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Underground fire hydrants — Surface box frames and covers — Specification

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Summary of pages

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Foreword

Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 July 2023. It was prepared by Technical Committee FSH/17, *Fire and rescue service equipment*. A list of organizations represented on this committee can be obtained on request to the committee manager.

Supersession

This British Standard supersedes [BS 750:2012](#), which is withdrawn.

Information about this document

This is a full revision of the document, and introduces the following principal changes:

- new figures for integral and through-bore hydrant types;
- updated requirements for stem seals, drive and termination;
- revision of pressure units for consistency to SI units, for example, converting bar to MPa;
- inclusion of non-metallic materials used for the manufacture of surface boxes installed in areas subject to non-vehicular traffic; and
- new annex containing requirements for alignment and depth of the fire hydrant in the chamber.

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Where websites and webpages have been cited, they are provided for ease of reference and are correct at the time of publication. The location of a webpage or website, or its contents, cannot be guaranteed.

Presentational conventions

The provisions of this document are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is “shall”.

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

Where words have alternative spellings, the preferred spelling of the *Shorter Oxford English Dictionary* is used (e.g. “organization” rather than “organisation”).

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Introduction

A fire hydrant is installed primarily for use by the Fire and Rescue Service (FRS) to quickly secure a supply of water to extinguish a fire in the vicinity. A fire hydrant may also be installed for other purposes that allow a water supplier access to the pressurized water network.

NOTE A fire hydrant installed for non-fire fighting purposes is commonly known as a washout.

The water supplier is responsible for installing and maintaining fire hydrants for both purposes.

It is advisable to consult the FRS and the water supplier during the development of products in accordance with this standard. In general terms, the FRS requires quick access to a supply of water from a fire hydrant using an operating key/bar and a standpipe. The water supplier does not require such quick access but carries a wider range of tools and equipment for operation and maintenance.

Surface boxes manufactured in non-metallic materials are now included for use in low abrasion environments not subject to vehicular traffic.

1 Scope

This British Standard specifies the operational and health and safety requirements for underground fire hydrants conforming to the dimensional, material and performance requirements of [BS EN 14339](#) and [BS EN 1074-6](#). It also includes specific national requirements not included in [BS EN 14339](#) and [BS EN 1074-6](#).

This British Standard applies to underground fire hydrants:

- a) to be installed in a water supply system;
- b) of size DN80;
- c) suitable for a maximum allowable operating pressure (PFA) of 1.6 MPa or 2.5 MPa;
- d) with operating valves; and
- e) with one outlet.

It also specifies requirements for their surface box frames and covers.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes provisions, or limits the application, of this document¹⁾. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Standards publications

[BS 336](#), *Specification for fire hose couplings and ancillary equipment*

[BS 5163-1](#), *Valves for waterworks purposes – Part 1: Predominantly key-operated cast iron gate valves – Code of practice*

[BS 5163-2](#), *Valves for waterworks purposes – Part 2: Stem caps for use on isolating valves and associated water control apparatus – Specification*

[BS 5834-2:2011](#), *Surface boxes, guards and underground chambers for the purposes of utilities – Part 2: Specification for surface boxes*

¹⁾ Documents that are referred to solely in an informative manner are listed in the Bibliography.

[BS 6001-3](#), *Sampling procedures for inspection by attributes – Part 3: Skip-lot sampling procedures*

[BS 6920-1](#), *Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water – Part 1: Specification*

BS EN 736 (all parts), *Valves – Terminology*

[BS EN 1074-1:2000](#), *Valves for water supply – Fitness for purpose requirements and appropriate verification tests – Part 1: General requirements*

[BS EN 1074-2](#), *Valves for water supply – Fitness for purpose requirements and appropriate verification tests – Part 2: Isolating valves*

[BS EN 1074-6:2008](#), *Valves for water supply – Fitness for purpose requirements and appropriate verification tests – Part 6: Hydrants*

[BS EN 1092-2](#), *Flanges and their joints – Circular flanges for pipes, valves, fittings and accessories, PN designated – Part 2: Cast iron flanges*

[BS EN 1092-3](#), *Flanges and their joints – Circular flanges for pipes, valves, fittings and accessories, PN designated – Part 3: Copper alloy flanges*

[BS EN 1561](#), *Founding – Grey cast irons*

[BS EN 1563](#), *Founding – Spheroidal graphite cast irons*

[BS EN 1982](#), *Copper and copper alloys – Ingots and castings*

[BS EN 10088-1](#), *Stainless steels – Part 1: List of stainless steels*

[BS EN 10213](#), *Steel castings for pressure purposes*

[BS EN 10283](#), *Corrosion resistant steel castings*

[BS EN 12163](#), *Copper and copper alloys – Rod for general purposes*

[BS EN 12164](#), *Copper and copper alloys – Rod for free machining purposes*

[BS EN 12165](#), *Copper and copper alloys – Wrought and unwrought forging stock*

[BS EN 12167](#), *Copper and copper alloys – Profiles and bars for general purposes*

[BS EN 12168](#), *Copper and copper alloys – Hollow rod for free machining purposes*

[BS EN 14339:2005](#), *Underground fire hydrants*

[BS EN ISO 7500-1](#), *Metallic materials – Calibration and verification of static uniaxial testing machines – Part 1: Tension/compression testing and machines – Calibration and verification of the force-measuring system*

Other publications

[N1] WATER UK. WIS 04-52-01, *Specification for polymeric anti-corrosion (barrier) coatings* (as amended). Swindon: WRc plc, 1992. ISSN 1353-2510.²⁾

[N2] WATER UK. WIS 04-52-02, *The use of polymeric anti-corrosion (barrier) coatings*. Swindon: WRc plc, 1993. ISSN 0267-0305.³⁾

[N3] WATER UK. WIS 04-52-03, *Specification for anti-corrosion coatings on threaded fasteners* (as amended). Swindon: WRc plc, 1994. ISSN 1353-2510.⁴⁾

²⁾ Available at <https://standards-board.water.org.uk/document/wis-4-52-01-issue-1-specifications-for-polymeric-anti-corrosion-barrier-coatings/>.

³⁾ Available at <https://standards-board.water.org.uk/document/ign-4-52-02-issue-1-the-use-of-polymeric-anti-corrosion-barrier-coatings/>.

⁴⁾ Available at <https://standards-board.water.org.uk/document/wis-4-52-03-issue-1-specification-for-anti-corrosion-coatings-on-threaded-fasteners/>.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in [BS EN 14339](#) and BS EN 736 (all parts) apply.

4 Fire hydrants

4.1 General

As a minimum, fire hydrants conforming to this British Standard shall conform to [BS EN 14339](#).

Fire hydrants shall have a design life of a minimum of 50 years as determined by reference to:

- a) the properties of the materials used in the construction;
- b) the engineering design of the fire hydrant;
- c) the normal situation of installation; and
- d) the conditions of use.

Where materials have time-dependent properties, these shall be selected with reference to the manufacturer's data on such properties to determine their suitability for the function and life span.

Where components of the fire hydrant are designed to be serviceable, this shall not be regarded as a reason to design for a shorter operating life.

Serviceable components shall include those having potential for accidental damage and wear from abnormal use.

The manufacturer shall confirm that parts that are considered to be subject to wear shall be available for the lifetime of the valve.

Fire hydrants shall be one of the following three types:

- 1) type 1 (see [4.2](#) and [Figure 1](#) and [Figure 2](#));
- 2) type 2 (see [4.3](#) and [Figure 3](#)); or
- 3) type 3 (new through-bore variant, [Figure 4](#)).

4.2 Type 1 fire hydrant

Type 1 fire hydrants shall conform to the dimensions shown in [Figure 1](#) or [Figure 2](#).

The operating valve shall conform to [BS EN 1074-1](#), [BS EN 1074-2](#), [BS 5163-1](#) and [BS 5163-2](#) for PFA 16 or PFA 25 valves.

Materials for duckfoot bends shall conform to [BS EN 1561](#) or [BS EN 1563](#).

The Y and Z flanges DN50, PN 16 or PN 25, as shown in [Figure 1](#) or [Figure 2](#), shall be compatible with the mating dimensions given in [BS EN 1092-2](#) and [BS EN 1092-3](#) as appropriate, using the bolts, studs or set screws specified.

NOTE 1 The flanges are not required to be circular and are not required to have raised faces.

NOTE 2 Y or Z flanges may have a groove in the face to accommodate an "O" ring. The bolt holes may be slotted and the slots may extend to the periphery of the flange.

NOTE 3 The duckfoot bend can be integral with the valve body. The inlet bore has a minimum diameter of 80 mm.

Figure 1 — Type 1 fire hydrant showing required dimensions

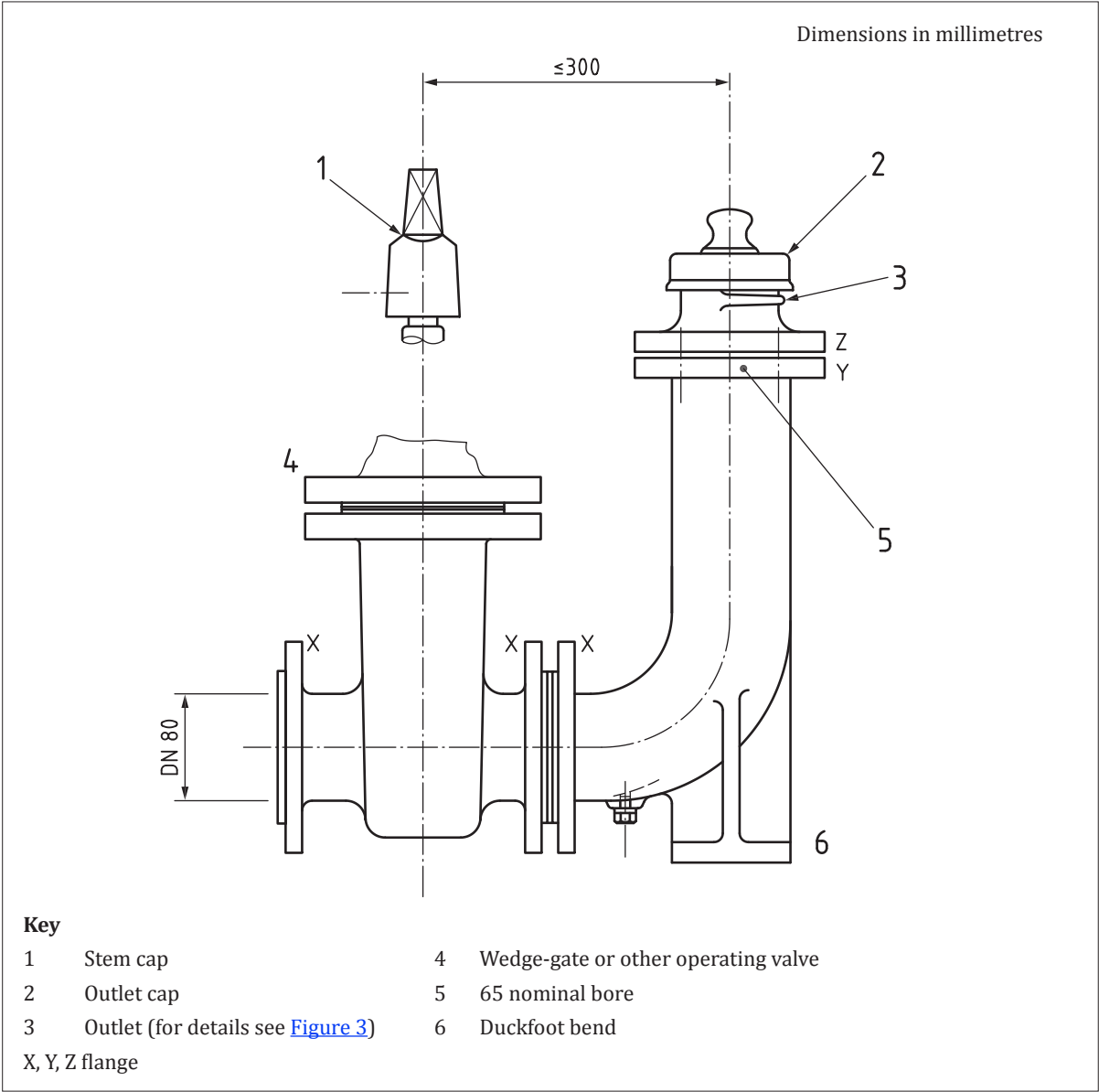
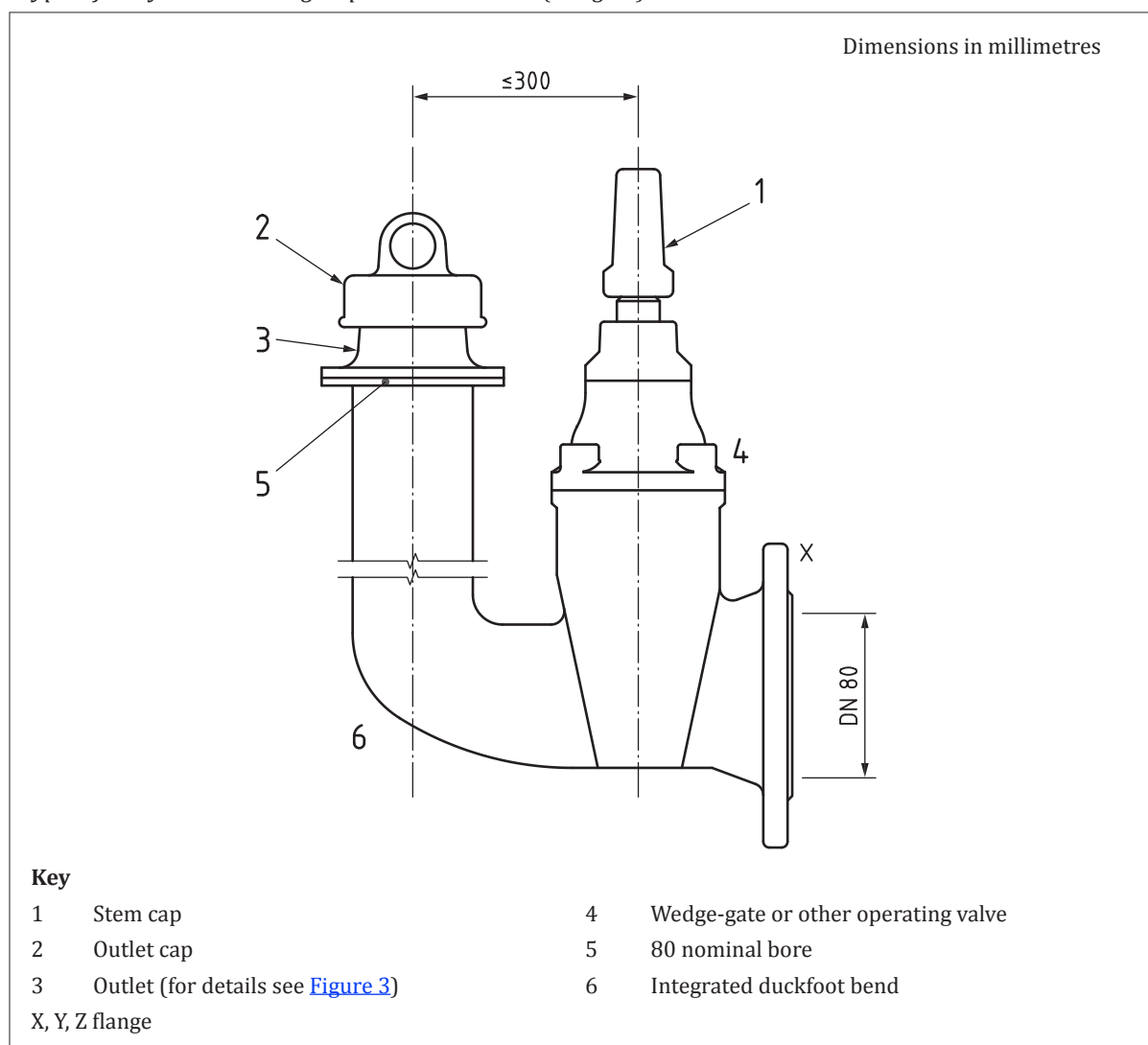


Figure 2 — Type 1 fire hydrant showing required dimensions (integral)

4.3 Type 2 fire hydrant

4.3.1 Classification

Type 2 fire hydrants shall conform to one of the following patterns.

- a) Type 2a: The bonnets and/or outlets of this pattern shall be secured in such a manner that they cannot be removed when installed in a pipeline. With the exception of stem sealings, the manufacturer's literature shall clearly indicate that the fire hydrant cannot be maintained while in situ.
- b) Type 2b: This pattern shall be designed to facilitate maintenance of the obturator, stem, outlet and their seals, in situ, while mounted in a chamber with a surface box frame and cover in accordance with [Clause 14](#). They shall have:
 - 1) Y and Z flanges DN50, PN 16 or PN 25, compatible with the mating dimensions given in [BS EN 1092-2](#) and [BS EN 1092-3](#) as appropriate, using bolts, studs or set screws specified; and

NOTE 1 The flanges are not required to be circular and are not required to have raised faces.

NOTE 2 Y or Z flanges may have a groove in the face to accommodate an "O" ring. The bolt holes may be slotted and the slots may extend to the periphery of the flange.

- 2) a bolted connection at the body/bonnet joint with a minimum of three bolts.
- c) Type 2c: This pattern shall be designed to facilitate maintenance as for type 2b. They shall have bolted connections between both the outlet and body, and the bonnet and body. These connections shall each have a minimum of three bolts.
- d) Type 2d: This pattern shall be designed to facilitate maintenance as for type 2b, but shall have a means of connecting the outlet and/or bonnet to the fire hydrant body other than type 2c (see [4.3.5](#), [5.4](#) and [5.5](#)).

Type 2b, type 2c and type 2d fire hydrants shall be capable of being dismantled in situ using standard, readily available tools.

4.3.2 Dimensions

Type 2 fire hydrants shall conform to the dimensions shown in [Figure 3](#) or [Figure 4](#).

The clearance between the back of flange X, where used, (see [Figure 3](#) or [Figure 4](#)) and the body shall be not less than 17 mm at the position of any bolt hole.

The mating dimensions of flange X, where used, (see [Figure 3](#) or [Figure 4](#)) shall be in accordance with [BS EN 1092-2](#), DN80 and PN 10, PN 16 or PN 25.

NOTE Flange X is not required to be circular or full-form and may be provided with additional holes, which may be slotted, to suit other flange designs.