BS EN ISO 3964:2016

BSI Standards Publication

Dentistry — Coupling dimensions for handpiece connectors (ISO 3964:2016)

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National foreword

This British Standard is the UK implementation of EN ISO 3964:2016. It supersedes BS 7077-2.2:1989 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee CH/106/4, Dental Instruments and Equipment.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Published by BSI Standards Limited 2016

ISBN 978 0 580 85771 3

ICS 11.060.20; 11.060.25

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 December 2016.

Amendments/corrigenda issued since publication

Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 3964

November 2016

ICS 11.060.25

Supersedes EN 23964:1989

English Version

Dentistry - Coupling dimensions for handpiece connectors (ISO 3964:2016)

Médecine bucco-dentaire - Dimensions d'accouplement pour pièces à main dentaires (ISO 3964:2016)

Zahnheilkunde - Kupplungsmaße für Handstückverbindungen (ISO 3964:2016)

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Ref. No. EN ISO 3964:2016 E

European foreword

This document (EN ISO 3964:2016) has been prepared by Technical Committee ISO/TC 106 “Dentistry” in collaboration with Technical Committee CEN/TC 55 “Dentistry” the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2017, and conflicting national standards shall be withdrawn at the latest by May 2017.

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The text of ISO 3964:2016 has been approved by CEN as EN ISO 3964:2016 without any modification.

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 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information.

The committee responsible for this document is ISO/TC 106 *Dentistry*, Subcommittee SC 4 *Dental instruments*.

This third edition cancels and replaces the second edition (ISO 3964:1982), which has been technically revised with the following changes:

a) addition of definitions for "coupling dimension" and "coupling systems";

b) addition of four types for "classification";

c) additional types of coupling systems:

   — with and without light supply;

   — with internal and external supply of air and water (spray);

d) improved technical drawings.

Dentistry — Coupling dimensions for handpiece connectors

1 Scope

This International Standard specifies the coupling between handpieces and motors connected to dental units.

This International Standard specifies the nominal dimensions, tolerances and the extraction force of coupling systems for use between handpiece and motor which supply the handpiece with water, air and light and rotation energy.

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 1942, *Dentistry — Vocabulary*

ISO 2768-1, *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*

ISO 2768-2, *General tolerances — Part 2: Geometrical tolerances for features without individual tolerance indications*

ISO 14457, *Dentistry — Handpieces and motors*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1942, ISO 14457 and the following apply.

3.1
coupling dimension
description of the dimensions of connectors between air- and electrical motors and straight and angled handpieces, used to connect and supply the handpiece system

3.2
coupling system
combination of connector parts between air- and electrical motors and straight and angled handpieces, used to connect and supply the handpiece system

4 Classification

For the purpose of this International Standard, coupling systems are classified into the following types:

— Type 1: coupling system for straight and angle handpieces and motors without internal spray supply and without light supply;

— Type 2: coupling system for straight and angle handpieces and motors with internal spray supply and without light supply;

— Type 3: coupling system for straight and angle handpieces and motors with internal spray supply and with light supply;

— Type 4: coupling system for straight and angle handpieces and motors without internal spray supply and with light supply.

5 Requirements

5.1 General

Types of the coupling for handpieces and for motors are specific parts of dental handpieces.

Requirements for dental handpieces are specified in ISO 14457.

5.2 Dimensions

The dimensions and the configuration of handpiece-sides and motor-sides shall be as specified in Figure 1, Figure 2, Figure 3, Figure 4, Figure 5, Figure 6, Figure 7 and Figure 8 with coupling dimensions X_1 and X_2 as specified in Table 1.

Table 1 — Coupling dimensions X_1 and X_2

Coupling	Dimension	Long	Middle	Short	Extra short
Motor	X_1	max. 31,8 mm	max. 24,8 mm	max. 22,8 mm	max. 18,8 mm
Handpiece	X_2	min. 32 mm	min. 25 mm	min. 23 mm	min. 19 mm

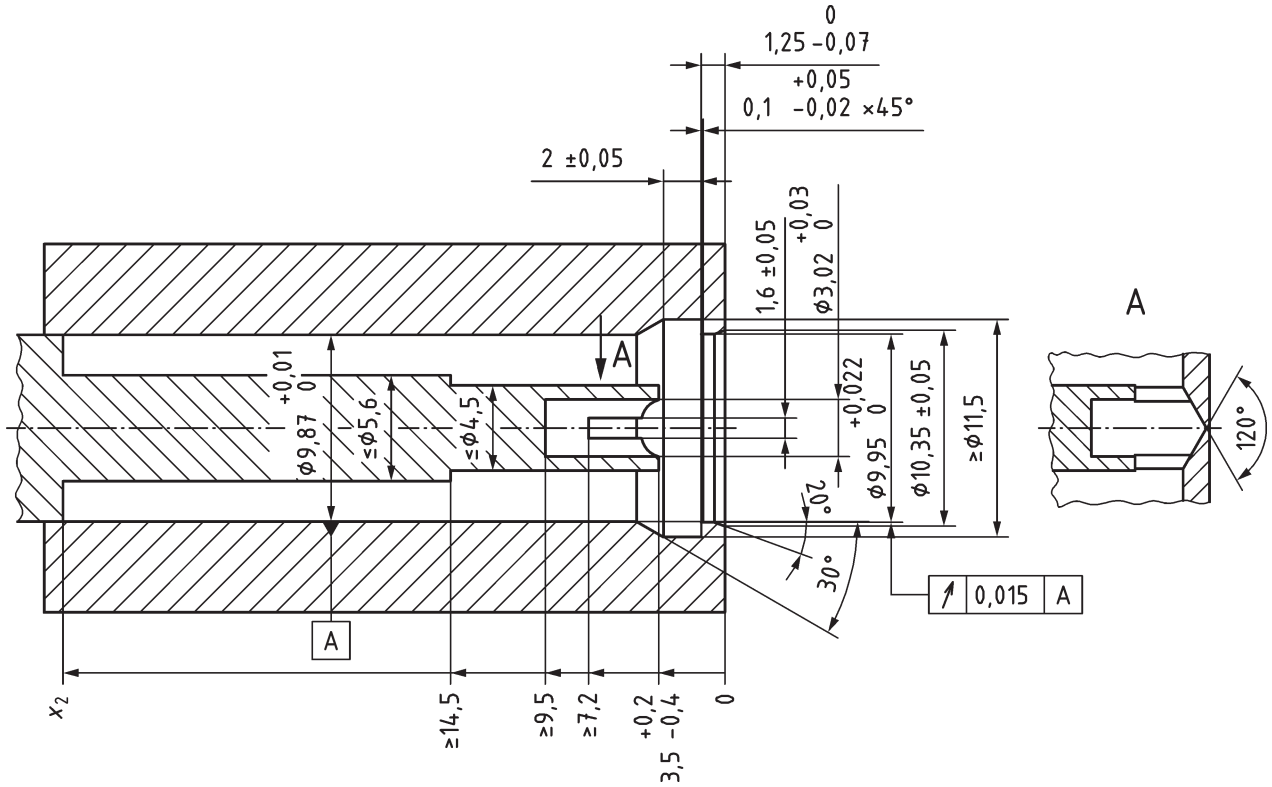
Dimensions without tolerances shall be in accordance with ISO 2768-1 and ISO 2768-2.

Alternative designs of the coupling lock system are permitted.

The type of handpiece length shall be indicated in the manufacturer's instructions for use.

Testing shall be carried out in accordance with 7.1.

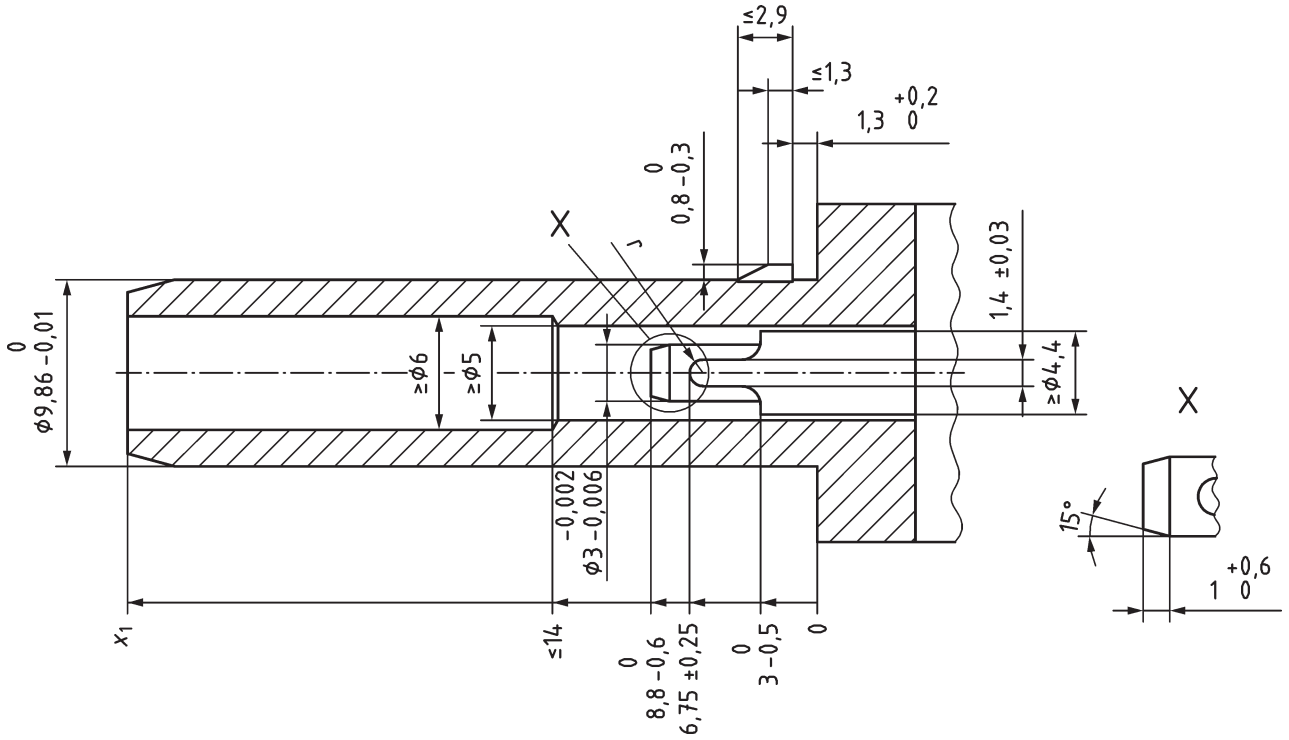
Dimensions in millimetres



Edges shall be burr-free or round.

Figure 1 — Type 1 — Handpiece

Dimensions in millimetres



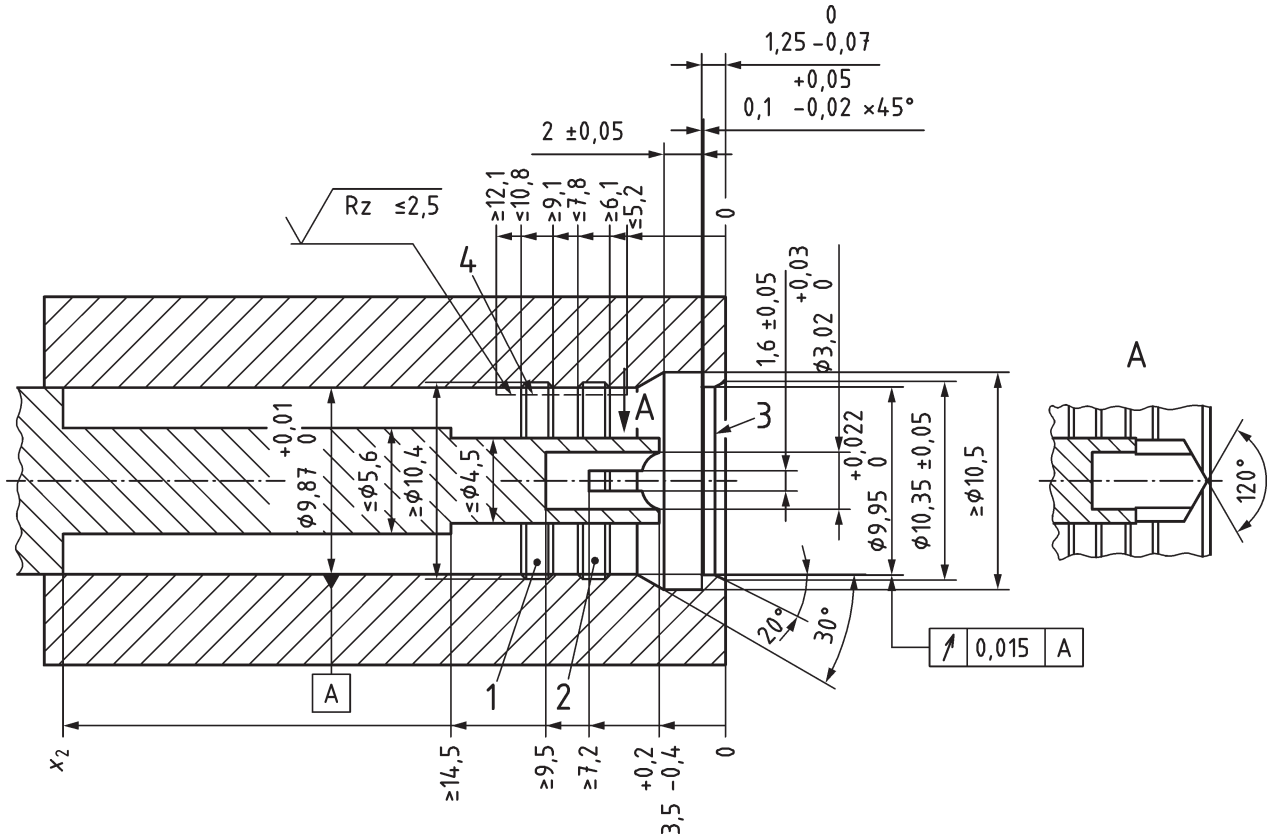
Key

r can either be a radius or a cone shape with the point angle of ≤120

Edges shall be burr-free or round.

Figure 2 — Type 1 — Motor

Dimensions in millimetres



Key

1 air

2 water

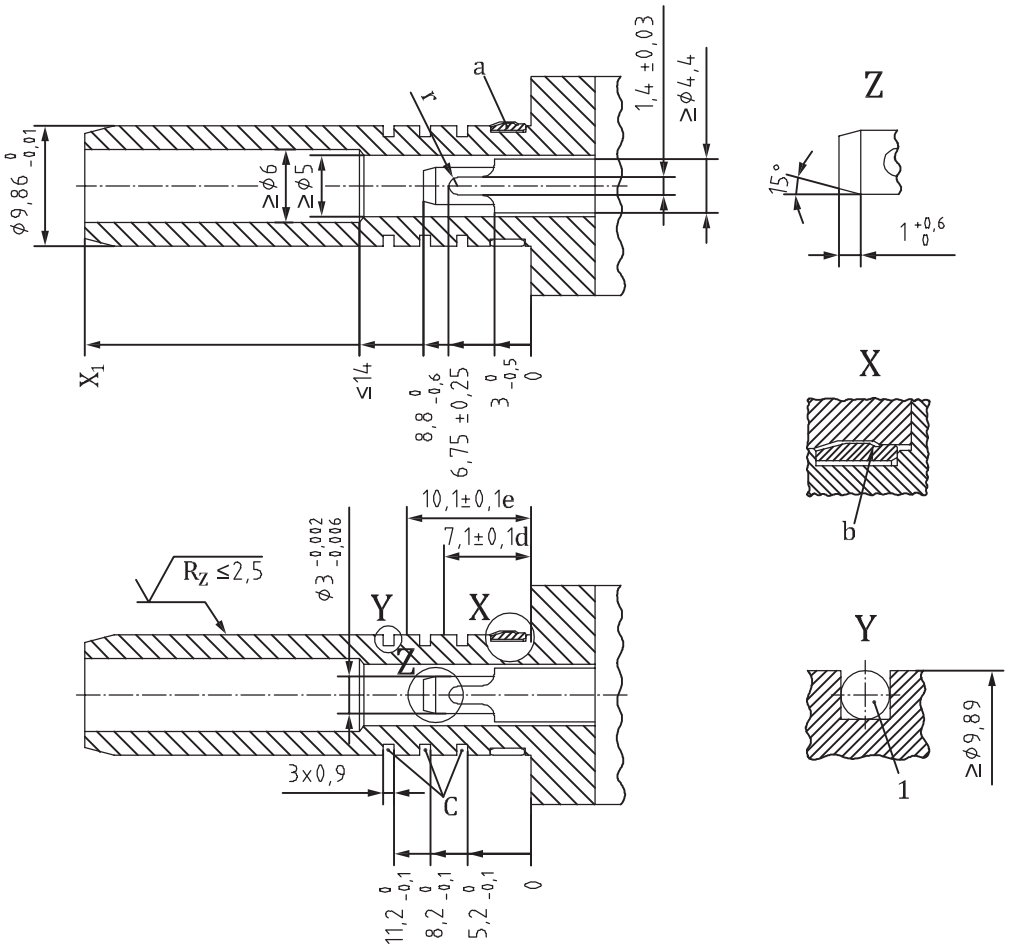
3 grooves and geometry for sealing rings given by the manufacturer

4 - - - - - sealing surface

Edges shall be burr-free or round.

Figure 3 — Type 2 — Handpiece

Dimensions in millimetres



Key

1 sealing ring

r can either be a radius or a cone shape with the point angle of ≤120

Edges shall be burr-free or round.

a Locking device, as given by the manufacturer.

b Axial clearance with connected handpiece max. 0,3 mm.

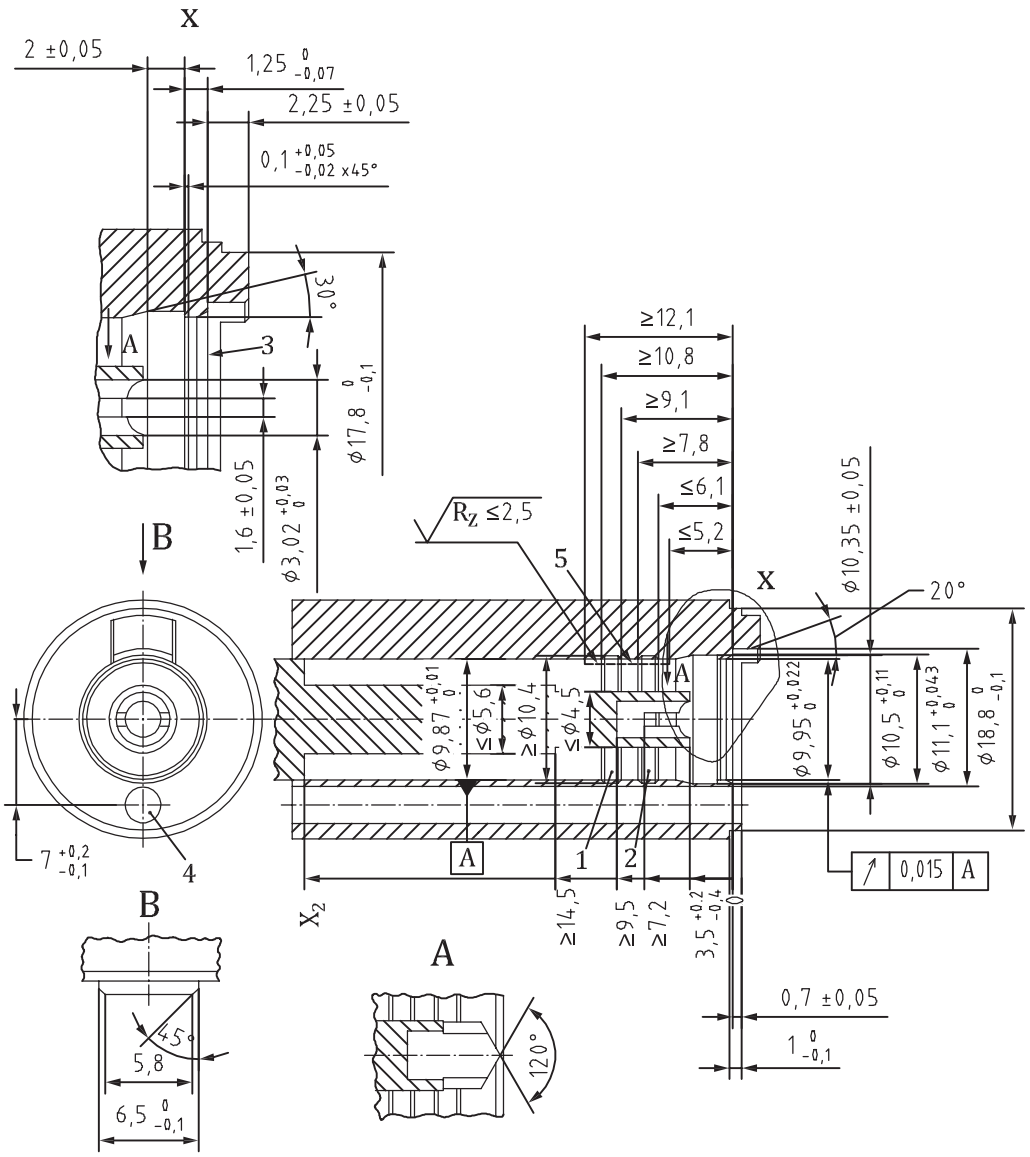
c Grooves and geometry for sealing rings given by the manufacturer.

d Water.

e Air.

Figure 4 — Type 2 — Motor

Dimensions in millimetres



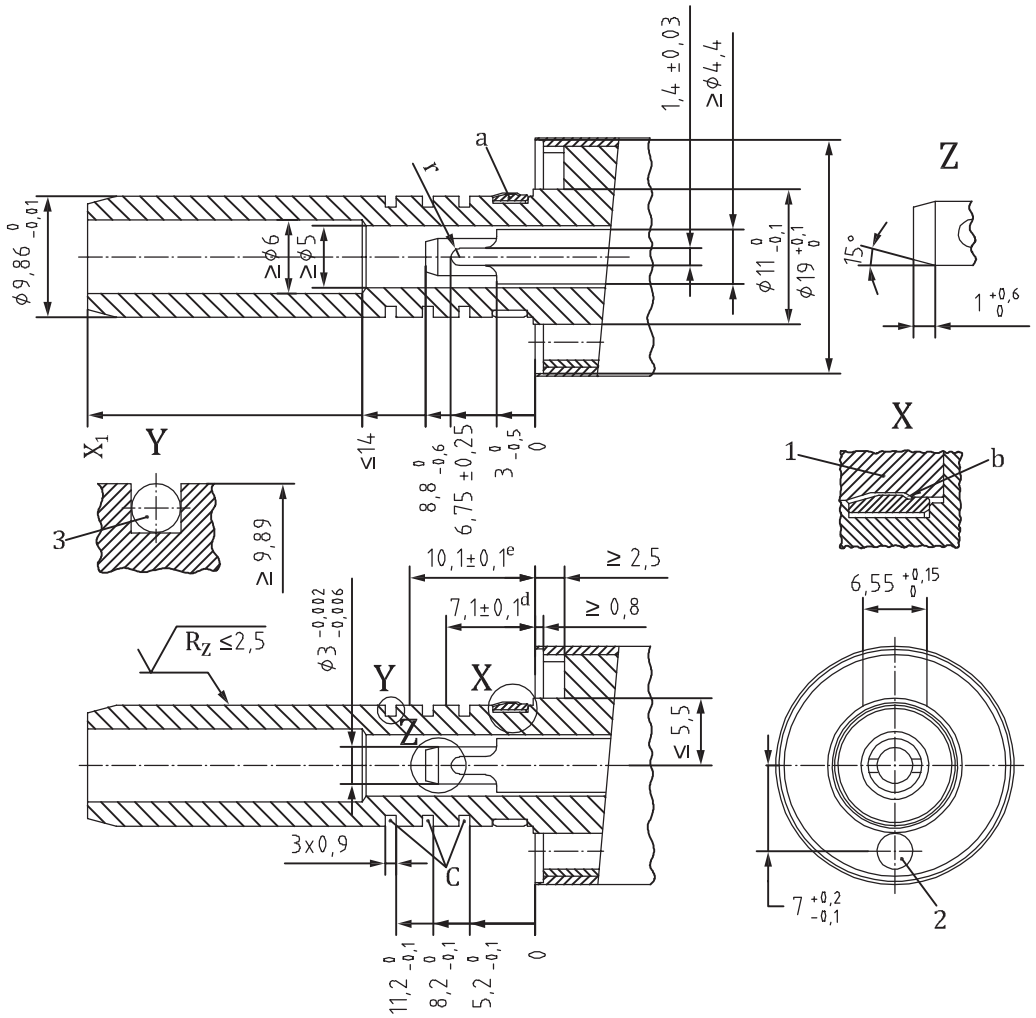
Key

1 air
2 water
3 grooves and geometry for sealing rings given by the manufacturer
4 light entrance
5 - - - - - - sealing surface

Edges shall be burr-free or round.

Figure 5 — Type 3 — Handpiece

Dimensions in millimetres



Key

1 handpiece, connected

2 light exit

3 sealing ring

r can either be a radius or a cone shape with the point angle of ≤120

Edges shall be burr-free or round.

a Locking device, as given by the manufacturer.

b Axial clearance with connected handpiece max. 0,3 mm.

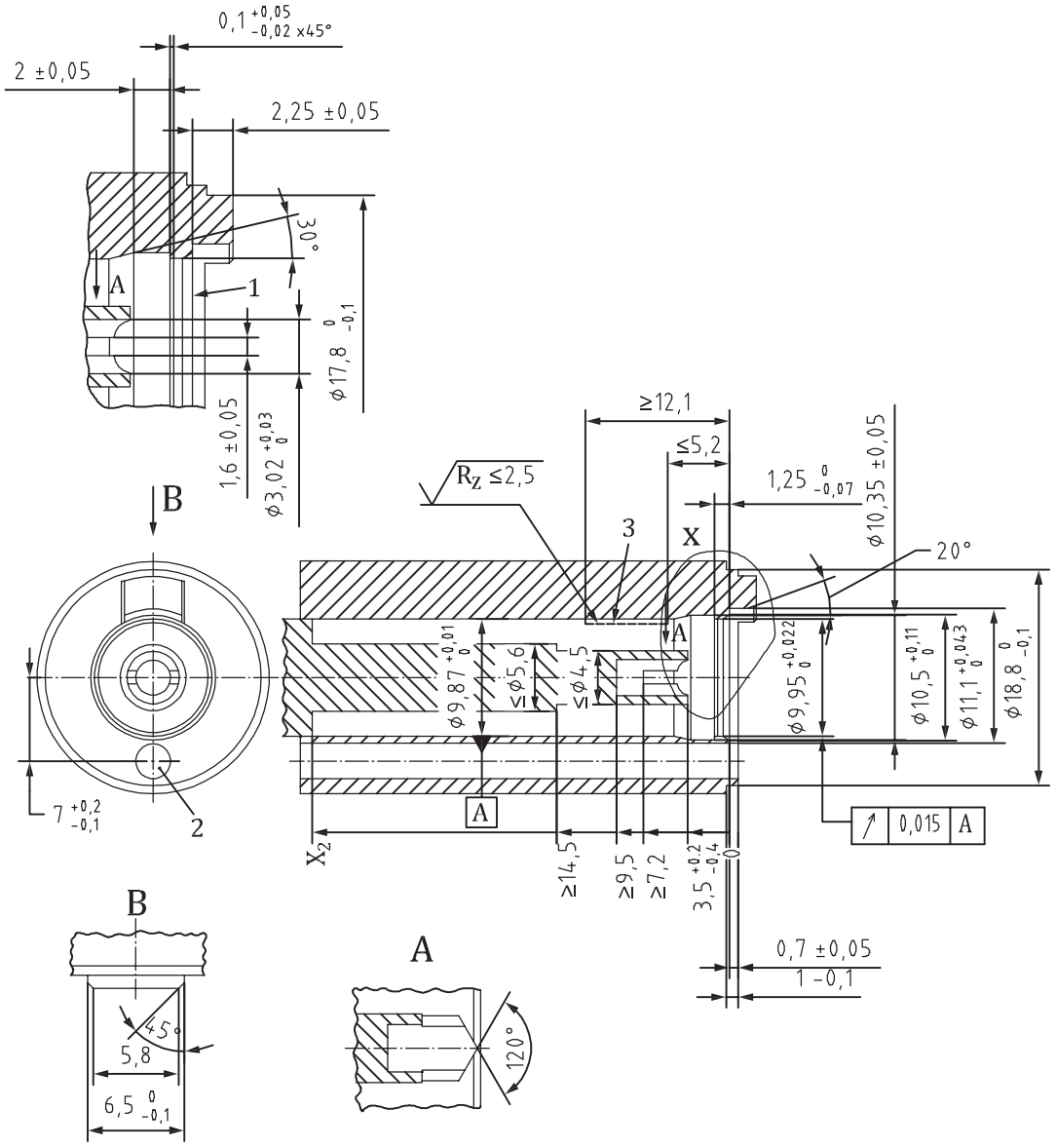
c Groves and geometry of sealing rings given by the manufacturer.

d Water.

e Air.

Figure 6 — Type 3 — Motor

Dimensions in millimetres



Key

1 grooves and geometry for sealing rings given by the manufacturer

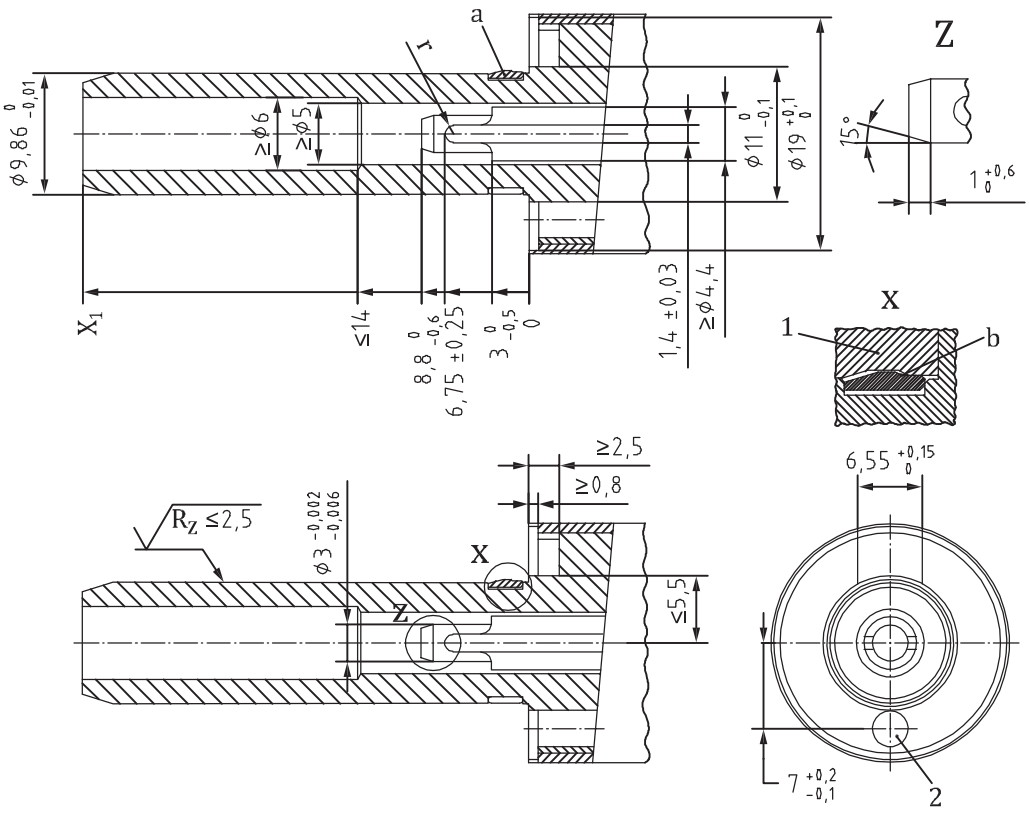
2 light entrance

3 - - - - - - sealing surface

Edges shall be burr-free or round.

Figure 7 — Type 4 — Handpiece

Dimensions in millimetres



Key

1 handpiece, connected

2 light exit

r can either be a radius or a cone shape with the point angle of ≤120

Edges shall be burr-free or round.

a Locking device, as given by the manufacturer.

b Axial clearance with connected handpiece max. 0,3 mm.

Figure 8 — Type 4 — Motor

5.3 Coupling force

The extraction force required to move the connected handpiece from the motor shall be at least 30 N or the motor shall have an appropriate design to release cooling air pressure.

Testing shall be carried out in accordance with 7.2.

6 Sampling

One representative sample of each type of coupling system shall be selected for the test.

7 Test methods

7.1 Dimensions

Use a measuring device with an accuracy of ±0,01 mm for linear dimensions or ±1° for angles, e.g. a gauge or dial indicator. Measure and record the dimensions shown in Figure 1, Figure 2, Figure 3, Figure 4, Figure 5, Figure 6, Figure 7 and Figure 8.

7.2 Coupling force

Install the handpiece with the motor in accordance with the manufacturer's instructions. Use a measuring device such as a spring force gauge with an accuracy of ±0,5 N. Measure and record the extraction forces required to disconnect the coupling system.

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