
AUTOMIST HYDRA PRE-ENGINEERED WATER MIST SYSTEM

MANUFACTURER'S DECLARATION OF CONFORMITY (MDOC)

For manufacturer supplied components and fire testing results


Components and declaration:

Watermist spray head assembly: SH11

Watermist positive displacement pump assembly: AP08

Watermist system controller: CT01

We hereby declare that the water mist components detailed above conforms to the appropriate recommendations given in BS 8458: 2015, *Fixed fire protection systems – Residential and domestic watermist systems – Code of practice for design and installation*, and BS 8663-1:2019, *Fixed fire protection systems – Components for watermist systems Part 1: Specification and test methods for watermist nozzles* as set out in the accompanying declarations, except as stated below.



08/03/2022

William Makant - Managing Director

BS 8458 Clause	Clause name	Details of deviation
1	Scope	Standard not yet updated to include electronic nozzles so currently out of scope of the standard as it does not conform to the prescriptive requirement for "an integral quick-response thermal release element". Instead, uses an electronically controlled nozzle for improved performance
5	System actuation should be automatic by glass bulb or fusible link, initiated by heat.	System is actuated automatically by a "double-knock" smoke detector and verified through an infra-red temperature sensor, not by a glass bulb or fusible link, for faster and targeted activation. It is proven for a number of scenarios, the measured activation times of a concealed sprinkler head are 2.0 to 13.7 times greater than those using an electronic nozzle system. A combination of an effective Response Time Index (RTI) of 20 m ^{1/2} s ^{1/2} and an effective conduction factor (C factor) of 0.25 m ^{1/2} s ^{-1/2} has been shown to reasonably predict activation times for an electronic nozzle system when simulated in a B-RISK zone model (fire engineering study available on request).
6.3 b)	System design	Hydra is not a wet pipe system, it is a dry-pipe unpressurised system on

		standby which avoids Escape of Water claims from tampering, legionella, corrosion and clogging. Still, it has been successfully fire tested following Annex C and meets 6.1 performance criteria.
6.3 c)	Thermally actuated nozzles	Automist does not use thermally actuated nozzles. It uses either existing fire detection, or it own, which is third party certified to either EN-54 or to BS EN 14604:2005, to initiate the scanning prior to discharge.
6.5	Hydraulic calculations	Automist is a pre-engineered system with a maximum total hose length of 60m. The hydraulic calculations have been done by the manufacturer. See DIOM for details.
6.6	Discharge performance	Automist is electronically controlled so there is no risk of more nozzles activating than required to tackle the fire. This requirement is relevant and critical only to mechanical systems where the activation of nozzles cannot be voluntarily controlled.
6.10	Nozzle coverage and location	Automist has proprietary nozzle locations and coverage which are defined in its DIOM for improved performance, by discharging mist at the base of the fire without loss through the hot layer.
6.11	Components testing and certification	BS 8663 does not cover electronically controlled watermist nozzles. Plumis have summarised all the first-party (internal) and third-party (external) testing done on its system. The test program was either been carried out using BS 8663-1 test protocols or equivalent international certification protocols. In depth, clause by clause details can be found here .
6.11.6.2	Automatic test and monitoring facilities	Pump does not need to and should not be churned as Automist is not a wet pipe system which is charged with water continuously. Still, every component in the system is continuously monitored through an RS-485 bus and Automist is the only residential suppression system which includes a full discharge as part of its commissioning process.

BS 8663 Clause	Clause name	Details of deviation
4.1.1	Stress corrosion	SH11 in its domestic application does not pass this test. Plumis does not consider this test relevant for Automist's domestic application given the room temperature, the nozzle height, infrequent stress cycling (once a year) and absence of water or chloride salts on the nozzle in standby condition, as per assessment in this HSE study: www.hse.gov.uk/research/rrpdf/rr902.pdf . More details on BS 8663 and electronic nozzles here .

Supporting documents:

Type	Link	For official use - Notes
Manufacturer's spray head data sheet	SH11	
Manufacturer's pump data sheet	AP08	
Manufacturer's controller data sheet	CT01	
Manufacturer's spray head drawings	SH11	
Manufacturer's pump drawings	AP08	
Manufacturer's controller drawings	CT01	
Manufacturer's system design manual and installation manual	DIOM 3.02	
Manufacturer's fire performance test report	Warringtonfire fire test report	

MDOC Table 1 – Declaration of system details and design parameters

	System specification and limits	Data	For official use Notes
Flow	Supply type (pump or cylinder)	Positive displacement pump	
	Minimum operating pressure (bar) and flowrate (l/min)	80 bar and 5.6 lpm	
	Maximum operating pressure (bar) and flowrate (l/min)	110 bar and 6 lpm	
	Standby pressure, minimum (bar)	0 bar (dry, open pipe)	
	Standby pressure, maximum (bar)	0 bar (dry, open pipe)	
	Maximum nozzle spacing (m)	Custom to Hydra: 6 m radius, chamfered laterally at 4m as	

		per DIOM	
	Minimum nozzle spacing (m)	0 m	
	Maximum depth below ceiling (mm) Note: Nozzle depth > 300 mm is outside the intended scope of BS 8458: 2015	Depth from FFL of 1100mm to 1450mm	
	Maximum room area (m ²) Note: either fire test room area or 80 m ²	80 m ² as per fire test but unlimited for this targeted system	
	Maximum ceiling height (m), for standard rooms	3.5 m as per fire test	
	Maximum ceiling height (m), for taller spaces	Only as part of fire engineered solution	
Dimensioning of water supply	Minimum design area (m ²)	46m ² which is the maximum area of 1 nozzle	
	Minimum number of nozzles	1 nozzle, always, as it is electronically controlled	
	Minimum design duration (min)	30 minutes	
	Wet system only (dry and pre-action not allowed)	Dry system which performs to the fire performance requirements despite the 21 seconds delay to fill pipes. "Not Allowed" is a misleading statement when performance can nevertheless be met.	
	Flat ceilings and limited slopes	Not limited as nozzles are not in the ceiling. Placement of detectors following BS 5839 should be followed	
	Obstructions	As per details on DIOM and avoided by using "Preferred Positions"	
	Other		

MDOC Table 2 – Declaration of conformance to BS 8458: 2015 fire test protocol for the system in MDOC Table 1

Information required	Details to be completed by manufacturer	For official use
BS 8458 fire test report (report number, number of pages, date, issue number)	Report 514130, 08/03/2022, Issue 1, 33 pages	
Name and address of test laboratory	Warringtonfire, Holmesfield Road, Warrington, UK	
Nozzle arrangement: designation (model, material, unique identifier), type, orientation, k-factor, temperature rating, spacing, operating pressure	SH11 nozzles, AP08 pump and CT01 controller arranged as per this document	
Details of any additives used in the test programme	None	
Details of the water supply method used in the test programme (pump/cylinder specification as well as pressure/flow and duration)	Mains inlet water at 3 bar, supplying 6 lpm	
Fire test series arrangements completed (see Table 1 in guide) from the following: <ul style="list-style-type: none"> • Baseline series (4 tests), give room area and ceiling height • Series for larger rooms (2 tests plus baseline 4 tests), give room area and ceiling height • Series for taller rooms (4 tests plus baseline 4 tests), give room area and ceiling height • Series for taller and larger room (6 tests plus baseline 4 tests), give room area and ceiling height 	Room area for all tests: 32m ² (8m x 4m)	
Any other supporting data	none	
Questions	Answer (yes/no) If no, detail non-compliances and provide supporting data	
Is the test report by an independent third-party, UKAS accredited test laboratory or equivalent?	It is a laboratory that complies with BS EN ISO/IEC 17025:2017, as required by BS 8458:2015	

Is the nozzle in MDOC Table 1 identical to that used for <u>all</u> fire tests?	Yes	
Is the nozzle arrangement (e.g. spacing, pressure, flow, height, depth) in MDOC Table 1 identical to that used for <u>all</u> fire tests?	Yes	
Is the maximum room area of 32 m ² or 50 m ² in MDOC Table 1 confirmed by successful completion of all tests (baseline series) and against all clauses (as given in BS 8458 clause 6.1)? Note: If no, the nozzle model cannot be applied to room areas greater than the fire test room area (i.e. 32 m ² or 50 m ² as tested).	Yes, open room tests successfully completed, allowing for maximum room area of 80m ² as per BS 8458	
Is the maximum ceiling height of 3.5 m in MDOC Table 1 confirmed by successful completion of all tests (baseline series) and against all clauses (as given in BS 8458 clause 6.1)? Note: If no, the nozzle model cannot be applied to room heights from zero to 3.5 m or above.	Yes	
Is the larger room area (maximum area of 80 m ² for maximum ceiling heights of 3.5 m) in MDOC Table 1 confirmed by successful completion of the all tests (series for larger rooms) and against all clauses (as given in BS 8458 clause 6.1)? Note: If no, the nozzle model cannot be applied to room areas of 80 m ² .	Yes	
Is the taller room (maximum ceiling height of 5.5 m and standard test room area) in MDOC Table 1 confirmed by successful completion of the all tests (series for taller rooms) and against all clauses (as given in BS 8458 clause 6.1)? Note: If no, the nozzle model cannot be applied to room heights from 3.5 m to 5.5 m for maximum room areas = area of fire test room.	No	
Is the taller and larger room (maximum ceiling height of 5.5 m and maximum area of 80 m ²) in MDOC Table 1 confirmed by successful completion of all tests (series for taller and larger rooms) and against all clauses (as given in BS 8458 clause 6.1)? Note: If no, the nozzle model cannot be applied to room heights from 3.5 m to 5.5 m and room areas of 80 m ² .	No	
Does the water mist system and test report show full compliance with all clauses BS 8458 (e.g. clause 6.1 and Annex C)?	Yes	

Rationale

BS 8458 contains some prescriptive requirements that exclude the Automist from its scope while it is still a watermist system which meets the performance requirements in the standard. These are

against the principles set in BS-0 and will need to be corrected with the publication of an update to the standard:

'Particularly for the purpose of preventing anticompetitive effects or impeding innovation, whenever possible, provisions are expressed in terms of performance rather than design or descriptive characteristics.'

There is no justification for the refusal to accept Automist on the basis of "not complying with BS 8458" as this would be against Regulation 7, which is law.

Furthermore, the BSI website states that *'British Standards are voluntary in that there is no obligation to apply them or comply with them, except in those few cases where their application is directly demanded by regulatory instruments. They are tools devised for the convenience of those who wish to use them.'*

We have produced this document, at the request of stakeholders, to show how we have considered the existing best practices and framework for traditional mechanical watermist systems as a foundation to provide evidence for the assessment of our innovative product. We do this to show our thinking is consistent with past values and practices and that the only deviations are purposeful for the objective of improved performance. We have created a website with further information at <http://duediligence.automist.uk/>