

CONTROL VALVES AND SAFETY VALVES

Technical document 079-06

Traps for hydraulic safety units

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MODIFICATION HISTORY

Revision no.	Application date	Modifications
00	15/03/2019	<p>Update to the document layout and reference.</p> <p>Content modifications:</p> <p>Part 1: Application rules</p> <ul style="list-style-type: none"> – Article 1.8.3 Behaviour when subjected to hot water: deleted (rev08) – Article 2 Added reference standard and deleted reference to NF EN 274 – Article 3.3 Deflector – Article 4 Classification: removed traps of type c (U- and S-bends) – Article 6 Materials: deleted reference to requirements of NF EN 274-1 (temperature variation) – Article 7 Dimensional characteristics: <ul style="list-style-type: none"> ○ addition of a note on tracking of dimensional deviations for connections; ○ figure and dimensions table reviewed and modified – Article 8 Hydraulic characteristics: details added for operating procedure and requirements – Article 9 Thermal shock test: operating procedure modified – Article 10 Steam test: operating procedure modified – Added articles: <ul style="list-style-type: none"> ○ 11 Tensile test ○ 12 Marking and documentation ○ 13 Test sequence <p>Part 2 and Part 3 are moved into a Technical Management Appendix (Control methods) and</p> <p>Update to Tables “Inspection during production” and “Inspection of finished products”.</p>

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PART 1. IMPLEMENTATION RULES AND ADDITIONAL SPECIFICATIONS

Purpose

This document specifies:

- the dimensional, hydraulic, physical and chemical requirements which must be met by all traps used in water-heater hydraulic safety units;
- the testing method used to check compliance with those requirements;
- marking and presentation.

1 Scope

This document applies only to traps intended to be used on the discharge outlet of safety units. It does not apply to products covered by Standards NF EN 274, parts 1, 2 and 3.

2 Normative references

The following reference documents are essential for the application of this document.

NF EN 1487: 2014	Building valves – Hydraulic safety groups – Tests and requirements.
NF DTU 60-11: 2013	Calculation rules for sanitary installations and rainwater draining off.
NF EN ISO 228-1: 2003	Pipe threads where pressure-tight joints are not made on the threads - Part 1 – Dimensions, tolerances and designation.
NF EN 1717: 2001	Protection against pollution of potable water in water installations and general requirements of devices to prevent pollution by backflow

3 Definitions

3.1 Trap

A hydraulic obturating device installed between the hydraulic safety unit and the drainage pipe system, the role of which is to prevent contaminated air from the drainage pipes from coming into contact with the air of the human environment, without interfering with the discharging of liquids.

3.2 Water seal

Column of water forming a buffer at rest, due to the level difference between the lowest horizontal level of the drainage pipe and the highest level of the pipe wall or the dip tube.

3.3 Deflector

Device to direct the flow of water that escapes from the pressure release in the hydraulic safety unit.

4 Classification

Traps for hydraulic safety units are classified according to their form:

- barrier traps;
- dip tube traps.

5 Designation (supplemented)

A trap for use in a hydraulic safety unit is defined by:

- its classification (barrier trap or dip tube trap);
- its usage (for hydraulic safety units);
- the diameter of the connection to the unit's pressure release;
- the outlet diameter (OD) for the connection to the drainage piping.

Added to this designation is the logo for this certification.

Minimum designation.

EXAMPLE

Dip tube trap, for hydraulic safety unit, G1, OD32, **NF**

6 Materials, design and construction

The materials used to manufacture the products must comply with the requirements of Articles 9 Thermal shock test and 10 Steam test of this document.

The design of the traps must meet the following requirements:

- adjustable-height traps shall be designed so that the minimum water level cannot be modified while the hydraulic safety unit is being set up;
- a trap for use in a hydraulic safety unit is equipped with a deflector.

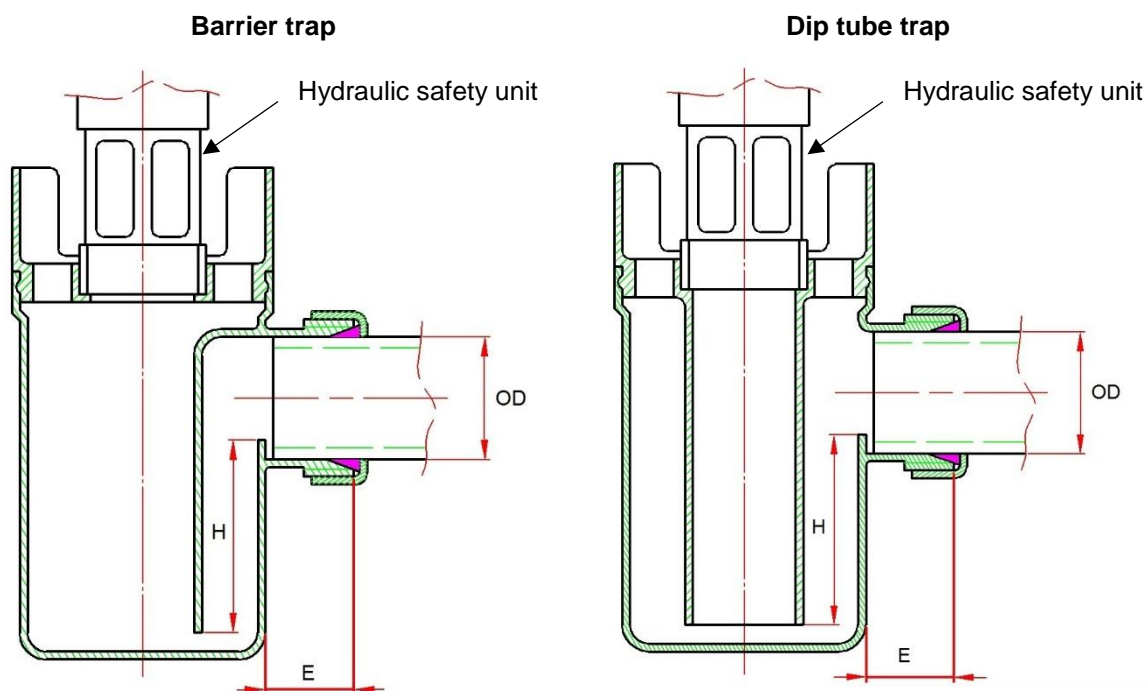


Figure 1 – Examples of traps

H: Height of water seal

OD: Outside diameter of drainage pipe

E: Socket depth

NOTE:

These diagrams of different types of traps are given as examples only, and have no bearing whatsoever on the various different methods used by manufacturers to produce the corresponding parts.

7 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.

Standardising the dimensions of traps guarantees that:

- the assembly of standardised safety units will meet the requirements of Standard NF EN 1487 Article 5.6 Hydraulic safety valve discharge connection to drain device;
- their connection to the drainage system meets the requirements of Table 3 of DTU 60.11, Part 2, Paragraph 5.3.

The trap shall be paired with a deflector to avoid splashes. The installation shall be designed so as to ensure that the safety unit's air gap is not obstructed. To achieve this, the deflector must include openings with a surface at least equivalent to the surface of the air inlets to the pressure release in the safety unit.

The dimensions of the trap and the deflector are provided in Table 1.

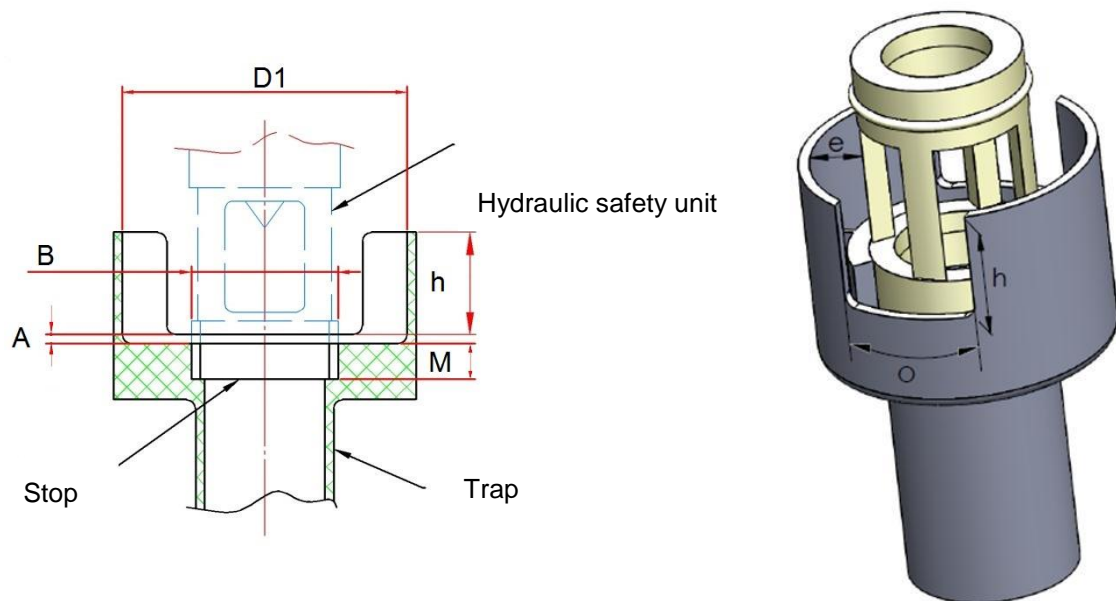


Figure 2 – Example of deflector (schematic diagram)

Table 1 – Trap and deflector dimensions

Dimension	Value (mm)	Notes
B	ISO 228-1 - G 1	The trap must always be connected to the unit with an ISO 228/1 threading. G 1 for traps used with units of DN15, DN20 and DN25
H	≥ 50	Height of water seal (cf. Figure 1)
OD	≥ 32	Outside diameter of drainage pipe
M	8 (0/+1)	Usable length of threading for connection to the safety unit
A	≤ 3	Distance between the high point of the threading of the connection from the pressure release and the deflector's overflow point
E	≥ 15	Min. socket depth dimension (cf. Figure 1)
S	≥ 1360 mm ²	Minimum deflector cross-section. ($S = b \times 2 \pi G/3$, where, for example, b (max.) = 26; $G=25$; refer to EN 1717 for the b and G dimensions)
D1	≥ 50	/
o	≥ 25	Deflector opening (chord)
h	≥ 26	Height of deflector

8 Hydraulic characteristics

8.1 Principle

The test consists of verifying the rate of flow absorbed by the trap when the water heater is drained.

8.2 Operating Procedure

- attach the trap to a safety unit with DN25 that complies with the NF EN 1487 standard.
- attach the assembly (safety unit + trap) to a hydraulic circuit;
- to the outlet of the trap, connect a drain pipe with a diameter equal to that of the trap. Manually and without using a tool, tighten the outlet connection nut until leaktightness is achieved;
- install a receptacle under the “safety unit + trap” assembly to collect any and all potential leaks and splashes;
- keep the valve's drain device in the open position, using only the position intended for that purpose;
- raise the pressure upstream from the group to achieve a flow rate of 600 (+50/0) l/h, i.e. 0.17 (+0.01/0) l/s.

8.3 Requirements

The trap must absorb the flow rates indicated above.

Throughout the duration of the test, no external leak shall be observed on the body of the trap.

9 Thermal shock test

9.1 Principle

The test consists of verifying the trap's behaviour in response to temperature cycles.

9.2 Operating Procedure

The trap is subjected to flows of hot water and cold water, according to the following cycle:

- a) (0.17 ± 0.05) l/s of hot water at (93 ± 2) °C for a period of 15 (+3/0) min;
- b) Wait 5 to 10 s;
- c) (0.17 ± 0.05) l/s of cold water at (15 ± 10) °C for a period of 10 (+3/0) min;
- d) Wait 5 to 10 s.

Repeat this cycle 5 times.

9.3 Requirements

At the end of the test, comply with the hydraulic characteristics indicated in Article 0.

10 Steam test

10.1 Principle

The test consists of verifying the trap's behaviour in contact with steam.

10.2 Operating Procedure

- install the trap on a device including a 1 mm diaphragm;
- feed steam into the assembly at a pressure of 7 ± 1 bar;
- maintain this pressure for a minimum of 10 minutes.

10.3 Required characteristics

At the end of the test:

- the water seal must remain compliant with the requirement for the dimension H ($H=50$ mm min., cf. Table 1);
- deformations are permitted if the hydraulic characteristics specified in Article 0 are satisfied.

11 Tensile test

11.1 Principle

The test consists of verifying the trap's resistance to a tensile force.

NOTE:

This test was established to verify trap "sturdiness", following certain defects observed in the field.

11.2 Operating Procedure

- attach the trap to a safety unit or equivalent device;
- apply a tensile force of 150 (-2/0) N to one end of the trap as shown in Figure 3;
- maintain the tensile force for at least 10 minutes.

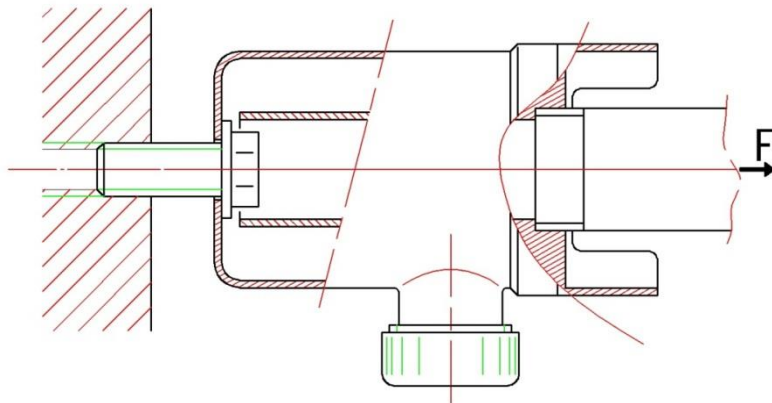


Figure 3 – Example configuration for the tensile test (schematic diagram)

NOTE:

The configuration used for the tensile test must not degrade the product's resistance.

11.3 Required characteristics

At the end of the test, the parts of the trap must not separate.

12 Marking and documentation

12.1 Marking

The product must bear a legible, visible and permanent marking that provides at least the following information:

- Manufacturer's name, logo;
- logo for this certification;
- GDS.

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

12.2 Technical documentation

The product must be stored and delivered in a package that contains all of the elements that comprise it.

The manufacturer shall indicate:

- the field of application,
- the diameter of the drainage piping (at least equal to the trap's outlet diameter);
- compliance with standard practices for attachment to the drainage system.

If this information is not included in the technical documentation, it must appear on the packaging or directly on the product.

Technical documentation 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.) must accompany the product and provide direct access to the product's technical documents.

13 Test sequence

Where applicable, the tests set out in Table 2 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 shall be verified on all products tested.

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

Table 2: Distribution of tests

Sequence	Sequence name and order of the tests
1.	Dimensions 6 Materials, design and construction 7 Dimensional characteristics
2.	Hydraulic 8 Hydraulic characteristics 9 Thermal shock test 8 Hydraulic characteristics
3.	Steam 8 Hydraulic characteristics 10 Steam test 8 Hydraulic characteristics
4.	Tensile 11 Tensile test

