of two years from the date of original purchase. If annual servicing is kept up to date, then this warranty is extended to four years. This warranty is limited to repair or replacement of units returned to Plumis Ltd according to our return procedure. The warranty on any replacement units, will last for the remainder of the period of the original warranty. Plumis Ltd reserves the right to offer an alternative product similar to that being replaced if the original model is no longer available or in stock.

If the product is found to have failed for reasons outside our warranty cover Plumis may quote to repair the unit and return it. Where products are replaced or repaired under warranty, they will be returned to a UK address free of charge.

This warranty does not cover the removal or reinstallation of products, or faults in installation.

Plumis Ltd shall not be liable for any incidental or consequential damages caused by the breach of any expressed or implied warranty. Except to the extent prohibited by applicable law, any implied warranty of merchantability or fitness for a particular purpose is limited in duration for two years. This warranty does not affect your statutory rights.

Guidance on the Maintenance of Automist Hydra – including blocks of flats

What this section covers:

What are the failure modes susceptible to an installed system

What failure modes are caught at commissioning versus caught at maintenance

How is Automist different from wet pipe systems

The key benefit of commissioning with discharge

How to address the failure modes

Benefit of self-diagnosis – no downtime

How to build resilience into the self-diagnostics of Automist

The purpose of Commissioning and Maintenance in a Suppression system

Commissioning is used to validate the system has been installed and designed correctly, it attempts to address failure modes generated during the design and installation phase.

The purpose of maintenance is to ensure the safety maintains its effectiveness throughout its life and failure modes do not develop over time. This is done by periodic checking of elements subject to age. Maintenance does not cover the same failure modes as commissioning.

Design and Installation Failure Modes Addressed in Commissioning

Failure Mode	Addressed on Automist	Addressed in wet pipe
Hydraulic Flow Performance	Full discharge done on every spray head validates both water flow capability and pressure lose.	Test point/ drainage test checks for water flow on a single head but not on multiple heads. Does not validate pressure losses to all nozzles either.
Blockages	Full discharge on every spray head validates there are no blockages on piping.	Test point discharge validates only that there are no blockages to that path but not to all nozzles.
Leaks	Pipe pressurization test checks for leaks before commissioning.	Pipe pressurization test checks for leaks before commissioning.

Lifetime Failure Modes Addressed by Maintenance

Failure Mode	Critical?	Addressed on Automist	Addressed on Wet Pipe
Corrosion	No	Being a dry pipe system with a rubberized high pressure hose there is no corrosion risk developed over time.	Modern residential/domestic plastic pipes do not suffer from corrosion as older steel pipes did when there is air trapped in wet pipes.
Tampering	Yes	Automist's electronic self-diagnosis will raise an alarm fault if any of the devices in the system are removed or damaged. The controller will beep and flash. Plumis recommends the placement of controllers in communal corridor cupboard so that faults can be noticed immediately.	Not a necessary measure because if a wet pipe system is tampered with and activates, there will be immediate water discharge indicating the tamper.
Power shut-off/loss	Yes	As it is driven by a pump, a power loss will disable the system. Additionally, controllers can have their 24VDC power supply daisy chained (or provided by the alarm system power supply) to raise a fault if mains power is lost to the controller.	In domestic sprinkler systems* which requires a pump, power interruption will also disable its operation. A fault raising device should be added to avoid this going unnoticed. In a residential system*, the pump room may be remote so the fault raising device may include a dialler to increase resilience.
Water shut-off	Yes	No water, no suppression. Automist is intended to be inherently safe because it is connected to the water supply of the dwelling (not a remote, unmonitored source). If it fails the occupant will raise the fault. The shut-off valve should be accessible only by the responsible person, in either a restricted access in a flat or in the communal corridor cupboard.	No water, no suppression. In a domestic setting the shut off valve should be easily accessible to the occupants. In a residential system it should only be accessible by the maintenance worker. In tank systems (which are common for sprinklers) the ability for tanks to be filled is also critical and should be checked.
Obstructions to nozzles	No	It is assumed that Automist nozzles can be easily obstructed because of their height with respect to the floor. However, design rules limit the places heads can be located, giving preference to circulation areas, above light switches, etc to avoid placement of high furniture. Automist also has a remote check feature (from controller) that can move all heads in a property to ensure they have not been covered or blocked in any manner.	Can only be checked by visual inspection of the nozzle in the room. This is an increased risk with the proliferation of concealed nozzles.

Breach to pressure piping/hoses	Yes	As this is a dry pipe system it is not immediately noticed. The flexible hoses behind fire rated walls is intentionally left loose so that drilling does not easily breach the double wire braided high pressure hose. The remote check feature (on controller) can also be used to quickly pressurize the system with air to check for leaks.	This excludes tamper/vandalism and can be the result of poor pipe fittings, incorrect pipe glue, impact of fire stopping measures etc. When it takes place, immediate water discharge occurs, causing damage or the (flow switch triggered) alarm to sound, indicating activation.
Clogging of nozzle seals	Yes	As a dry-pipe system, the O-rings in the nozzle are not under constant pressure or exposure to impurities in the water so they are much less susceptible to deterioration. O-rings have over 60,000 cycle endurance testing and the remote check feature can be used to check their integrity with air pressure.	This has been a notorious problem in the past for sprinklers with product recalls but with the experience the certification of nozzles now take this into consideration, reducing its risk.
Pump shaft seizure	Yes	The 3 piston, positive displacement pump used in Automist does not suffer from potential seizure so there is no need to run it from time to time.	Centrifugal pumps need to be churned periodically to ensure their seals do not seize and stop the impeller from rotating. The pump unit should have this as an automatic feature to prevent downtime.

Conclusions

The key advantage of using electronics for fire suppression is the ability for the system to self-diagnose and indicate any failures there might be to the system as soon as they occur, avoiding downtime altogether. Despite the higher complexity of such a system, it can verify continuously whether it will work as intended. This is the same evolution the automotive and aeronautical industries have gone through, long ago. Self-diagnostics allow a car to indicate to the driver that a fault requires attention before the car breaks down on the motorway. Electronics has also allowed cars to pollute less, consume less, be more reliable and durable, despite the higher complexity. Automist follows the same principles.

The key is to provide the responsible person with attention to the controller so that faults can be noticed. This may be by placing it in a communal corridor in a block of flats or through a link to an alarm panel. Further resilience in diagnostics can be achieved with secondary 24VDC power to the controller so that it can also indicate power loss. Maximum diagnostics resilience can be achieved with an output to a remote monitoring facility while maximum performance resilience can be achieved with backup power to all systems. None of these offered additional features are mandatory for life safety, they are simply increasing the layers of resilience to further reduce the risk to occupants by ensuring that systems will operate as intended and when demanded.

Automist does not need to be recommissioned every year to ensure it will work. It is only suggested as the most robust measure to validate that it will work as intended. If the power is not cut off, the water shut off and the hoses disconnected, it should work as intended if left untouched. This is in fact the benefit of having a full discharge commissioning process and a dry, unpressurised system.

The recommissioning procedure (that may take as little as 20 minutes) is the only method to fully confirm the ability of Automist to operate as intended and should be run if there is any doubt regarding the integrity of the system (after maintenance works in the property, for example).

*Clarification of a domestic versus a residential suppression system

A domestic system is intended to be used in a single or two dwelling application. It is designed to protect a single family in a single home. A residential is a single system (pump unit) intended to protect multiple dwellings. It is designed as a central system for the whole building which covers all properties at once. A domestic system can be installed into a flat but not as a single system to cover a block of flats. A block of flats either has multiple domestic systems (multi-domestic) or a residential system.

APPENDIX A

The method of gaining approval through demonstrating compliance with building and fire codes depends on the requirements of the local Authority Having Jurisdiction (AHJ) and the local and/or state codes that are being enforced. Check the Plumis website for updates.

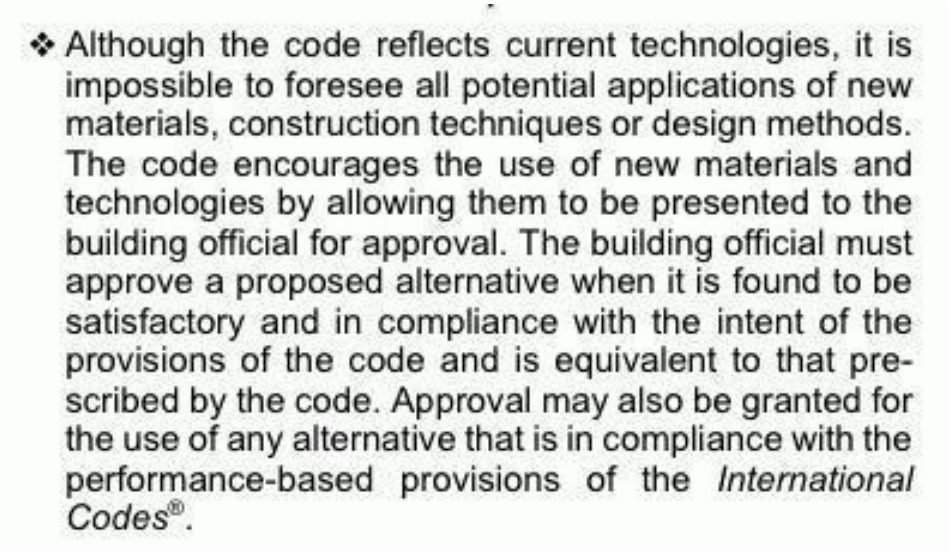
International Residential Code (2015 / 2012)

Pathway to Approval

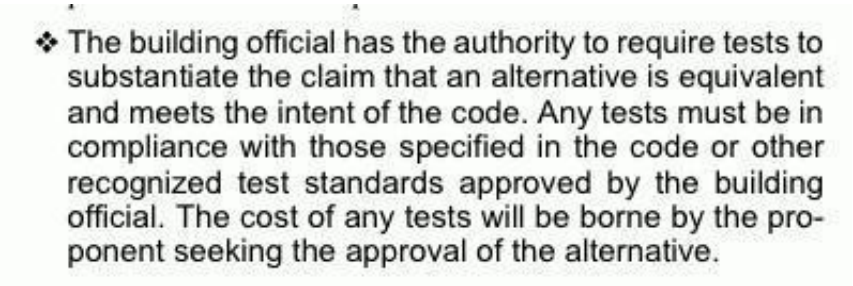
SECTION R104
DUTIES AND POWERS OF THE BUILDING OFFICIAL

R104.9 Approved materials and equipment. Materials, equipment and devices approved by the building official shall be constructed and installed in accordance with such approval.

R104.11 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code. Compliance with the specific performance-based provisions of the International Codes shall be an alternative to the specific requirements of this code. Where the alternative material, design or method of construction is not approved, the building official shall respond in writing, stating the reasons why the alternative was not approved.



R104.11.1 Tests. Where there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, the building official shall have the authority to require tests as evidence of compliance to be made at no expense to the jurisdiction. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the building official shall approve the testing procedures. Tests shall be performed by an approved agency. Reports of such tests shall be retained by the building official for the period required for retention of public records.



SECTION R313
AUTOMATIC FIRE SPRINKLER SYSTEMS

R313.1 Townhouse automatic fire sprinkler systems. An automatic residential fire sprinkler system shall be installed in townhouses.

Exception: An automatic residential fire sprinkler system shall not be required where additions or alterations are made to existing townhouses that do not have an automatic residential fire sprinkler system installed.

R313.1.1 Design and installation. Automatic residential fire sprinkler systems for townhouses shall be designed and installed in accordance with Section P2904 or NFPA 13D.

R313.2 One- and two-family dwellings automatic fire systems. An automatic residential fire sprinkler system shall be installed in one- and two-family dwellings.

Exception: An automatic residential fire sprinkler system shall not be required for additions or alterations to existing buildings that are not already provided with an automatic residential sprinkler system.

R313.2.1 Design and installation. Automatic residential fire sprinkler systems shall be designed and installed in accordance with Section P2904 or NFPA 13D.

International Building Code (IBC 2015)

[A] 104.11 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety. Where the alternative material, design or method of construction is not approved, the building official shall respond in writing, stating the reasons why the alternative was not approved.

[A] 104.11.1 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from approved sources.

[A] 104.11.2 Tests. Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, the building official shall have the authority to require tests as evidence of compliance to be made at no expense to the jurisdiction. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the building official shall approve the testing procedures. Tests shall be performed by an approved agency. Reports of such tests shall be retained by the building official for the period required for retention of public records.

SECTION 202 DEFINITIONS

[A] APPROVED. Acceptable to the building official.

[F] AUTOMATIC FIRE-EXTINGUISHING SYSTEM. An approved system of devices and equipment which automatically detects a fire and discharges an approved fire-extinguishing agent onto or in the area of a fire.

[F] AUTOMATIC SPRINKLER SYSTEM. An automatic sprinkler system, for fire protection purposes, is an integrated system of underground and overhead piping designed in accordance with fire protection engineering standards. The system includes a suitable water supply. The portion of the system above the ground is a network of specially sized or hydraulically designed piping installed in a structure or area, generally overhead, and to which automatic sprinklers are connected in a systematic pattern. The system is usually activated by heat from a fire and discharges water over the fire area.

[F] FIRE PROTECTION SYSTEM. Approved devices, equipment and systems or combinations of systems used to detect a fire, activate an alarm, extinguish or control a fire, control or manage smoke and products of a fire or any combination thereof.

[A] HISTORIC BUILDINGS. Buildings that are listed in or eligible for listing in the National Register of Historic Places, or designated as historic under an appropriate state or local law.

[A] REGISTERED DESIGN PROFESSIONAL. An individual who is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed.

SECTION 903 AUTOMATIC SPRINKLER SYSTEMS

[F] 903.1 General. Automatic sprinkler systems shall comply with this section.

[F] 903.1.1 Alternative protection. Alternative automatic fire-extinguishing systems complying with Section 904 shall be permitted instead of automatic sprinkler protection where recognized by the applicable standard and approved by the fire code official.

From Commentary:

This section permits the use of an alternative automatic fire-extinguishing system when approved by the fire code official as a means of compliance with the occupancy requirements of Section 903. Although the use of an alternative extinguishing system allowed by Section 904, such as a carbon dioxide system or clean-agent system, would satisfy the requirements of Section 903.2, it would not be considered an acceptable alternative for the purposes of exceptions, reductions or other code alternatives that would. be applicable if an automatic sprinkler system were installed.

SECTION 904 ALTERNATIVE AUTOMATIC FIRE-EXTINGUISHING SYSTEMS

[F] 904.1 General. Automatic fire-extinguishing systems, other than automatic sprinkler systems, shall be designed, installed, inspected, tested and maintained in accordance with the provisions of this section and the applicable referenced standards.

[F] 904.2 Where permitted. Automatic fire-extinguishing systems installed as an alternative to the required automatic sprinkler systems of Section 903 shall be approved by the fire code official.

[F] 904.2.1 Restriction on using automatic sprinkler system exceptions or reductions. Automatic fire-extinguishing systems shall not be considered alternatives for the purposes of exceptions or reductions allowed for automatic sprinkler systems or by other requirements of this code.

[F] 904.11 Automatic water mist systems. Automatic water mist systems shall be permitted in applications that are consistent with the applicable listing or approvals and shall comply with Sections 904.11.1 through 904.11.3.

From Commentary:

This section provides the ability to use automatic water mist systems in specific applications. These installations are required to be consistent with the listings or approvals to which such systems have been tested. See Commentary Figure 904.11 for a picture showing the discharge of a water mist nozzle.

[F] 904.11.1 Design and installation requirements. Automatic water mist systems shall be designed and installed in accordance with Sections 904.11.1.1 through 904.11.1.4.

[F] 904.11.1.1 General. Automatic water mist systems shall be designed and installed in accordance with NFPA 750 and the manufacturer's instructions.

[F] 904.11.1.2 Actuation. Automatic water mist systems shall be automatically actuated.

[F] 904.11.1.3 Water supply protection. Connections to a potable water supply shall be protected against backflow in accordance with the International Plumbing Code.

[F] 904.11.1.4 Secondary water supply. Where a secondary water supply is required for an automatic sprinkler system, an automatic water mist system shall be provided with an approved secondary water supply.

[F] 904.11.2 Water mist system supervision and alarms. Supervision and alarms shall be provided as required for automatic sprinkler systems in accordance with Section 903.4.

[F] 904.11.2.1 Monitoring. Monitoring shall be provided as required for automatic sprinkler systems in accordance with Section 903.4.1.

[F] 904.11.2.2 Alarms. Alarms shall be provided as required for automatic sprinkler systems in accordance with Section 903.4.2.

[F] 904.11.2.3 Floor control valves. Floor control valves shall be provided as required for automatic sprinkler systems in accordance with Section 903.4.3.

[F] 904.11.3 Testing and maintenance. Automatic water mist systems shall be tested and maintained in accordance with the International Fire Code.

NFPA 13D (2013)

From the 13D/13R Handbook:

1.1.2 This standard shall not provide requirements for the design or installation of water mist fire protection systems, which are not considered fire sprinkler systems and are addressed by NFPA 750.

Because the definition of the term sprinkler system in 3.3.11.8 could be misconstrued to include a water mist system, it was necessary to clarify that the design and installation of water mist systems are not within the scope of NFPA 13D. The inclusion of this language is not intended to mean that a water mist system could not be used where specifically listed for such use in residential applications and approved by the authority having jurisdiction. As noted in the commentary to 1.1."I, other regulations, such as building codes, specify the type of protection and systems to be installed within certain types of buildings and structures.

ASK THE AHJ

There have been a lot of demonstrations to authorities having jurisdiction in recent years suggesting that water mist systems are a viable fire protection system. Is 1.1.2 indicating that water mist is an unacceptable technology to protect life in the occupancies addressed by NFPA 13D?

Paragraph 1.1.2 is not stating that water mist systems are an unacceptable technology. It is indicating that water mist systems are an entirely different type of system than fire sprinkler systems and that the design and installation requirements for water mist systems are not included within the scope of NFPA 13D. See NFPA 750 for information about the design and installation of water mist systems.

1.4 Equivalency. Nothing in this standard is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this standard.

1.4.1 Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency.

1.4.2 The system, method, or device shall be approved for the intended purpose by the authority having jurisdiction.

1.6 New Technology.

1.6.1 Nothing in this standard shall be intended to restrict new technologies or alternate arrangements, provided the level of safety prescribed by this standard is not lowered.

1.6.2 Materials or devices not specifically designated by this standard shall be utilized in complete accord with all conditions, requirements, and limitations of their listings.

3.3.3 Dwelling. Any detached building, or any part of a townhouse structure that is separated from the remainder of the townhouse structure with fire resistance rated assemblies in accordance with local building code, that contains no more than two dwelling units intended to be used, rented, leased, let, or hired out to be occupied or that are occupied for habitation purposes.

3.3.4 Dwelling Unit. One or more rooms, arranged for the use of one or more individuals living together, as in a single housekeeping unit, that normally have cooking, living, sanitary, and sleeping facilities.

NFPA 750 (2015)

1.1* Scope. This standard contains the minimum requirements for the design, installation, maintenance, and testing of water mist fire protection systems. This standard does not provide definitive fire performance criteria, nor does it offer specific guidance on how to design a system to control, suppress, or extinguish a fire. Reliance is placed on the procurement and installation of listed water mist equipment or systems that have demonstrated performance in fire tests as part of a listing process.

1.2* Purpose.

1.2.1 The purpose of this standard is to provide protection for life and property from fire through the standardization of design, installation, maintenance, and testing requirements for water-based fire suppression systems that use a specific spray (mist) that absorbs heat, displaces oxygen, or blocks radiant heat to control, suppress, or extinguish fires as required by the application.

1.2.2 The user of this standard shall recognize the complexity of water mist fire suppression systems. Therefore, the designer shall be cautioned that the standard is not a design handbook. The standard shall not do away with the need for the engineer or for competent engineering judgment. It is the intent that a designer capable of applying more complete and rigorous analysis to special or unusual problems shall have latitude in the development of such designs. In such cases, the designer shall be responsible for demonstrating the validity of the design approach.

1.3 Application. This standard shall apply to water mist fire protection systems and shall establish minimum requirements for water mist technology on the basis of sound engineering principles, test data, and field experience.

1.5 Equivalency. Nothing in this standard is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this standard.

1.5.1 Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency.

1.5.2 The system, method or device shall be approved for the intended purpose by the authority having jurisdiction.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

A.3.2.1 Approved. The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials; nor does it approve or evaluate testing laboratories. In determining the acceptability of installations, procedures, equipment, or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure, or use. The authority having jurisdiction may also refer to the listings or labelling practices of an organization that is concerned with product evaluations and is thus in a position to determine compliance with appropriate standards for the current production of listed items.

3.2.3* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

A.3.2.3 Listed. The means for identifying listed equipment may vary for each organization concerned with product evaluation; some organizations do not recognize equipment as listed unless it is also labeled. The authority having jurisdiction should utilize the system employed by the listing organization to identify a listed product.

3.3.24.7* ***Pre-Engineered Water Mist Systems.*** Those systems that have predetermined pipe and tube sizes, maximum and minimum pipe lengths, number of fittings and numbers and types of nozzles, nozzle pressures, atomizing media, and water storage quantities and that do not require additional hydraulic calculations.

A.3.3.24.7 Pre-Engineered Water Mist Systems. These systems have the specific pipe size, maximum and minimum pipe lengths, flexible hose specifications, number of fittings, and number and types of nozzles prescribed by a testing laboratory. Systems are provided with either a self-contained or an external water supply. Based on actual test fires, the hazards protected by these systems are specifically limited as to type and size by a testing laboratory. Limitations on hazards that are allowed to be protected by these systems are contained in the manufacturer's installation manual, which is referenced as part of the listing.

5.1* Classification of Occupancies for Water Mist Systems.

5.1.1 Occupancy classifications for this standard shall relate to water mist system design, installation, and water supply requirements only, as designated for the occupancies by their listing.

5.1.1.1* Light Hazard Occupancies. Light hazard occupancies shall be defined as occupancies or portions of other occupancies where the quantity and/or combustibility of contents is low and fires with relatively low rates of heat release are expected. [**13:**5.2]

A.5.1.1.1 Light hazard occupancies include occupancies having uses and conditions similar to the following:

(1) Animal shelters

(2) Churches

(3) Clubs

(4) Eaves and overhangs, of combustible construction with no combustibles beneath

(5) Educational

(6) Hospitals, including animal hospitals and veterinary facilities

(7) Institutional

(8) Kennels

(9) Libraries, except large stack rooms

(10) Museums

(11) Nursing or convalescent homes

(12) Offices, including data processing

(13) Residential

(14) Restaurant seating areas

(15) Theaters and auditoriums, excluding stages and prosceniums

(16) Unused attics

6.1.1 Component Listing.

6.1.1.1 Unless the requirements of 6.1.1.2 or 6.1.1.3 are met, all water mist system components shall be listed for their intended use.

6.1.1.2 The requirements of 6.1.1.1 shall not apply where approved components are specifically permitted to be substituted for listed components.

6.1.1.3 The requirements of 6.1.1.1 shall not apply to individual components where the components are part of a listed, pre-engineered system.

9.1* General.

A.9.1 Currently, no generic design method is recognized for water mist protection systems. The relationship between flux density or nozzle spacing and performance in controlling fires is not consistent between systems designed by different manufacturers. The system features, such as nozzle spacing, flow rate, drop size distribution, cone angle, and other characteristics, need to be determined for each manufacturer's system through full-scale fire testing to obtain a listing for each specific application.

9.1.1 Listing. Water mist protection systems shall be designed and installed for the specific hazards and protection objectives specified in the listing**.**

9.1.2 Application Characteristics. The characteristics of the specific application (compartment variables and hazard classification) shall be consistent with the listing of the system.

9.1.3 Application Evaluations. An evaluation of the compartment geometry, fire hazard, and system variables described in this chapter shall be performed to ensure that the system design and installation are consistent with the system listing.

9.1.4 Pre-Engineered Systems. Pre-engineered water mist systems for compartment enclosures shall not be extrapolated beyond the volume, ceiling height, ventilation rate, and number of nozzles tested, unless dimensions of the enclosure are such that additional nozzles are required to maintain nozzle spacing.

9.2* Listing Evaluations.

9.2.1* Scope. Listing of water mist fire protection systems or devices shall be based on a comprehensive evaluation designed to include fire test protocols, system components, and the contents of the manufacturer's design and installation manual.

10.3.1 Residential Occupancies up to and Including Four Stories in Height.

10.3.1.1 Scope.

10.3.1.1.1 This section shall cover the design and installation of occupancy protection systems in residential occupancies up to and including four stories in height in buildings not exceeding 18 m (60 ft) in height above grade plane.

10.3.1.2 Purpose.

10.3.1.2.1 The purpose of this section shall be to provide a water mist system that aids in the detection and control of residential fires and thus provides improved protection against injury, life loss, and property damage.

10.3.1.2.2 A water mist system shall be designed and installed in accordance with this section to prevent flashover (total involvement) in the room of fire origin, where water mist protection is provided, and to improve the chance for occupants to escape or be evacuated.

10.3.1.3 System Arrangement. In townhouse-style buildings protected in accordance with this standard, each dwelling unit shall have its own dedicated water mist system, or the control valves for the water mist system shall be located outside the dwelling units or in a common area.

10.3.2 One- and Two-Family Dwellings.

10.3.2.1 Scope.

10.3.2.1.1 This section shall cover the design and installation of occupancy protection systems for one- and two-family dwelling applications.

10.3.2.2 Purpose.

10.3.2.2.1 The purpose of this section shall be to provide a water mist system that aids in the detection and control of residential

10.3.2.4 System Components.

10.3.2.4.1 General. Tanks, pumps, filters, hangers, waterflow detection devices, and waterflow valves shall be in accordance with manufacturers' requirements, but are not required to be listed.

10.3.2.4.2 Pre-Engineered Systems. Where listed pre-engineered systems are installed, they shall be installed within the limitations that have been established by the testing laboratories.

Annex C Examples of Fire Test Protocols

This annex is not a part of the recommendations of this NFPA document but is included for informational purposes only.

C.1 General. In the absence of a generalized design method based on engineering first principles, water mist systems must be listed for specific hazards and protection objectives. It is the intent of NFPA750 that such listings be obtained through full-scale fire tests and system component evaluations conducted by internationally recognized laboratories to demonstrate that performance objectives can be met. New potential applications of water mist arise continuously, for which ad hoc test procedures have been developed. Only a limited number of such ad hoc fire test protocols meet the intent of this standard, which is as follows:

(1) Test protocols should be based on a fire protection engineering evaluation of the fire hazard, the compartment conditions, and the performance objectives for the system.

(2) Test protocols should be developed, carried out, and interpreted by internationally recognized fire testing laboratories.

Only test protocols developed in that manner are recognized as the basis of a listing. The full listing consists of an approval report describing the results of the performance-based fire testing and of the component evaluations and the manufacturer's design installation and maintenance manual. The nozzle characteristics; spacing between nozzles; distances from ceilings, walls, or obstructions; minimum nozzle operating pressures; and water supply requirements are all established by the approval report.

C.1.1 Testing and certification laboratories should extend their system evaluation to components other than the nozzle, based on a customized evaluation or review. Where such evaluations are done, details of the evaluation criteria should be included in the approval report. It is the intent of NFPA 750 that all components not included in the approval report be listed or approved equipment. However, some types of equipment utilized in water mist systems but not fully evaluated in the approval process are new to fire protection applications and no prior listings exist. An example includes the piston-type pumps used in high pressure systems. Such gaps in the approval process are gradually being addressed through changes to other standards (such as NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection) and by case-by-case evaluations conducted by a recognized testing laboratory. C.1.2 Table C.1.2 identifies several organizations with wide International recognition that currently develop or administer test protocols for water mist fire suppression systems. The following sections provide brief descriptions of the scope of application and the acceptance criteria of the test protocols that are the basis for the 1998 listings for water mist systems. The testing laboratories can add or subtract certain fire tests, at their discretion, based on their interpretation of the system performance limits. The reader should refer to the original test protocols for complete test details.

3. Underwriters Laboratories Inc., Northbrook, IL, USA	ANSI/UL 2167, *Standard for Water Mist Nozzles for Fire Protection Service* [contents can be read from the standard]

APPENDIX B

Technical Specification for High Pressure Hose

"All hoses and fittings should be supplied and installed in accordance with the manufacturer's instructions and should be suitable for use at the pressures and flows to be experienced in the systems with the necessary factors of safety."

Fittings

- 1/4" BSP Female thread with swivel nut with 60° cone mating surface
- Material: mild steel (zinc plated)
- NOTE: do not use stainless steel material for any fitting or hose adapter

Hose General

- 1/4" or 3/8" nominal diameter
- Hose working pressure of at least: 2175.57 psi (150 bar)
- Minimum burst Pressure: 8702.26 psi (600 bar)
- Total length up to 196.85 ft (60m), which contains max. 65.6 ft (20m) 1/4" hose and max. 131.23 ft (40m) 3/8" hose.
- Any hoses crimped by the installer or on-site must be pressure tested to at least 2320.6 psi (160 bar) and checked for leaks, before connection to the Automist pump

Hose with 1/4" Inner Diameter (Up to 65.6 ft (20m) in total length)

Multiple hose pieces can be connected by tees or connectors with 1/4" BSP fittings. The total length of 1/4" hose in one Smartscan Hydra system shall NOT exceed 65.6 ft (20m).

For lengths up to 13.1 ft (4m) (Plumis supplied in lengths of 6.6 ft (2m) or 13.1 ft (4m)):

- Minimum curvature working radius: 1.6 inches (40mm)
- Plastic exterior to withstand some abrasion during installation and maintenance works
- Hose is pressure tested in factory assembly to 2X working pressure (4351.13 psi (300bar), so no site testing is necessary)

For lengths of more than 13.1 ft (4m) and up to 65.6 ft (20m):

- Minimum curvature working radius: 3.9 inches (100mm)
- Robust rubberised exterior and double wire braiding to withstand heavy abrasion during installation and maintenance works and attempts to hammer a nail through from an adjacent wall.
- Recommended hose specifications that meet the above requirements:
    - DIN EN 853 2SN / SAE 100R2AT - 1/4" nominal diameter
    - DIN EN 857 2SN - 1/4" nominal diameter
        - Rubber inner tube, double steel wire braid and outer rubber tube with 15mm external diameter
        - 5801.51 psi (400 bar) working pressure

Hose with 3/8" Inner Diameter (Up to 131.23 ft (40m) in total length)

Multiple hose pieces can be connected by tee or connector with 1/4" BSP connection. The total length of 3/8" hose in one Smartscan Hydra system shall NOT exceed 131.23 ft (40m).

- Minimum curvature working radius: 4.5 inches (115mm)
- Robust rubberised exterior and double wire braiding to withstand heavy abrasion during installation and maintenance works and attempts to hammer a nail through from an adjacent wall.
- Recommended hose specifications that meet the above requirements:
    - DIN EN 853 2SN / SAE 100R2AT – 3/8" nominal diameter
    - DIN EN 857 2SN – 3/8" nominal diameter
        - Rubber inner tube, double steel wire braid and outer rubber tube with 0.6 inches external diameter
        - 5801.51 psi (400 bar) working pressure
- Note that you should still be able to use 1/4" BSP Fittings with a 3/8" Diameter hose.

APPENDIX C

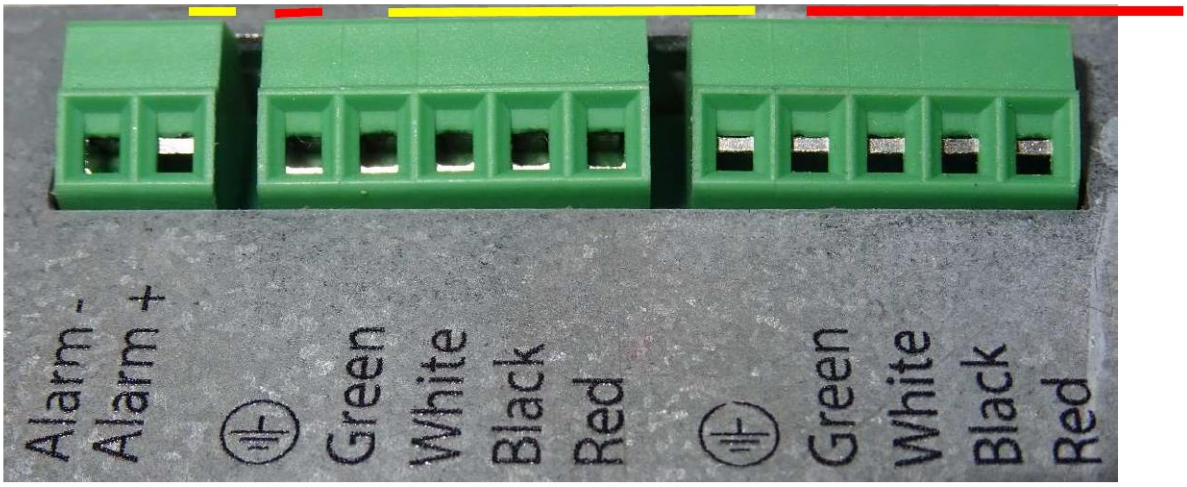
Plumis Hydra Screw Terminals

Hydra connections use 'Rising Clamp' type of terminal. Very important to operate the terminals correctly, otherwise they won't make reliable electrical connection and won't properly clamp the wire.

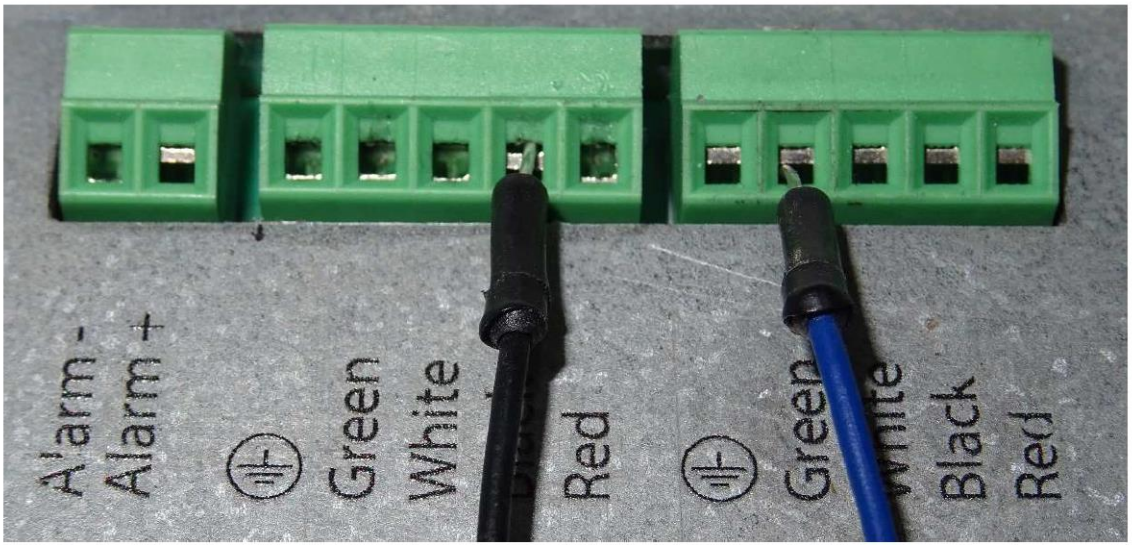
Before inserting wire ensure terminal is fully open/down by rotating terminal screw ANTI-CLOCKWISE 4-5 turns until end-stop, clutch will click with further turns.

After inserting wire turn screw clockwise until tight, use torque settings from DOIM manual. Test connection by gently pulling on wire to confirm it's not loose.

Clamp open/down **Clamp closed/up**



✓ Correct connection **× Bad connection**



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APPENDIX D

Plumis Wireless Smoke Heat Alarm (DT01)

GENERAL INFORMATION

The Wireless Smoke Heat Alarm is 3xAAA battery powered wireless detector intended for use with a compatible wireless alarm system. The detector has a built-in wireless transmitter, which communicates with the control panel. When smoke is detected, the alarm sounds a loud local alarm and the built-in transmitter sends a signal to the control panel. The Wireless Smoke Heat Alarm contains an integrated fixed 41 F (5 C) temperature freeze sensor that will send a warning signal based on temperature detected. This detector is designed to provide protection with 68.9 feet (21 meters) spacing capability.

The detector can send alarm, tamper and battery condition messages to the system's receiver. Refer to the wireless system's instruction for the maximum number of transmitters that can be supported.

CONTENTS OF BOX:

- Wireless Smoke Heat Alarm with base
- Pack of screws and anchors
- Labels or decals as appropriate
- 3 AAA PC2400 Duracell Procell batteries (1.5V 1100mAh) or 3 AAA Energizer E92 batteries (1.5V 1100mAh)

The Wireless Smoke Heat Alarm contains a sounder which generates the ANSI S3.41 temporal 3 pattern in an alarm condition. In alarm, a message is also sent to the control panel. The mounting base installation is simplified by the incorporation of features compatible for both drywall fasteners (not supplied) and other methods.

During initial power-up the LED blinks alternately red, yellow then green. It takes about 8 seconds for the detector to stabilize.

After power-up has completed and the detector is functioning normally, the green LED blinks once every 12 seconds.

SPECIFICATION

Operating Frequency: 2.4 GHz

Maximum Transmit Power: 10 dBm

BATTERY INSTALLATION AND REPLACEMENT

To replace the batteries:

1. Remove the detector from its mounting base by twisting the detector counter-clockwise. Remove and dispose of the batteries according to your local regulations.

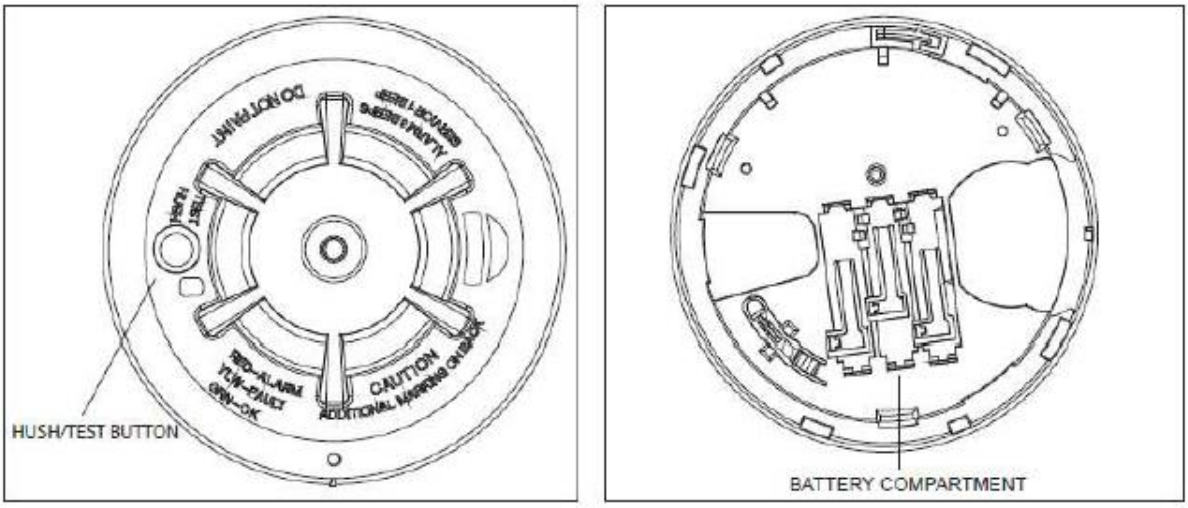
2. To ensure proper power-down sequence wait a minimum of 20 seconds before installing new batteries.

3. Install 3 new AAA batteries (available from your local Duracell or Energizer dealer) in the battery compartment. Follow the polarity diagram inside the compartment. If the batteries are incorrectly inserted, please remove gently with a non-conductive tool and correctly reinsert.

4. Reinstall the detector onto the mounting base by turning the detector clockwise until the mating marks align.

5. After the power-up sequence, the green LED should blink about every 12 seconds to indicate normal operation. If the batteries are not installed correctly, the detector will not operate and the batteries may be damaged. If the detector does not power-up, check for correct batteries installation and for fully charged batteries

CONSTANT EXPOSURES TO HIGH OR LOW TEMPERATURES OR HIGH HUMIDITY MAY REDUCE BATTERY LIFE.



APPENDIX E

Technical Specification for Hydra Data & Alarm Cables

GENERAL INFORMATION

Any queries should be made to info@plumis.com

Note: maximum cable lengths for Hydra is indicated below, installation using longer cables is not approved.

Also, wire ends should have bootlace ferrules fitted to improve connection reliability and avoid short circuits.