



BSI Standards Publication

DRAFT FOR DEVELOPMENT

Fixed fire protection systems – Residential and domestic watermist systems –

Part 1: Code of practice for design
and installation

This publication is not to be regarded as a British Standard. See Foreword for further information.

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Committee references FSH/18/2 and FSH/18/6

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Foreword

Publishing information

This part of DD 8458 is published by BSI and came into effect on 31 October 2010. It was prepared by Subcommittees FSH/18/2, *Sprinkler systems* and FSH/18/6, *Gaseous extinguishing media and systems*, under the authority of Technical Committee FSH/18, *Fixed fire fighting systems*. A list of organizations represented on these committees can be obtained on request to their secretary.

Information about this document

Watermist fire suppression systems for domestic and residential applications are designed to provide an additional degree of protection of life and property, above that to be achieved by the installation of smoke and/or fire detectors and systems.

This Draft for Development presumes that the watermist fire suppression system will form part of an integrated fire safety system as part of the building design.

This Draft for Development currently excludes buildings over 20 m in height. It also currently excludes room sizes larger than the test room detailed in Annex A, which will require a different fire test. Recommendations for such buildings are under consideration by the relevant BSI committee.

Product certification/inspection/testing. Users of this Draft for Development are advised to consider the desirability of third-party certification/inspection/testing of product conformity with this Draft for Development. Users seeking assistance in identifying appropriate conformity assessment bodies or schemes may ask BSI to forward their enquiries to the relevant association.

This publication is not to be regarded as a British Standard.

It is being issued in the Draft for Development series of publications and is of a provisional nature because watermist is a new technology, and publication as a Draft for Development will enable the committee to gauge reactions and gather feedback before a full British Standard is produced. It should be applied on this provisional basis, so that information and experience of its practical application can be obtained.

A review of this Draft for Development will be carried out not later than 2 years after its publication.

Notification of the start of the review period, with a request for the submission of comments from users of this Draft for Development, will be made in an announcement in the appropriate issue of *Update Standards*.

According to the replies received, the responsible BSI Committee will judge whether the Draft for Development can be converted into a British Standard or what other action should be taken.

Observations which it is felt should receive attention before the official call for comments will be welcomed.

These should be sent to the Secretary of BSI Technical Committee FSH/18 at British Standards House, 389 Chiswick High Road, London W4 4AL.

Use of this document

As a code of practice, this Draft for Development takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

Any user claiming compliance with this Draft for Development is expected to be able to justify any course of action that deviates from its recommendations.

This Draft for Development is intended for the use of designers, engineers, architects, surveyors, contractors, installers and authorities having jurisdiction.

It has been assumed in the preparation of this Draft for Development that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Presentational conventions

The provisions in this Draft for Development are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is "should".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a Draft for Development cannot confer immunity from legal obligations.

Attention is drawn to the requirements of the water regulations [1–3]¹⁾.

¹⁾ The Water Supply (Water Fittings) Regulations 1999 [1], the Water Byelaws (Scotland) 2004 [2] and the Water Supply (Water Fittings) Regulations (Northern Ireland) 2009 [3].

Introduction

Watermist fire suppression systems have demonstrated their value in assisting the protection of life and property in industrial and commercial applications for many years. The advent of watermist nozzles that operate at an earlier stage in the development of a fire, together with the recognition that the largest numbers of deaths from fire occur in the home, have led to the introduction of watermist fire suppression systems specifically designed for residential and domestic occupancies.

A correctly designed, installed and properly maintained watermist fire suppression system can detect, suppress and control a fire at an early stage of development, and activate an alarm. Operation of the system will rapidly reduce the rate of production of heat and smoke, allowing more time for the occupants to escape to safety or be rescued.

This Draft for Development accordingly covers design, installation, water supplies, maintenance and testing of residential and domestic watermist fire suppression systems installed to assist life safety. However, fire-fighting and life protection encompasses a wide field of endeavour and as such it is impracticable to cover every possible factor or circumstance that might affect implementation of this Draft for Development.

Residential and domestic watermist fire suppression systems consist of a water supply, filter, check valve, stop valve, priority demand valve (where required), automatic alarm system (both internal and external) and pipework to automatic watermist nozzles.

The watermist nozzles are fitted at specified locations, the appropriate watermist nozzle type being used for each location.

The main elements of a typical watermist fire suppression system are shown in Figures 1 to 3. Automatic watermist nozzles operate at a pre-determined temperature to discharge water over a known area below. The flow of water thus initiated causes the sounding of an alarm. Only those watermist nozzles operate which are individually heated above their operating temperature by the heat from the fire.

The provision of a watermist fire suppression system does not negate the need for other fire precautions or practical measures, which may include structural fire resistance, escape routes, smoke or fire detectors and safe housekeeping practices. Even with the installation of a watermist fire suppression system, normal actions on the discovery of a fire need to be taken, such as immediate evacuation and the calling of the fire and rescue service, and owners and occupiers need to be made aware that the watermist fire suppression system should only be turned off by the fire and rescue service when it is deemed safe to do so.

Watermist fire suppression system maintenance is not complex but is essential (see Clause 7). It is important that owners and occupiers pay particular attention to precautions issued by the watermist system supplier, such as the avoidance of obstructions to the watermist nozzle, or the painting of the watermist nozzle or its mounting.

Figure 1 Cylinder-based system

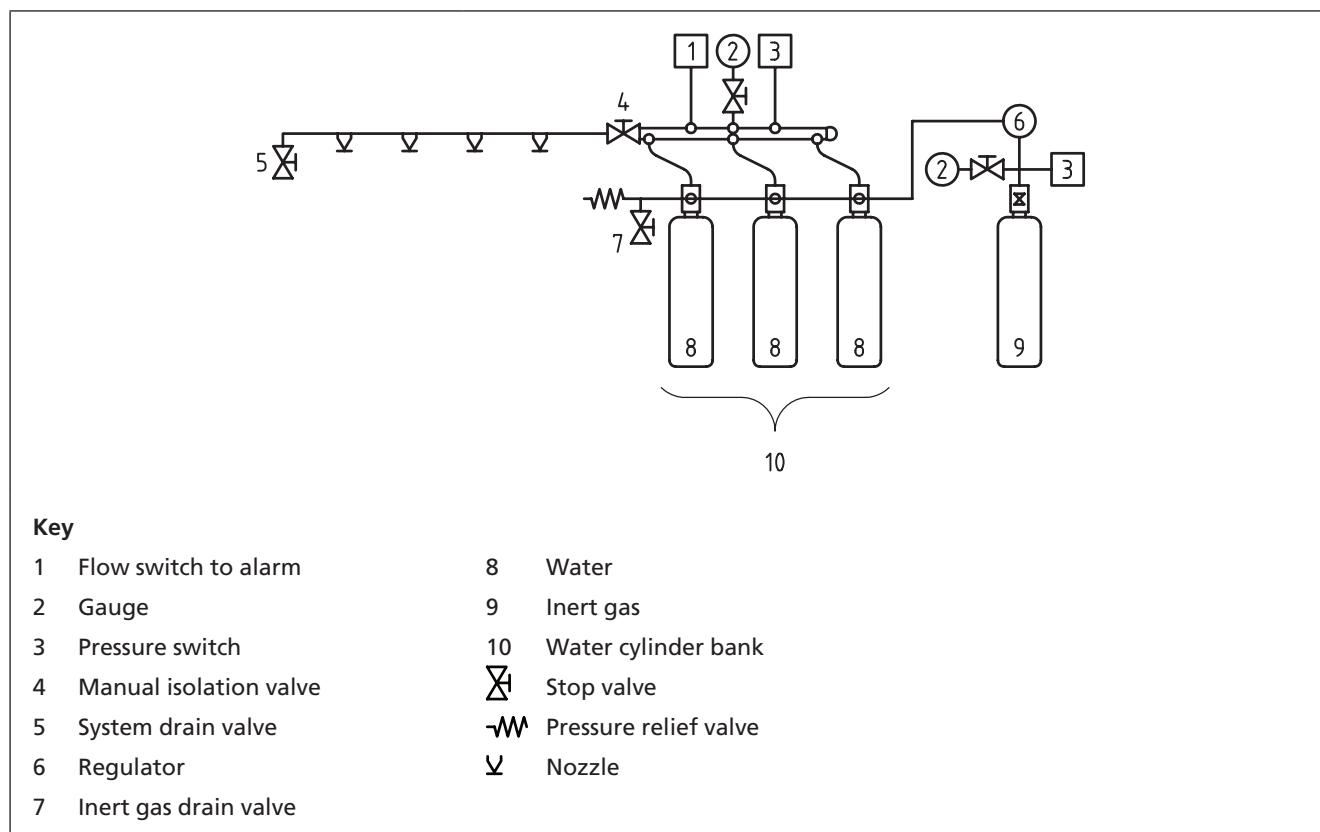


Figure 2 Fire pump and town mains system

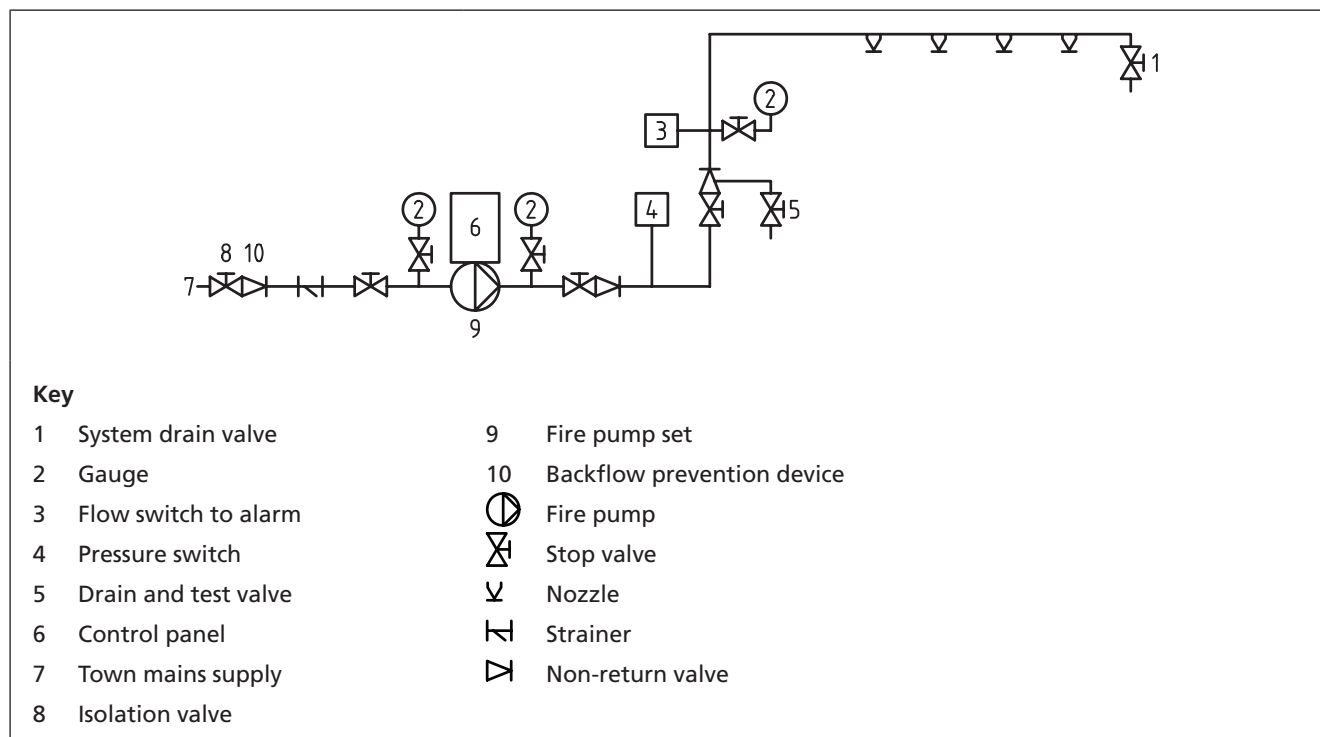
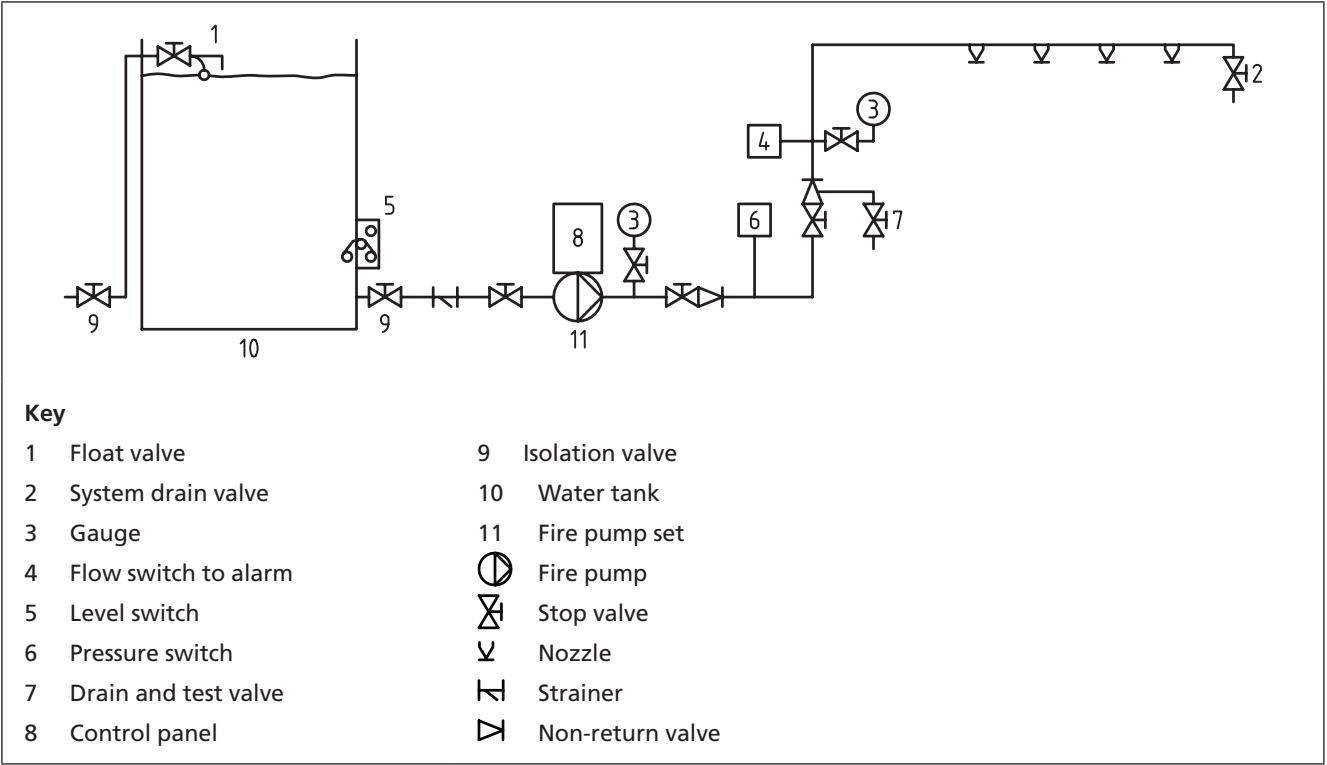


Figure 3 Fire pump and tank system



1 Scope

This Draft for Development gives recommendations for the design, installation, water supplies, commissioning, maintenance and testing of watermist systems with automatic nozzles installed in residential occupancies not exceeding 20 m in height and domestic occupancies. It primarily covers watermist systems used for life safety, but might also provide property protection.

NOTE 1 Residential occupancies for multiple occupation include apartments, residential homes, houses of multiple occupancy (HMOs), blocks of flats, boarding houses, homes for the elderly, nursing homes, residential rehabilitation accommodation and dormitories. Domestic occupancies include individual dwelling houses, individual flats, maisonettes and transportable homes. Secure accommodation, asylum centres and large, open, communal dormitories or equivalent hazards are not covered.

The Draft for Development does not cover watermist systems in industrial and commercial buildings. Recommendations for these systems are given in DD 8489²⁾.

NOTE 2 If the fire/fuel loading in any given occupancy exceeds that which would normally be found in a residential or domestic living room, kitchen or bedroom, or if the fire hazard is greater than that of a conventional residential or domestic occupancy, then this Draft for Development will not be suitable for use. Key indicators of adverse fire hazard include significant volumes of video tapes, books, paper and institutional catering facilities, and the configuration of the building (e.g. high ceilings, large volumes), ventilation and its contents.

²⁾ In preparation.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 5839 (all parts), *Fire detection and fire alarm systems for buildings*

BS 6700, *Design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages – Specification*

BS 7671, *Requirements for electrical installations – IEE Wiring Regulations – Seventeenth edition*

BS EN 520:2004, *Gypsum plasterboards – Definitions, requirements and test methods*

BS EN 1057:2006+A1:2010, *Copper and copper alloys – Seamless, round copper tubes for water and gas in sanitary and heating applications*

BS EN 10255, *Non-alloy steel tubes suitable for welding and threading – Technical delivery conditions*

BS EN 12259-1, *Fixed firefighting systems – Components for sprinkler and water spray systems – Part 1: Sprinklers*

BS EN 13238, *Reaction to fire tests for building products – Conditioning procedures and general rules for selection of substrates*

BS EN 15004-1, *Fixed firefighting systems – Gas extinguishing systems – Part 1: Design, installation and maintenance*

BS EN ISO 9453, *Soft solder alloys – Chemical compositions and forms*

ASTM A269-10, *Standard specification for seamless and welded austenitic stainless steel tubing for general service*

ASTM A312, *Standard specification for seamless, welded, and heavily cold worked austenitic stainless steel pipes*

3 Terms and definitions

For the purposes of this Draft for Development, the following terms and definitions apply.

3.1 additive

chemical or mixture of chemicals or gases, intentionally introduced into a watermist system for one or more of the following purposes:

- enhancement of, or compliance with, fire protection requirements;
- corrosion protection;
- frost protection

3.2 alarm device

electrical or mechanical device for indicating water flow in the system by sounding an alarm

3.3 alarm system

electrical or mechanical system audible internally and externally, with a built-in precaution to avoid spurious alarms

- 3.4 alarm test valve**
valve through which water can flow to test the operation of alarm system
- 3.5 authority having jurisdiction**
organization, office or individual responsible for approving equipment, installations and/or procedures
- 3.6 backflow prevention device**
type EA verifiable single check valve which permits water to flow from upstream, but not in the reverse direction
- 3.7 cistern**
stored water supply with cover
- NOTE Attention is drawn to the water regulations [1–3]³⁾, which cover requirements for cisterns.*
- 3.8 control**
<of fire> prevention of fire spread beyond a defined fire zone
- 3.9 design pressure**
range of pressures expected to be applied to a system component
- 3.10 discharge duration**
sum of all the times that watermist discharges throughout one fire-fighting event
- 3.11 domestic occupancy**
individual dwelling for occupation as a single family unit used or constructed or adapted to be used wholly or principally for human habitation, with a maximum individual room plan area of 8 m × 4 m
- 3.12 extinguishment**
<of fire> complete elimination of any flaming or smouldering fire
- 3.13 fire pump**
pump that is automatically operated in the event of a fire and that supplies water to a watermist system from a water storage facility or from a mains supply
- 3.14 maintenance**
combination of all technical and administrative actions, including supervision actions, intended to retain an item in, or restore it to, a state in which it can perform a required function
- 3.15 manufacturer**
organization responsible for manufacturing watermist systems, including nozzles, and for producing the watermist system design manual and the fire test programmes to which it is linked
- 3.16 manufacturer's design and installation manual**
document containing design and installation rules for all details of a watermist system
- 3.17 priority demand valve**
valve for isolating the water supply to the domestic service in the event of watermist operation

³⁾ The Water Supply (Water Fittings) Regulations 1999 [1], the Water Byelaws (Scotland) 2004 [2] and the Water Supply (Water Fittings) Regulations (Northern Ireland) 2009 [3].

3.18 residential occupancy

occupancy for multiple occupation with a building height not exceeding 20 m, with a maximum individual room plan area of 8 m × 4 m

NOTE This occupancy classification does not cover secure accommodation, asylum centres and large, open, communal dormitories or equivalent hazards.

3.19 responsible person

person(s) responsible for or having effective control over fire safety provisions adopted in or appropriate to the occupancy

3.20 room

area, enclosed by walls, floor and a ceiling, which may have personnel doorways to an adjoining room or adjoining rooms provided such doorways have a lintel depth of at least 200 mm

3.21 service pipe

pipe supplying water from a water supply to any premises that are subject to water pressure and flow from that water supply

3.22 stop valve

manually operated valve for controlling the flow of water into the system pipework which is normally kept in the open position

3.23 supplier

company fully trained and authorized by a manufacturer for the design, installation, commissioning and maintenance of its fixed watermist systems and has documentation providing evidence of this

System certification/inspection/testing. Users of this Draft for Development are advised to consider the desirability of third-party certification/inspection/testing of system conformity with this Draft for Development.

Assessed capability. Users of this Draft for Development are advised to consider the desirability of using a contractor who has quality system assessment and registration by an accredited third-party certification body. Appropriate conformity attestation arrangements are described in BS EN ISO 9001.

3.24 suppression

<of fire> reduction in the heat release rate and prevention of re-growth of a fire over the discharge duration

3.25 watermist

water spray for which the $D_{v0,90}$ is less than 1 mm measured in a plane 1 m from the nozzle at its minimum operating pressure

NOTE $D_{v0,90}$ is the drop diameter such that the cumulative volume, from zero diameter to the respective diameter, is nine tenths of the corresponding sum of the total distribution.

3.26 watermist nozzles**3.26.1 concealed watermist nozzle**

recessed watermist nozzle (see 3.26.5) with a cover plate that disengages when heat is applied

3.26.2 fusible link watermist nozzle

watermist nozzle (see 3.26.6) which opens when an element provided for that purpose melts