INTERNATIONAL STANDARD

ISO 4064-4

First edition
2014-06-01

Water meters for cold potable water and hot water —

Part 4: Non-metrological requirements not covered in ISO 4064-1

Compteurs d'eau potable froide et d'eau chaude —

Partie 4: Exigences non métrologiques non couvertes par l'ISO 4064-1

Reference number
ISO 4064-4:2014(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2, www.iso.org/directives.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received, www.iso.org/patents.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

The committee responsible for this document is ISO/TC 30, *Measurement of fluid flow in closed conduits*, Subcommittee SC 7, *Volume methods including water meters*.

ISO 4064 consists of the following parts, under the general title *Water meters for cold potable water and hot water*:

— *Part 1: Metrological and technical requirements*

— *Part 2: Test methods*

— *Part 3: Test report format*

— *Part 4: Non-metrological requirements not covered in* ISO 4064-1

— *Part 5: Installation requirements*

Water meters for cold potable water and hot water —

Part 4:
Non-metrological requirements not covered in ISO 4064-1

1 Scope

This part of ISO 4064 applies to water meters used to meter the volume of cold potable water and hot water flowing through a fully charged, closed conduit. These water meters incorporate devices which indicate the integrated volume.

This part of ISO 4064 specifies technical characteristics and pressure loss requirements for meters for cold potable water and hot water. It applies to water meters which can withstand:

a) a maximum admissible pressure (MAP) equal to at least 1 MPa[1] [0,6 MPa for meters for use with pipe nominal diameters (DNs) ≥500 mm];

b) a maximum admissible temperature (MAT) for cold potable water meters of 30 °C;

c) a MAT for hot water meters of up to 180 °C, depending on class.

In addition to meters based on mechanical principles, this part of ISO 4064 also applies to water meters based on electrical or electronic principles, and to water meters based on mechanical principles incorporating electronic devices, used to meter the volume flow of hot water and cold potable water. It also applies to electronic ancillary devices. As a rule ancillary devices are optional. However, national or international regulations may make some ancillary devices mandatory in relation to the utilization of the water meter.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 228–1, Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation

ISO 4064-1|OIML R 49-1, Water meters for cold potable water and hot water — Part 1: Metrological and technical requirements

ISO 7005-2, *Metallic flanges — Part 2: Cast iron flanges*

ISO 7005-3, *Metallic flanges — Part 3: Copper alloy and composite flanges*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4064–1|OIML R 49-1 apply.

NOTE Many of the definitions used in this part of ISO 4064 conform to ISO/IEC Guide 99:2007|OIML V 2-200:2012,[1] OIML V 1:2013,[2] and OIML D 11.[3]

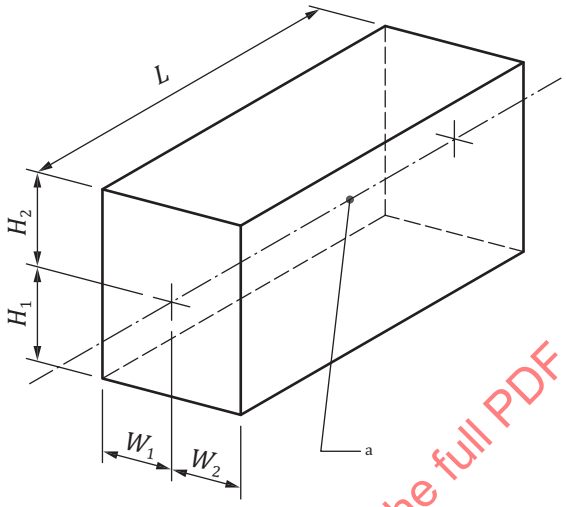
1) 1 MPa = 10 bar

4 Technical characteristics

4.1 In-line meters

4.1.1 Meter size and overall dimensions

Meter size is characterized either by the thread size of the end connections or by the nominal size of the flange. For each meter size, there is a corresponding fixed set of overall dimensions. The dimensions of the meter, as illustrated in Figure 1, shall be in accordance with Table 1.



Key

W_1, W_2 $W_1 + W_2$ is the width of a cuboid within which the water meter can be contained

H_1, H_2 $H_1 + H_2$ is the height of a cuboid within which the water meter can be contained

L length of a cuboid within which the water meter can be contained

NOTE The cover is at right angles to its closed position. Dimensions H_1, H_2, W_1 and W_2 are maxima; L is a fixed value with specified tolerances.

a Pipe axis.

Figure 1 — Meter size and overall dimensions

4.1.2 Threaded connection

Permissible values of dimensions *a* and *b* for threaded connections are given in Table 1. Threads shall conform to ISO 228-1. Figure 2 defines dimensions *a* and *b*.

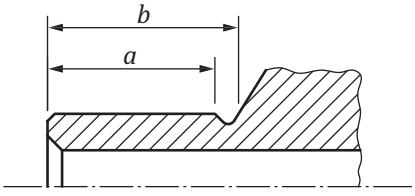


Figure 2 — Threaded connection

4.1.3 Flanged connection

Flanged end connections shall conform to ISO 7005-2 and ISO 7005-3 for the maximum pressure corresponding to that of the water meter. Dimensions shall be as given in Table 1.

The manufacturer shall provide a reasonable clearance behind the rear face of the flange to allow access for installation and removal.

Table 1 — Water meter dimensions for threaded and flanged connections

Dimensions in millimetres

DN[a] size	a_{min}	b_{min}	Preferred values of L[b]	Alternative values of L[b]	W_1, W_2	H_1	H_2
15	10[c]	12[c]	165	80, 85, 100, 105, 110, 114, 115, 130, 134, 135, 145, 170, 175, 180, 190, 200, 220	65	60	220
20	12	14	190	105, 110, 115, 130, 134, 135, 165, 175, 195, 200, 220, 229	65	60	240
25	12	16	260	110, 150, 175, 199, 200, 210, 225, 273	100	65	260
32	13	18	260	110, 150, 175, 199, 200, 230, 270, 300, 321	110	70	280
40	13	20	300	200, 220, 245, 260, 270, 387	120	75	300
50	13	20	200	170, 245, 250, 254, 270, 275, 300, 345, 350	135	216	390
65	14	22	200	170, 270, 300, 450	150	130	390
80			200	190, 225,300, 305,350, 425, 500	180	343	410
100			250	210, 280, 350, 356, 360, 375, 450, 650	225	356	440
125			250	220, 275, 300, 350, 375, 450	135	140	440
150			300	230, 325, 350, 450, 457,500, 560	267	394	500
200			350	260, 400, 500, 508, 550, 600, 620	349	406	500
250			450	330, 400, 600, 660, 800	368	521	500
300			500	380, 400,800	394	533	533
350			500	420, 800	270	300	500
400			600	500, 550, 800	290	320	500
500			600	500, 625, 680, 770, 800, 900, 1000	365	380	520
600			800	500, 750, 820, 920, 1000, 1200	390	450	600
800			1200	600	510	550	700
>800			1,25× DN	DN	0,65× DN	0,65× DN	0,75× DN

[a] Nominal size of flanges and threaded connections.

[b] Tolerance on length: DN 15 to 40 — L_{-2}^{0}; DN 50 to 300 — L_{-3}^{0}; DN 350 to 400 — L_{-5}^{0}. Tolerances on lengths of meters greater than DN 400 should be agreed between the user and manufacturer.

[c] For DN 15 meters of length 80 mm or 85 mm, $a_{min} = b_{min} = 7{,}5$ mm.

4.1.4 Combination meter connection

Dimensions shall be as set out in Table 2.

The overall length of a combination meter may be a fixed dimension or may be adjustable by means of a sliding coupling. In this case, the minimum possible adjustment of the meter overall length shall be 15 mm relative to the nominal value of L defined in Table 2.

At the time of publication, because of the wide variation in the height of the various types of combination meters, it has not been possible to standardize this dimension.

Table 2 — Combination water meter with flanged end connections

Dimensions in millimetres

DN[a] size	Preferred values of L	Alternative values of L	W_1, W_2
50	300	270, 432, 560, 600	220
65	300	650	240
80	350	300, 432, 630, 700	260
100	350	360, 610, 750, 800	350
125	350	850	350
150	500	610, 1000	400
200	500	1160, 1200	400

[a] Nominal size of flange connection.

4.2 Concentric and cartridge meters and exchangeable metrological modules

NOTE 1 This subclause contains the necessary information on meter size and overall dimensions. Two meter manifold connection designs are shown in Annex A.

NOTE 2 It is possible that this subclause and Annex A will be subject to change as concentric water meter and manifold designs evolve.

4.2.1 Meter size and overall dimensions

Dimensions for a current meter design are shown in Figure 3 and Table 3.

4.2.2 Design of the meter manifold connection

The meter connection shall be designed to connect the meter, using the screw thread provided, to a manifold having this design of face. Suitable seals shall ensure that no leaks occur between the inlet connection and the meter/manifold exterior or between the inlet and outlet passages at the meter/manifold interface.

4.2.3 Dimensions of concentric and cartridge meters

4.2.3.1 General

Dimensions for concentric and cartridge meters are defined by a cylinder into which the meter fits — see Figure 3, in which J and K define respectively the height and diameter of a cylinder enclosing the meter.

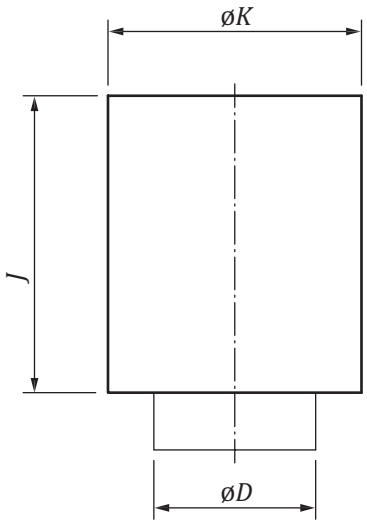


Figure 3 — Concentric and cartridge meter dimensions

NOTE Where there is a separate indicating device or calculator, the overall size specified in Figure 3 applies only to the housing of the measurement transducer.

4.2.3.2 Concentric meters

Dimensions for concentric meters are specified in Table 3.

Table 3 — Concentric meter dimensions

Dimensions in millimetres

Type	Maximum $\varnothing D$	Maximum J	Maximum $\varnothing K$
1	(G 1½ B)[a]	220	110
2	(G 2 B)[a]	220	135
[a] Whitworth threading.			

4.2.3.3 Dimensions of cartridge meters

Dimensions for cartridge meters are specified in Table 4.

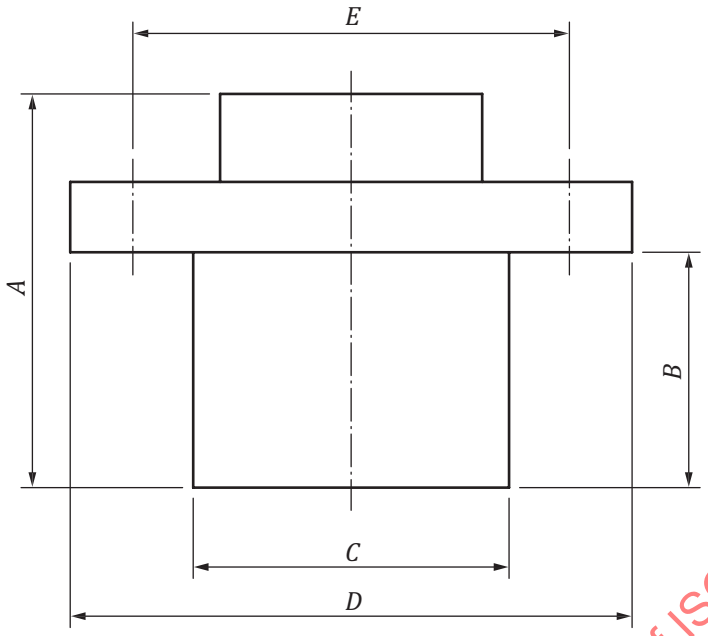
Table 4 — Cartridge meter dimensions

Dimensions in millimetres

Maximum $\varnothing D$	Maximum J	Maximum $\varnothing K$
90	200	150

4.2.4 Dimensions of exchangeable metrological modules

The dimensions of exchangeable metrological modules in meters with horizontal or vertical flow patterns (WP or WS) shall be in accordance with Figure 4 and Tables 5 and 6.



Key

A, B, C, D, E see Tables 5 and 6

Figure 4 — Dimensions of exchangeable metrological modules — Meters with horizontal or vertical flow pattern (WP or WS)

Table 5 — Exchangeable metrological modules: dimensions — Meters with horizontal flow pattern (WP)

Dimensions in millimetres

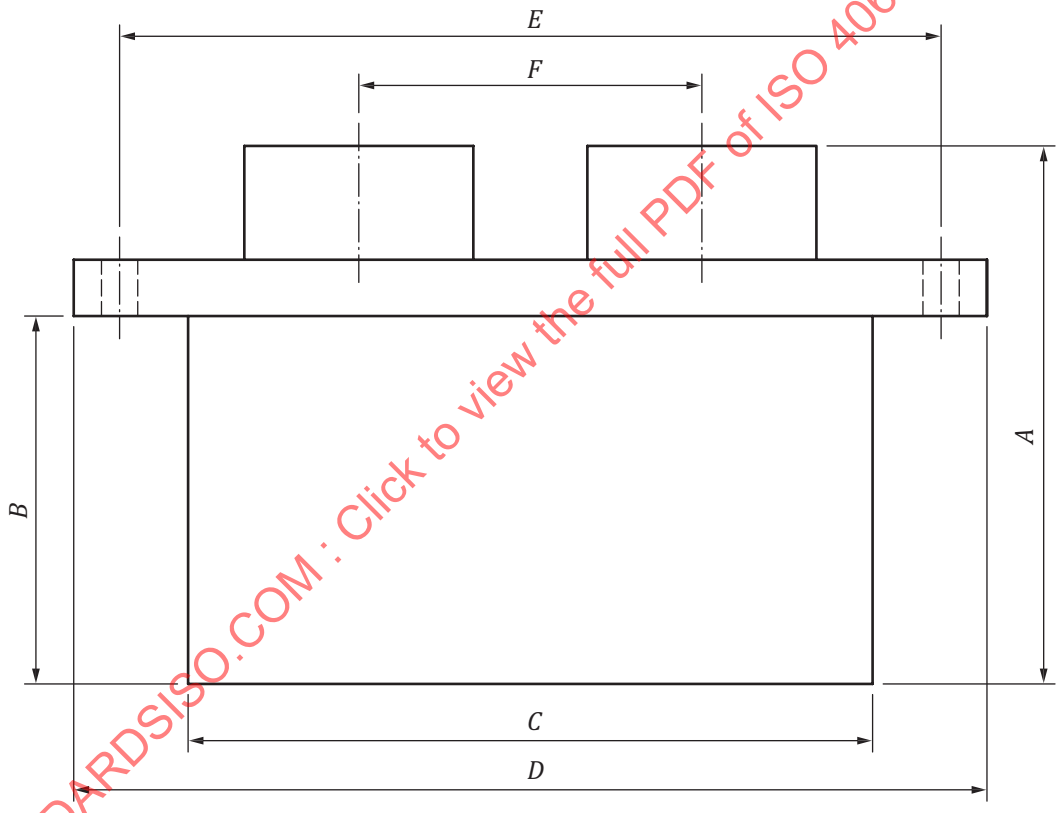
DN	Maximum *A*	Maximum *B*	Maximum *C*	Maximum *D*	Maximum *E*
40	210	125	125	190	147
50	210	125	125	190	147
65	210	125	125	190	147
80	235	147	145	190	180
100	235	147	145	190	180
125	235	147	145	190	180
150	370	252	210	290	245
200	370	258	220	290	276
250	370	258	220	290	276
300	370	258	220	290	276

Table 6 — Exchangeable metrological modules: dimensions — Meters with vertical flow pattern (WS)

Dimensions in millimetres

DN	Maximum *A*	Maximum *B*	Maximum *C*	Maximum *D*	Maximum *E*
50	232	150	130	160	170
65	250	168	130	202	170
80	270	177	166	250	218
100	310	204	168	252	218
150	425	290	255	345	292
200	440	340	280	400	360

Dimensions of exchangeable modules for use in combination meters shall be in accordance with Figure 5 and Table 7.



Key

A, B, C, D, E, F see Table 7

Figure 5 — Dimensions of exchangeable metrological modules — Combination meters

Table 7 — Exchangeable metrological modules: dimensions — Combination meters

Dimensions in millimetres

DN	Maximum *A*	Maximum *B*	Maximum *C*	Maximum *D*	Maximum *E*	Maximum *F*
50	310	195	260	300	266	150
65	345	215	260	330	280	150
80	365	235	260	320	290	150
100	385	255	260	335	300	150

Figures 6 to 10 show examples of meters with interchangeable inserts.

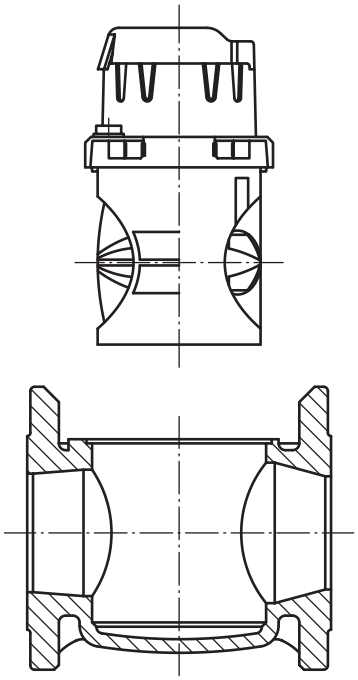


Figure 6 — Meter with exchangeable metrological module — Axial flow pattern

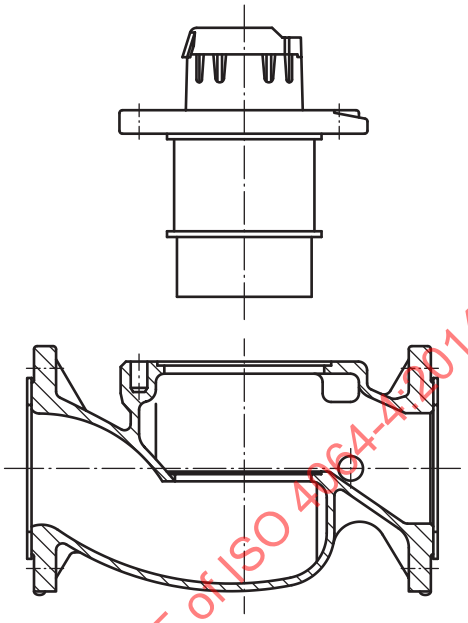


Figure 7 — Meter with exchangeable metrological module — Vertical flow pattern

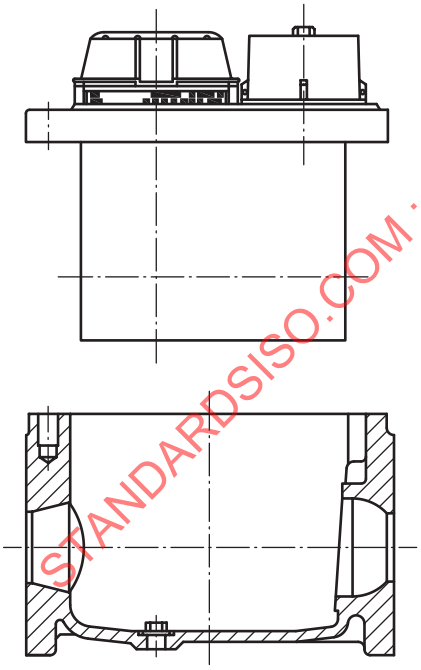


Figure 8 — Meter with exchangeable metrological module — Axial flow pattern, combination type

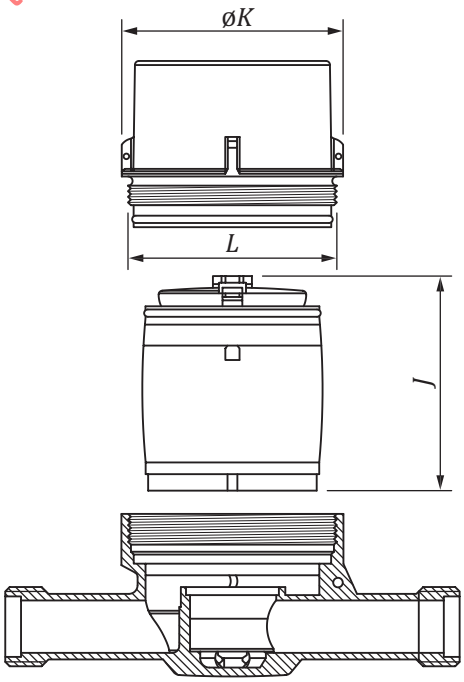


Figure 9 — Meter with exchangeable metrological module — Concentric flow pattern, inferential

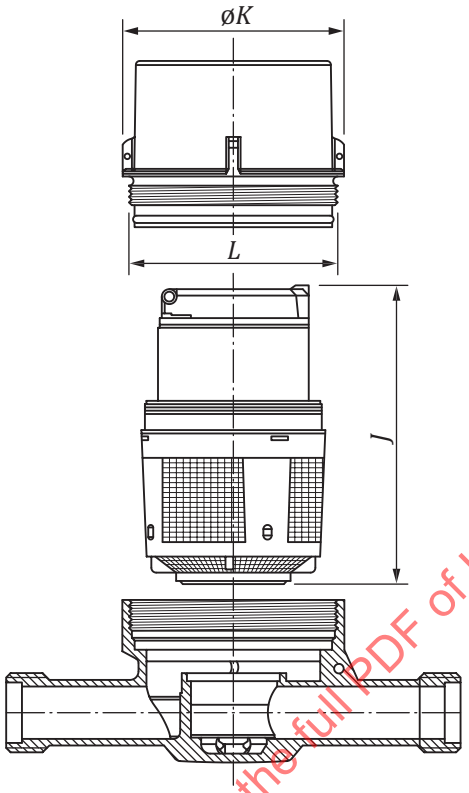


Figure 10 — Meter with exchangeable metrological module — Concentric flow pattern, volumetric

Annex A
(informative)

Concentric water meter manifold

A.1 General

At the time of publication of this part of ISO 4064, an International Standard for the connections to concentric water meters does not exist. This annex contains the necessary information to design and construct the meter manifold connection and refers to any relevant sources of information. This annex is subject to expansion as other manifold designs are submitted for inclusion.

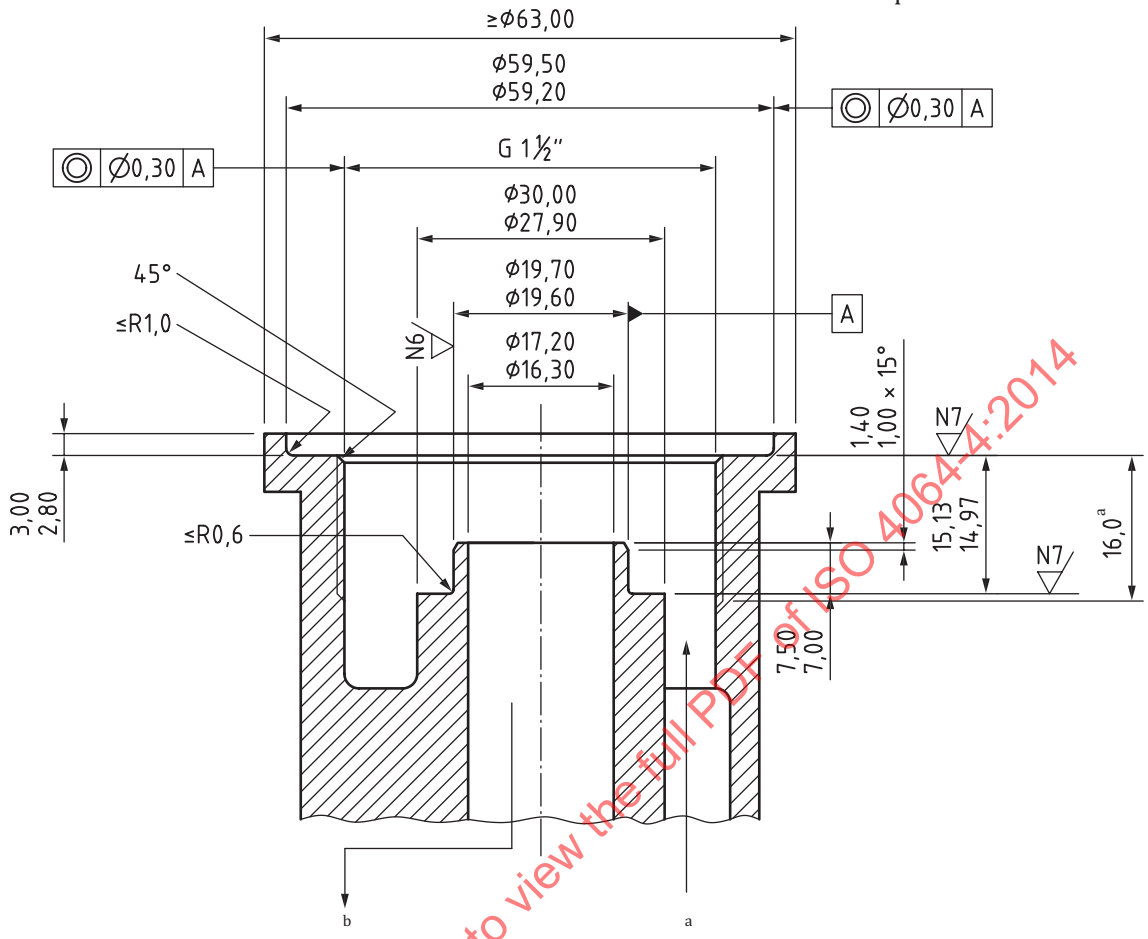
A.2 Concentric water meter manifold design

The design of two manifold interfaces is shown in Figures A.1 and A.2 (see also Table 3).

The meter connection should be designed to connect the meter, using the screw thread provided, to a manifold having this design of face. Suitable seals should ensure that no leaks occur between the inlet connection and the meter/manifold exterior or between the inlet and outlet passages at the meter/manifold interface.

NOTE ISO 4064-2|OIML R 49-2 refers to the additional pressure tests to be passed by this meter type.

Dimensions in millimetres except where otherwise indicated



Key

A minimum, full thread

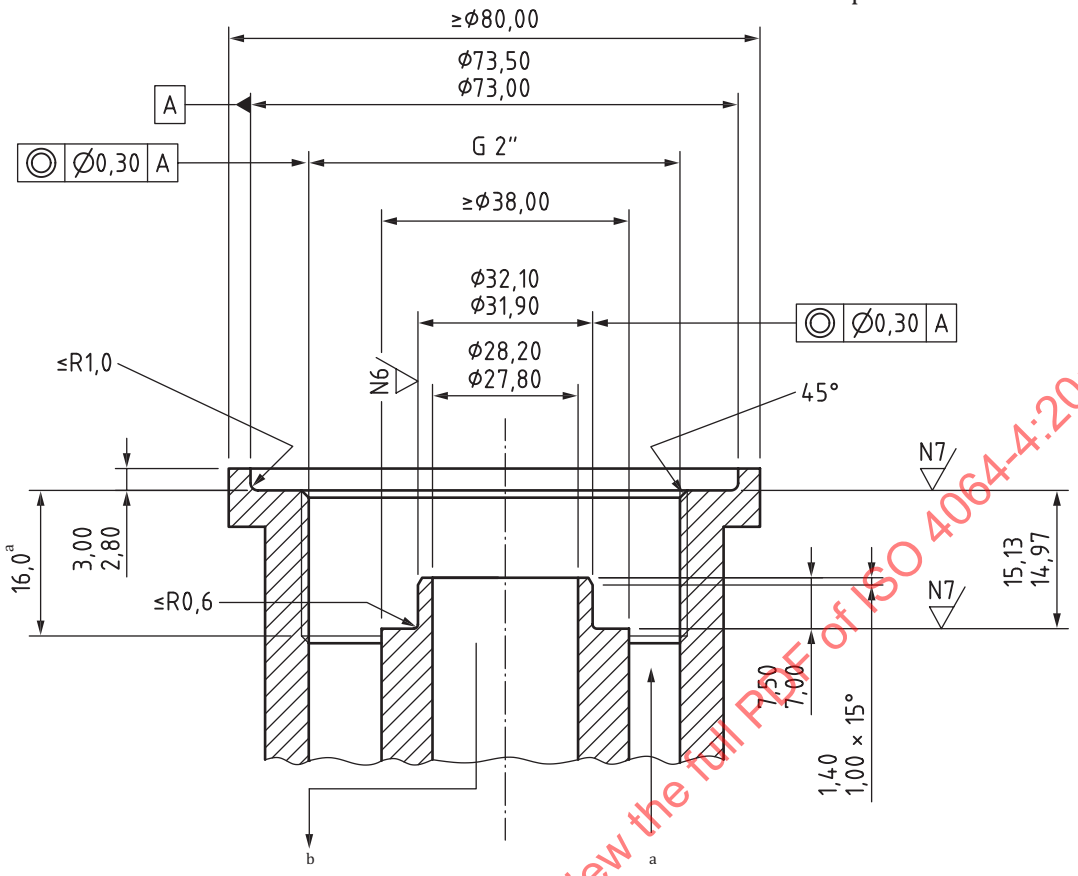
NOTE Machined surface roughness 3,2 µm, unless otherwise stated. Tolerance on angles: ±3°.

a Water flow in.

b Water flow out.

Figure A.1 — Example manifold dimensions — G 1½ concentric meters

Dimensions in millimetres except where otherwise indicated



Key

A minimum, full thread

NOTE Machined surface roughness 3,2 µm, unless otherwise stated. Tolerance on angles: ±1°.

a Water flow in.

b Water flow out.

Figure A.2 — Example manifold dimensions — G 2 concentric meters

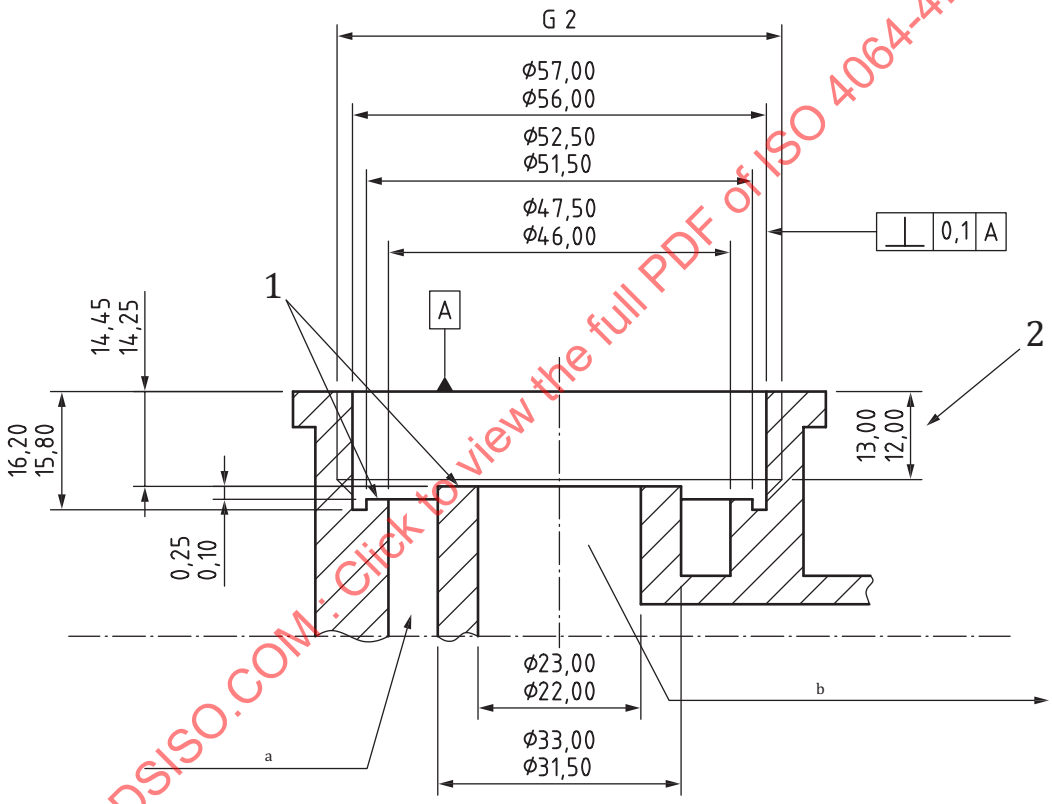
Annex B
(normative)

Connection interfaces — Solutions for cartridge meters

B.1 Concentric cartridge meters

Figures B.1 to B.10 show connection interface types for concentric cartridge meters.

Dimensions in millimetres

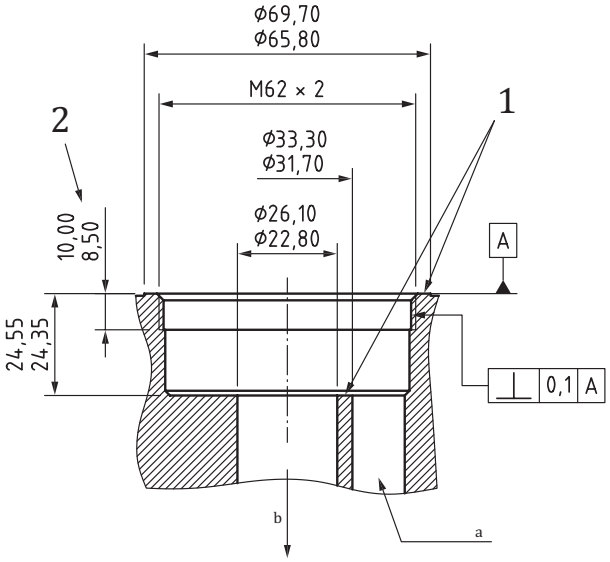


Key

1	sealing surface	2	thread length
a	Upstream flow.	b	Downstream flow.

Figure B.1 — Connection interface — Type IST

Dimensions in millimetres

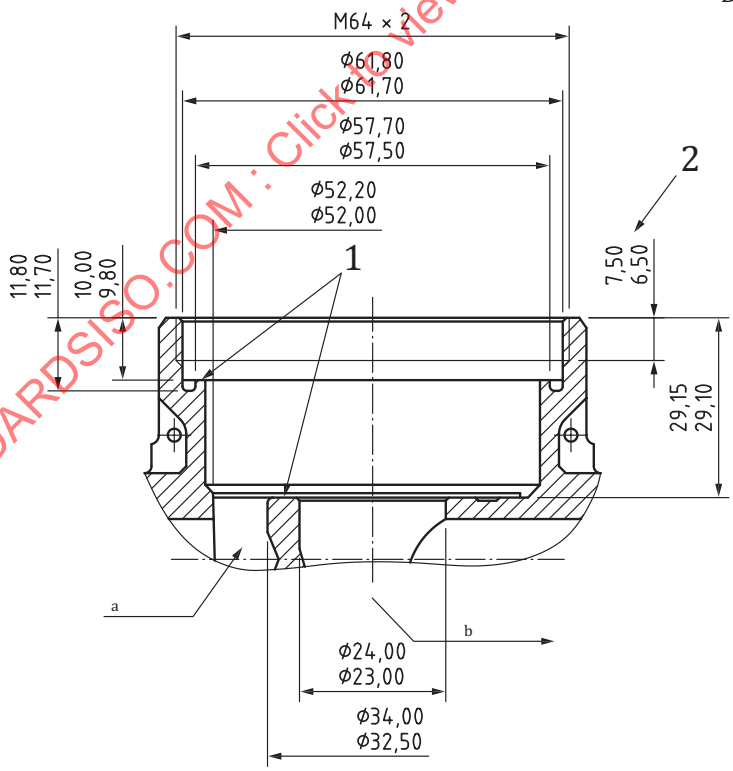


Key

1 sealing surface
2 thread length
a Upstream flow.
b Downstream flow.

Figure B.2 — Connection interface — Type TE1

Dimensions in millimetres

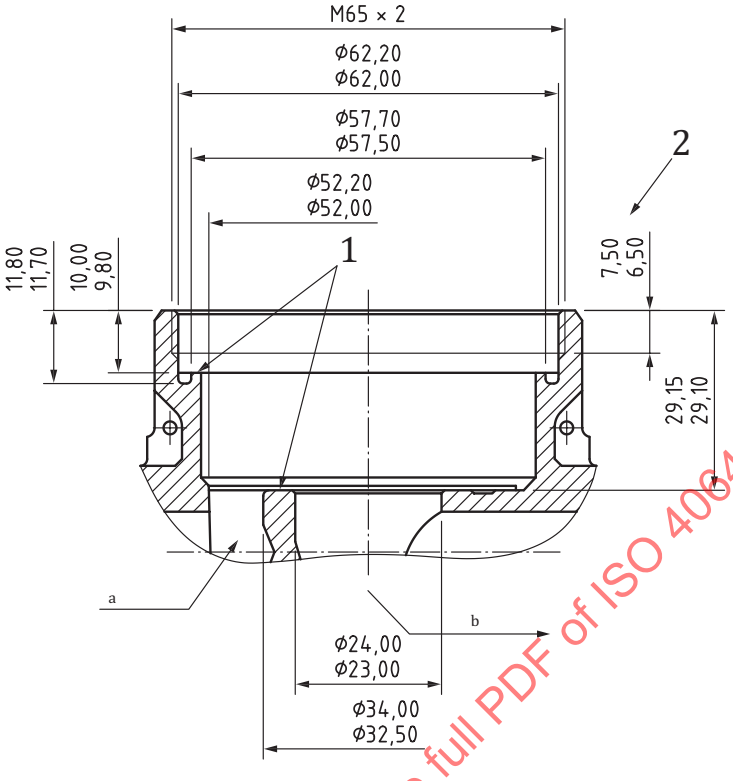


Key

1 sealing surface
2 thread length
a Upstream flow.
b Downstream flow.

Figure B.3 — Connection interface — Type MET

Dimensions in millimetres

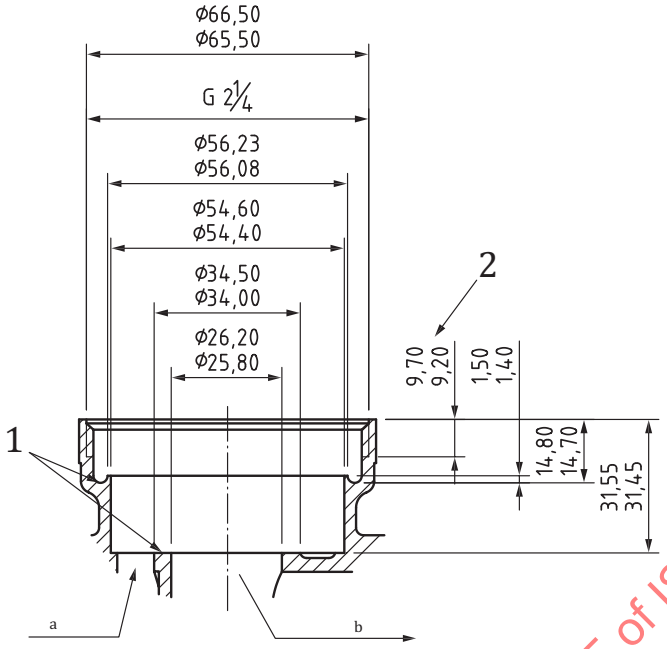


Key

1 sealing surface
2 thread length
a Upstream flow.
b Downstream flow.

Figure B.4 — Connection interface — Type MOC

Dimensions in millimetres

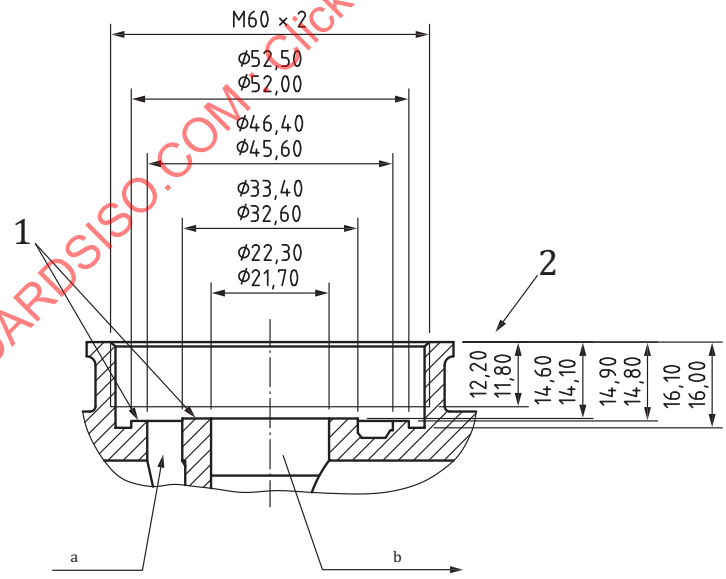


Key

1 sealing surface
2 thread length
a Upstream flow.
b Downstream flow.

Figure B.5 — Connection interface — Type MUK

Dimensions in millimetres

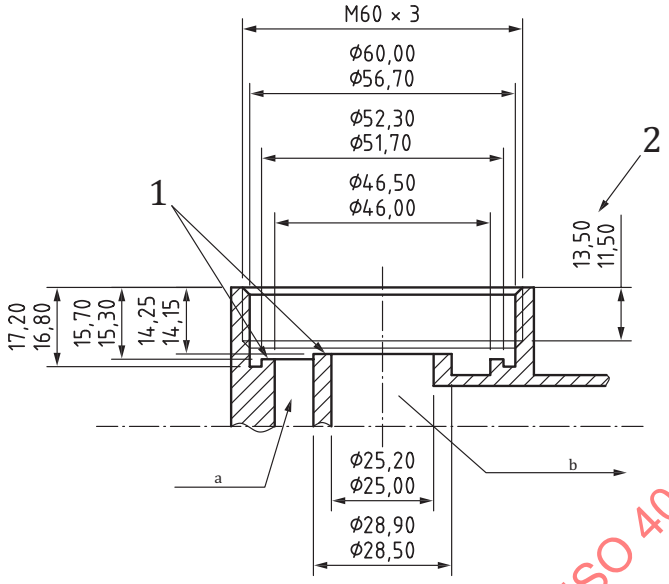


Key

1 sealing surface
2 thread length
a Upstream flow.
b Downstream flow.

Figure B.6 — Connection interface — Type PCC

Dimensions in millimetres

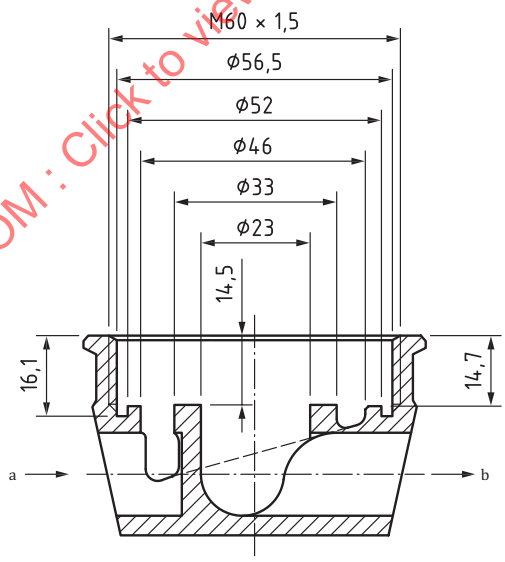


Key

1 sealing surface
2 thread length
a Upstream flow.
b Downstream flow.

Figure B.7 — Connection interface — Type Y01

Dimensions in millimetres

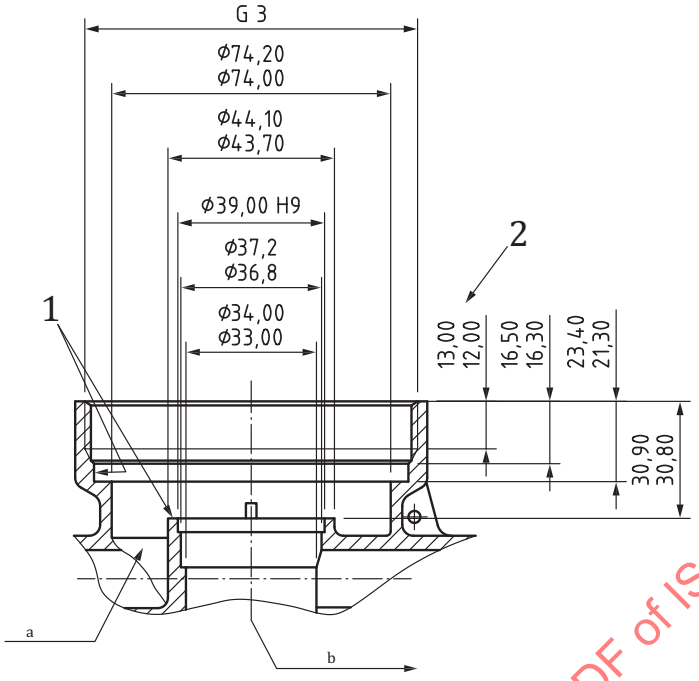


Key

a Upstream flow.
b Downstream flow.

Figure B.8 — Connection interface — Type M60

Dimensions in millimetres

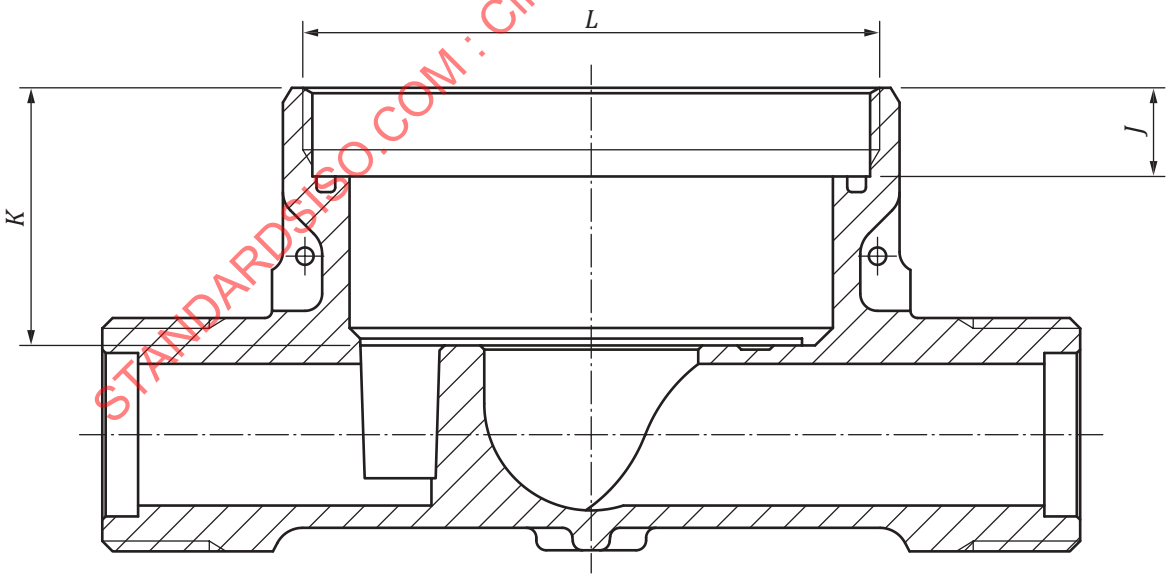


Key

1 sealing surface
2 thread length
a Upstream flow.
b Downstream flow.

Figure B.9 — Connection interface — Type CRI

Dimensions in millimetres



Key

L, J, K see Table B.1

Figure B.10 — Non-preferred connection interface solutions for installations in existing pipe fittings only

Table B.1 gives dimensions of existing connection interfaces for concentric cartridge meters.

Table B.1 — Dimensions of existing connection interfaces for concentric cartridge meters

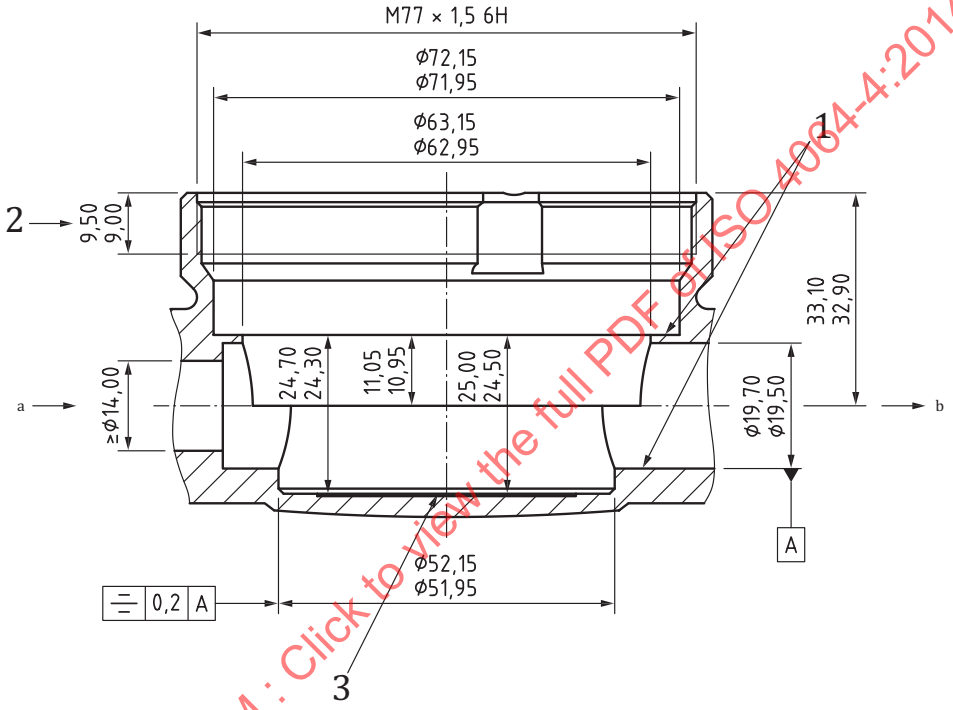
Dimensions in millimetres

Type	*L*	*J*	*K*
MOE	M65 × 2	9,8 to 10	41,85 to 41,95

B.2 Axial cartridge meters

Figures B.11 to B.17 show connection interface types for axial cartridge meters.

Dimensions in millimetres

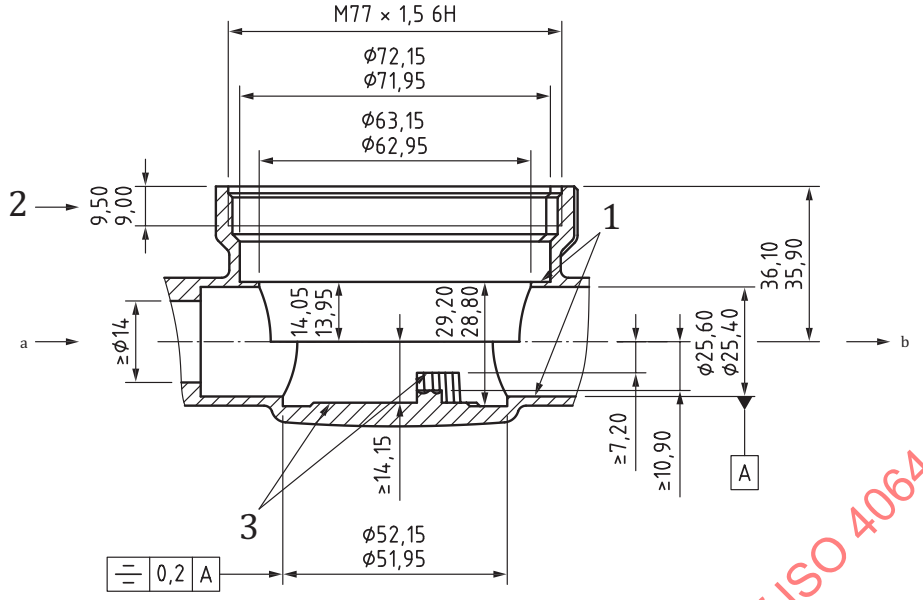


Key

1	sealing surface	2	thread length	3	area for specific marking, e.g. A34 / →flow direction / manufacturer / 3/4”
a	Upstream flow.	b	Downstream flow.		

Figure B.11 — Connection interface — Type A34

Dimensions in millimetres

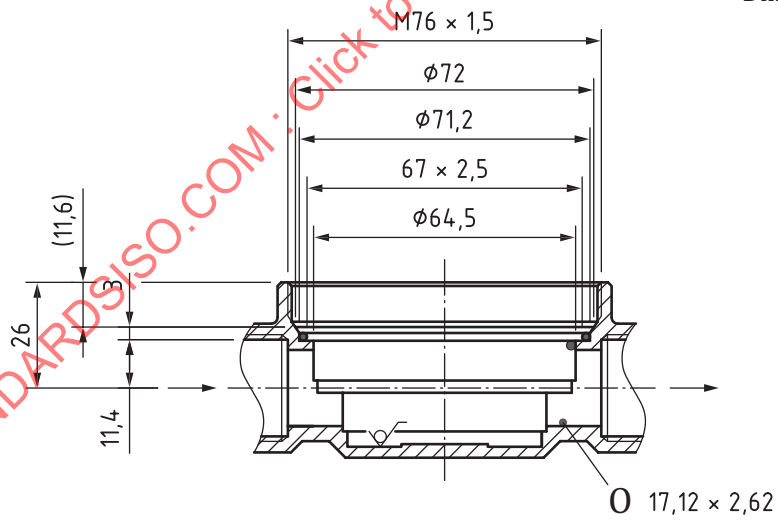


Key

1	sealing surface	2	thread length	3	area for specific marking, e.g. A1 / → flow direction / manufacturer / 1”
a	Upstream flow.	b	Downstream flow.		

Figure B.12 — Connection interface — Type A1

Dimensions in millimetres

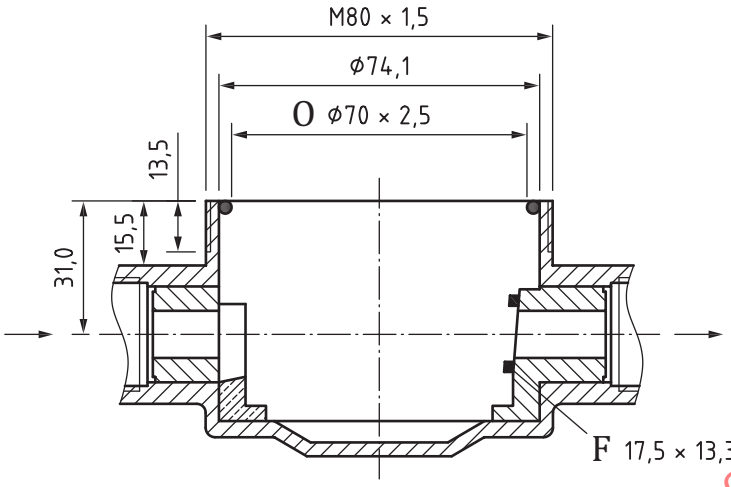


Key

O O-ring sealing or O-ring groove

Figure B.13 — Connection interface — Type MB3

Dimensions in millimetres



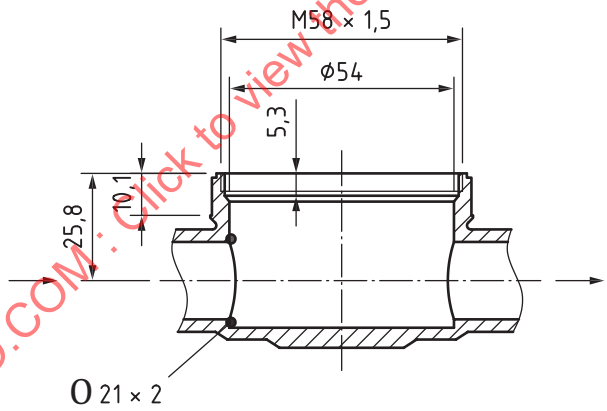
Key

F form -sealing

O O-ring sealing or O-ring groove

Figure B.14 — Connection interface — Type MB2

Dimensions in millimetres



Key

O O-ring sealing or O-ring groove

Figure B.15 — Connection interface — Type M7L