HAMILTON-MR1

Installation Guide

REF 161010, 1610100

624507/03 | 2021-11-17

HAMILTON MEDICAL

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Hamilton Medical AG will make available, on request, circuit diagrams, component parts lists, descriptions, calibration instructions, or other information that will assist appropriately trained personnel to repair those parts of the equipment designated by Hamilton Medical AG to be repairable.

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1. Document history

Table 1-1. Document history

Document version No.	Amendment	Date of issue
00	First release	July 2012
01	Content updated	November 2014
02	– Feature icons added – Illustrations updated	February 2016
03	– New template – Text and illustrations updated due to new hardware and software specifications	November 2021

2. Notes, cautions and warnings

Safety messages are displayed as follows:

⚠ WARNING

A WARNING alerts the user to the possibility of injury, death, or other serious adverse reactions associated with the use or misuse of the device.

⚠ CAUTION

A CAUTION alerts the user to the possibility of a problem with the device associated with its use or misuse, such as device malfunction, device failure, damage to the device, or damage to other property.

NOTICE

A NOTICE emphasizes information of particular importance.

For additional information, see the System Overview Chapter of the *HAMILTON-MR1 Operator's Manual* (PN 10101887).

3. Introduction

This guide describes how to set up the HAMILTON-MR1 ventilator and prepare it for operation. This includes instructions to install all its main components and optional accessories.
If you have questions, contact your Hamilton Medical technical support representative or write to techsupport@hamilton-medical.com.

NOTICE

Depending on the ordered configuration some parts may not be available or already be installed on the ventilator.

4. Installation requirements

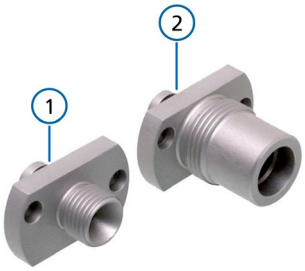
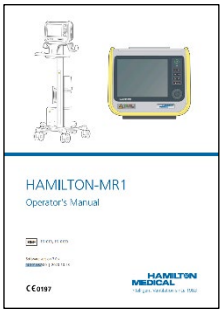
Service engineers/technicians responsible for the installation must comply or fulfill the following requirements:

- Only trained service engineers authorized by Hamilton Medical are allowed to service, maintain, install, and replace parts/components of the ventilator.
- Always return defective parts, components, or assemblies to Hamilton Medical AG, Switzerland, with a completed Return Good Authorization (RGA) request.

5. Delivered parts and accessories

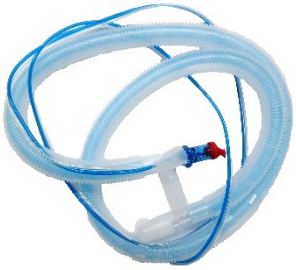
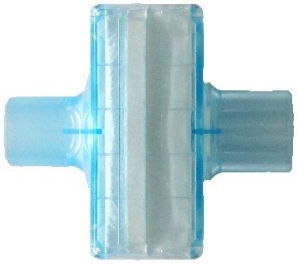
5.1. Required parts

Table 5-1. Required parts

Graphic	Part description	Part number
	HAMILTON-MR1 ventilator	161010 1610100
	High pressure oxygen connector (including nut and nipple connector)	① 160470 DISS or ② 160471 NIST
	Battery	369108
	Power Supply	161840
	Operator's Manual	161020 English 161021 Spanish 161022 German 161023 French 161024 Italian 161026 Russian 161027 Chinese 161028 Portuguese

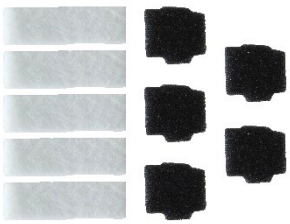
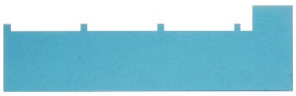
5.2. Basic accessories

Table 5-2. Basic accessories

Graphic	Part description	Part number
	Power cord	355271 USA 355272 GBR 355270 EU 355269 CHN
	Single use coaxial breathing set, 1.80 m with flow sensor	260087[1] [1] Not delivered to all countries
	Single use HMEF inspiratory filter	279963[1] Adult or 279204[1] Neonatal [1] Not delivered to all countries
	Single use expiratory valve set	161154 Adult or 161188 Neonatal
	Demonstration lung	151815 Adult or 282494 Neonatal

5.3. Optional accessories

Table 5-3. Optional accessories

Graphic	Part description	Part number
	O2 sensor	10110473
	O2 sensor	396200
	Filter set	161275
	Feature icons positioning guide	161975
	Feature icons	161737

6. Packaging

Figure 6-1. Packaging overview

NOTICE

- Store the original packaging, including the protective material for later use. This will protect the equipment if you have to move it.
- Breathing set not included for all countries.

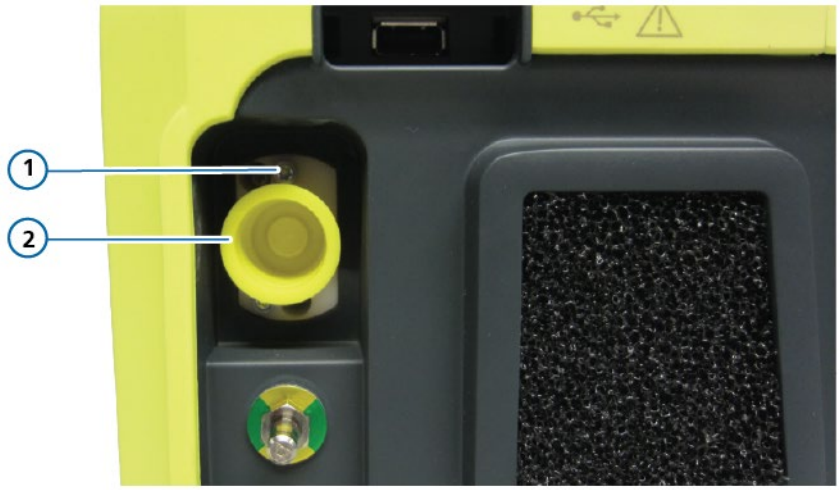
7. Installing the oxygen connector

NOTICE

For 1610100 devices, the DISS or NIST oxygen connector is preassembled during production.

1. Remove the yellow protective cap (2) from the high-pressure oxygen inlet.
2. Use a Torx TX 10 screwdriver to remove the two screws (1).

Figure 7-1. Removing the yellow protective cap and screws from the high-pressure oxygen inlet



3. Position the DISS or NIST connector (3) in its housing and push it in position.

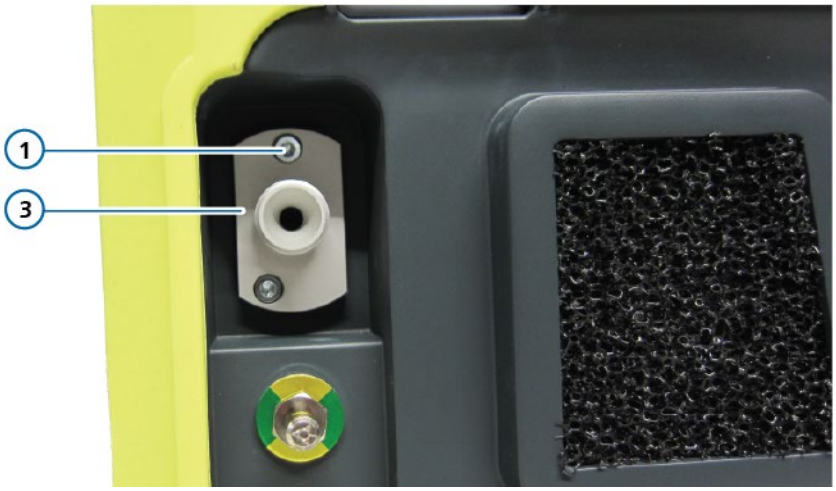
⚠ CAUTION

- *Make sure the two holes for the screws in the connector (3) matches the ones in the ventilator. Use the figure below as a reference.*
- *Make sure the connector (3) is correctly placed and fully inserted in its housing.*

For additional information, see the *Oxygen Connectors Set Installation Guide* (PN 612219).

4. Install the two screws (1). Use a Torx TX 10 screwdriver to tighten the two screws (1).

Figure 7-2. Installing the DISS/NIST connector



8. Installing the O2 sensor

1. Use a Torx TX 20 screwdriver to remove the seven screws (2) shown in the figure below.
2. Remove the filter cover (1).

Figure 8-1. Removing the filter cover

3. Check the presence of the O2 sensor (5).

⚠ CAUTION

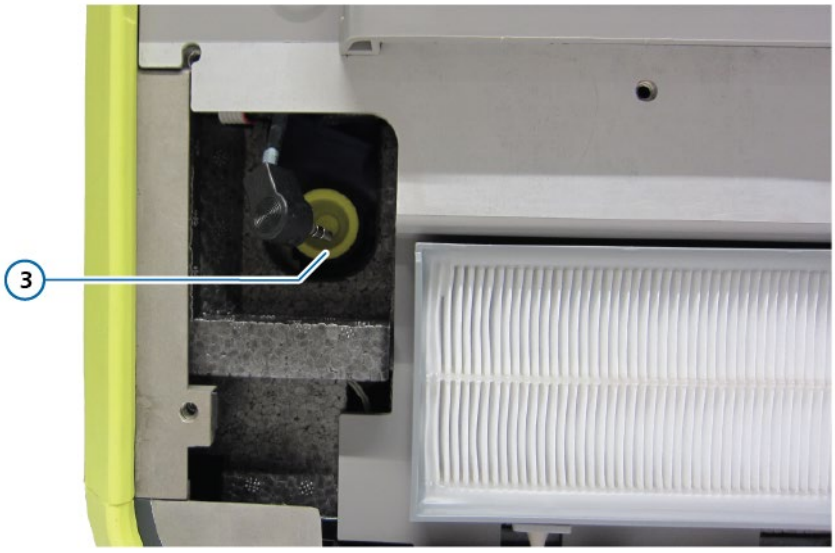
Do not switch on the ventilator if the O2 sensor (5) is not correctly installed. Contact Hamilton Medical for assistance.

NOTICE

- If the O2 sensor (5) is already mounted to the ventilator, remove the cell plug (4) and check that the O2 sensor (5) is tightly mounted into its housing. In case of movement, tighten the O2 sensor (5) by turning it clockwise.
- Afterwards, reconnect the cell plug (4), reinstall the filter cover (1) and secure it in position with the screw (2).

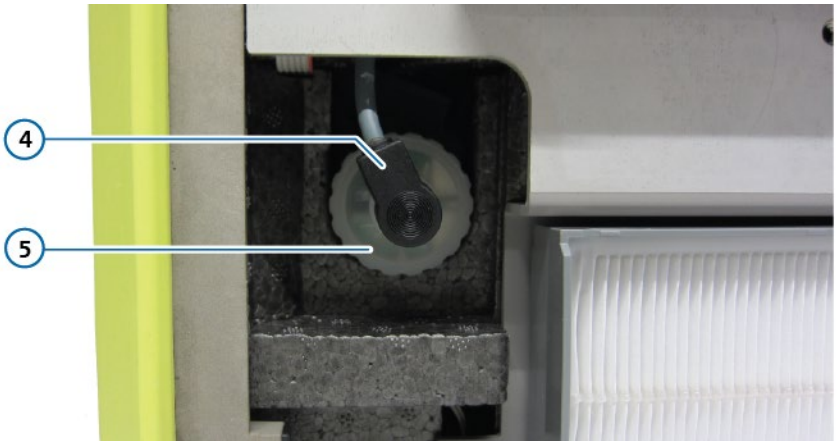
4. Remove the yellow protective cap (3) from the O2 sensor housing.

Figure 8-2. Removing the yellow protective cap from the O2 sensor housing



5. Align the O2 sensor (5) with the screw thread in the housing. Then, turn the O2 sensor (5) clockwise to tighten it.
6. Insert the cell plug (4) into the O2 sensor (5).

Figure 8-3. Installing the O2 sensor



NOTICE

Do not attach the filter cover yet. Check the batteries first.

9. Connecting the power sources

Before proceeding with the installation, see the Connecting to a power source Chapter of the *HAMILTON-MR1 Operator's Manual* (PN 10101887).

9.1. Checking the batteries

NOTICE

- The two batteries are preassembled during production.
- The HAMILTON-MR1 ventilator is a class I device according to IEC 60601-1. Therefore, it requires protective earth grounding.
- Before installing the ventilator, always check the reliability of the AC power source.

1. Check that both batteries (1) are correctly installed and fully inserted.

Figure 9-1. Checking the batteries

2. Attach the filter cover removed earlier. Use a Torx TX 20 screwdriver to reinstall the seven screws to secure the filter cover to the ventilator.

9.2. Connecting to AC power

NOTICE

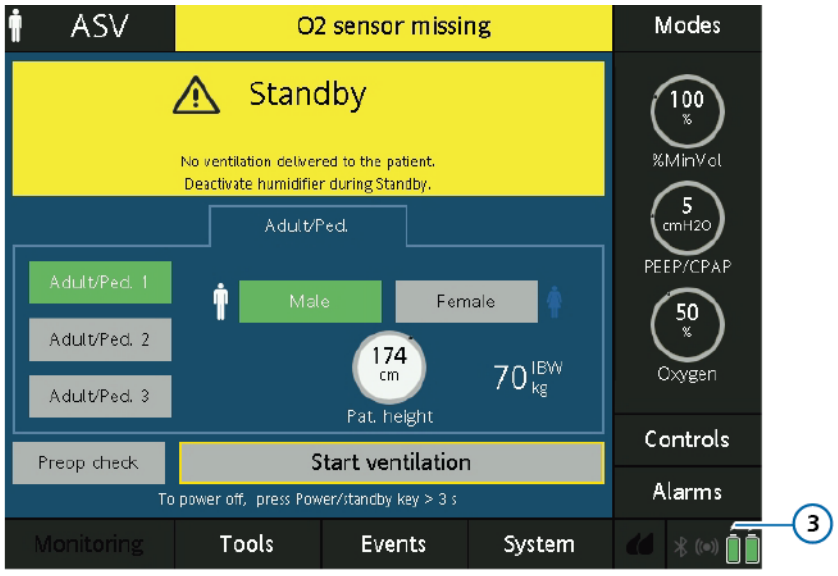
- The primary power supply for the HAMILTON-MR1 ventilator is AC between 100 and 240 V and between 50 and 60 Hz.
- Before installing the ventilator, check the location of the AC plugs and make sure to have enough free space to easily disconnect the power supply whenever needed.
- To avoid unintentional disconnections, always secure the AC power cord with the provided cable clamp.

1. Connect the DC power cord (2) from the power supply to the ventilator and secure it using the knurled ring (1) on the power cord connector.

Figure 9-3. Removing the cable clamps

2. Connect the AC power cable from the power supply to a suitable AC power supply.
3. After switching on the ventilator, the power symbol (3) will be displayed in the bottom right corner of the screen.

Figure 9-4. Power and battery symbols on the display



10. Switching on the TeslaSpy

NOTICE

Always switch on the TeslaSpy before switching on the ventilator.

1. The TeslaSpy switch (1) is located on the underside of the MR1 ventilator. Use a pen or any other thin object to gently push the switch (1) and activate the TeslaSpy.

Figure 10-1. Switching on the TeslaSpy

2. When the TeslaSpy is active the green LED (2) on the front panel flashes.

Figure 10-2. TeslaSpy green LED

11. Attaching the icons

11.1. Feature icons

1. Attach the feature icons positioning guide (2) to the front left corner of the ventilator.
2. Attach the required feature icons (1) to the ventilator in the spaces marked by the feature icons positioning guide (2).
3. Remove and discard the feature icons positioning guide (2).

Figure 10-1. Attaching the feature icons

12. Testing and acceptance

12.1. Device information

Table 11-1. Device information

HAMILTON-MR1	
Ventilator serial number:	SN __ __ __ __ __ __ __
Inventory number:	__ __ __ __ __ __ __
Software version:	__ . __ . __
Name of hospital and location:	
Name of distributor and country:	
Name of installer:	
Date (YYYY/MM/DD)	__ __ __ __ / __ __ / __ __

12.2. Component installation

Table 11-2. Component installation checks

Task	Yes	No	Not applicable	HAMILTON-MR1 manual reference
DSS / NIST connector correctly installed?	❑	❑	❑	See the *Installing the oxygen connector* Chapter of the Installation guide (PN 624507/03).
O2 sensor correctly installed?	❑	❑	❑	See the *Installing the O2 sensor* Chapter of the Installation guide.
Both batteries correctly installed?	❑	❑	❑	See the *Checking the batteries* Chapter of the Installation guide.
DC power cord correctly connected?	❑	❑	❑	See the *Connecting to AC power* Chapter of the Installation guide.
AC power cord correctly connected?	❑	❑	❑	

Task	Yes	No	Not applicable	HAMILTON-MR1 manual reference
TeslaSpy switched on?	❑	❑	❑	See the *Switching on the TeslaSpy* Chapter of the Installation guide.
Feature icons correctly installed?	❑	❑	❑	See the *Attaching the icons* Chapter of the Installation guide.

12.3. General checks

Table 11-3. General checks

Task	Yes	No	Not applicable	HAMILTON-MR1 manual reference
Connect the ventilator to an AC power supply and an oxygen supply. Assemble the patient breathing circuit. Is the breathing circuit correctly assembled?	❑	❑	❑	See the *Preparing the ventilator* Chapter of the Operator's Manual (PN 10101887).
Switch on the power. When the ventilator is switched on the buzzer sounds briefly and the red alarm lamp flashes. After the self-test is passed the alarm lamp flashes again.	❑	❑	❑	See the *Turning the ventilator on and off* Chapter of the Operator's Manual.
Use the configuration setting to choose the language. Is the desired language set?	❑	❑	❑	See the *Selecting the default language* Chapter of the Operator's Manual.
Set the date and time correctly. Are the correct date and time set?	❑	❑	❑	See the *Setting date and time* Chapter of the Operator's Manual.
Do the electrical safety tests. Document the measured values. Are the measured values ok?	❑	❑	❑	See the *Electrical safety* Chapter of the Service Manual (PN 624394).
Do the leak test. Is the leak test passed?	❑	❑	❑	See the *Performing the breathing circuit Leak test* Chapter of the Operator's Manual.
Do the flow sensor calibration test. Is the flow sensor calibration test passed?	❑	❑	❑	See the *Calibrating the adult/pediatric flow sensor* Chapter of the Operator's Manual.

Task	Yes	No	Not applicable	HAMILTON-MR1 manual reference
Do the O2 sensor calibration test. Is the O2 sensor calibration test passed?	❑	❑	❑	See the *Calibrating the O2 sensor* Chapter of the Operator's Manual.
Generate an alarm situation. Is the corresponding alarm message correctly displayed?	❑	❑	❑	See the *Responding to alarms* Chapter of the Operator's Manual.
Resolve the alarm situation (e.g. re-connect the main power). Is the alarm reset?	❑	❑	❑	

NOTICE

- If the HAMILTON-MR1 ventilator does not pass the initial installation tests and checks, contact your local Hamilton Medical representative or Hamilton Medical's technical support for assistance.
- After you have completed the Initial Installation Testing and Acceptance Report for the HAMILTON-MR1 ventilator, please send a copy of the report to your local Hamilton Medical representative or Hamilton Medical (techsupport@hamilton-medical.com), and save/archive the original report for your records.

Remarks:

Date (YYYY/MM/DD)

__ __ __ __ / __ __ / __ __

Signature

_____

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