
**Terminal units for medical gas pipeline
systems —**

Part 2:

**Terminal units for anaesthetic gas
scavenging systems**

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Prises murales pour systèmes de distribution de gaz médicaux —
(standards.iteh.ai) *Partie 2: Prises murales pour systèmes d'évacuation des gaz*
d'anesthésie

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 9170-2 was prepared by Technical Committee ISO/TC 121, *Anaesthetic and respiratory equipment*, Subcommittee SC 6, *Medical gas systems*.

This second edition cancels and replaces the first edition (ISO 9170-2:1999) which has been technically revised.

ISO 9170 consists of the following parts, under the general title *Terminal units for medical gas pipeline systems*:

- *Part 1: Terminal units for use with compressed medical gases and vacuum*
- *Part 2: Terminal units for anaesthetic gas scavenging systems*

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Introduction

Anaesthetic gas scavenging system (AGSS) terminal units are the points in an anaesthetic gas scavenging system where the operator makes connections and disconnections for the disposal of medical gases and anaesthetic vapours from anaesthetic machines or other items of medical equipment, and where a wrong connection may create a hazard to the patient. It is important that terminal units and their components be designed, manufactured, installed and maintained in such a way as to meet the basic requirements specified in this part of ISO 9170.

This part of ISO 9170 pays particular attention to:

- suitability of materials;
- type specificity;
- dimensions of probes and type-specific connection points;
- cleanliness;
- testing;
- identification;
- information supplied.

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This part of ISO 9170 specifies the provision of information for the installation and subsequent testing of terminal units. Testing of terminal units prior to use is critical to patient safety and it is essential that terminal units are not used until full testing in accordance with ISO 7396-2 has been completed.

Annex A contains rationale statements for some of the requirements of this part of ISO 9170. The clauses and subclauses marked with an asterisk (*) after their number have corresponding rationale contained in Annex A, included to provide additional insight into the reasoning that led to the requirements and recommendations that have been incorporated in this part of ISO 9170. It is considered that knowledge of the reasons for the requirements will not only facilitate the proper application of this part of ISO 9170, but will expedite any subsequent revisions.

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Terminal units for medical gas pipeline systems —

Part 2: Terminal units for anaesthetic gas scavenging systems

1 Scope

1.1 This part of ISO 9170 specifies the requirements and dimensions for terminal units intended for use in anaesthetic gas scavenging disposal systems in accordance with ISO 7396-2.

1.2 This part of ISO 9170 specifies two types of terminal unit according to whether the power device is upstream or downstream of the terminal unit.

1.3 This part of ISO 9170 also specifies requirements and dimensions for the mating counterpart (probe) of the type-specific connection point which is part of the terminal unit.

1.4 This part of ISO 9170 does not specify the ranges of nominal operating pressure for terminal units, which are defined in ISO 7396-2. (standards.iteh.ai)

1.5 This part of ISO 9170 does not specify requirements for terminal units for use with compressed medical gases and vacuum, which are covered in ISO 9170-1.

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2 * Normative references

The following referenced documents are indispensable for the application 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.

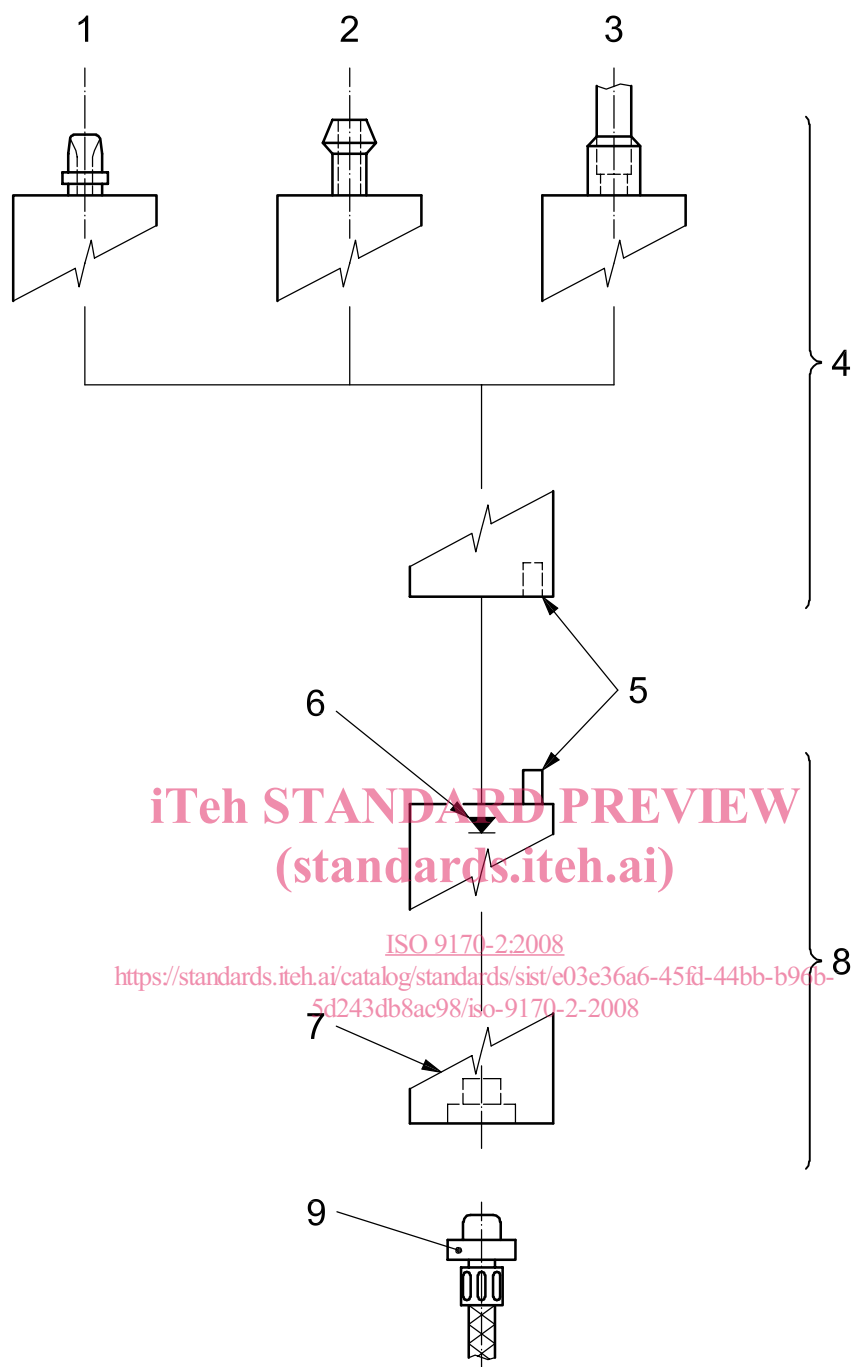
ISO 6506-1:2005, *Metallic materials — Brinell hardness test — Part 1: Test method*

ISO 7396-2:2007, *Medical gas pipeline systems — Part 2: Anaesthetic gas scavenging disposal systems*

ISO 8835-3:2007, *Inhalational anaesthesia systems — Part 3: Transfer and receiving systems of active anaesthetic gas scavenging systems*

ISO 14971:2007, *Medical devices — Application of risk management to medical devices*

ISO 15001:2003, *Anaesthetic and respiratory equipment — Compatibility with oxygen*



Key

- 1 type-specific connection
- 2 hose insert (permanent)
- 3 point for brazed connection (permanent)
- 4 terminal unit base block
- 5 type-specific interface
- 6 terminal unit check valve (Type 1 only)
- 7 type-specific connection point
- 8 socket
- 9 type-specific probe

Figure 1 — Diagram of a typical AGSS terminal unit

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

NOTE A diagram of a typical AGSS terminal unit with an example of terminology is given in Figure 1.

3.1

AGSS Type 1 terminal unit

connection point between the receiving system and disposal system at which the operator makes connections and disconnections

See Figure 2.

3.2

AGSS Type 1L terminal unit

terminal unit to be used in low-flow disposal systems

3.3

AGSS Type 1H terminal unit

terminal unit to be used in high-flow disposal systems

3.4

AGSS Type 2 terminal unit

connection point between the power device or disposal hose and the remainder of the disposal system at which the operator makes connections and disconnections

See Figure 2.

3.5

AGSS type-specific

having characteristics which prevent interchangeability and thereby allow assignment to one AGSS type only

3.6

AGSS type-specific connection point

that part of the AGSS socket which is the receptor for an AGSS type-specific probe

3.7

anaesthetic gas scavenging system

AGSS

complete system that is connected to the exhaust port(s) of a breathing system or other equipment for the purpose of conveying expired and/or excess anaesthetic gases to an appropriate place of discharge

NOTE Functionally, an AGSS comprises three different parts: a transfer system, a receiving system and a disposal system. These three functionally discrete parts may be either separate or sequentially combined in part or in total. In addition, one or more parts of an AGSS can be combined with a breathing system or other equipment to include the transfer system or transfer and receiving systems. See Figure 2.

3.8

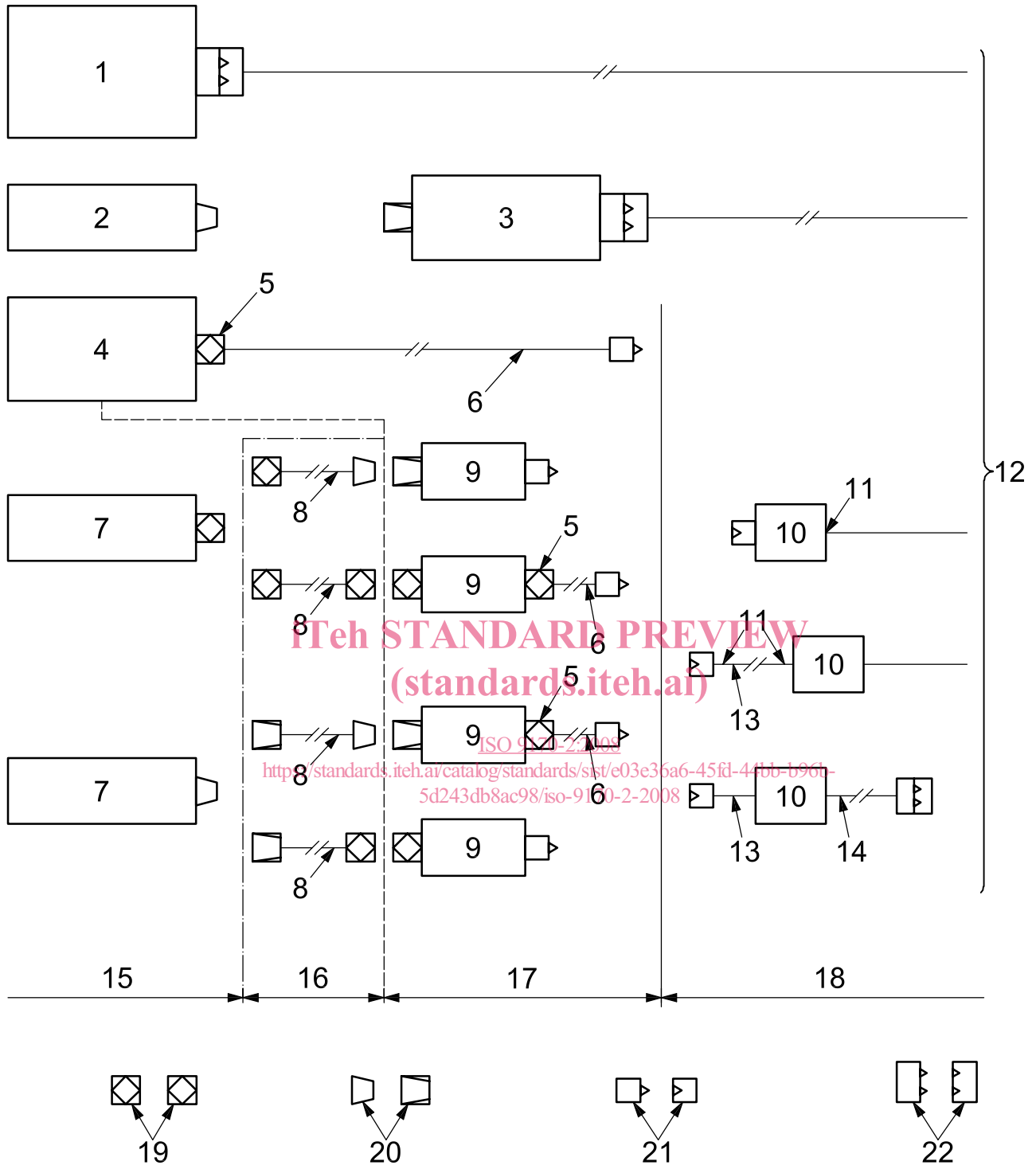
terminal unit check valve

valve that remains closed until opened by insertion of an appropriate probe and which then flows in either direction

3.9

disposal hose

that part of the AGSS which transfers expired and/or excess anaesthetic gases from the power device to the probe of the AGSS Type 2 terminal unit



Key

- 1 apparatus including breathing system, integral transfer/receiving system and power device
- 2 apparatus including breathing system
- 3 transfer/receiving system and power device
- 4 apparatus including breathing system and integral transfer/receiving system
- 5 permanent or proprietary connector
- 6 receiving hose
- 7 breathing system or anaesthetic ventilator
- 8 transfer tube
- 9 receiving system
- 10 power device
- 11 permanent connection
- 12 discharge
- 13 flexible hose or pendant
- 14 disposal hose
- 15 limit of breathing system
- 16 limit of transfer system
- 17 limit of receiving system
- 18 limit of disposal system
- 19 proprietary connection (functionally specific)
- 20 30 mm conical connection
- 21 type 1 terminal unit probe/socket
- 22 type 2 terminal unit probe/socket

NOTE 1 Type 1 terminal unit probe/socket is for negative pressure. Type 2 terminal unit probe/socket is for positive pressure.

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NOTE 2 The limit between the receiving system and the disposal system as shown may not coincide with an actual physical limit such as a wall.

Figure 2 — Schematic diagram of typical anaesthetic gas scavenging systems

3.10**disposal system**

means by which expired and/or excess anaesthetic gases are conveyed from the receiving system to an appropriate place of discharge

NOTE A place of discharge can be, for example, the exterior of a building or a non-recirculating extract ventilation system.

3.11**high-flow disposal system**

disposal system that is intended to operate with a high-flow transfer and receiving system complying with ISO 8835-3

3.12**low-flow disposal system**

disposal system that is intended to operate with a low-flow transfer and receiving system complying with ISO 8835-3

3.13**maximum test pressure**

maximum pressure to which the terminal unit is designed to be subjected during pipeline pressure testing

**3.14
operating pressure**

pressure at which the AGSS terminal unit is designed to operate

NOTE The operating pressure for a Type 1 AGSS terminal unit is negative; the operating pressure for a Type 2 AGSS terminal unit is positive.

**3.15
power device**

that part of the AGSS disposal system that provides power for scavenging at specified flows and pressures

**3.16
probe**

non-interchangeable male component designed for acceptance by, and retention in, a socket

**3.17
quick connector**

pair of non-threaded type-specific components that can be easily and rapidly joined together by a single action of one or both hands without the use of tools

**3.18
receiving hose**

that part of an AGSS which transfers expired and/or excess anaesthetic gases from the receiving system to the disposal system

**3.19
receiving system**

that part of an AGSS which provides an interface between a transfer system and a disposal system

**3.20
single-fault condition**

condition in which a single means for protection against a safety hazard in equipment is defective or a single external abnormal condition is present

**3.21
socket**

that female part of a terminal unit which is either integral or attached to the base block by a type-specific interface and which contains the type-specific connection point

**3.22
terminal unit base block**

that part of a terminal unit which is attached to the disposal system

**3.23
terminal unit check valve**

valve that remains closed until opened by the insertion of an appropriate probe and which then permits flow in either direction

**3.24
transfer system**

that part of an AGSS which transfers scavenged gases from the exhaust port of a breathing system or other equipment to a receiving system

**3.25
transfer tube**

that part of an AGSS that transfers expired and/or excess anaesthetic gases from the breathing system or other equipment to the receiving system

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