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

Part 2:
Terminal units for anaesthetic gas scavenging
systems

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Prises murales pour réseaux de distribution de gaz médicaux —

Partie 2: Prises murales pour systèmes d'évacuation des gaz d'anesthésie

ISO 9170-2:1999

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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 3.

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.

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

This first edition, together with ISO 9170-1, cancels and replaces the first edition of ISO 9170 (ISO 9170:1994), 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*

Annex A of this part of ISO 9170 is for information only.

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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 are 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.

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Terminal units for medical gas pipeline systems —

Part 2: Terminal units for anaesthetic gas scavenging systems

1 Scope

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 .

It is intended especially to ensure the type specificity of terminal units and to prevent their interchange between different services.

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

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.

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

NOTE Throughout this part of ISO 9170, clauses for which a rationale is provided in annex A are indicated by a boldface capital R.

2 Normative references

The following normative document contains provisions which, through reference in this text, constitute provisions of this part of ISO 9170. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 9170 are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 6506, *Metallic materials — Hardness test — Brinell test.*

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

ISO 8835-3, *Inhalational anaesthesia systems — Part 3: Anaesthetic gas scavenging systems — Transfer and receiving systems.*

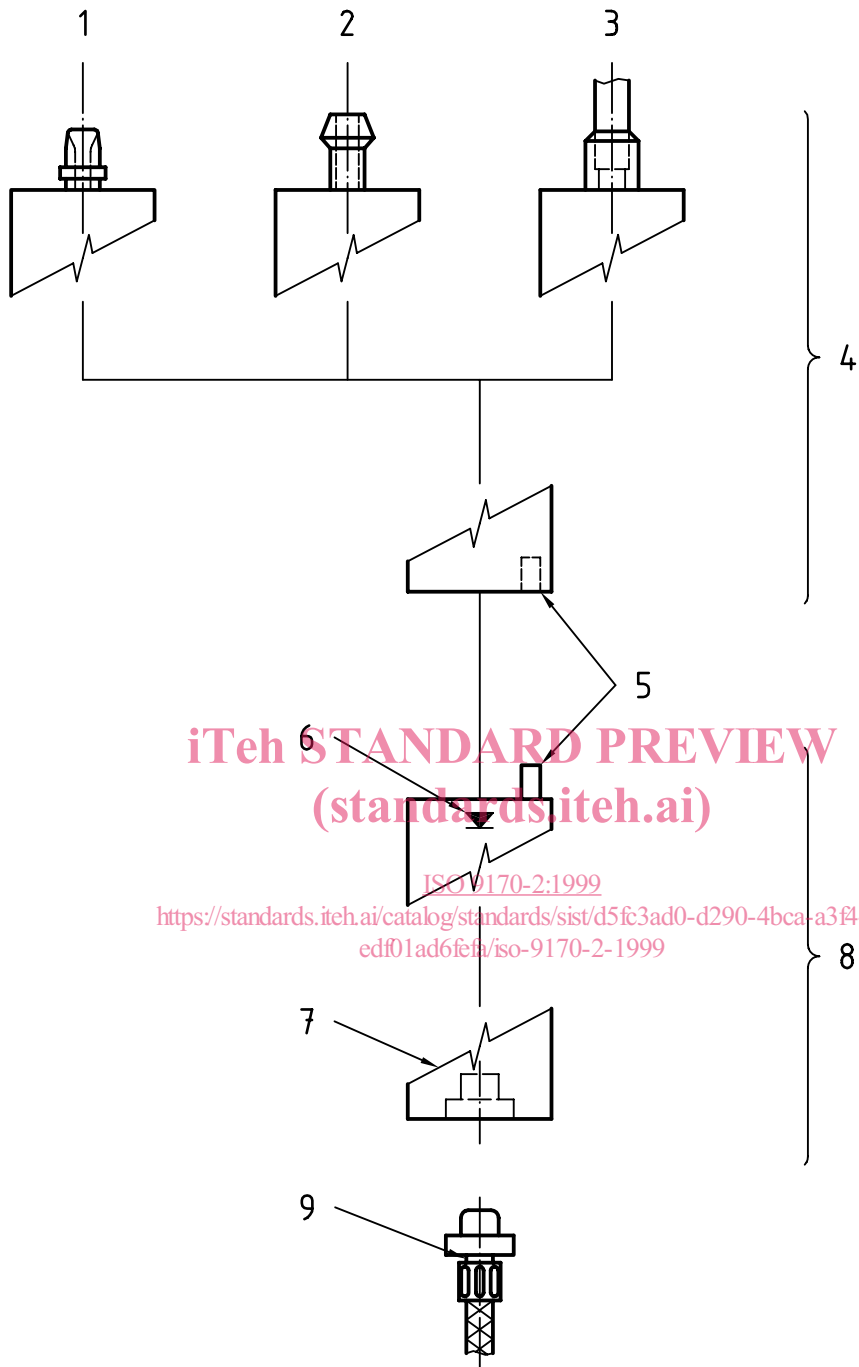
ISO 14971-1, *Medical devices — Risk management — Part 1: Application of risk analysis.*

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

3 Terms and definitions

For the purposes of this part of ISO 9170, the following terms and definitions apply.

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



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

3.1**AGSS type 1 terminal unit**

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

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 the disposal hose and the remainder of the disposal system at which the operator makes connections and disconnections

3.5**AGSS type-specific**

having characteristics which prevent interchangeability and thereby allows 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 (standards.iteh.ai)**

complete system which is connected to the exhaust port(s) of an anaesthetic workstation or which is integrated into an anaesthetic workstation for the purpose of conveying scavenged 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 may be sequentially combined with a breathing system to include the transfer system or transfer and receiving systems.

See Figure 2.

3.8**disposal hose**

that part of the AGSS which transfers scavenged gases from the power device to the probe of the AGSS Type 2 terminal unit

3.9**disposal system**

means by which the scavenged gases are conveyed from the receiving system to an appropriate place of discharge

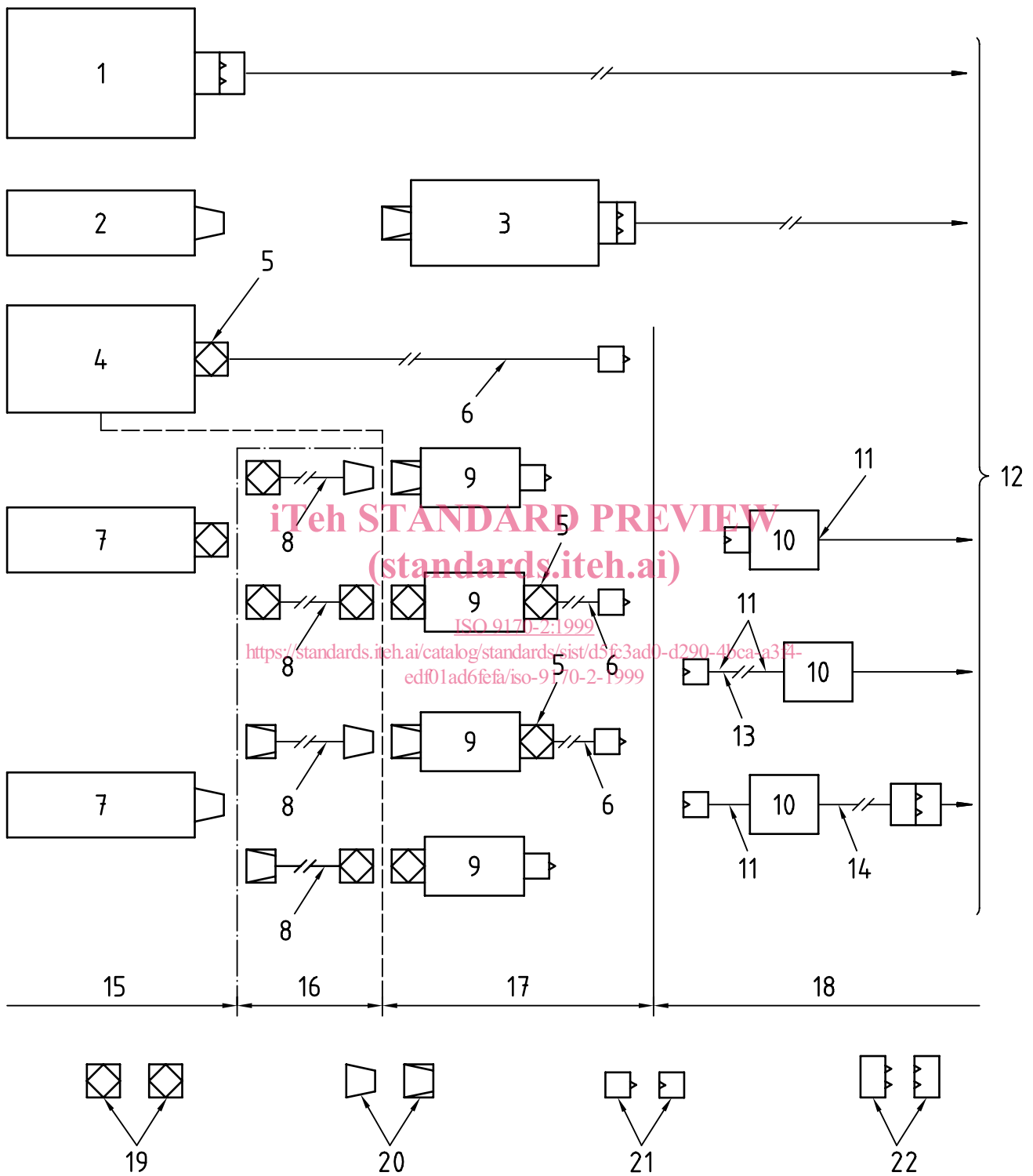
NOTE A place of discharge may be, for example, the exterior of a building or a non-recirculating extract ventilation system.

3.10**high-flow disposal system**

disposal system that generates extract flowrates not lower than 75 l/min from transfer and receiving systems complying with ISO 8835-3

3.11**legible**

discernible or identifiable to an operator with 6/6 (20/20) vision (corrected if necessary) from a distance of 1 m at a light level of 215 lx when viewing the information, markings, etc., perpendicular to and including 15° above, below, left and right of the direct line of vision of the operator



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 (see note 2).

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.

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Figure 2 — Schematic diagram of typical anaesthetic gas scavenging system

3.12**low-flow disposal system**

disposal system that generates extract flow rates not more than 50 l/min from transfer and receiving systems 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 Operating pressure for Type 1 AGSS terminal units is negative; operating pressure for Type 2 AGSS terminal units is positive.

3.15**power device**

that part of the disposal system of an AGSS which provides the gas flow for scavenging

3.16**probe**

male component designed for acceptance by and retention in the socket

3.17**quick connector**

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