

## CONTROL VALVES AND SAFETY VALVES

### Technical document 079-05

Hydraulic safety units  
Multifunction devices  
Domestic hot water safety kits

Technical document 079-05 Rev00  
15/03/2019

CSTB (Centre Scientifique et Technique du Bâtiment), a public establishment supporting innovation in construction, has five key activities—research and expertise, assessment, certification, tests, and dissemination of knowledge—organised to meet the challenges of the ecological and energy transition in the construction sector. Its field of expertise includes construction materials, buildings and their integration into districts and towns.

With over 900 employees, its subsidiaries and networks of national, European and international partners, the CSTB group works for all the stakeholders in the construction sector to advance building quality and safety.

Any reproduction or representation, in whole or in part, by whatever means, of the pages published in this technical document and executed without the authorisation of CSTB is illegal and constitutes a counterfeit. The only authorised exceptions are 1) reproductions strictly reserved for the use of the typist and not intended for any collective use or 2) analyses and short quotations required due to the scientific or informational nature of the work in which they appear (article L.122-5 of the Intellectual Property Code). This document has been drawn up under the initiative and direction of CSTB, which has gathered the opinions of all interested parties.

© CSTB

## MODIFICATION HISTORY

Revision no.	Application date	Modifications
00	15/03/2019	<p><b>Update to the document layout and reference.</b></p> <p><b>Content modifications:</b></p> <p><b>Part 1: Rules of application</b></p> <p>The issuance of the NF EN 1487 Standard in September 2014 caused this document to be simplified. Most of the articles in DT05 rev08 have been integrated into the standard;</p> <ul style="list-style-type: none"> <li>– Article 3 Terms and definitions: added detail about the interchangeability of the check valve</li> <li>– Article 4.7 Compatibility with products used for disinfection: added detail about the quality of the water that must be used;</li> <li>– Article 5.2 Dimensional characteristics: <ul style="list-style-type: none"> <li>○ added a note on tracking of dimensional deviations for connections;</li> <li>○ clarifications on the dimensions of the end connections (type c end connection)</li> </ul> </li> <li>– Article 5.3 Inspection orifice: requirements from the standard, with dimension “d” added to the diagram;</li> <li>– Article 8.1.3 Torsional strength of the body of the hydraulic safety unit: requirements from the standard;</li> <li>– Article 9.3.1 Pressures: Deleted lower limits for first-trip pressure;</li> <li>– Article 9.7 Air break to drain: added figure and table of dimensions for the air break to drain;</li> <li>– Article 13 Designation: only the essential information has been retained;</li> <li>– Deleted articles <ul style="list-style-type: none"> <li>○ 13 Hydraulic safety units containing plastic components</li> <li>○ 13.2 Resistance to thermal shocks replaced by Article 10 Thermal shock resistance</li> <li>○ 13.3 Mechanical resistance to alternating pressures</li> <li>○ 13.4 Steam resistance</li> </ul> </li> </ul> <p><b>Part 2 and Part 3 are moved into a Technical Management Appendix (Control methods) and</b></p> <p><b>Update to Tables “Inspection during production” and “Inspection of finished products”.</b></p>

## Contents

<b>PART 1. A) RULES FOR APPLYING STANDARD NF EN 1487 AND ADDITIONAL SPECIFICATIONS</b>	<b>9</b>
Purpose	9
<b>1 FIELD OF APPLICATION</b>	<b>9</b>
<b>2 NORMATIVE REFERENCES</b>	<b>9</b>
<b>3 TERMS AND DEFINITIONS</b>	<b>9</b>
3.1 Hydraulic safety unit	9
3.2 Isolating valve	9
3.3 Check valve (supplemented)	9
<b>4 MATERIALS AND SURFACES</b>	<b>9</b>
4.1 General	9
4.2 Materials	9
4.3 Detection of residual stresses	9
4.3.1 Test	9
4.3.2 Test method (operating procedure) (supplemented)	9
4.3.3 Requirements (supplemented)	9
4.4 Visible outside surfaces	10
4.4.1 Surfaces without coatings (supplemented)	10
4.4.2 Surfaces with coating	10
4.5 Corrosion resistance	10
4.5.1 Test method	10
4.5.2 Requirements	10
4.6 Coating bonding strength	10
4.6.1 Test method	10
4.6.2 Requirements	10
4.7 Compatibility with products used for disinfecting systems (modified)	10
4.7.1 General	10
4.7.2 Test method	10
4.7.3 Requirements	10
<b>5 DIMENSIONAL AND DESIGN CHARACTERISTICS</b>	<b>10</b>
5.1 General	10
5.2 Dimensional characteristics	10
5.2.1 End connections (modified)	10
5.3 Inspection orifice (supplemented)	11
5.4 Pressure tap	11
5.5 Safety valve outlet orifice to the air break to drain	11
5.6 Safety unit outlet orifice to drain device	11
5.7 Exclusions	11
5.8 Replacing the safety valve	11
5.9 Check valve (supplemented)	11

<b>6</b>	<b>EQUIPMENT .....</b>	<b>12</b>
6.1	General .....	12
6.2	Tolerances relative to the parameters and precision of the measuring equipment .....	12
6.2.1	Tolerances relative to the specified parameters .....	12
6.2.2	Precision of the measuring equipment .....	12
6.2.3	Test fluids .....	12
<b>7</b>	<b>HYDRAULIC TESTS AND REQUIREMENTS .....</b>	<b>12</b>
7.1	Flow test .....	12
7.1.1	Operating procedure .....	12
7.1.2	Requirement .....	12
7.2	Leaktightness test .....	12
7.2.1	General .....	12
7.2.2	Leaktightness of the isolating valve at a pressure of 1.6 MPa (16 bar) .....	12
7.2.2.1	Operating procedure (modified) .....	12
7.2.2.2	Requirement (supplemented) .....	12
7.2.3	Leaktightness of the hydraulic safety unit .....	12
7.2.3.1	Operating procedure .....	12
7.2.3.2	Requirement .....	12
<b>8</b>	<b>MECHANICAL TESTS AND REQUIREMENTS .....</b>	<b>12</b>
8.1	Mechanical strength .....	12
8.1.1	Pressure test on the body of the hydraulic safety unit .....	12
8.1.1.1	Operating procedure .....	12
8.1.1.2	Requirement (supplemented) .....	12
8.1.2	Bending test of the body and pull-out test of the drain device of the hydraulic safety unit 13	
8.1.2.1	Operating procedure .....	13
8.1.2.2	Requirements .....	13
8.1.3	Torsional strength of the body of the hydraulic safety unit .....	13
8.1.3.1	General .....	13
8.1.3.2	Operating procedure (supplemented) .....	13
8.1.3.3	Requirement .....	13
8.1.4	Tensile strength of the captive rotating nuts .....	13
8.1.4.1	Operating procedure .....	13
8.1.4.2	Requirement .....	13
8.2	Mechanical strength of the lift control of the safety valve .....	13
8.2.1	Operating procedure (supplemented) .....	13
8.2.2	Requirement (modified) .....	13
<b>9</b>	<b>TESTS AND REQUIREMENTS FOR THE DIFFERENT COMPONENTS OF THE SAFETY UNIT .....</b>	<b>14</b>
9.1	Isolating valve .....	14
9.1.1	General .....	14
9.1.2	Manual operating test .....	14

9.1.2.1	Operating procedure .....	14
9.1.2.2	Requirement .....	14
9.1.3	Endurance test.....	14
9.1.3.1	Operating procedure (supplemented).....	14
9.1.3.2	Requirement .....	14
9.1.4	Manual operating test (extended) .....	14
9.1.4.1	General .....	14
9.1.4.2	Operating procedure .....	14
9.1.4.3	Requirement .....	14
9.2	Check valve .....	14
9.2.1	Verification of leaktightness at low pressure between the body of the safety unit and the check valve .....	14
9.2.1.1	Test method .....	14
9.2.1.2	Requirement .....	14
9.2.2	Verification of leaktightness at high pressure between the body of the safety unit and the check valve .....	14
9.2.2.1	Test method .....	14
9.2.2.2	Requirement .....	14
9.3	Safety valve .....	15
9.3.1	Pressures.....	15
9.3.1.1	General .....	15
9.3.1.2	Nominal set pressure (Pnr).....	15
9.3.1.3	Watertightness pressure (Pe) .....	15
9.3.1.4	Nominal flow pressure (Pdn) (modified) .....	15
9.3.1.5	First trip pressure (Pdc) .....	15
9.3.1.6	Opening pressure (Po) .....	15
9.3.1.7	Closing pressure (Pf) .....	15
9.3.2	Cold-water pressure tests.....	15
9.3.2.1	General .....	15
9.3.2.2	Test method .....	15
9.3.2.3	Operating procedure and requirement (supplemented) .....	15
9.3.3	Steam test.....	15
9.3.3.1	General .....	15
9.3.3.2	Operating procedure (modified).....	15
9.3.3.3	Requirement .....	15
9.4	Endurance test.....	15
9.4.1	Operating procedure (modified) .....	15
9.4.2	Requirement (supplemented) .....	16
9.5	Lift valve control (manual device) .....	16
9.5.1	Operation of the lift control.....	16
9.5.1.1	Operating procedure .....	16
9.5.1.2	Requirement .....	16
9.5.2	Lift control endurance test .....	16

9.5.2.1	Operating procedure.....	16
9.5.2.2	Requirement .....	16
9.6	Drain device .....	16
9.6.1	General (modified).....	16
9.6.2	Flow test .....	16
9.6.2.1	Operating procedure.....	16
9.6.2.2	Requirement .....	16
9.7	Air break to drain (supplemented) .....	16
10	THERMAL SHOCK RESISTANCE .....	17
10.1	Test method .....	17
10.2	Requirement (supplemented).....	17
11	ACOUSTIC TESTS AND REQUIREMENTS .....	18
12	CLASSIFICATION .....	18
13	DESIGNATION (MODIFIED).....	18
14	MARKING (MODIFIED) .....	18
15	TECHNICAL DOCUMENTS AND PRESENTATION AT DELIVERY (SUPPLEMENTED).....	18
16	TEST SEQUENCE (ADDED) .....	18
PART 1.	B) SPECIFICATIONS FOR MULTIFUNCTION DEVICES OF TYPE “HYDRAULIC SAFETY UNIT AND TEMPERATURE LIMITER” .....	21
	Purpose.....	21
1	FIELD OF APPLICATION .....	21
2	DESIGN .....	21
3	TEST PROCEDURE.....	21
3.1	Verification of the “Hydraulic safety unit” function .....	21
3.2	Verifying the “Temperature limiter” function .....	21
3.2.1	Operating procedure.....	21
4	DESIGNATION .....	22
5	PRESENTATION AND TECHNICAL DOCUMENTATION.....	22
5.1	Presentation .....	22
5.2	Technical documents .....	22
PART 1.	C) SPECIFICATIONS FOR “DOMESTIC HOT WATER SAFETY KITS” .....	23
	Purpose.....	23
1	FIELD OF APPLICATION .....	23
2	TECHNICAL CHARACTERISTICS OF THE COMPONENTS .....	23
2.1	Safety unit .....	23
2.2	Temperature limiter .....	23
2.3	Connection .....	23
3	SCHEMATIC DIAGRAM .....	24
3.1	Cold water supply to limiter incorporated in the safety unit .....	24

3.2	Cold water supply to limiter located upstream from the safety unit .....	25
4	PRESENTATION AND TECHNICAL DOCUMENTATION .....	25
4.1	Presentation .....	25
4.2	Technical documents.....	25



## Part 1. A) Rules for applying Standard NF EN 1487 and additional specifications

---

### Purpose

The purpose of this document is to add details and/or supplementary information to certain articles in Standard NF EN 1487 (Sept. 2014), using the same numbering system as that of the Standard.

The supplemented, modified and added articles are identified in the title.

### 1 Field of application

### 2 Normative references

### 3 Terms and definitions

#### 3.1 Hydraulic safety unit

#### 3.2 Isolating valve

#### 3.3 Check valve (supplemented)

Device that opens automatically under the forward pressure of fluid in a defined direction, and that automatically closes when the flow stops in order to prevent fluid backflow.

**It may be replaceable or not.**

### 4 Materials and surfaces

#### 4.1 General

#### 4.2 Materials

Materials in contact with potable water must comply with regulations: see Article 2.1 of the certification reference system for "Control Valves and Safety Valves" (ACS).

#### 4.3 Detection of residual stresses

##### 4.3.1 Test

##### 4.3.2 Test method (operating procedure) (supplemented)

The article is supplemented as follows:

- e) The test specimen is comprised of three samples of the same hydraulic safety unit. The specimen is placed into the test chamber **under** stress. The samples are subjected to an air pressure of 3 (+1/0) bar.

##### 4.3.3 Requirements (supplemented)

The article is supplemented as follows:

Only the test described in 7.2.3 Leaktightness test of the hydraulic safety unit is performed, as indicated in Appendix A of the NF EN 1487 Standard.

## 4.4 Visible outside surfaces

### 4.4.1 Surfaces without coatings (supplemented)

The article is supplemented as follows:

**It is strongly recommended not to use “decorative” coatings on this kind of product (Ni, Ni-Cr).**

### 4.4.2 Surfaces with coating

## 4.5 Corrosion resistance

### 4.5.1 Test method

### 4.5.2 Requirements

## 4.6 Coating bonding strength

### 4.6.1 Test method

### 4.6.2 Requirements

## 4.7 Compatibility with products used for disinfecting systems (modified)

NOTE 1:

The purpose of this test is to account for the disinfection carried out before an installation is put into service.

In order to reflect current practice, it is performed only with a sodium hypochlorite solution diluted with “Quality 3” water, defined as water that is appropriate for the preparation of solutions and for most chemical applications. It is produced by single distillation, demineralisation or reverse osmosis.

### 4.7.1 General

### 4.7.2 Test method

### 4.7.3 Requirements

# 5 Dimensional and design characteristics

## 5.1 General

## 5.2 Dimensional characteristics

NOTE:

Dimensional deviations on the connections observed during checks at CSTB will be subject to follow-up at audits of manufacturing sites. This follow-up will be included in the audit reports and communicated to the Committee.

### 5.2.1 End connections (modified)

Table 2 of the NF EN 1487 Standard has been supplemented for the nominal diameter of the following connector types:

- Type a: Threaded end fitting without shoulder with flat gasket
- Type b: Threaded end fitting with shoulder
- Type c: Tapped sleeve
- Type e: Rotating nut

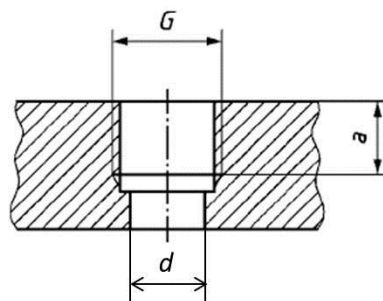
The female connection (type c) must comply with Table 1 of this document.

Table 1: Dimensions of female connection

Nominal diameter (DN)	A2	l <sub>3</sub> (mm) (min.)
DN15	G 1/2	10.0
DN20	G 3/4	10.3
DN35	G 1	12.5

### 5.3 Inspection orifice (supplemented)

Figure 3 of the NF EN 1487 Standard has been supplemented with the addition of dimension “d”.



### 5.4 Pressure tap

### 5.5 Safety valve outlet orifice to the air break to drain

### 5.6 Safety unit outlet orifice to drain device

### 5.7 Exclusions

### 5.8 Replacing the safety valve

### 5.9 Check valve (supplemented)

The article is supplemented as follows:

If the EB check valve built into the product does not hold the NF045 mark, it must be subjected to endurance testing in accordance with Standard NF EN 13959, according to the following sequence of tests:

- 1) Pressure tightness under a low reverse pressure differential (Article 11.5);
- 2) Pressure tightness under a high reverse pressure differential and verification that the check valve has not jammed (Article 11.6);
- 3) Pressure differential at which the check valve closes (Article 11.7);
- 4) Endurance (Article 11.9);
- 5) Pressure tightness under a low reverse pressure differential (Article 11.10);
- 6) Pressure tightness under a high reverse pressure differential and verification that the check valve has not jammed (Article 11.11);
- 7) Pressure differential at which the check valve closes (Article 11.12);

## 6 Equipment

### 6.1 General

### 6.2 Tolerances relative to the parameters and precision of the measuring equipment

#### 6.2.1 Tolerances relative to the specified parameters

#### 6.2.2 Precision of the measuring equipment

#### 6.2.3 Test fluids

## 7 Hydraulic tests and requirements

### 7.1 Flow test

#### 7.1.1 Operating procedure

#### 7.1.2 Requirement

### 7.2 Leaktightness test

#### 7.2.1 General

#### 7.2.2 Leaktightness of the isolating valve at a pressure of 1.6 MPa (16 bar)

##### 7.2.2.1 *Operating procedure (modified)*

The article is modified as follows:

Supply the safety unit with water at ambient temperature for at least 5 min.

##### 7.2.2.2 *Requirement (supplemented)*

The article is supplemented as follows:

There should not be any **visible** leaks for the duration of the test.

#### 7.2.3 Leaktightness of the hydraulic safety unit

##### 7.2.3.1 *Operating procedure*

##### 7.2.3.2 *Requirement*

## 8 Mechanical tests and requirements

### 8.1 Mechanical strength

#### 8.1.1 Pressure test on the body of the hydraulic safety unit

##### 8.1.1.1 *Operating procedure*

##### 8.1.1.2 *Requirement (supplemented)*

The article is supplemented as follows:

There should not be any breaks or **visible** permanent deformations of the body of the hydraulic safety unit.

## 8.1.2 Bending test of the body and pull-out test of the drain device of the hydraulic safety unit

### 8.1.2.1 *Operating procedure*

### 8.1.2.2 *Requirements*

## 8.1.3 Torsional strength of the body of the hydraulic safety unit

### 8.1.3.1 *General*

### 8.1.3.2 *Operating procedure (supplemented)*

The article is supplemented as follows:

- Gradually apply the tightening torque as indicated in Table 6 of Standard NF EN 1487, using a standardised open-ended spanner.

### 8.1.3.3 *Requirement*

## 8.1.4 Tensile strength of the captive rotating nuts

### 8.1.4.1 *Operating procedure*

### 8.1.4.2 *Requirement*

## 8.2 Mechanical strength of the lift control of the safety valve

### 8.2.1 *Operating procedure (supplemented)*

The article is supplemented as follows:

Hold the valve on the seat in the closed position, **without blocking the operating device**.

- for rotating control devices, apply two tangential forces of 100 N at their periphery;
- for levers, apply a force of 75 N at the end.

### 8.2.2 *Requirement (modified)*

The article is supplemented as follows:

The lift control mechanism must not show any visible damage or any **visible** permanent deformation.

## 9 Tests and requirements for the different components of the safety unit

### 9.1 Isolating valve

#### 9.1.1 General

#### 9.1.2 Manual operating test

##### 9.1.2.1 *Operating procedure*

##### 9.1.2.2 *Requirement*

#### 9.1.3 Endurance test

##### 9.1.3.1 *Operating procedure (supplemented)*

The article is supplemented as follows:

The supply pressure is between 2 and 4 bar.

- b) For a period of 30 to 35 days, maintain a minimum flow rate of 120 l/h **through the isolating valve.**

##### 9.1.3.2 *Requirement*

#### 9.1.4 Manual operating test (extended)

The article is supplemented as follows:

The test is carried out on three products. The test is validated if two of the products are compliant.

##### 9.1.4.1 *General*

##### 9.1.4.2 *Operating procedure*

##### 9.1.4.3 *Requirement*

### 9.2 Check valve

#### 9.2.1 Verification of leaktightness at low pressure between the body of the safety unit and the check valve

##### 9.2.1.1 *Test method*

##### 9.2.1.2 *Requirement*

#### 9.2.2 Verification of leaktightness at high pressure between the body of the safety unit and the check valve

##### 9.2.2.1 *Test method*

##### 9.2.2.2 *Requirement*

## 9.3 Safety valve

### 9.3.1 Pressures

#### 9.3.1.1 General

#### 9.3.1.2 Nominal set pressure ( $P_{nr}$ )

#### 9.3.1.3 Watertightness pressure ( $P_e$ )

#### 9.3.1.4 Nominal flow pressure ( $P_{dn}$ ) (modified)

The article is modified as follows:

The watertightness pressure is correlated to the nominal set pressure ( $P_{nr}$ ) by the relation  $\min. P_e = 0.95 P_{nr}$ .

#### 9.3.1.5 First trip pressure ( $P_{dc}$ )

#### 9.3.1.6 Opening pressure ( $P_o$ )

#### 9.3.1.7 Closing pressure ( $P_f$ )

### 9.3.2 Cold-water pressure tests

#### 9.3.2.1 General

#### 9.3.2.2 Test method

#### 9.3.2.3 Operating procedure and requirement (supplemented)

The article is supplemented as follows:

- a) Increase the pressure (gradually, by 0.1 MPa (1 bar) every 20 to 60 seconds, starting at 0.7  $P_{nr}$ ) until the safety valve opens. The safety valve's opening pressure must be less than  $P_{dn}$ .
- c) Continue to gradually increase the pressure up to 1.05  $P_{nr}$ . Let the pressure stabilise for at least 30 s. The valve must start to open (visible droplets). The safety valve's flow rate must be greater than 2.4 l/h (**corresponding to a drip-by-drip rate**).

### 9.3.3 Steam test

#### 9.3.3.1 General

#### 9.3.3.2 Operating procedure (modified)

The article is modified as follows:

- c) Gradually increase the pressure up to 1.2  $P_{nr}$ . Maintain this pressure while applying a flow of steam for 2 min. The flow rate must be greater than 0.9 times the values **indicated in Table 10 of the NF EN 1487 Standard**.

#### 9.3.3.3 Requirement

## 9.4 Endurance test

### 9.4.1 Operating procedure (modified)

Before carrying out this test, perform a test as specified in 9.3.2 (Cold-water pressure tests).

The hydraulic safety unit must be connected to a test device that provides water at a minimum temperature of 65°C or at the maximum temperature specified by the manufacturer.

- a) Operate the hydraulic safety unit as follows for 5,000 cycles:
  - 1) increase the pressure until **a flow rate of at least 750 l/h is achieved**, and maintain this for **at least 5 s**;
  - 2) reduce the pressure **until the valve closes** and maintain for **at least 5 s**.
- b) Store the hydraulic safety unit at ambient temperature for 28 days.
- c) Repeat the operations described in a) on the hydraulic safety unit that was stored.

At the end of the endurance test, perform the steam test as specified in 9.3.3 (Steam test).

## 9.4.2 Requirement (supplemented)

The article is supplemented as follows:

The results should not deviate by more than 10% **from the original requirements**.

### EXAMPLE

For the opening pressure ( $P_o$ ):

- before endurance testing:  $0.90 P_{nr} \leq P_o \leq 1.05 P_{nr}$
- after endurance testing:  $0.81 P_{nr} \leq P_o \leq 1.16 P_{nr}$

## 9.5 Lift valve control (manual device)

### 9.5.1 Operation of the lift control

#### 9.5.1.1 Operating procedure

#### 9.5.1.2 Requirement

### 9.5.2 Lift control endurance test

#### 9.5.2.1 Operating procedure

#### 9.5.2.2 Requirement

## 9.6 Drain device

### 9.6.1 General (modified)

The article is modified as follows:

The security valve **shall have** a stable position for draining purposes.

### NOTE

French version modified to reflect the English text (“**shall have**”).

### 9.6.2 Flow test

#### 9.6.2.1 Operating procedure

#### 9.6.2.2 Requirement

## 9.7 Air break to drain (supplemented)

The article is supplemented as follows:



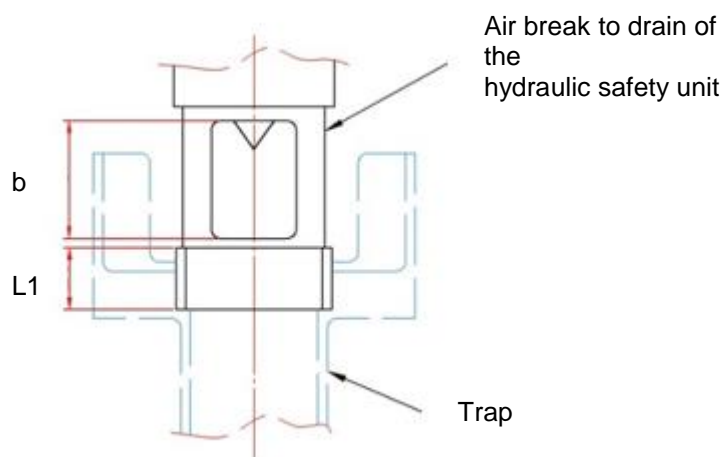


Figure 1: Air break to drain

Table 2: Dimensions

Dimension	Value (mm)	Comments
L1	11.5 max	Threaded length (*)
b	25 – 26	Height of the air break to drain (b compliant with EN 1717) Minimum cross-section of air passages: $(\Sigma S = b \times 2 \pi G / 3)$ , where, for example, b max = 26; G=25; refer to EN 1717 for dimensions b and G)

(\*): The threaded length must be sufficient for the pull-out test.

The hydraulic safety unit must be fitted to the trap in such a way as to maintain the cross sections of the air passages (thread root or stop).

The water-leak verification test is performed after test 9.6 (Drain device).

## 10 Thermal shock resistance

### 10.1 Test method

### 10.2 Requirement (supplemented)

The article is supplemented as follows:

After this test, the leaktightness, operation and integrity characteristics must be maintained, see articles:

- 7.2.3 Leaktightness of the hydraulic safety unit;
- 9.1.2 Manual operating test;
- 9.3.2 Cold-water pressure tests:
  - a) first trip pressure (Pdc);
  - b) watertightness pressure (Pe);
  - c) opening pressure (Po).

The results should not deviate by more than 10% **from the requirements** of the NF EN 1487 standard.

#### EXAMPLE

For the opening pressure (Po):

- before thermal shock:  $P_o \leq 1.05 P_{nr}$
- after thermal shock:  $0.95 P_{nr} \leq P_o \leq 1.16 P_{nr}$

## 11 Acoustic tests and requirements

## 12 Classification

## 13 Designation (modified)

The article is modified as follows:

For practical reasons and ease of comprehension, it has been decided to keep the essential information defined in the standard:

- name;
- nominal diameter;
- nominal set pressure Pnr;
- reference to the European Standard.

Added to this designation is the logo for this certification.

Minimum designation.

EXAMPLE

Hydraulic safety group, DN20, Pnr 7 bar, NF EN 1487, **NF**

## 14 Marking (modified)

The article is supplemented as follows:

- i) If the maximum temperature at the inlet is greater than or equal to 65°C, it must be specified on the unit.

As regards the marking of the logo for this certification, refer to the certification rules concerned.

## 15 Technical documents and presentation at delivery (supplemented)

The article is supplemented as follows:

The documentation may be made available in electronic form.

In this case, the link (QR code, web address, etc.) shall accompany the product and provide direct access to the product's technical documents.

The manual shall also specify the following points:

- e) a description of the correct inspection and maintenance procedures, as defined in EN 806-5; at least:
  - manually operate the safety valve and the isolating valve at least once a month to prevent any risk of jamming;
- j) the unit shall be fitted to the tank with standardised open-ended spanners;
- k) if the valve is interchangeable, it shall be changed only by a **qualified plumbing professional**.

## 16 Test sequence (added)

This article provides an explicit description of Table A.1 of Appendix A (for information purposes) of the NF EN 1487 standard.

Where applicable, the tests set out in Table 3 shall be performed in the specified sequence.

The test sequence must be performed on the same specimen, except in case of an additional test.

The marking and appearance of exterior surfaces are verified on all products tested.

The technical documentation will be verified wherever it appears (packaging, data sheets, etc.).

Table 3: Distribution of tests

Sequence	Sequence name and order of the tests
1.	<b>Dimensions</b> 5.1 to 5.8 and 9.7
	<b>Mechanical strength</b> 8.1.1 Pressure test on the body of the hydraulic safety unit 8.1.2 Bending test of the body and pull-out test of the drain device of the hydraulic safety unit 8.1.3 Torsional strength of the body of the hydraulic safety unit
2.	<b>Cracking under stress</b> 7.2.3 Leaktightness of the hydraulic safety unit 4.3 Detection of residual stresses 7.2.3 Leaktightness of the hydraulic safety unit
3.	<b>Corrosion</b> 9.3.2 Cold-water pressure tests 4.6 Coating 4.5 Corrosion resistance 9.3.2 Cold-water pressure tests
4.	<b>Disinfection</b> 9.3.2 Cold-water pressure tests 4.7 Compatibility with products used for disinfecting systems (modified) (Disinfection) 9.3.2 Cold-water pressure tests
5.	<b>Test on the check valve</b> 9.2 Check valve (Leaktightness) 5.9 Check valve (supplemented) (Endurance as per NF EN 13959 (only if check valve is not NF or for additional check valve))
6.	<b>Hydraulic + steam</b> 7.1 Flow test (Unit) 9.3.2 Cold-water pressure tests 9.6.2 Flow test (Drain device) 9.7 Air break to drain (supplemented) (Leak check) 9.3.3 Steam test
7.	<b>Endurance of isolating valve</b> 7.2.3 Leaktightness of the hydraulic safety unit 7.2.2 Leaktightness of the isolating valve at a pressure of 1.6 MPa (16 bar) 9.1.3 Endurance test (Isolating valve) 7.2.2 Leaktightness of the isolating valve at a pressure of 1.6 MPa (16 bar) 7.2.3 Leaktightness of the hydraulic safety unit
8.	<b>Manual operation</b> 9.1.2 Manual operating test (Torque test) 9.1.4 Manual operating test (extended) 9.1.2 Manual operating test (Torque test)

Sequence	Sequence name and order of the tests
9.	<b>Tensile force</b> 8.1.4 Tensile strength of the captive rotating nuts
10.	<b>Endurance of safety valve</b> 9.3.2 Cold-water pressure tests 9.4 Endurance test (Safety valve) 9.3.3 Steam test
11.	<b>Endurance of safety valve lift control</b> 9.5.1 Operation of the lift control 9.5.2 Lift control endurance test 9.5.1 Operation of the lift control
12.	<b>Thermal shocks</b> 7.2.3 Leaktightness of the hydraulic safety unit 9.1.2 Manual operating test (Torque test) 9.3.2 Cold-water pressure tests a), b) and c) 10 Thermal shock resistance 7.2.3 Leaktightness of the hydraulic safety unit 9.1.2 Manual operating test (Torque test) 9.3.2 Cold-water pressure tests a), b) and c)
13.	<b>Acoustics</b> 11 Acoustic tests and requirements

## Part 1. B) Specifications for multifunction devices of type “Hydraulic Safety Unit and Temperature Limiter”

---

### Purpose

The purpose of this section is to define the requirements applicable to one-piece multifunction devices of type “Hydraulic Safety Unit incorporating a Temperature Limiter.”

### 1 Field of application

This section applies only to one-piece devices which combine:

- a “hydraulic safety unit” function in compliance with Standard NF EN 1487 and
- a “temperature limiter” function in compliance with Technical Document 8 of the certification rules.

### 2 Design

The authorised combinations are for:

- a DN 15 hydraulic safety unit with Class 12 temperature limiter;
- a DN 20 hydraulic safety unit with Class 20 temperature limiter;

The device shall include, at least one check valve as indicated in Standard NF EN 1487 and part 1A) of this document (Article 5.9).

The additional check valves shall hold the certification for “Antipollution of water installations”.

### 3 Test procedure

The two functions are verified separately, applying the requirements of this technical document.

#### 3.1 Verification of the “Hydraulic safety unit” function

The “Hydraulic safety unit” function is tested under the same conditions as for an independent hydraulic safety unit, **except for the steam tests**.

The product requires the following specific set-up:

- the “hot water” inlet to the device is connected to the steam network;
- the “mixed water” outlet from the device is closed off.

Throughout the test, there must be no visible deterioration to the elements of the limiter function.

#### 3.2 Verifying the “Temperature limiter” function

The temperature limiter function is tested under the same conditions as for an independent temperature limiter, except for:

- a) the test for “Influence of disturbances – supply pressure variation (Test 5a)”.

This test is replaced by a test of “**Simultaneous variation of supply pressures**”.

##### 3.2.1 Operating procedure

Under the normal test conditions from **Technical Document 079-08**, with a tolerance of  $\pm 0.1$  bar on the specified value for the pressure variation:

- set the drawing-off flow rate to  $(6 \pm 0.5)$  l/min;
- simultaneously, within 1 s, drop the cold-water pressure and the hot-water pressure by 1 bar (HWP = CWP = 2 bar);
- wait 30 s;
- in 1 s, go back to the equilibrium of the initial pressures (HWP = CWP = 3 bar);
- wait 30 s;

- simultaneously, within 1 s, raise the cold-water pressure and the hot-water pressure by 1 bar (HWP = CWP = 4 bar);
- wait 30 s;
- in 1 s, go back to the equilibrium of the initial pressures (HWP = CWP = 3 bar),
- wait 30 s;

Repeat the test with a drawing-off flow rate of  $(12 \pm 0.5)$  l/min.

b) the bending strength test.

This test is only performed on the hot water inlet. The required characteristics remain unchanged.

Because this test is destructive, the product shall not be subjected to any other tests.

## 4 Designation

- name;
- nominal diameter of the hydraulic safety unit;
- nominal set pressure P<sub>nr</sub>;
- reference to the European standard NF EN 1487;
- class of the temperature limiter function
- limiter type

Added to this designation is the logo for this certification.

Minimum designation.

EXAMPLE

Hydraulic safety group – Temperature limiter, DN20, P<sub>nr</sub> 7 bar, NF EN 1487, Class 20, type RO, **NF**

## 5 Presentation and technical documentation

### 5.1 Presentation

The multifunction devices are stored and delivered in packaging that encloses all the elements composing them.

They come with the connecting threading protected against impacts.

### 5.2 Technical documents

Each package shall contain technical documentation about the multifunction device. The documentation shall contain the following information:

- the product's designation and intended use,
- the installation instructions specific to the device,
- safety instructions (e.g. relating to burns, etc.),
- maintenance instructions,
- the list of spare parts, if needed,
- a reminder of the guidelines relating to the hydraulic safety unit as indicated in Standard NF EN 1487 and in this technical document.

Technical documentation for a product must be written in the common language of the country where the product is sold.

It may be made available in electronic form. In this case, the link (QR code, web address, etc.) shall accompany the product and provide direct access to the product's technical documents.

## Part 1. C) Specifications for “domestic hot water safety kits”

---

### Purpose

The purpose of this paragraph is to define the requirements applicable to domestic hot water safety kits.

### 1 Field of application

This paragraph applies to safety kits designed to be installed between the cold water inlet and the hot water outlet of a domestic hot water (DHW) production unit. This device distributes domestic hot water whose temperature does not exceed 50°C.

It performs three functions:

- safety unit;
- temperature-limiting device;
- connection:
  - either to supply the temperature limiter with cold water;
  - or to connect the outlet of the hot water production device (in general, an electric water heater) to the hot water inlet of the temperature limiter.

### 2 Technical characteristics of the components

#### 2.1 Safety unit

The safety unit holds this certification. It conforms to the requirements of this Technical Document.

#### 2.2 Temperature limiter

The temperature limiter holds the “Control Valves and Safety Valves” certification. It conforms to the requirements of document 079-08 of the certification reference system.

#### 2.3 Connection

The connection comprises pipes and fittings that hold an NF or QB certification mark when such marks exist for these devices.

### 3 Schematic diagram

#### 3.1 Cold water supply to limiter incorporated in the safety unit

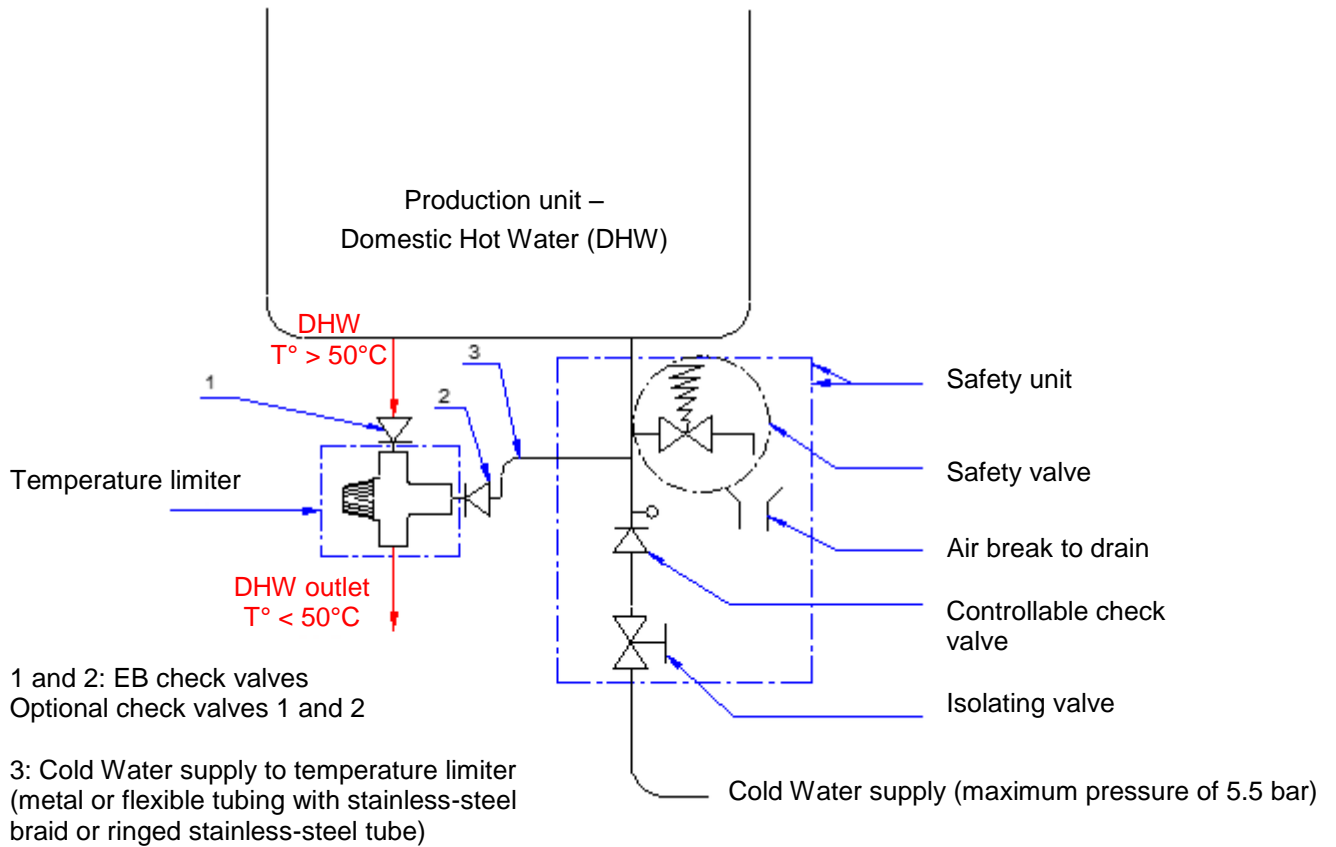


Figure 2: Installation diagram – configuration 1



### 3.2 Cold water supply to limiter located upstream from the safety unit

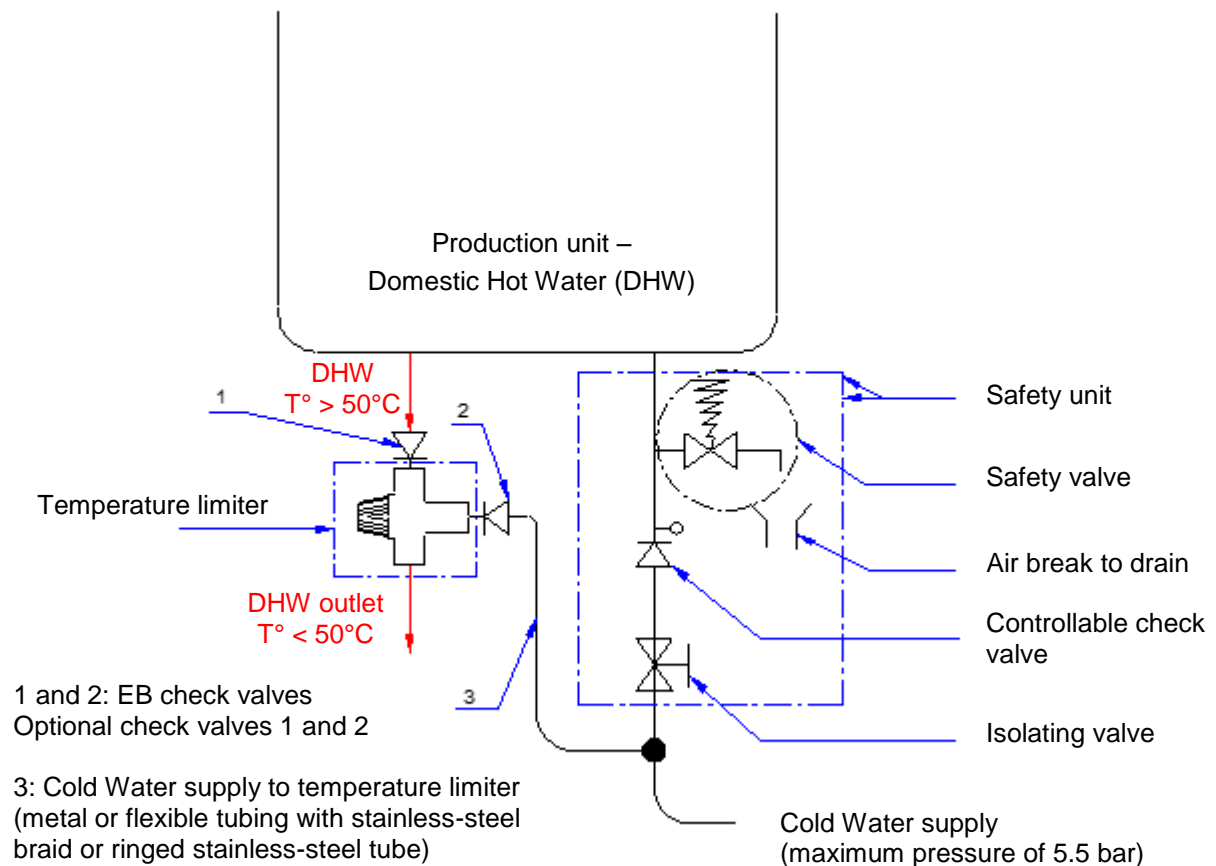


Figure 3: Installation diagram – configuration 2

## 4 Presentation and technical documentation

### 4.1 Presentation

The safety kits are stored and delivered in packaging that encloses all the elements composing them. They come either:

- pre-assembled;
- or in separate parts, and in this case the manual shall indicate the installation guidelines in detail.

The connection threading is protected against impacts.

### 4.2 Technical documents

Each package shall contain technical documentation about the kit. The documentation shall contain the following information:

- the kit's designation and intended use;
- the conformity of the various elements constituting the kit;
- the installation instructions specific to each element included in the kit;
- safety instructions (e.g. relating to burns, etc.);
- maintenance instructions;
- the list of spare parts, if needed;
- a reminder of the guidelines relating to the hydraulic safety unit as indicated in Standard NF EN 1487 and in this technical document.

Technical documentation for a product must be written in the common language of the country where the product is sold.

It may be made available in electronic form. In this case, the link (QR code, web address, etc.) shall accompany the product and provide direct access to the product's technical documents.

