
Cevi za daljinsko ogrevanje - Poviti enocevni sistemi za neposredno vkopana vročevodna omrežja - Tovarniško izdelan sestav jeklenih ventilov za jeklene delovne cevi, obdane s poliuretansko toplotno izolacijo in zaščitnim plaščem iz polietilena

District heating pipes - Bonded single pipe systems for directly buried hot water networks
- Factory made steel valve assembly for steel service pipes, polyurethane thermal insulation and a casing of polyethylene

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Tuyaux de chauffage urbain - Systèmes bloqués monotubes pour les réseaux d'eau chaude enterrés directement - Assemblages d'appareils de robinetterie manufacturés pour tubes de service en acier, isolation thermique en polyuréthane et tube de protection en polyéthylène

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**District heating pipes - Bonded single pipe systems for
directly buried hot water networks - Factory made steel
valve assembly for steel service pipes, polyurethane
thermal insulation and a casing of polyethylene**

Tuyaux de chauffage urbain - Systèmes bloqués
monotubes pour les réseaux d'eau chaude enterrés
directement - Assemblages d'appareils de robinetterie
manufacturés pour tubes de service en acier, isolation
thermique en polyuréthane et tube de protection en
polyéthylène

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 107.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (prEN 488:2018) has been prepared by Technical Committee CEN/TC 107 “Prefabricated district heating and district cooling pipe system”, the secretariat of which is held by DS.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 488:2015.

In comparison with the previous edition, the main changes in this new edition of EN 488 are:

- editorial changes to the new structure of standards prepared by the Technical Committee CEN/TC 107.

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Introduction

prEN 488 has also been aligned with EN 448 and other relevant European Standards.

Other standards from CEN/TC 107 are:

- EN 253, *District heating pipes — Preinsulated bonded pipe systems for directly buried hot water networks — Pipe assembly of steel service pipe, polyurethane thermal insulation and outer casing of polyethylene*;
- EN 448, *District heating pipes — Preinsulated bonded pipe systems for directly buried hot water networks — Fitting assemblies of steel service pipes, polyurethane thermal insulation and outer casing of polyethylene*;
- prEN 488, *District heating pipes — Bonded single pipe systems for directly buried hot water networks — Factory made steel valve assembly for steel service pipes, polyurethane thermal insulation and a casing of polyethylene*;
- prEN 489-1, *District heating pipes — Bonded single and twin pipe systems for buried hot water networks — Part 1: Joint casing assemblies and thermal insulation for hot water networks in accordance with EN 13941-1*;
- prEN 13941-1, *District heating pipes — Design and installation of thermal insulated bonded single and twin pipe systems for directly buried hot water networks — Part 1: Design*;
- prEN 13941-2, *District heating pipes — Design and installation of thermal insulated bonded single and twin pipe systems for directly buried hot water networks — Part 2: Installation*;
- EN 14419, *District heating pipes — Preinsulated bonded pipe systems for directly buried hot water networks — Surveillance systems*;
- EN 15632 (all parts), *District heating pipes — Pre-insulated flexible pipe systems*;
- EN 15698-1, *District heating pipes — Preinsulated bonded twin pipe systems for directly buried hot water networks — Part 1: Twin pipe assembly of steel service pipe, polyurethane thermal insulation and outer casing of polyethylene*;
- EN 15698-2, *District heating pipes — Preinsulated bonded twin pipe systems for directly buried hot water networks — Part 2: Fitting and valve assembly of steel service pipes, polyurethane thermal insulation and outer casing of polyethylene*.

1 Scope

This document specifies requirements and test methods for factory made thermally insulated bonded valve assemblies for hot water networks in accordance with prEN 13941-1, comprising a steel valve, rigid polyurethane foam insulation and a casing of polyethylene.

The valve assembly may also include the following additional elements: measuring wires, spacers and diffusion barriers.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

EN 19, *Industrial valves — Marking of metallic valves*

EN 253, *District heating pipes — Preinsulated bonded pipe systems for directly buried hot water networks — Pipe assembly of steel service pipe, polyurethane thermal insulation and outer casing of polyethylene*

EN 448:2015, *District heating pipes — Preinsulated bonded pipe systems for directly buried hot water networks — Fitting assemblies of steel service pipes, polyurethane thermal insulation and outer casing of polyethylene*

EN 736-1, *Valves — Terminology — Part 1: Definition of types of valves*

EN 10088-1:2014, *Stainless steels — Part 1: List of stainless steels*

EN 10204, *Metallic products — Types of inspection documents*

EN 12266-1, *Industrial valves — Testing of metallic valves — Part 1: Pressure tests, test procedures and acceptance criteria — Mandatory requirements*

prEN 13941-1, *District heating pipes — Design and installation of thermal insulated bonded single and twin pipe systems for directly buried hot water networks — Part 1: Design*

prEN 13941-2, *District heating pipes — Design and installation of thermal insulated bonded single and twin pipe systems for directly buried hot water networks — Part 2: Installation*

EN 14419, *District heating pipes — Preinsulated bonded pipe systems for directly buried hot water networks — Surveillance systems*

EN ISO 12944-2, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 2: Classification of environments (ISO 12944-2)*

EN ISO 12944-5, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 5: Protective paint systems (ISO 12944-5)*

3 Terms and definitions

For the purposes of this document, the terms and definitions regarding types of valves given in EN 736-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

4 Requirements

4.1 Pressure ratings for valves

4.1.1 General

The valves shall be designed for use in pipe systems with a maximum operating pressure of 16 bar or 25 bar.

The valves shall be able to withstand a strength test pressure of the district heating system of 1,3 times the maximum operating pressure at ambient temperature in open and closed position.

4.1.2 Valves without indicated flow direction

Valves without an indicated flow direction shall support the pressure load in both directions.

4.2 Service temperatures for valves

The valves shall be able to withstand continuous operation with hot water at various temperatures in accordance with prEN13941-1 and at a minimum water temperature of 4 °C.

4.3 Steel parts

4.3.1 General

Steel grades are specified in prEN 13941-1.

All valves, steel pipes and steel components used for manufacturing of valve assemblies under the scope of this European Standard shall as a minimum be delivered to the manufacturer with an inspection certificate 3.1 according to EN 10204. The inspection certificate shall on request be passed on to the customer.

In case a material related inspection certificate 3.1 according to EN 10204 is required by the customer who orders the factory made valve assemblies, this information shall be given while placing the order with the manufacturer of the factory made valve assemblies.

Any later request for provision of such documentation can be too late and can possibly not be met by the manufacturer, since the manufacturer has to organize the assignment of 3.1 certificates to valves and valve assemblies before starting the production.

4.3.2 Valve

The valve shall be fully welded. Detachable joints, such as flanged or screwed connections, except sealing system at the stem, shall not be used in the pressurized area.

4.3.3 Valve extension pipe

The quality of the valve body shall match with the quality of the valve extension pipe.

4.3.4 Welding ends

The welding ends of the valve assembly shall match with the service pipe in accordance with prEN 13941-1.

Pipe ends shall be prepared in accordance with EN 448.

prEN 488:2018 (E)**4.3.5 Welding of steel parts**

Fusion welding between valves and valve extension pipe, shall be carried out in accordance with EN 448

The quality of the steel at the welding ends of the valve or valve assembly shall match with steel of the service pipes.

Welding of pressurized parts of the valve assembly shall comply with EN 448.

4.4 Casing**4.4.1 General**

The casing shall be in accordance with EN 448 and EN 253.

4.4.2 Requirements for polyethylene welding

The general requirements for polyethylene welding shall be in accordance with EN 448.

4.4.3 Diameter and wall thickness of the casing

The outside diameter and the minimum wall thickness of the casing shall be in accordance with EN 253.

4.5 Polyurethane (PUR) foam thermal insulation**4.5.1 General**

The requirements for thermal insulation shall be the same as in EN253 when tested in accordance with 5.5 of this European Standard.

4.5.2 Minimum thickness of thermal insulation

The minimum thickness of thermal insulation shall be in accordance with EN 448.

4.6 Valve assembly**4.6.1 Ends of valve assembly****4.6.1.1 General**

The ends of the valve extension pipe of the valve assembly shall be prepared for welding according to 4.3.3 and shall be free from thermal insulation in accordance with EN 253.

4.6.1.2 Centre line deviation

The distance between the centre lines of the valve extension pipe and the casing at the ends of the valve assembly shall not exceed the limits given in EN 253.

The centre line deviation shall be measured between the centre lines with the largest deviation.

4.6.1.3 Angular deviation

The angular deviation between the centre lines of the not insulated ends of the valve extension pipe at the length of 100 mm from the ends shall not exceed 2°.

The angular deviation shall be measured between the centre lines with the largest deviation.

4.6.2 End of stem construction

To ensure a long service life of the end stem passing through the casing, it shall withstand the aggressive underground condition such as heat, cold, moisture, ground and salty water. Where the stem construction passes the casing there shall be an arrangement to protect against water ingress to the thermal insulation.

The stem construction outside the thermal insulation shall be:

- made from stainless steel as defined in EN 10088-1:2014, 3.1, however minimum specified Cr-content is 16 %. Factors influencing the corrosion probability of the stainless steel construction can be assessed according to EN 12502-4.

Specifically used steel type is documented by appropriate quality management system;

Under specific installation and operation conditions a chrome content of 16 % alone might not be sufficient, so that other alloy elements are then recommended.

- or made from carbon steel and protected by a paint system securing durability range “high” according to EN ISO 12944-5. Underground installed valves shall be suitable for corrosivity categories of Im1, Im2 and Im3 according to EN ISO 12944-2 and for atmospheric-corrosivity categories C5-M and C5-I according to EN ISO 12944-2.

Specifically used paint system shall be according to EN ISO 12944-5 and documented by appropriate quality management system.

The protection by corrosion resistant material or corrosion protecting paint shall be added at the length of at least 100 mm from the top of the ‘stem house’ (see Figure 1).

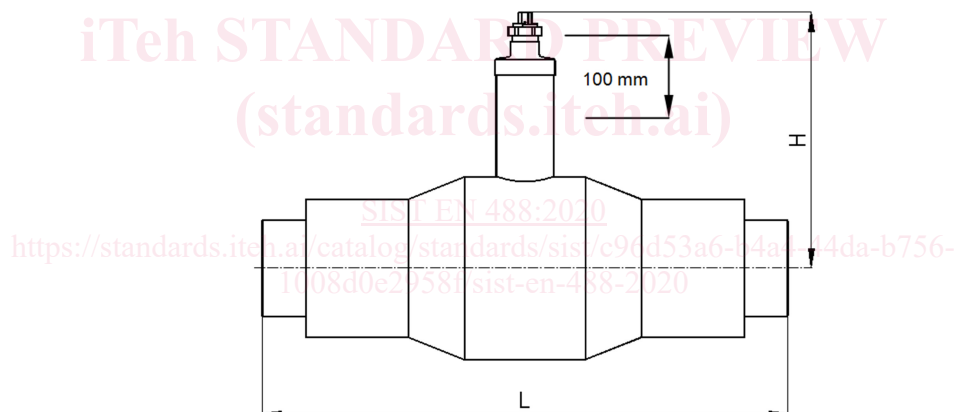


Figure 1 — Anti corrosion protection of the stem construction

4.6.3 Main dimensions of the valve assembly

The main dimensions of the valve assembly H and L are shown in Figure 2.

The values of the main dimensions “L” and “H” shall be declared by the manufacturer.

The tolerances of the valve assembly dimensions shown in Figure 2 shall be in accordance with Table 1.

Table 1 — Tolerances on the main valve dimensions

DN	H mm	L mm
≤ 300	±5	±20
> 300	±10	±50

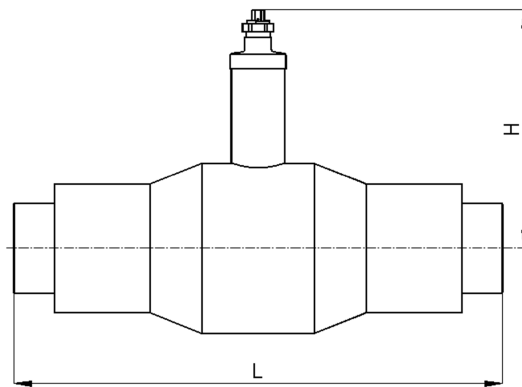


Figure 2 — Main dimensions

4.6.4 Installation of measuring elements

Measuring elements for surveillance systems shall be in accordance with EN 14419.

4.7 Requirements for effective operation and maintenance

The design of the valve shall make it possible to operate the valve outside the thermal insulation and the casing.

The valve shall close when turned clockwise and open when turned anti-clockwise.

The stem construction shall make it possible to manoeuvre the valve by means of a T key from ground level.

NOTE 1 Commonly used keyways are 19 mm, 27 mm, 36 mm, 50 mm and 60 mm or conical quadrangle 27 mm/ 32 mm.

Butterfly valves with nominal diameter DN 100 and larger, ball valves and gate valves with nominal diameter DN 200 and larger shall be provided with a gear or a connection for an actuator to ensure controlled manoeuvring of the valve.

NOTE 2 Commonly used keyways for connections for actuators are 60 mm, 70 mm and 90 mm, or conical quadrangle 27 mm/32 mm.

Valves shall be provided with a stop device that can be replaced without removing the thermal insulation and the casing. Alternatively, an internal stop device can be used. The internal stop device shall be designed to resist a maximum strength torque of at least twice the maximum operating torque specified by the manufacturer with a minimum of 150 Nm in the fully open and fully closed position of the valve. Using an internal stop device, the valve stem shall be designed to resist a maximum strength torque of at least 1,5 times the designed strength torque of the stop device.

The sealing around the stem shall be capable of being maintained without removing the thermal insulation and the casing.

4.8 Resistance to axial forces and bending moments

The resistance of the valves to axial forces and bending moments shall comply with Table B.1.