



**Directions for use** 

Ambu<sup>®</sup> Airway Man I Ambu<sup>®</sup> Airway Man W





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#### English

Directions for use Note: Figures ①-⑧ referred to in these directions are all shown inside the cover of this manual. Please note that the cover will unfold.

# Dansk

Brugsanvisning .11 Bemærk: figur 1-8 der henvises til i denne brugsanvisning er alle vist indvendigt i omslaget på denne brugsanvisning. Bemærk venligst at omslaget kan foldes ud.

#### Deutsch

Bedienungsanleitung 19 Hinweis: Alle Zahlen ①-⑧, auf die in dieser Gebrauchsanleitung verwiesen wird, sind auf der Innenseite der Umschlagklappe dieses Handbuchs aufgeführt.

#### Español

Manual de instrucciones 29 Nota: Todas las cifras ①-⑧ a las que hacen referencia estas instrucciones de uso aparecen en la parte interior de la portada de este manual. Adviértase que se trata de una portada desplegable.

#### Français

Mode díemploi 39 Nota: Toutes les figures ①-⑧ citées dans la présente notice se trouvent à l'intérieur de la couverture du manuel. Veuillez noter que cette couverture est un dépliant.

#### Magyar

Használati útmutató 49 Megjegyzés: Az itteni utasításokban hivatkozott 1-8. ábrák a jelen kézikönyv borítóának belső részén találhatók. Kérjük, ne feledje, hogy a borító kinyílik.

#### Italiano

Manuale d'uso 59 Nota: Tutte le figure ①-⑧ a cui si fa riferimento in queste istruzioni per l'uso sono mostrate all'interno della copertina di questo manuale. Vogliate notare che la copertina si dispiega.

#### Nederlands

Gebruiksaanwijzing Opmerking: Afbeeldingen ①-⑧, naar welke in deze handleiding verwezen wordt, bevinden zich aan de binnenkant van deze uitvouwbare handleiding.

#### Polski

Instrukcja obsługi .79 Uwaga: rysunki ①-⑧ wymienione w niniejszej instrukcji znajdują się wewnątrz rozkładanej okładki.

### Português

Manual de instruções Nota: as figuras ①-⑧ referidas nestas instruções estão todas ilustradas dentro da capa deste manual. Por favor, note que a capa se desdobra.





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# Safety and Regulatory Notices

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications to the product are not allowed.

Contains FCC ID U3O-G2M5477

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Ambu<sup>®</sup> is a registered trademark of Ambu A/S, Denmark. Ambu is certified according to ISO 9001 and ISO 13485.

This product complies with the essential requirements of Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.

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# 1. Introduction

The Ambu<sup>®</sup> Airway Man is an advanced instruction and training manikin for the simulation of realistic conditions during cardiopulmonary resuscitation by means of rescue breathing and chest compression moreover the Airway Man will cover all aspect of basic life-support training.

The manikin has the size of a normal adult and provides an exceptionally lifelike representation of the human anatomy, particularly of those features important to training in modern resuscitation techniques.

The built-in instrumentation shows the effectiveness of the resuscitation, including results achieved for insufflation volume and depth of external chest compression, and indicates any stomach inflation and incorrect hand positioning as well.

#### 1.1. Airway Man models

The Airway Man is available in the following configurations:

#### Version I:

The Airway Man I (Instrument) models are equipped with an mechanical monitoring instrument showing effectiveness of the resuscitation, including results achieved for depth of external chest compression, incorrect hand positioning, ventilation volume furthermore indications of stomach inflation.

#### Version W:

The Airway Man W (Wireless) models are equipped with a mechanical monitoring instrument as well as digital sensors showing effectiveness of the resuscitation, including results achieved for depth of external chest compression, incorrect hand positioning, ventilation volume furthermore indications of stomach inflation.

Airway Man W models can be connected to a computer through USB or WLAN using the Ambu CPR-Software for a more detailed analysis of the performed resuscitation.

# 2. Restrictions and Cautions (only Airway Man W)

Wideband Data Transmission Systems

2400,0 - 2483,5 MHz

The product con be used in EU member states and EFTA countries in respect to the following restrictions.

Country	Restriction
France	Not allowed for outdoor use.
Italy	Not allowed for outdoor use.
Luxembourg	Implemented general authorisation is required for network and service supply.
Norway	Not allowed to be used within a radius of 20 km from the centre of Ny-Ålesund.
Russian Federation	Not allowed to be used before national approval based on the national standard system (GOST) and conformity certificate.

#### Caution



- Only use the manikin in dry surroundings. Do not expose the manikin directly to any kind of liquid.
- Remove the batteries if the manikin is not used for a longer period of time.
- If you detect any smoke or smell from the manikin turn off the manikin immediately and stop using the manikin.
- If the manikin has been stored in the cold, let the manikin warm to room temperature before use and assure that no condensation has occurred as this could harm the electronics.

# 3. Specifications

#### 3.1 Weight:

Torso with carrying case: approx. 12 kg

#### 3.2 Dimension:

Torso: approx. 80 cm

#### Part/Material

Basic unit	Polyethylene
Instrument part	ABS plastic
Skull	PVC, hard
Chest skin	PVC, soft
Face piece	PVC, soft
Head bag, disposable	Polyethylene
Training suit	50 % cotton and 50 % polyester
Carrying bag/training mat	PVC coated nylon material

#### 3.3 Battery (only Airway Man W)

Recommended battery types: 6 standard alkaline batteries size AA with a capacity of minimum 2850 mAh. 6 rechargeable Batteries size AA with a capacity of minimum 2700 mAh.

#### 3.4 Battery lifetime (only Airway Man W)

The battery lifetime using WLAN is approximately 7 hours using brand new batteries of the type described above.

#### 3.5 Adapter (optional, only AmbuMan W)

AC/DC Adapter Input: 100-240 V AC / 47-63 Hz / 400 mA) Output: 9 V DC / 1,5 A + -Connector: 5,5 x 2,1 x 12 mm



#### 3.6 Operating distance (only Airway Man W)

The wireless connection has a range of approximately 50 meters outside having no obstacles in between.

#### 3.7 Usage and storage:

Storage temperature (non-condensing): -18 °C (-0,4 °F) to 40 °C (105 °F) Usage temperature (non-condensing): -5 °C (23 °F) to 40 °C (105 °F) Humidity: 5 % to 95 %

#### 4. Functions

#### **4.1.** Monitoring instrument ①

To pull out the monitoring instrument depress the catch (1.1) and let the instrument slide out.

Readings on the monitoring instrument can be viewed from two sides. By activating the cover plate on the side facing the trainee, instrument readings can be concealed from trainees undergoing a CPR test (1.2), while allowing the training instructor to monitor the effectiveness of the CPR on the opposite side.

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The monitoring instrument is divided into two halves. The left-hand side registers ventilation, including inspiration volume (1.3), and provides indication of stomach inflation (1.4). The right-hand side of the instrument registers chest compression, including depth of compression in millimetres (1.5), and provides indication of incorrect hand positioning (1.6).

The gauges for insufflated volume and depth of compression are designed to display green when the correct volume and chest compression have been reached, and red when the measurement recorded is outside the correct range.

If the display is green and red the measurement is at the borderline of the correct range. The instrument registers inflation in the stomach (1.4) and incorrect hand positioning (1.6) by changing from black to red colour display.

The values on the scale plates on the monitoring instrument are in accordance with the actual guidelines for resuscitation. It is possible to order instrument plates with other recommendations or guidelines.

#### 4.1.1 USB connector (only Airway Man W) ①

To connect the manikin to a computer use the USB-Plug (1.7), which is placed on the left side of the monitoring instrument. The orange LED (1.8) is active when the USB connection has been established.

#### 4.1.2 Power button (only Airway Man W) ①

To turn on the manikin for the use of the CPR-Software press the power button (1.9) on the right side of the monitoring instrument. The green LED (1.10) is flashing while the system is booting and is steady activated once the system is completely powered up When the manikin is power by batteries and the power is drained to a point where approximately 30 minutes of operational time is left, the green power LED starts flashing which indicates that the batteries needs to be replaced.

An overview of the different LED status can be seen in the following table:

LED status	LED	Description	Flashing pattern
Green steady	•	System running	0 1 2 3 4 5 6 7 Seconds
Green slow flashing	ο	System booting	0 1 2 3 4 5 6 7 Seconds
Green fast flashing	۲	System running and low battery	0 1 2 3 4 5 6 7 Seconds
Off	0	System off	0 1 2 3 4 5 6 7 Seconds

#### 4.1.3 Reset to default settings (only Airway Man W)

To reset the manikin into the default settings press the power button for more than 10 seconds. The manikin will reboot with the default settings.

Detailed information about the default settings can be found in the Directions for use for the Ambu CPR-Software.

# 5. Preparation for training

The manikin is normally supplied in a special carry bag which, when opened, folds out to provide a mat for the trainee during training.

When supplying as a full body model, the legs will be in a separate carry bag.

#### 5.1. Carry bag/training mat (2)

Unfold the bag. Make sure that the manikin is firmly secured to the training mat by inserting the fitting on the training mat into the recess high up on the back of the manikin.

#### 5.2. Mounting the legs on the torso ③

Pull down the trousers a little around the hips. Place the legs in a position so that the 2 dowels on the hip part can slide into the corresponding dents at the bottom of the manikin's body, see 3.1.

Press the two Velcro straps firmly to the body, see 3.2.

To remove legs pull off the Velcro straps and the legs will be disengaged.

#### 5.3. Monitoring Instrument

Activate the instrument by depressing the catch. In case the instrument is not activated (pulled out), no damage is done to the manikin nor to the instrument during chest compression.

#### 5.4. Carotid pulse ④

Fit the tube with bellows onto the tube connector. The instructor can now activate the carotid pulse manually by compressing the bellows.

#### 5.5. Adjusting chest stiffness (5)

The stiffness of the chest can be adjusted as required by loosening the thumb screw on the back of the manikin: For reduced stiffness set to 'LOW' position, for increased stiffness set to 'HIGH' position.

The values shown, approximately 6 N/mm (0,6 kg/mm) and 11 N/mm (1,1 kg/mm), indicate the force, which must be applied to compress the chest by 1 mm.

Example: Compressing the chest by 40 mm at the 'LOW' setting, a force of approximately 240 Newton (24 kg) must be applied.

The normal setting is 'MEDIUM' corresponding to approximately 8,5 N/mm (0,85 kg/mm).

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#### 5.6 Battery placement (only Airway Man W) 6

The battery compartment is placed on the backside of the manikin. Depress the catch to open (6.1) and remove the lid. Place the batteries inside the battery holders and close the lid. **NOTE:** Take care that the batteries are place correctly in the battery holders and the polarity is correctly.

#### 5.7 Power supply (optional for Airway Man W) 6

Optional the manikin can be powered using a universal external AC/DC adapter (output 9 V / 1,5 A) with a straight connection plug (5,5x2,1x12 mm). The connector can be connected to the socket place inside the battery compartment, see 6.2.

# 6. Usage of the manikin

#### 6.1 Ventilation ⑦

The manikin is not supplied with a hygienic system, as normally a resuscitator is used. Mouth-to-mouth or mouth-to-nose ventilation must therefore not be performed.

Ventilation can be performed by using a resuscitator with mask (7.1), ventilation through an endotracheal tube (7.2) or other modern airway management devices. Correct ventilation makes the manikin's chest raise and fall. When doing bag/mask ventilation there is a possibility for stomach inflation, which causes the manikin's stomach to rise. This happens if the ventilation is too fast, the volume is too high or if the head is not tilted correctly. As in real-life situations, ventilating through the intubation tube eliminates the risk of stomach inflation if the tube is correctly placed.

#### 6.2 Intubation

The manikin can be intubated through the mouth (oral intubation). Intubation through the nose (nasal intubation) is not possible.

The intubation can be performed with modern airway management devices like ET-tube (8 mm I.D. endotracheal tube is recommended), supraglottic airway or Combitube<sup>™</sup> etc.

The insertion of the laryngoscope and endotracheal tube is to be made very carefully as if it was a real patient. It is important to grease the tongue part from the oral cavity down to the white stripes simulating the vocal chords using the accompanying water-soluble lubricating gel and lubricate as often as the tongue part feels dry. Do not pour lubricating gel down the tongue parts but grease the parts with a thin layer of lubricating gel. Furthermore, it is important also to grease the tracheal tube and laryngoscope well with lubricating gel.

Lack of lubrication can destroy the parts, especially the tongue part, but can also make the face piece separate from the tongue part.

Silicone oil or Silicone spray must not be used as the parts can become sticky and almost impossible to clean. The facemask must not be removed by the user. Disassembly should only take place during service or repair.

#### 6.3 Compression ⑧

External chest compression can be practised, and the depth of compression will be displayed on the monitoring instrument in millimetres. It is possible to adjust the stiffness of the chest to simulate a patient with a soft, normal or hard chest.

To ensure that the correct point of compression is applied during chest compression, the instrument also provides indication of incorrect hand positioning, see 8.1. The carotid pulse can be felt on both sides of the neck if simulated manually by the instructor, see 8.2.

# 7. Cleaning

#### 7.1 Cleaning of skull, neck and body

The skull, face piece, neck and body can be wiped over with a cloth moistened in a mild detergent and then wiped over once more using a cloth moistened in clean water. When washing, never allow detergent or water to enter the skull, body or instrument unit. If necessary, cover the connection between body and instrument unit with a cloth. Marks on the manikin left by lipstick or ball pen can penetrate the material and should therefore be removed as quickly as possible using alcohol.

#### 7.2 Cleaning of clothing

The tracksuit is made of 50 % cotton and 50 % polyester and is washable at max. 40° C (104° F).

#### 7.3. Cleaning of carry bag

The carry bag can be washed in a mild detergent using a cloth or soft brush, rinsed in dean water, and then dried off.

#### 8. Computer connection (only Airway Man W)

For more advanced instruction is the manikin equipped with digital sensors to record the performance of the CPR. The performance can be recorded and displayed on a computer using the Ambu CPR-Software.

To connect the manikin to a computer the CPR-Software has to be installed on the computer. The connections can be established by using a USB cable or by using Wireless LAN (WLAN).

Further detailed information about the functionality of the computer program can be found in the Directions for use for the Ambu CPR Software.