

Introduction

This Technical Booklet has been prepared by the Department of the Environment for Northern Ireland and provides for certain methods and standards of building which, if followed, will satisfy the requirements of the Building Regulations (Northern Ireland) 1994 (“the Building Regulations”).

There is no obligation to follow the methods or comply with the standards set out in this Technical Booklet.

If you prefer you may adopt another way of meeting the requirements of the Building Regulations but you will have to demonstrate that you have satisfied those requirements by other means.

Other regulations

This Technical Booklet relates only to the requirements of regulation P5. The work will also have to comply with all other relevant Building Regulations.

British Standards and European Technical Specifications

In this introduction and throughout this Technical Booklet any reference to a British Standard shall be construed as a reference to –

- (a) a British Standard or British Standard Code of Practice;
- (b) a harmonised standard or other relevant standard of a national standards body of any Member State of the European Economic Area;
- (c) an international standard recognised for use in any Member State of the European Economic Area;
- (d) any appropriate, traditional procedure of manufacture of a Member State of the European Economic Area which has a technical description sufficiently detailed to permit an assessment of the goods or materials for the use specified; or
- (e) a European Technical Approval issued in accordance with the Construction Products Directive,
provided that the proposed standard, code of practice, specification, technical description or European Technical Approval provides, in use, equivalent levels of safety, suitability and fitness for purpose as that provided by the British Standard.

Products conforming with a European Council Directive

Any product designed and manufactured to comply with the requirements of a European Council Directive does not have to comply with any other standard or part of a standard, whether British, International or other, which relates to the same characteristic or specific purpose as the EC Directive.

EC marked construction products

Any construction product (within the meaning of the Construction Products Directive) which bears an EC Mark shall be treated as if it satisfied the requirements of any appropriate British Board of Agrément Certificate, British Standard or British Standard Code of Practice relating to such a product, where the EC Mark relates to the same characteristic or specific purpose as the Certificate, Standard or Code of Practice.

Testing of materials and construction

Where for the purposes of this Technical Booklet testing is carried out it shall be carried out by an appropriate organisation offering suitable and satisfactory evidence of technical and professional competence and independence. This condition shall be satisfied where the testing organisation is accredited in a Member State of the European Economic Area in accordance with the relevant parts of the EN 45000 series of standards for the tests carried out.

Materials and workmanship

Any work to which a requirement of the Building Regulations applies must, in accordance with Part B of the Building Regulations, be carried out with suitable materials and in a workmanlike manner. You can comply with the requirements of Part B by following an appropriate British Standard or you may demonstrate that you have complied with those requirements by other suitable means, such as an acceptable British Board of Agrément Certificate, Quality Assurance Scheme, Independent Certification Scheme or Accredited Laboratory Test Certificate.

Diagrams

The diagrams in this Technical Booklet supplement the text. They do not show all the details of construction and are not intended to illustrate compliance with any other requirement of the Building Regulations. They are not necessarily to scale and should not be used as working details.

References

Any reference in this Technical Booklet to a publication shall, unless otherwise stated, be construed as a reference to the edition quoted, together with any amendments, supplements or addenda thereto current at 28 February 1994.

Contents

	Page
Section 1 General	3
Section 2 Systems with a storage vessel up to 500 litres and 45 kW	5
Section 3 Systems with a storage vessel over 500 litres or over 45 kW	6
Section 4 Discharge pipes from tundishes	8
Appendix Publications referred to	10

Section 1 – General

1.1 This Section contains provisions for an unvented hot water storage system.

All the components within the system shall be of adequate strength and capable of safely withstanding the temperatures and pressures.

Definitions

1.2 In this Technical Booklet the following definitions apply –

Package – an unvented hot water storage system having factory fitted safety devices together with a kit containing pressure and other devices supplied by the package manufacturer, to be fitted by the installer (see Diagram 1.1).

Unit – an unvented hot water storage system having safety devices and all other devices factory fitted by the unit manufacturer (see Diagram 1.2).

Unvented hot water storage system – includes a system with an unvented vessel for either –

- (a)** storing domestic hot water for subsequent use; or
- (b)** heating domestic hot water as it passes through an integral coil or pipe (eg. water jacketed tube heater or combi boiler).

1.3 Limitation on heating sources

An unvented hot water storage system shall not be heated –

- (a)** directly by a solid fuel heating appliance; or
- (b)** indirectly by a sealed primary circuit which is heated by a solid fuel heating appliance.

1.4 Installation

The installation shall be carried out by a person holding a current Registered Operative Identity Card for the installation of unvented hot water storage systems issued by –

- (a)** the Association of Installers of Unvented Hot Water Storage Systems (Scotland and Northern Ireland);
- (b)** the Institute of Plumbing;
- (c)** the Construction Industry Training Board; or
- (d)** an equivalent body.

Diagram 1.1 Unvented hot water storage system – Package *

see para 1.2

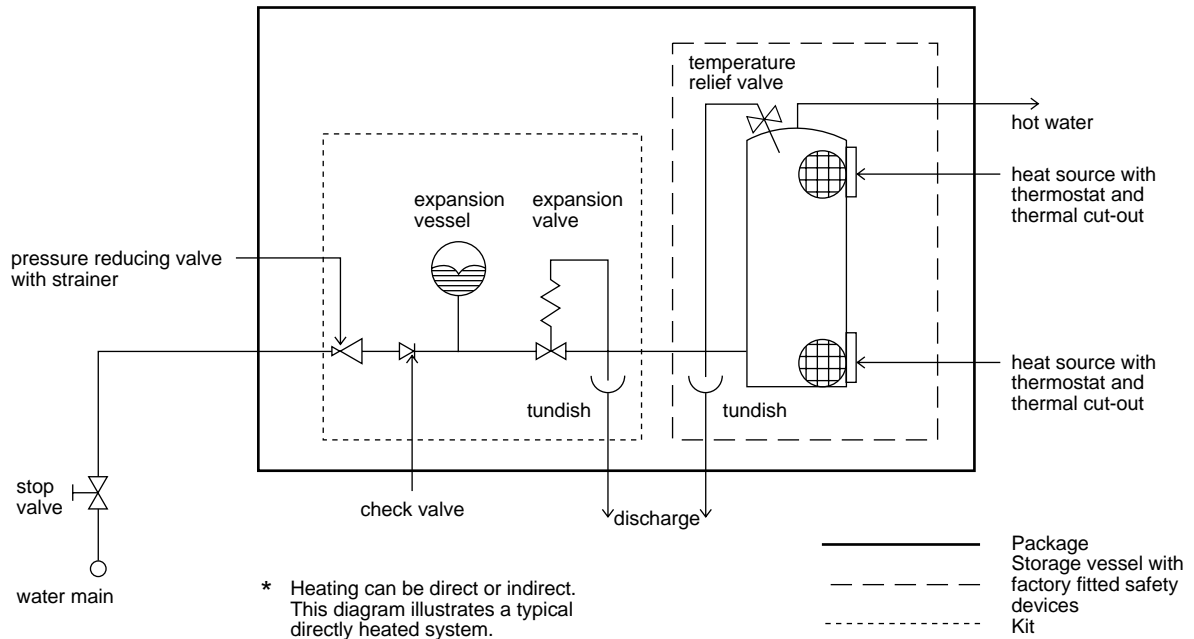
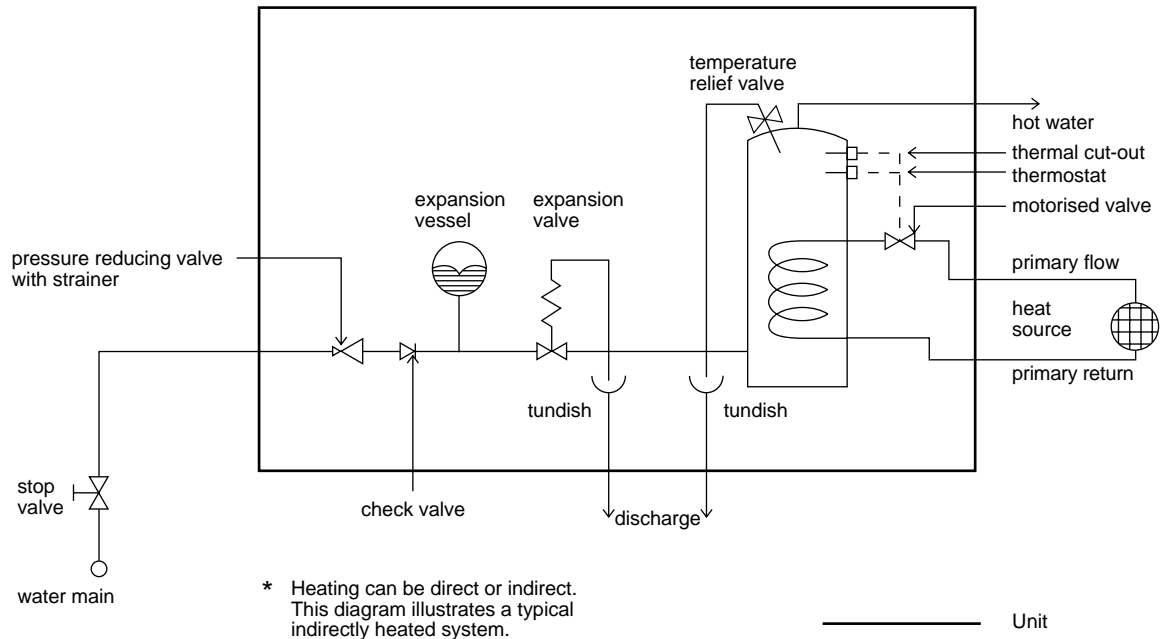


Diagram 1.2 Unvented hot water storage system – Unit *

see para 1.2



Section 2 – Systems with a storage vessel up to 500 litres and 45 kW

2.1 This Section contains provisions for an unvented hot water storage system, whether heated directly or indirectly, having a storage vessel which has a capacity of not more than 500 litres and a power input of not more than 45 kW.

2.2 Unvented hot water storage systems

An unvented hot water storage system shall –

(a) have pipework complying with Clause 7 of BS 6700: 1987;

(b) be a unit or package which has been certified –

(i) as meeting the relevant requirements of regulation P5 by a member body of the European Organisation for Technical Approvals (EOTA) operating a Technical Approvals Scheme (eg. the British Board of Agrément under MOAT 38: 1986); or

(ii) by a certification body having National Accreditation Council for Certification Bodies accreditation as complying with BS 7206: 1990;

(c) have controls over the heating source or sources complying with paragraph 2.3;

(d) have a tundish or tundishes complying with paragraph 3.6; and

(e) have a suitable discharge pipe or pipes complying with Section 4.

2.3 Control on heating sources

Devices to control the heating source or sources shall be supplied by the manufacturer as part of the unit or package, and shall comply with paragraphs 3.2 and 3.3.

However, an indirectly heated system, which incorporates a boiler, may have the thermal cut out on the boiler.

Section 3 – Systems with a storage vessel over 500 litres or over 45 kW

3.1 An unvented hot water storage system, whether heated directly or indirectly, having a storage vessel which has a capacity of more than 500 litres or a power input of more than 45 kW will generally be an individual design for a specific project.

The system shall generally comply with Clause 7 of BS 6700: 1987, as qualified by paragraphs 3.2 to 3.6.

Safety devices – temperature

3.2 An unvented hot water storage system shall have the following safety devices to limit the temperature of the stored water –

(a) a non self-resetting thermal cut out on each heating source, complying with either –

(i) BS 3955: 1986; or

(ii) BS EN 257: 1992, when the stored water is heated by a gas burning appliance; and

(b) one or more temperature relief valves to BS 6283 Part 2: 1991 or BS 6283: Part 3: 1991 which have a total discharge capacity (measured in accordance with Appendix F of BS 6283: Part 2: 1991 or Appendix G of BS 6283: Part 3: 1991) at least equal to the power input to the water.

These safety devices shall be factory fitted and located directly on the storage vessel, operate in sequence as the temperature rises and be additional to any thermostatic device fitted to control the temperature of the stored water.

3.3 Where the system is indirectly heated the non self-resetting thermal cut out shall be wired to a motorised valve or some other device which is –

(a) approved by a member of EOTA; or

(b) approved by a body having NACCB accreditation,

as being capable of shutting off the flow to the primary heater.

However, an indirectly heated system, which incorporates a boiler, may have the thermal cut out on the boiler.

3.4 Pressure devices

An unvented hot water storage system shall have the following devices to control the pressure within the system –

(a) a pressure reducing valve complying with BS 6283: Part 4: 1991; and

(b) an expansion valve complying with BS 6283: Part 1: 1991.

3.5 Other devices

An unvented hot water storage system shall also have –

(a) a check valve complying with BS 6282: Part 1: 1982 to prevent the expansion of water to the cold supply; and

(b) an expansion vessel complying with BS 6144: 1990 sized to accommodate all the expansion of the water on heating.

3.6 Tundishes

Each temperature relief valve and expansion valve shall discharge through a metal pipe either individually, or via a manifold, to a tundish incorporating an air break.

Where the discharge is individual the pipe size, between the valve and the tundish, shall be not less than the nominal outlet size of the valve.

Where a manifold is used it shall be so sized that it can accept the total discharges from the valves connected to it.

The tundish shall be located –

- (a) vertically;
- (b) not more than 500 mm horizontally from any valve discharging to it;
- (c) where it can be readily seen but not create a hazard; and
- (d) in the case of a temperature relief valve – in the same space as the storage vessel.

The tundish shall be connected to a discharge pipe complying with Section 4.

Section 4 – Discharge pipes from tundishes

General

4.1 A discharge pipe from a tundish shall –

- (a)** be of metal;
- (b)** be at least one pipe size larger than the outlet from the safety device or manifold discharging to the tundish;
- (c)** be no longer than the equivalent in hydraulic resistance of a straight 9 m length of pipe unless its size is increased in accordance with paragraph 4.2;
- (d)** have a vertical section of not less than 300 mm long below the tundish before any elbows or bends in the pipework (see Diagram 4.1); and
- (e)** have a continuous fall.

4.2 In calculating the hydraulic resistance of a discharge pipe the resistance of straight lengths, elbows and bends shall be taken into account.

If a discharge pipe is of copper its size shall be calculated using the values given in Table 4.1 and the method shown in the worked example.

Visibility of discharge

4.3 The discharge from a safety device which may consist of scalding water and steam, shall be visible at the tundish and shall also be visible at the final point of discharge.

4.4 Acceptable discharge arrangements include –

- (a)** below a fixed louvred grating and above the water seal in a trapped gully (see Diagram 4.1); or
- (b)** downward discharge at low level but no less than 100 mm above external surfaces and having a wire cage or suitable guard to prevent contact.

Where a number of discharge pipes are grouped together each discharge pipe shall be marked to make the system which is discharging readily identifiable.

Diagram 4.1 Typical discharge pipe arrangement

see paras 4.1 – 4.4

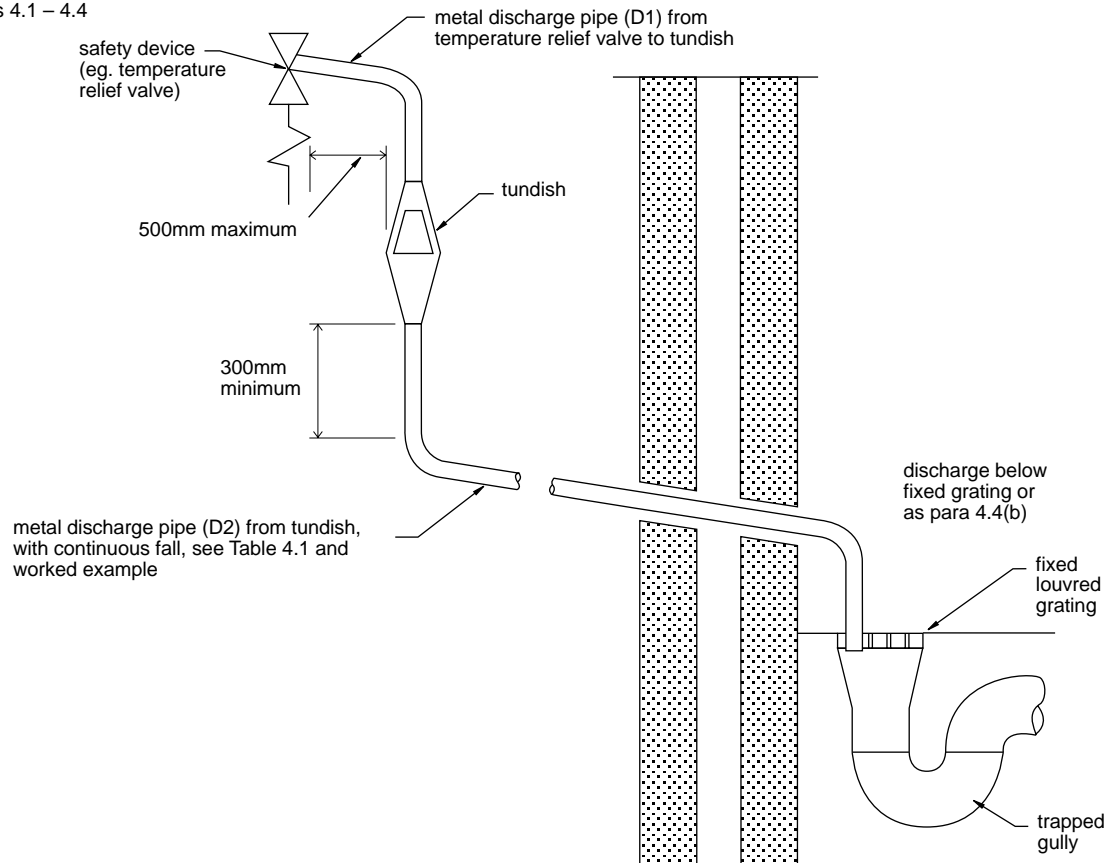


Table 4.1 Sizing of copper discharge pipe 'D2' for common temperature relief valve outlet sizes

Valve outlet size	Minimum size of discharge pipe D1*	Minimum size of discharge pipe D2* from tundish	Maximum resistance allowed, expressed as a length of straight pipe (ie. no elbows or bends)	Resistance created by each elbow or bend
G½	15 mm	22 mm	up to 9 m	0.8 m
		28 mm	up to 18 m	1.0 m
		35 mm	up to 27 m	1.4 m
G¾	22 mm	28 mm	up to 9 m	1.0 m
		35 mm	up to 18 m	1.4 m
		42 mm	up to 27 m	1.7 m
G1	28 mm	35 mm	up to 9 m	1.4 m
		42 mm	up to 18 m	1.7 m
		54 mm	up to 27 m	2.3 m

* See paragraphs 3.2(b), Section 4 and Diagram 4.1

Worked example

The example below is for a G½ temperature relief valve with a discharge pipe (D2) having 4 No. elbows and length of 7 m from the tundish to the point of discharge.

From Table 4.1

Maximum resistance allowed for a straight length of 22 mm copper discharge pipe (D2) from a G½ temperature relief valve equates to: 9 m

Subtract the resistance for 4 No. 22 mm elbows at 0.8 m each = 3.2 m

Therefore the maximum permitted length equates to: 5.8 m.

5.8 m is less than the actual length of 7 m therefore calculate the next largest size.

Maximum resistance allowed for a straight length of 28 mm pipe (D2) from a G½ temperature relief valve equates to: 18 m
Subtract the resistance for 4 No. 28 mm elbows at 1 m each = 4 m

Therefore the maximum permitted length equates to: 14 m

As the actual length is 7 m, a 28 mm (D2) copper pipe will be satisfactory.

Appendix – Publications referred to

BS 3955: 1986 Specification for electrical controls for household and similar general purposes.

AMD 5940, December 1988

BS 6144: 1990 Specification for expansion vessels using an internal diaphragm, for unvented hot water supply systems.

BS 6282: Devices with moving parts for the prevention of contamination of water by backflow.

Part 1: 1982 Specification for check valves of nominal size up to and including DN 54.

BS 6283: Safety and control devices for use in hot water systems.

Part 1: 1991 Specification for expansion valves for pressures up to and including 10 bar.

Part 2: 1991 Specification for temperature relief valves for pressures from 1 bar to 10 bar.

Part 3: 1991 Specification for combined temperature and pressure relief valves for pressures from 1 bar to 10 bar.

Part 4: 1991 Specification for drop-tight pressure reducing valves of nominal size up to and including DN 50 for supply pressures up to and including 12 bar.

BS 6700: 1987 Specification for design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages.

BS 7206: 1990 Specification for unvented hot water storage units and packages.

BS EN 257: 1992 Mechanical thermostats for gas-burning appliances.

British Board of Agrément MOAT 38: 1986 The Assessment of Unvented Hot Water Systems and the Approval and Surveillance of Installers.