



Series: TECHNICAL APPROVALS

# **TECHNICAL APPROVAL OF THE BUILDING RESEARCH INSTITUTE (ITB) AT-15-8084/2014**

Pursuant to Regulation of the Minister of Infrastructure of 8 November 2004 on technical approvals and organisational units authorised to issue them (Official Journal No. 249, item 2497), based on the assessment for technical approval purposes at the Building Research Institute in Warsaw, undertaken at the request of:

**CAPRICORN S.A.**  
**Ciernie 11, 58-160 Świebodzice, Poland**

it is hereby certified that the following products:

**CAPRICORN manifolds for radiant and surface  
heating systems and  
drinking water systems**

are suitable for use in the building industry in accordance with the requirements of the Appendix that forms an integral part of this Technical Approval of the Building Research Institute (ITB) and to the extent specified therein.

This Technical Approval expires as of:

6 June 2019

Appendix:

General and technical requirements

**DIRECTOR**  
Building Research Institute (ITB)

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Warsaw, 6 June 2014

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## 1. SCOPE OF TECHNICAL APPROVAL

This Technical Approval of the Building Research Institute (ITB) refers to CAPRICORN manifolds for radiant and surface heating systems and drinking water systems, manufactured by CAPRICORN S.A. based at Ciernie 11, 58-160 Świebodzice, Poland.

CAPRICORN manifolds consist of two pipes, i.e. one supply and one return pipe, fitted onto mounting supports via stainless steel brackets. A total of 2 to 12 system circuits can be connected to the manifolds.

Manifold pipes are made of brass or stainless steel sections. Depending on their type and intended use, pipes in CAPRICORN manifolds can be provided with connectors, plugs, air vents, cut-off valves, outlet valves, air-vent/outlet units with or without temperature sensors, temperature control valves with or without electrical actuators, control valves, control valves with flow meters. Manifold pipes are shown in Fig. 1 – Fig. 6.

Connections between individual manifold components are provided with EPDM or NBR seals. Valves, air vents, flow meters and other accessories for manifolds fall outside the scope of this Technical Approval and should be authorised for placement on the market.

Manifold pipes have an internal connecting thread G1 at one or both ends. Openings in manifold pipes for connecting system circuits are provided with internal threads G½.

The structure and accessories of manifolds are shown in Fig. 7.

The technical and performance requirements for CAPRICORN manifolds are specified in section 3.

## 2. INTENDED USE, SCOPE AND CONDITIONS OF USE

CAPRICORN manifolds with or without connectors, plugs, air vents, cut-off valves, outlet valves, air-vent/outlet units with or without temperature sensors, temperature control valves with or without electrical actuators, control valves and control valves with flow meters are designed for use in surface heating systems.

CAPRICORN manifolds with or without connectors, plugs, air vents, cut-off valves, outlet valves, air-vent/outlet units with or without temperature sensors and control valves are designed for use in radiant heating systems.

CAPRICORN manifolds without accessories can be used in drinking water systems.

The maximum operating parameters of CAPRICORN manifolds for radiant heating and drinking water systems are as follows:

- temperature 95°C,
- pressure 1.0 MPa.

The maximum operating parameters of CAPRICORN manifolds for surface heating systems are as follows:

- temperature 70°C,
- pressure 0.6 MPa.

CAPRICORN manifolds for heating systems should be used in accordance with a technical design conforming to PN-EN 12828:2013.

Brass and steel manifolds for drinking water systems have been approved by the National Institute of Public Health (PZH) in Warsaw and declared suitable for use in the supply and distribution of water intended for human consumption under the Hygienic Approvals No. HK/W/0353/01/2012 and No. HK/W/0353/02/2012.

The manifolds referred to in this Technical Approval should be used in accordance with a technical design created for specific facilities, taking into account the requirements of Polish standards and regulations as well as the manufacturer's instructions.

### **3. TECHNICAL PARAMETERS. REQUIREMENTS**

#### **3.1. Materials and elements**

CAPRICORN manifolds should be made of the following materials:

- pipes in brass manifolds – brass (grade CW614N) in accordance with PN-EN 12164:2011,
- pipes in steel manifolds – stainless steel (grade 1.4301) in accordance with PN-EN 10088-1:2007,
- supports and brackets for manifold pipes – stainless steel in accordance with PN-EN 10088-1:2007.

O-ring seals should be made of EPDM or NBR and conform to the requirements of PN-EN 681-1:2002+A3:2006.

Control valves should conform to PN-M-75002:2012 and temperature control valves – PN-EN 215:2005+A1:2006. Accessories for manifolds should be authorised for placement on the market.

The properties of manufacturing materials as well as the respective test methods and acceptance procedures fall outside the scope of this Technical Approval of the Building Research Institute (ITB) and they should be ensured as part of the internal production control system.

### 3.2. Designation

All manifolds should be provided with indelible and legible manufacturer’s designation (labels can also be used).

### 3.3. Technical and performance parameters

The technical and performance requirements for CAPRICORN manifolds are specified in Table 1.

**Table 1**

No.	Parameters	Requirements	Test methods
1	2	3	4
1	External appearance	acc. to section 3.3.1	section 5.6.1
2	Dimensions	acc. to section 3.3.2	section 5.6.2
3	Tightness	tight, no deformations	section 5.6.3
4	Tightness under maximum operating conditions	tight, no deformations	section 5.6.4
5	Hydraulic parameters of manifolds, at a pressure drop of 1 bar, expressed by the factor $K_V, m^3/h$ <sup>1)</sup>	$\geq 1.0$	PN-EN 1074-5:2002 PN-EN 1267:2012

<sup>1)</sup> with valves fully opened

**3.3.1 External appearance.** Product surfaces should be smooth, clean, without any signs of defects or damage. Sharp edges should be blunted or rounded.

Threads should be clean, without any signs of cracks or corrosion.

**3.3.2 Dimensions.** Dimensions of manifolds should conform to those specified in Fig. 1 – Fig. 6. Unspecified tolerances should conform to Class c rough estimates in accordance with PN-EN 22768-1:1999. Threads should conform to PN-EN ISO 228-1:2005, PN-EN 10226-1:2006 or PN-ISO 724:1995.

### **3.4. Impact on water quality**

CAPRICORN brass and steel manifolds for drinking water systems should be provided with Hygienic Approval issued by the National Institute of Public Health (PZH) in Warsaw to certify that they can be used in the supply and distribution of water intended for human consumption.

## **4. PACKING, STORAGE, TRANSPORT**

The products referred to in this Technical Approval of the Building Research Institute (ITB) should be delivered in the Manufacturer's original packaging, stored and transported so as to ensure that their parameters remain unchanged.

All packaging should be accompanied by information containing at least the following details:

- product name and intended use,
- Manufacturer's name and address,
- number of the Technical Approval of the Building Research Institute (ITB): AT-15-8084/2014,
- number and date of issue of the national declaration of conformity,
- construction mark.

The products should be provided with a construction mark in accordance with Regulation of the Minister of Infrastructure of 11 August 2004 on methods of declaring conformity of construction products and methods of providing them with construction marks (Official Journal No. 198/2004, item 2041, as amended).

## 5. CONFORMITY ASSESSMENT

### 5.1. General requirements

Pursuant to Article 4, Article 5 (1) (3) and Article 8 (1) of the Building Materials Act of 16 April 2004 (Official Journal No. 92/2004, item 881, as amended) the products referred to in this Technical Approval are authorised for placement on the market and may be used for construction works in accordance with their performance parameters and scope of intended use, provided that the manufacturer has performed a conformity assessment, issued a national declaration of conformity with the Technical Approval of the Building Research Institute (ITB) No. AT-15-8084/2014 and provided the products with a construction mark, in accordance with the applicable regulations.

Pursuant to Regulation of the Minister of Infrastructure of 11 August 2004 on methods of declaring conformity of construction products and methods of providing them with construction marks (Official Journal No. 198/2004, item 2041, as amended) conformity assessments of the products referred to in the Technical Approval of the Building Research Institute (ITB) No. AT-15-8084/2014 should be performed by the Manufacturer using the system 4.

As far as the conformity assessment system 4 is concerned, the Manufacturer may issue a national declaration of conformity with the Technical Approval of the Building Research Institute (ITB) No. AT-15-8084/2014 based on:

- a) initial type examination conducted by the Manufacturer or at the Manufacturer's request,
- b) internal production control.

Until the decision of the European Commission on requirements for products in contact with water intended for human consumption, which shall be subject to the conformity assessment system 1+ for those purposes, the products should conform to Regulation of the Minister of Health of 29 March 2007 on quality of water intended for human consumption (Official Journal No. 61/2007, item 417).

### 5.2. Initial type examination

An initial type examination is performed to confirm that a product conforms to the technical and performance requirements prior to its placement on the market.

The initial type examination of manifolds should include the following parameters:

- a) tightness,
- b) tightness under maximum operating conditions,
- c) hydraulic parameters (flow rate factor  $K_v$ ).

The tests performed during the approval procedure with a view to establishing technical and performance parameters of the products are considered an initial type examination for the purpose of conformity assessment.

### **5.3. Internal production control**

The internal production control should include:

1. specifications and tests of constituent products and materials,
2. inspections and tests during the manufacturing process and tests of finished products (section 5.4) to be performed by the Manufacturer in accordance with the prescribed testing plan, rules and procedures specified in the documentation of the internal production control system, adapted to the manufacturing technology and aimed at obtaining products with the required parameters.

The production control should ensure that products conform to the Technical Approval of the Building Research Institute (ITB) No. AT-15-8084/2014. Production control results should be recorded on an ongoing basis. The records should confirm that products satisfy the conformity assessment criteria. Individual products or product batches and the relevant production details should be fully identifiable and reproducible.

### **5.4. Finished product tests**

Tests of finished products should include:

- a) dimensions
- b) external appearance,
- c) labels and designations,
- d) tightness.

### **5.5. Testing frequency**

Tests of finished products should be performed in accordance with the prescribed testing plan, however, at least for each product batch. The size of a product batch should be specified in the internal production control documentation.



## 5.6. Test methods

Tests and examinations should be performed by methods specified Table 1, column 4, and those described below.

**5.6.1. Examination of external appearance and designation.** The examination of the external appearance and designation should be performed by visual inspection with the naked eye in diffuse light, at a distance of 1 m.

**5.6.2. Examination of dimensions.** The dimensional examination should be performed using versatile measuring instruments so as to ensure the appropriate accuracy of measurements and tests.

**5.6.3. Tightness test.** Tightness test should be performed by way of a 1-hour water pressure test at water pressure of  $p = 1.5 p_{\max}$  (where  $p_{\max}$  is the maximum operating pressure) and temperature of  $(20 \pm 2)^{\circ}\text{C}$ . After closing valves it should be checked if there are any leaks. During the acceptance procedure the test should be performed for 30 s at a temperature of  $(20 \pm 2)^{\circ}\text{C}$  and pressure of air compressed by  $p = p_{\max}$  (where  $p_{\max}$  is the maximum operating pressure). After closing valves it should be checked if there are any leaks.

**5.6.4. Tightness test under maximum operating conditions.** Tightness test under maximum operating conditions should be performed by way of a 96-hour water pressure test with water pressure and temperature corresponding to the maximum operating parameters of the manifolds. After closing valves it should be checked if there are any leaks.

## 5.7. Sampling procedure

Test specimen should be sampled at random, in accordance with PN-N-03010:1983.

## 5.8. Assessment of test and examination results

Products can be considered to conform to the requirements of this Technical Approval of the Building Research Institute (ITB) if all test and examination results are positive.

## 6. FORMAL AND LEGAL REQUIREMENTS

**6.1.** The Technical Approval of the Building Research Institute (ITB) No. AT-15-8084/2014 supersedes the Technical Approval of the Building Research Institute (ITB) No. AT-15-8084/2009.

**6.2.** The Technical Approval of the Building Research Institute (ITB) No. AT-15-8084/2014 certifies that CAPRICORN manifolds for radiant and surface heating systems and drinking water systems are suitable for use in the building industry in accordance with the scope of the Technical Approval.

Pursuant to Article 4, Article 5 (1) (3) and Article 8 (1) of the Building Materials Act of 16 April 2004 (Official Journal No. 92/2004, item 881, as amended) the products referred to in this Technical Approval are authorised for placement on the market and may be used for construction works in accordance with their performance parameters and scope of intended use, provided that the manufacturer has performed a conformity assessment, issued a national declaration of conformity with the Technical Approval of the Building Research Institute (ITB) No. AT-15-8084/2014 and provided the products with a construction mark, in accordance with the applicable regulations.

**6.3.** The Technical Approval of the Building Research Institute (ITB) does not prejudice the rights arising from the regulations on industrial property protection, including in particular the Industrial Property Act of 30 June 2000 (uniform text: Official Journal 2013, item 1410, as amended). Users of this Technical Approval of the Building Research Institute (ITB) are required to ensure compliance with those rights.

**6.4.** By issuing this Technical Approval, the Building Research Institute (ITB) assumes no responsibility for infringements of any exclusive and acquired rights.

**6.5.** The Technical Approval of the Building Research Institute (ITB) shall not release the Manufacturer of CAPRICORN manifolds for radiant and surface heating systems and drinking water systems from responsibility for proper product quality nor designers of facilities and building contractors from responsibility for their proper use.

**6.6.** Brochures, notices and other documents published in the process of placement of CAPRICORN manifolds for radiant and surface heating systems and drinking water systems on the market and their application in the building industry should contain a reference to this Technical Approval of the Building Research Institute (ITB) No. AT-15-8084/2014.

## 7. VALIDITY PERIOD

The Technical Approval of the Building Research Institute (ITB) No. AT-15-8084/2014 expires as of 6 June 2019.

This Technical Approval of the Building Research Institute (ITB) may be renewed for subsequent periods, provided that the Applicant or its formal successor files with the Building Research Institute an appropriate application at least 3 months prior to the expiry of this document.

## END OF DOCUMENT

## ADDITIONAL INFORMATION

### Standards and related documents

PN-EN 215:2005+A1:2006	<i>Thermostatic radiator valves. Requirements and test methods</i>
PN-EN 681-1:2002+A3:2006	<i>Elastomeric seals. Material requirements for pipe joint seals used in water and drainage applications. Part 1: Vulcanized rubber</i>
PN-EN 1074-5:2002	<i>Valves for water supply. Fitness for purpose requirements and appropriate verification tests. Part 5: Control valves</i>
PN-EN 1267:2012	<i>Industrial valves. Test of flow resistance using water as test fluid</i>
PN-EN 10088-1:2007	<i>Stainless steels. Part 1: List of stainless steels</i>
PN-EN 10226-1:2006	<i>Pipe threads where pressure tight joints are made on the threads. Part 1: Taper external threads and parallel internal threads. Dimensions, tolerances and designation</i>
PN-EN 12164:2011	<i>Copper and copper alloys. Rod for free machining purposes</i>
PN-EN 12828:2013	<i>Heating systems in buildings. Design for water-based heating systems</i>

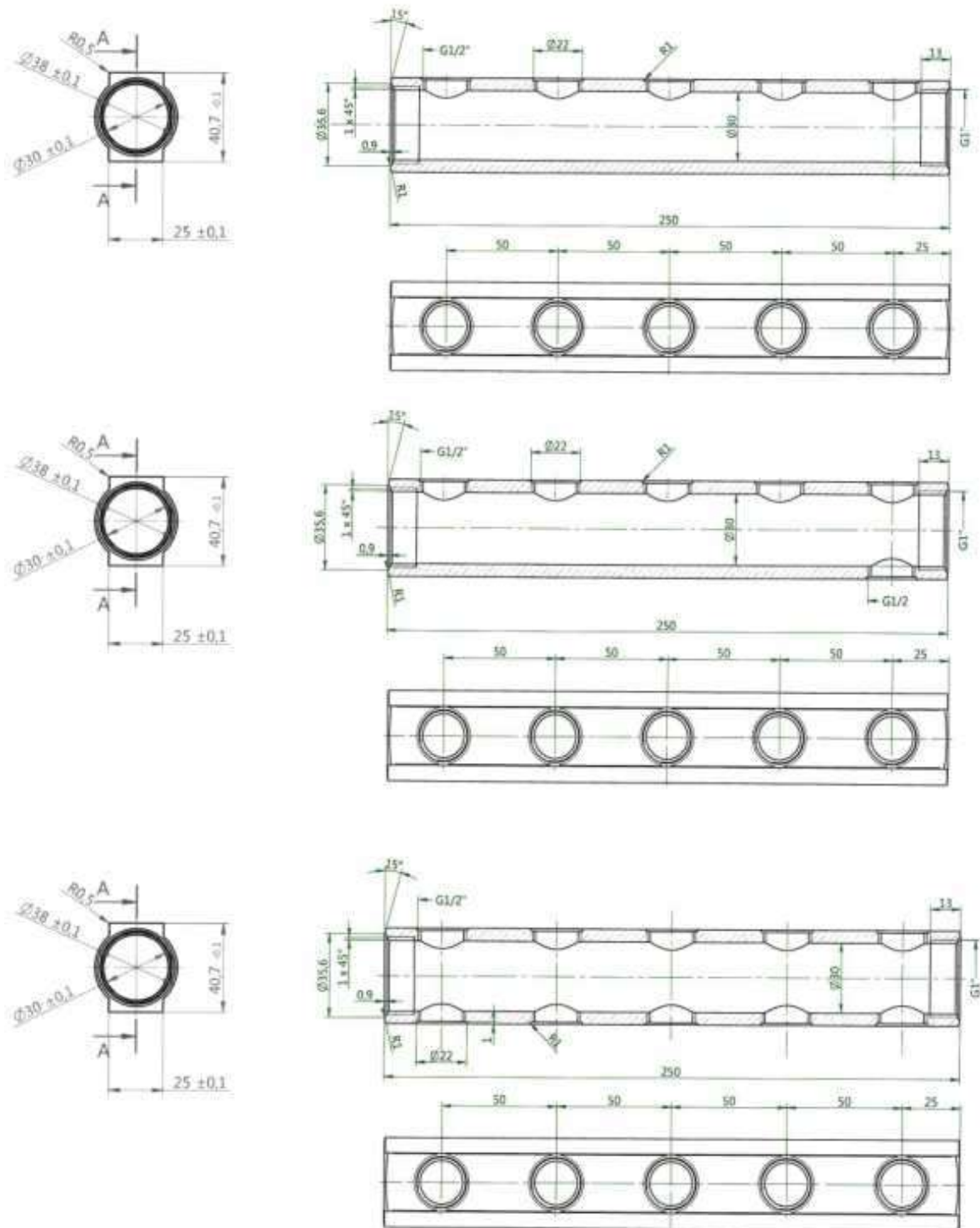
PN-EN 22768-1:1999	<i>General tolerances. Tolerances for linear and angular dimensions without individual tolerance indications</i>
PN-EN ISO 228-1:2005	<i>Pipe threads where pressure-tight joints are not made on the threads. Part 1: Dimensions, tolerances and designation</i>
PN-ISO 724:1995	<i>ISO metric threads for general use. Nominal dimensions</i>
PN-M-75002:2012	<i>Valves in water supply and central heating systems. Requirements and tests</i>
PN-N-03010:1983	<i>Statistical quality control. Random selection of sample product units</i>

### **Test and examination reports**

1. Test Report No. LOW01-00852/14/Z00OWN "CAPRICORN brass and steel manifolds", Building Hardware and Ironmongery Laboratory of the Building Research Institute, Wielkopolska Branch, Poznań.
2. Technical Opinion No. OWN-OT-005/2014 concerning CAPRICORN brass and steel manifolds, Building Hardware and Ironmongery Laboratory of the Building Research Institute, Wielkopolska Branch, Poznań.
3. Hygienic Approvals No. HK/W/0353/01/2012 and No. HK/W/0353/02/2012, National Institute of Public Health (PZH) in Warsaw

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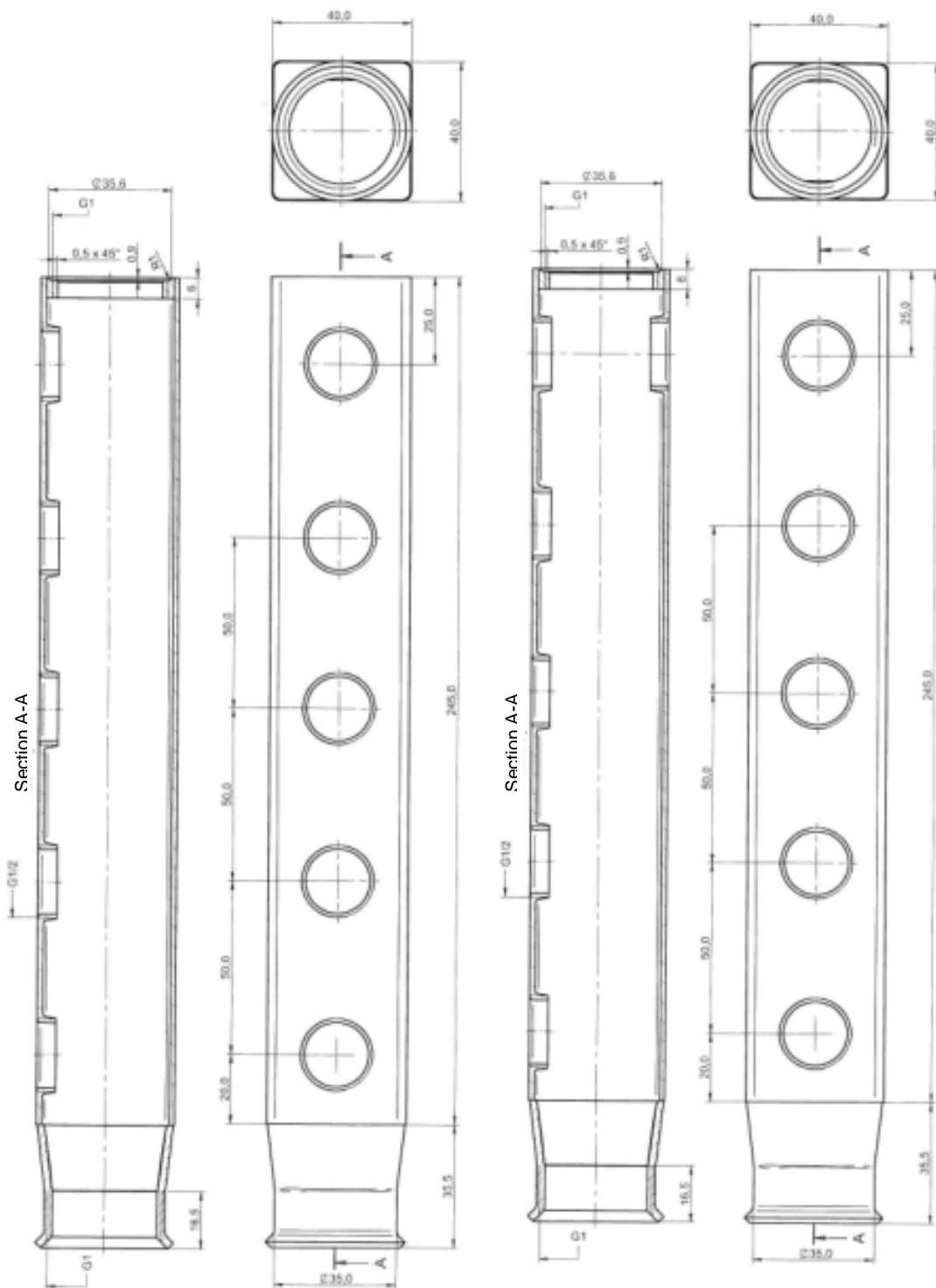
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Number of openings <sup>1)</sup>	2	3	4	5	6	7	8	9	10	11	12
Pipe length, mm	100	150	200	250	300	350	400	450	500	550	600

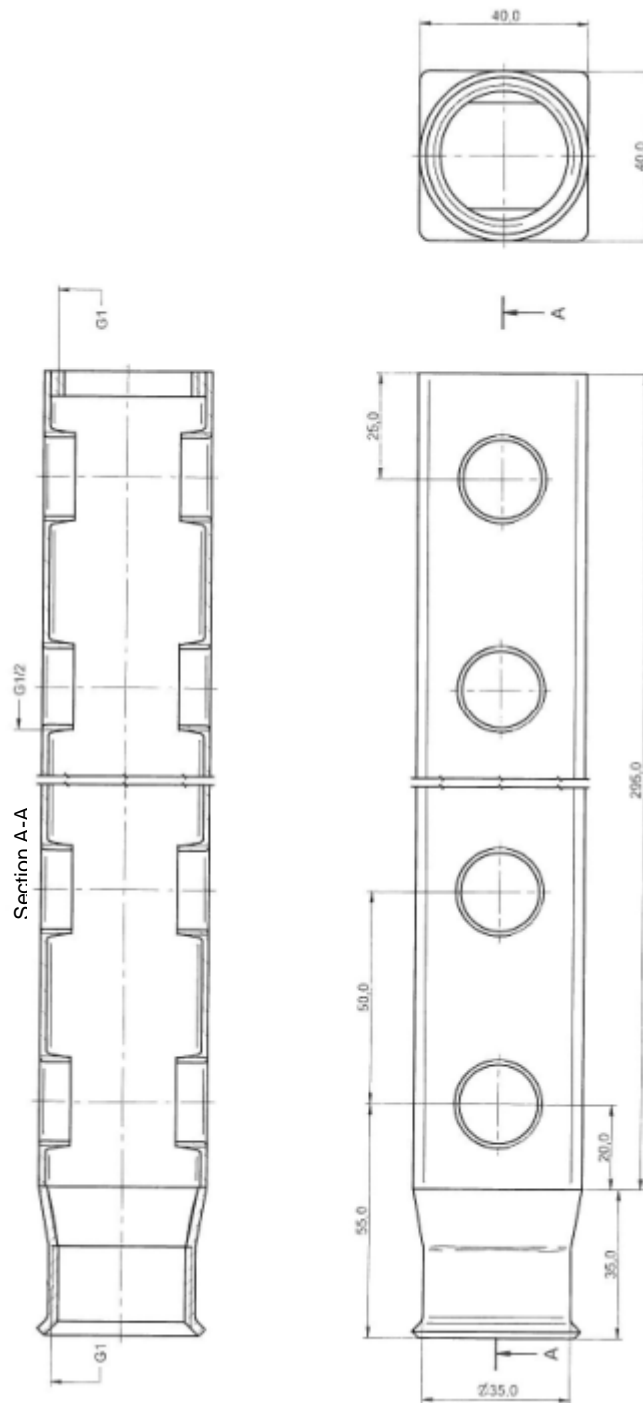
<sup>1)</sup> for connecting system circuits

**Fig. 1.** Supply and return pipes for CAPRICORN manifolds, brass, circular cross-section



Number of openings <sup>1)</sup>	2	3	4	5	6	7	8	9	10	11	12
Pipe length, mm	130	180	230	280	330	380	430	480	530	580	630
<sup>1)</sup> for connecting system circuits											

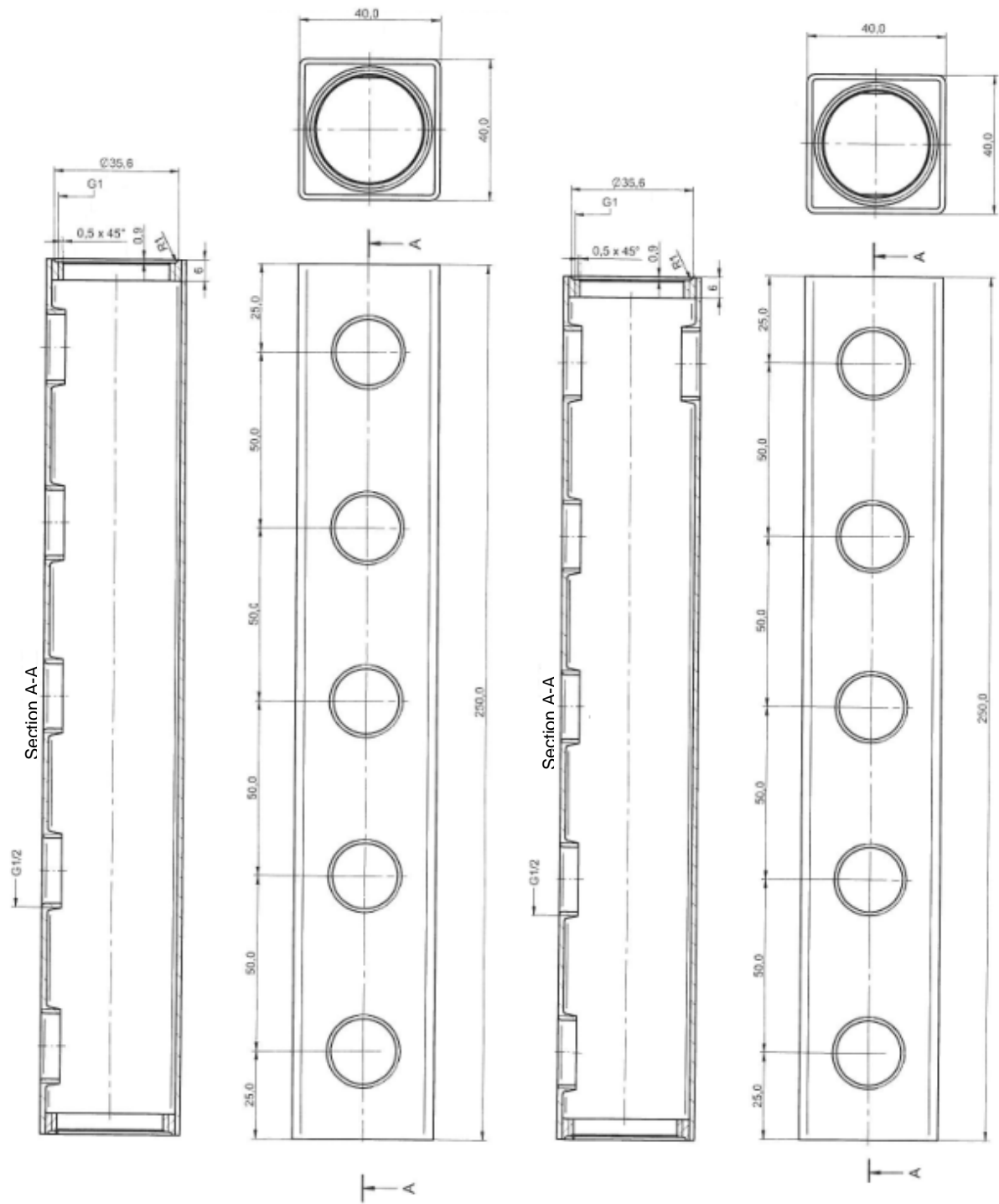
**Fig. 2.** Supply and return pipes for CAPRICORN manifolds, stainless steel, square cross-section



Number of openings <sup>1)</sup>	2	3	4	5	6	7	8	9	10	11	12
Pipe length, mm	130	180	230	280	330	380	430	480	530	580	630
<sup>1)</sup> for connecting system circuits											

**Fig. 3.** Supply and return pipes for CAPRICORN manifolds, stainless steel, square cross-section

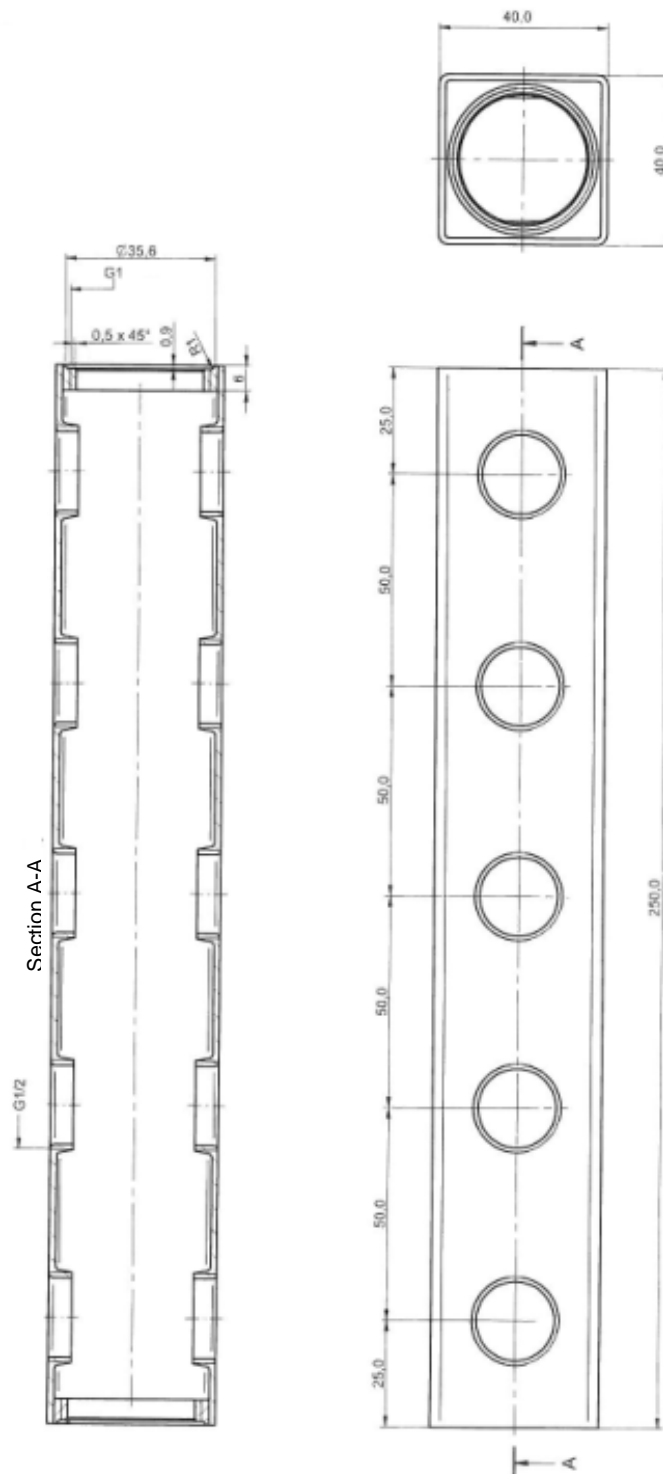




Number of openings <sup>1)</sup>	2	3	4	5	6	7	8	9	10	11	12
Pipe length, mm	100	150	200	250	300	350	400	450	500	550	600

<sup>1)</sup> for connecting system circuits

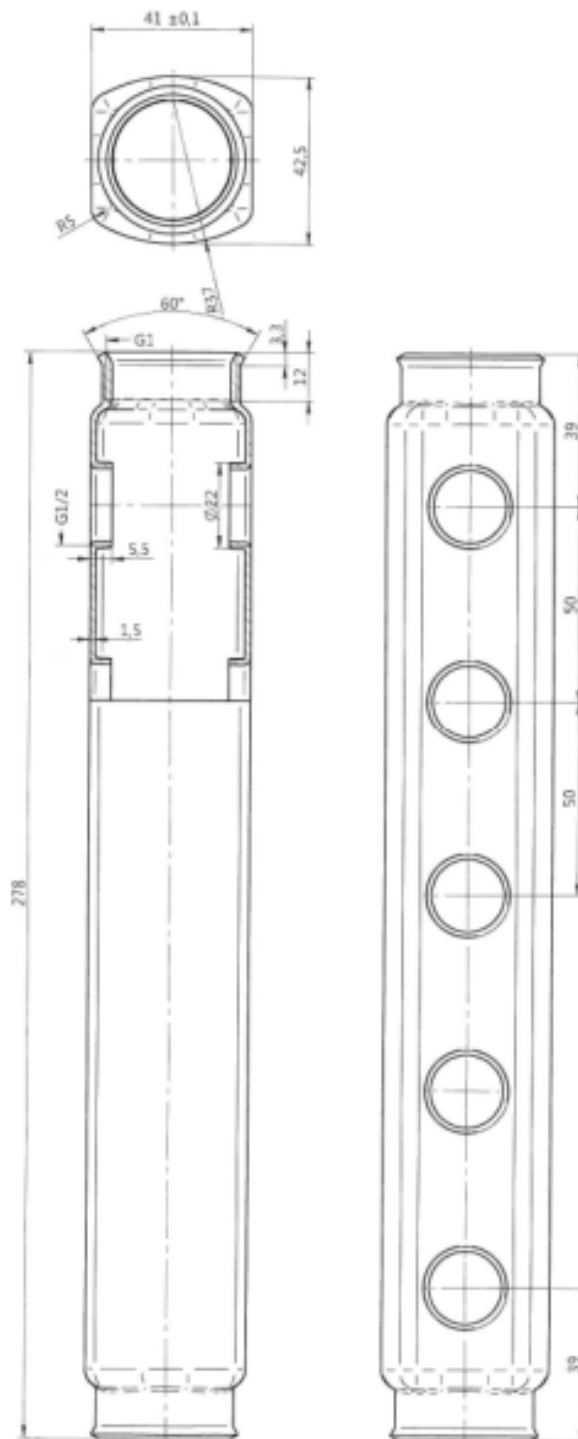
**Fig. 4.** Supply and return pipes for CAPRICORN manifolds, stainless steel, square cross-section



Number of openings <sup>1)</sup>	2	3	4	5	6	7	8	9	10	11	12
Pipe length, mm	100	150	200	250	300	350	400	450	500	550	600

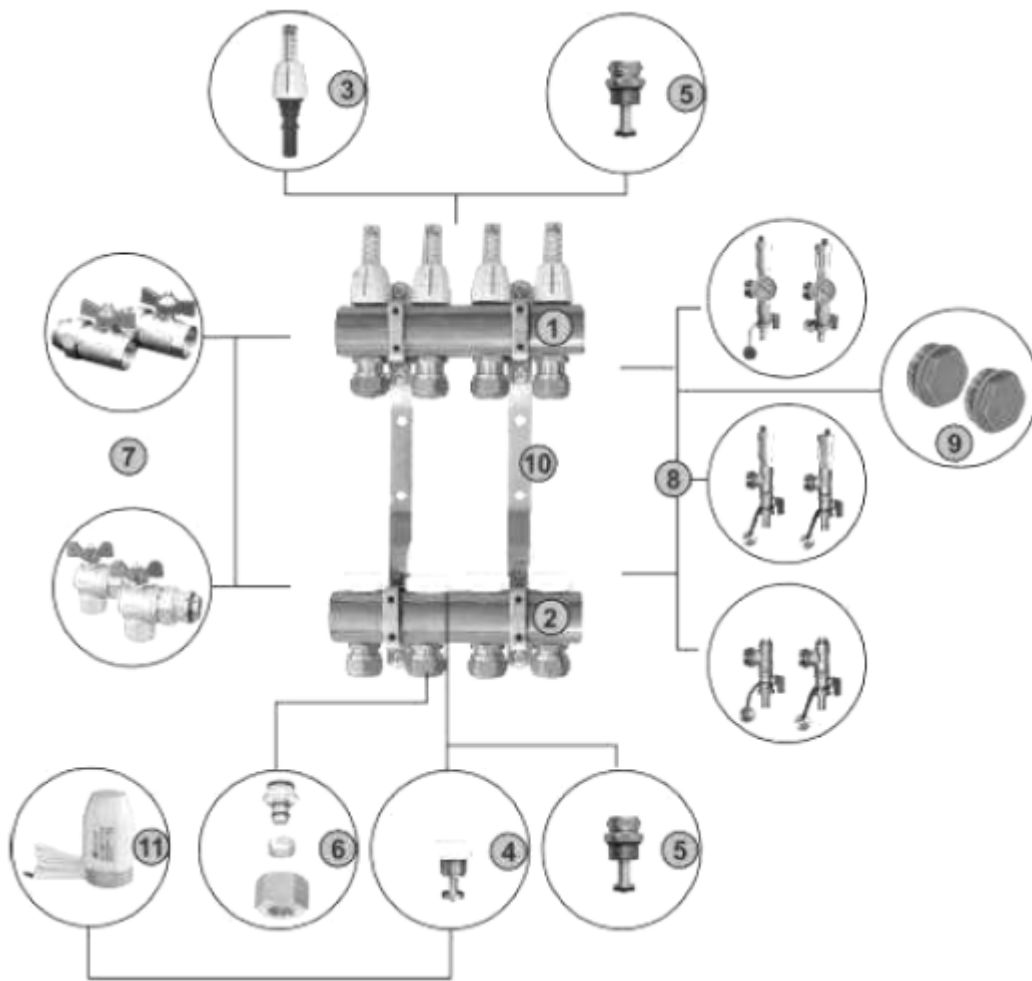
<sup>1)</sup> for connecting system circuits

**Fig. 5.** Supply and return pipes for CAPRICORN manifolds, stainless steel, square cross-section



Number of openings <sup>1)</sup>	2	3	4	5	6	7	8	9	10	11	12
Pipe length, mm	128	178	228	278	328	378	428	478	528	578	628
<sup>1)</sup> for connecting system circuits											

**Fig. 6.** Supply and return pipes for CAPRICORN manifolds, stainless steel, elliptical cross-section



- 1 – supply pipe
- 2 – return pipe
- 3 – control valve with flow meter
- 4 – temperature control valve (compatible with electrical actuator)
- 5 – manual control valve
- 6 – eurokonus fitting/nipple
- 7 – (straight or angle) ball valve
- 8 – tee with outlet valve, manual or automatic air vent and temperature sensor (optional)
- 9 – plug
- 10 – mounting supports and stainless steel brackets
- 11 – electrical actuator

**Fig. 7.** Structure and accessories of CAPRICORN manifolds