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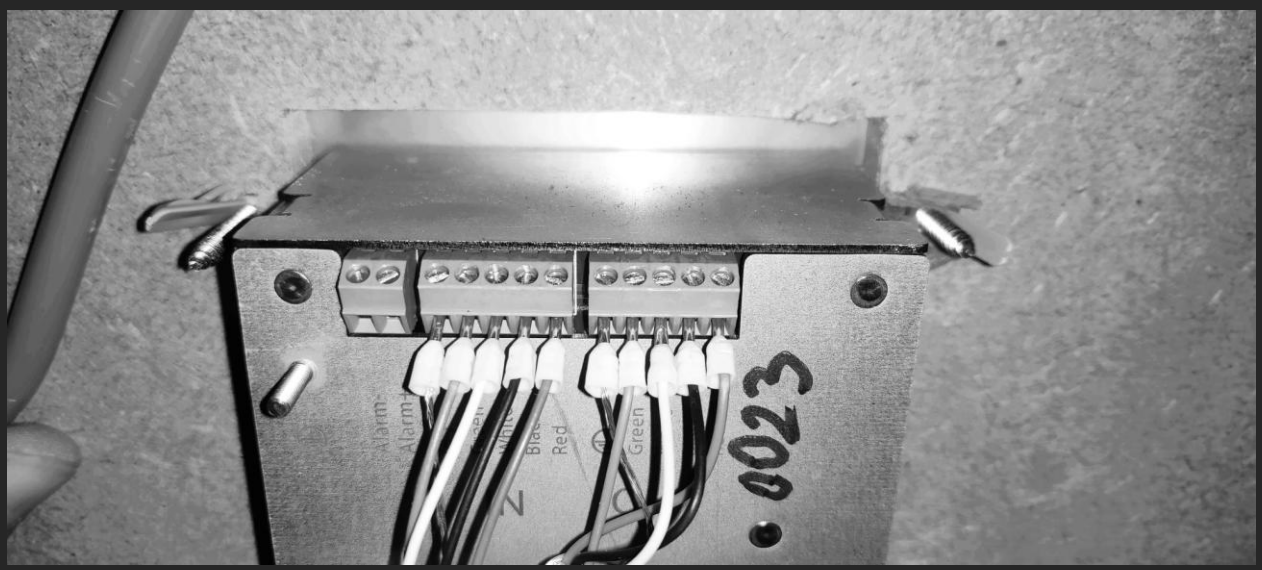
DESIGNED BY PLUMIS

Automist High Pressure hose & cable Installation guide



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1. Introduction to high pressure hose

The information in this guide is correct as of the time of publication. For further information or clarification, users should refer to the Automist DIOM manual or contact Plumis for clarification. Email: technical.automist@plumis.com

Automist uses electronically operated nozzles where the piping is dry and unpressurized until a fire is detected, and the pump is activated. From the hose perspective, it is as if it is in storage in a dry, indoor environment, not exposed to UV light or microbial build up.

Electronically controlled nozzles also mean that the annual service of the system includes a water discharge from every nozzle, inherently testing the integrity of the system piping, which is then fully flushed to return to a dry state.

The flexible hoses are made of long lasting, non-corrosive material in the form of synthetic rubber and braided stainless steel reinforcement. The hoses are placed inside walls so that they are protected from the effects of fire or either, a) utilize a flame-resistant sleeve; b) use a flame-retardant formulation; or c) are replaced by stainless steel piping where the hoses are exposed to potential fires, ensuring its integrity.

The use of flexible high-pressure hoses has been used for the last 14 years by Plumis in the UK across over 15,000 installations. The annual services during this period have demonstrated its suitability for the application.

As a dry and unpressurized flexible hose distribution system, Automist is also impervious to freezing conditions and to seismic activity which create stress and fatigue in piping systems. This means there is no need for the use of anti-freeze (with all its drawbacks) in an Automist installation.

Wet pipe systems have to endure harsher conditions such as the:

- stress cause by fatigue cycling from a jockey pump keeping the stand-by pressure in a pressurized system
- microbial or oxidation build up in the stored water in pipes leading to blockages
- stress caused by expansion and contraction of the water inside the pipes due to temperature variations
- stress from movements in the building, either from seismic activity or temperature variations

Flexible tubing is already used successfully in sprinkler systems in short lengths to make installation easier. PEX piping is already used throughout in domestic sprinkler systems.

Plumis have tested several hoses to ensure the inner friction loss does not exceed that of stainless steel pipe and does not alter the flow pressure or effect the K factor associated with the nozzles listing.

NFPA 750

It is important to note that using high-pressure hose instead of stainless steel tube deviates from the product's UL listing. Therefore, the installer must obtain approval for this deviation from the Authority Having Jurisdiction (AHJ) and strictly adhere to the manufacturer's recommendations for specification and installation. This guide demonstrates suitability for hose to be used with Automist as well as offering contractors advice on installation practices.

Sections 6.3 and 6.4 of NFPA 750 list clauses relating to stainless steel pipe, tube, and flexible hose.
For one and two family dwellings these clauses are not relevant.

Clause **8.3** Pipe and Tubing.
8.3.1 Installation Manual. Piping and tubing for water mist systems shall be installed in accordance with the manufacturer's installation manual.

At the time of writing there is no listing for high pressure hose for use with home fire sprinkler systems, however the recommended hose specifications do have certification standards that must be met.
SAE 100R1 in Britain is a common standard for petroleum and water based fluids and MSHA (Mine Safety and Health Administration) in the United States, tests hoses for both water and water based liquids in high pressure applications outside of the fire sprinkler sector.
No solvents, chemicals or anti-freeze should be used with the Automist system, only potable water should be used.

Hose specification

- 5/16” nominal inner diameter
- Hose working pressure of at least: 2,610 psi (180 bar)
- Minimum burst Pressure: 720 bar 10,445 psi (720 bar)
- Minimum bend radius (MBR): 115mm (subject to type of hose used)

The bend radius of the hose will vary depending on if a single or double braided hose is selected, either choice is compatible with Automist. Double braided hose offers extra protection where mechanical protection is not provided. Bend radiuses could vary by manufacturer. Always check with the hose manufacturer the correct bend radius for the hose being installed.

Robust rubberised exterior and single wire braiding to withstand heavy abrasion during installation and maintenance works and attempts to hammer a nail through from an adjacent wall.

Fittings

1/4” BSPP Female thread for crimped swivel nut ends of hoses and male thread for Tees and bends, with 60° cone mating surface

Material: Stainless Steel

Hose Installation & testing

Hoses can be purchased in predetermined lengths and pre-crimped with fittings by Ferguson Fire and Fabrication in the US. Any hose ends or fittings crimped on site must be pressure tested on site before commissioning. Hose ends must be capped off or covered to avoid dust or other contaminants entering the hose during the rough-in.

When installing pre crimped hoses, no onsite testing is required during the trim inspection. The contractor may choose to carry out a Pneumatic test to confirm the tee connection joints are correctly sealing. This won't detect any damage that may occur between the rough in and trim stage. During commissioning, continuity of hoses is tested during the high pressure flow test where any leak, loose connection or blockage would be observed by a high or low pressure reading on the pumps gauge.

Any hoses crimped at the shop by the installer or on-site must be pressure tested before commissioning is initiated. If hoses are tested after crimping at shop, no on-site testing is necessary.

Pneumatic Test

At a pressure of not less than 2.5 bar for not less than 24 h. Any leakage that results in a loss of pressure greater than 0.15 bar for the 24 h must be corrected.

Hydrostatic Test

At a pressure of 200 bar for 5 minutes. If the system fails to maintain the test pressure, the fault (such as permanent distortion, rupture, or leakage) must be found, corrected and the test repeated. Users must ensure all air is removed from the hoses / pipes network before undertaking a hydrostatic test. Following testing hoses / pipes must be drained and dried to remove any moisture in the network.

For more details on how to carry out Hydrostatic or Pneumatic tests, consult the hose manufacturer and follow their instructions.

High-pressure hoses can be connected in a star or a daisy chain configuration.

In a Star configuration, hoses can be installed from individual spray heads to a central location where they are then connected to a multiway manifold to create the water path.

Due to the data cables being required to be installed in a daisy chain formation, the most common hose installation method is to install the hose from the pump to the first spray head, install a tee to extend the hose to the spray head connection and connect the outlet from the tee to the next spray head or tee piece.

Figure 1 hoses connected via a tee

Supports and fixings

Where hose supports are used, they should meet the following recommendations:

a) 'Hose or pipework supports should be fixed directly to the structural elements or primary supports of the building.
b) Hose or pipework supports should not be used to support any other services.
c) Hose or pipework supports should prevent the pipe from being dislodged.
d) Supports should be secured in accordance with the hose / fittings manufacturer's instructions.
e) Supports should not be glued, welded, or soldered to the pipe, hose, or fittings.
f) Where necessary, supports for hoses or pipework should be suitably lined to prevent corrosion and abrasion.
g) The maximum support spacing should be in accordance with the piping/fittings manufacturer's installation instructions.'

The high-pressure hoses do not need to be protected against freezing as they are kept dry until pump discharge.

IMPORTANT! Before installation ensure the high-pressure hose lengths are in line with Plumis guidelines. The maximum total length of the high-pressure pipe/hose is 60 m. The maximum allowable distance between the pump and the furthest spray head is 30m.

IMPORTANT! Do not use pipe sealant, tape or lubricant on any of the hose end connections to the spray head or the tees, or on any part of the high pressure side of the pump.

IMPORTANT! Pipes must be closed with caps to prevent contaminants from entering the water path until trim.

Figure 2 High pressure stainless steel end cap

Figure 3 plastic end cap

Plastic end caps are designed to prevent debris from entering and contaminating the hose during rough in. Hose ends can be sealed with tape as an alternative way of preventing debris from entering the hose.

Do not carry out pressure tests with plastic end caps.

IMPORTANT! So that fire separating is effective, every joint, or imperfection of fit, or opening to allow services to pass through the element which has fire-resisting function, should be adequately protected by sealing or fire stopping so that the fire resistance of the element is not impaired.

When connecting the hose to the pump's outlet via the M22 adapter, connect the high pressure hose to the adapter first and then screw the adapter to the outlet port.

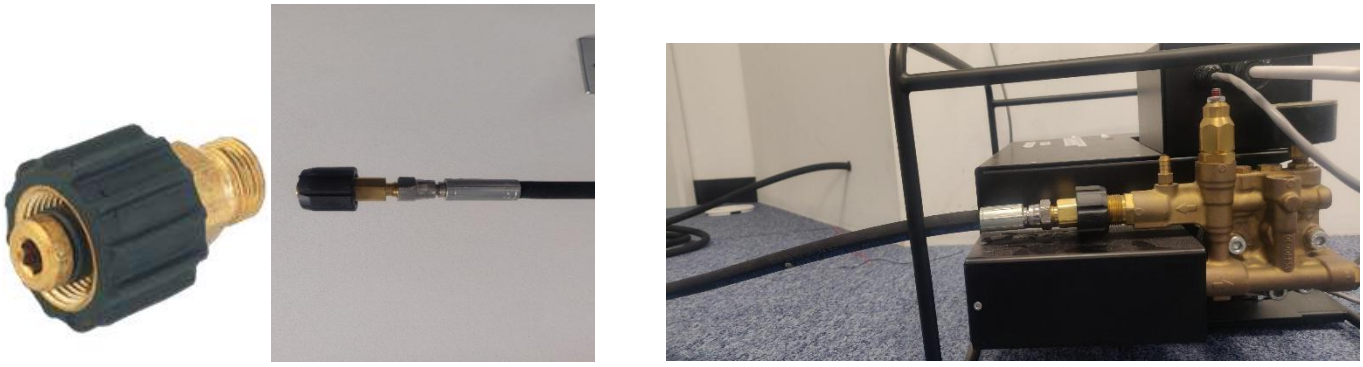

Figure 4 Connecting the high pressure hose to the pump

Cable trays, plastic or metal conduit or pipe clips must be fixed to the structure of the building. Hoses should not be cable tied or fixed to other pipes or cables.

Figure 5 Cable tray hose installation

Figure 6 Hose clips. Can secure the hose to any surface

During the rough in phase of the installation, hoses should be installed with at least 4” of slack to be pulled through the dry wall or back box, having some slack in the hoses will make the trim stage and servicing easier when testing the nozzles and inspecting for any potential leaks.

Figure 7 Hose left unrestricted labelled

Figure 8 slack for ease of connection data cables

Hoses and data cables should be installed in the walls should follow the typical safe zones used as guidance for electrical cables as illustrated below. Where hoses or cables are installed outside of these areas mechanical protection would typically be required.

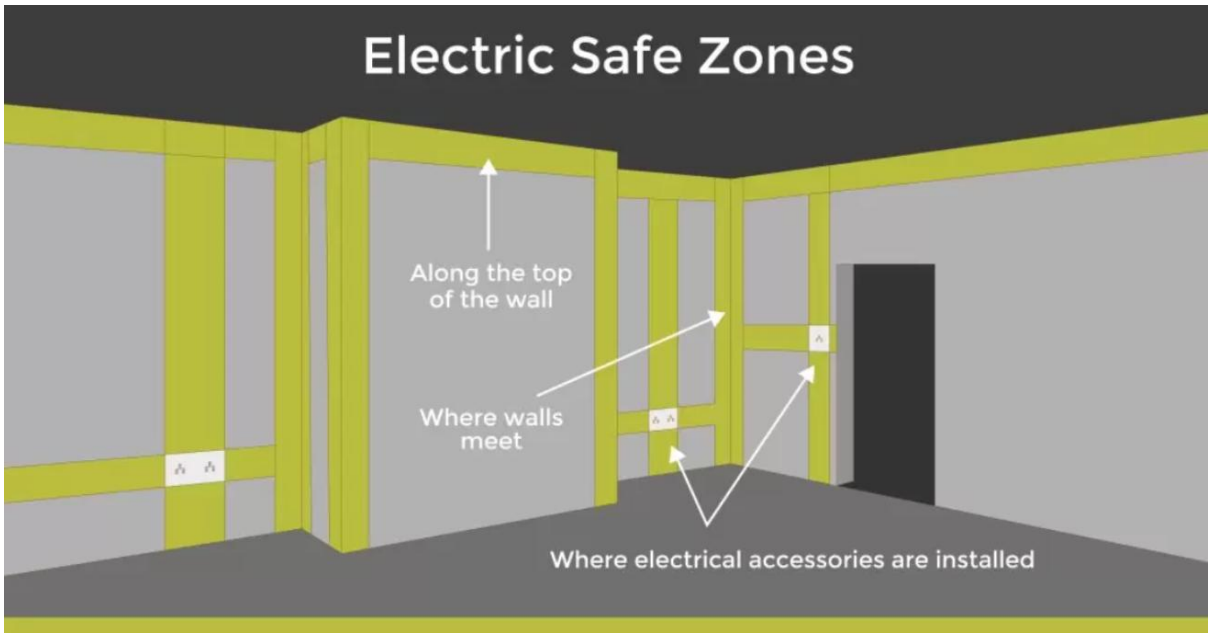

Figure 9 general guide to safe zones for hoses and cables

2. Introduction to Installing Automist cables.

Automist's unique activation method using electronically controlled nozzles, requires cabling for smoke sensors and data cables to be installed for the system to initiate the thermal scanning and process the heat signature data of the room. This data and the cabling infrastructure is as critical part of the system as the nozzle, pump or hose installation. This guide is for contractors who although experienced in running pipe are possibly less experienced installing cabling as part of a home fire suppression system. This guide elaborates on the information provided in the Automist DIOM manual.

Important The DIOM manual supersedes any guidance given in this document, any local or national wiring regulations or codes in your jurisdiction may differ from the guidance given in this document. where information conflicts the DIOM manual or local codes supersede the information in this guide.

Low voltage license

Plumis have designed this guide the DIOM and other training material, to give contractors who are not experienced installing low voltage cables the basic knowledge to safely and competently install the low voltage cabling associated with the Automist system.

Regional requirements for low voltage cables

Many jurisdictions require contractors to hold a specific license to install fire protection systems. In California, for example, a C-16 license is required. However, because Automist installations involve electrical connections—such as 24V data cables between spray heads—contractors often ask whether an additional electrical license, such as a C-7 (low voltage license) or C-10 (electrical license), is necessary.

Is an Electrical License Required for Automist Installations?

No. An additional electrical license is not required because the electrical connections are part of the fire suppression system rather than an independent electrical installation. However, only C-16 license holders should be responsible for installing Automist in homes, reinforcing that fire protection professionals should oversee the entire system.

Clarification from the California Licensing Board

To confirm this requirement, the California Licensing Board was consulted, and their response states:

"Based on the information provided, it is acceptable for specialty contractors, including C-16 Fire Protection contractors, to perform work in other trades that is incidental but essential to completing projects they are otherwise licensed to perform. The low voltage work described appears to be incidental to the installation of the system."

Supporting Legal References

The California Business and Professions Code Section 7059 states:

"Nothing in this section shall prohibit a specialty contractor from executing a contract involving two or more crafts or trades if the work in additional trades is incidental and supplemental to the craft for which the specialty contractor is licensed."

Additionally, Board Rule 831 further clarifies:

"For purposes of Business and Professions Code Section 7059, work in other classifications is considered 'incidental and supplemental' if it is essential to accomplishing the work in which the contractor is classified. A specialty contractor may use subcontractors to complete the incidental work or use their own employees."

Important Note for Installers

While this guidance is specific to California, other states or local jurisdictions may have different requirements. Always verify with the local Authority Having Jurisdiction (AHJ) or licensing board to ensure compliance with regional regulations.

Specifications

All cable specifications and maximum distances are detailed in the Automist DIOM manual, there are a variety of smoke alarm and sounder cables suitable for use with the Automist system. If contractors have queries on the type or compatibility of cables that can be used they should contact Plumis for clarification.

The Data cable listed in the DIOM manual is very specific; there are many data cables of similar specification that appear to the same but have subtle differences. These subtle differences can have significant adverse implications to the system and alternative cables should not be used unless specifically approved by Plumis.

Installing cables and fixing

There are a variety of fixings available for fixing the cables during the installation such as plastic or metal clips or cable ties, conduits, or cable trays to name a few. Where cables are installed in a shared cable tray the cables should be secured directly to the tray and not to other cables already using the tray.

Low voltage automist cables must not be installed in the same conduit, on the same tray or zip tied to AC power cables such as lighting or outlet cables. Doing so will cause interference and could prevent the system from operating properly in the event of a fire, this could also cause a variety of faults to be displayed on the controller.
Unprotected low voltage cables should be kept 12 inches away from high voltage cables to avoid interference.
When installing cables through ceiling joists or floor beams separate holes must be drilled to separate low and high voltage cables. Likewise, when bringing the low voltage cables into the controller do not do so through the same entry hole as the AC power cables.

Always ensure you are using the right size clips for the size of cable, consult with the cable manufacturer if in doubt.

Where cable clips are used these should be evenly spaced and a safe distance away from the edge of the surface to prevent them from becoming trapped or crushed during the construction phase such as by floorboards or dry wall boards being installed.

Cables will often share the same routes as the hoses, where this is the case, it is acceptable to use zip ties to secure cables and the hose together. When using cable ties be sure not to overtighten the zip ties to avoid the tie crushing and damaging the cables.

Cables are protected from fire by the ceiling or behind dry wall, cable routes should follow the same electrical safe zone guide as illustrated in figure 8 above. Where this is not possible mechanical protection should be considered.

Terminating wires

The data cable connections to the spray head must be terminated using bootlace ferrules. This ensures a good connection is made between the cable and the small terminals used on the spray heads. Because the controller uses a larger terminal block, ferrules are not required on the cables connected to the controller.

The bootlace Ferrule must be the correct size for both the size of cable being used and terminal being used. The specification for the Alpha data wire used with Automist is.

Bootlace Ferrule Multicomp E0508-WHITE, 0.5mm2 / 22AWG, pin length 8mm, overall length 14mm.

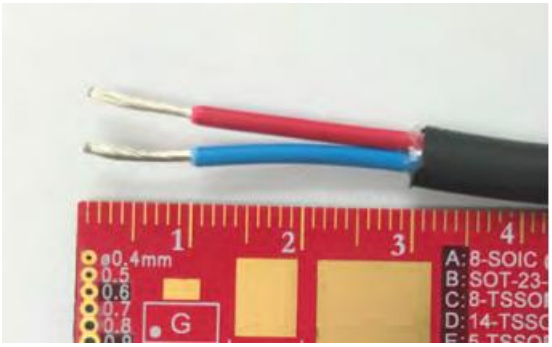

Figure 100 Stripped wire

Figure 11 Boot Lace Ferrule

Using wire strippers remove 30mm of the outer jacket of the cable. Strip back the individual wires to expose 10mm of bare wire. As seen in figure 10 above.

Push the wire into the ferrule, you may feel some resistance if the coloured insulation meets the metal part of the ferrule. If the wire is poking out of the metal end of the ferrule cut the wire back to the edge of the ferrule. Once the cable is inserted insert the ferrule into the crimping tool and crimp the end.

Figure 12 Crimping tool

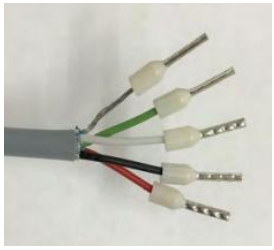

Figure 11 Wire with crimped ferrules

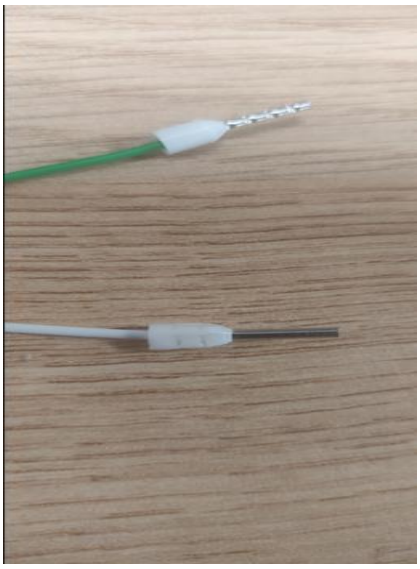

Figure 13 Good and bad wire crimp

Do not crimp the plastic part of the ferrule. Figure 13 shows an example of well crimped ferrule on the green wire and a poorly crimped ferrule on the white wire.

Wiring the spray head

Before inserting wire into the terminal, ensure that the terminal is fully open/down by rotating terminal screw ANTI-CLOCKWISE 4-5 turns until end-stop.

The connections use 'Rising Clamp' type of terminal. It is important to operate the terminals correctly, otherwise they will not make reliable electrical connection and won't properly clamp the wire. After inserting wire turn screw clockwise until tight. Use a torque screwdriver on the following setting: minimum 0.22Nm, maximum 0.25Nm. (Note: the green connector block has Phoenix Contact MKDS 1/5- 3,5). Test connection by Gently pulling on wire to confirm it is not loose.

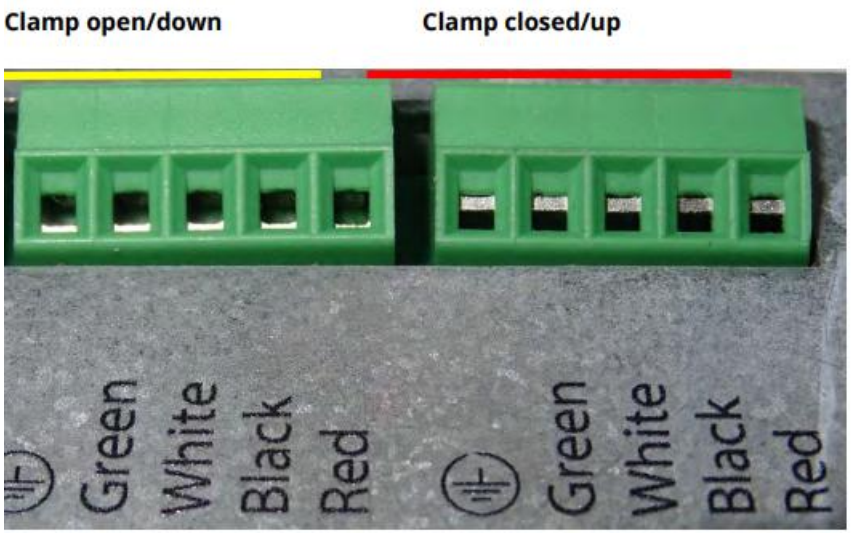

Figure 14 Rising clamp terminals

Figure 15 shoes the cable correctly crimped and wired to the IN terminals of the spray head.

Use the cable bars to hold the cable in place, use an M3 nut driver to remove and replace the cable bar. Do not over tighten the cable bar as this could cause the cable to become crushed and damaged. Tighten the nuts just enough to securely hold the cable.

The cable bar has a grove shape to overlay the cable do not install the cable bar upside down with the flat side against the cable.

Figure 15 Correctly wired spray head terminals

3. Additional support

If you require additional information, support or advice on how to install high pressure hoses or cables, contact Plumis technical support for assistance.

Send a what's app message from your android or apple device.

Connect to Wi-Fi to avoid potential international data charges from your cell plan provider.

Send a message to +44 2078713899

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