



Pocket Guide **Evita XL** Software version 7.n

The Evita XL Pocket Guide is not a replacement or substitute for the Instructions for Use.

Any use of the device requires full understanding and strict observation of the Instructions for Use.

The user must be familiar with the device according to the national and local laws and recommendations.

There will be no exchange of the Pocket Guide when the product is updated/upgraded.

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System Overview

NOTE

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Control panel



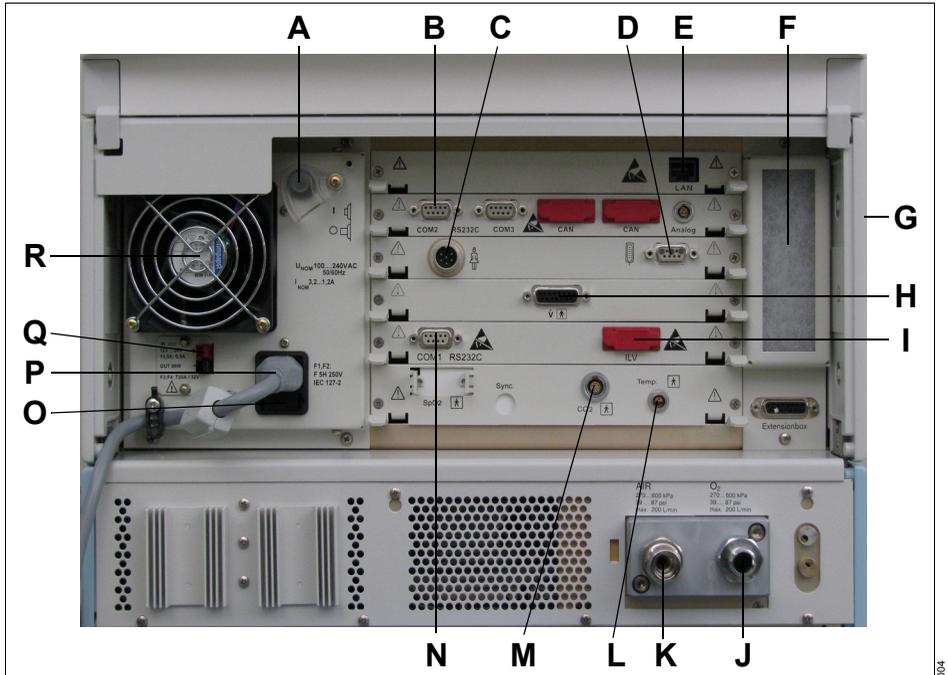
- A Touch-sensitive screen
- B **Audio paused 2 min.** key for suppressing the alarm tone for two minutes
- C **Alarm Limits** key for setting alarm limits
- D **Ventilator Settings** key for setting ventilation mode and ventilation parameters
- E Unassigned key for future functions
- F **Sensor Parameter** key for calibrating sensors and for switching monitoring on or off
- G **System Setup** key for configuring device functions
- H **Start/Standby** key for switching between operation and Standby mode
- I Rotary knob for selecting and confirming settings

Front connections



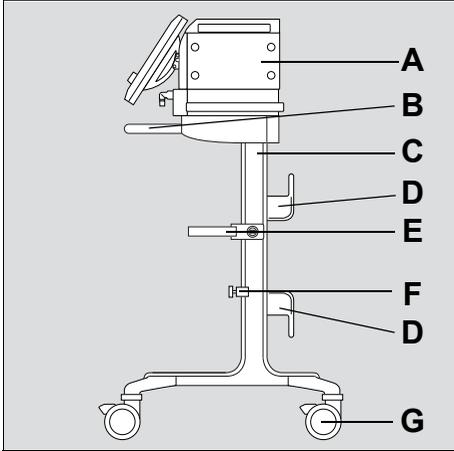
- A  Gas exhaust port
(EXHAUST – NOT FOR SPIROMETERS)
- B Flow sensor
- C Flow sensor flap (thermal cover)
- D Expiratory valve with expiratory connector port
(GAS RETURN)
- E Latch for expiratory valve
- F Nebulizer connection
- G Inspiratory connector port
(GAS OUTPUT)
- H Locking screw for protective cover
(behind it: O₂ sensor)

Back panel



- A** Power switch with protective cover
- B** COM 2, COM 3 ports for RS 232C, 2 CAN interfaces, and analog interface (optional)
- C** Connection  for nurse call (optional)
- D** Connection  for Remote Pad (optional)
- E** LAN connection for web application server of SmartCare
- F** Cooling-air filter
- G** Option overview plate (not visible) on the right-hand side panel
- H** Connection  for neonatal flow sensor (optional)
- I** ILV socket for the connecting cable for independent lung ventilation with two ventilators
- J** Connection for oxygen (O₂)
- K** Connection for medical compressed air (AIR)
- L** Temp  socket for temperature sensor (optional)
- M** CO₂  socket for CO₂ sensor (optional)
- N** COM 1 RS 232C port for RS 232 interface, e. g., for monitoring system
- O** AC fuses
- P** Connector for power cable (AC)
- Q** DC socket
- R** Cooling fan

Trolley



- A** *Evita XL*
- B** Handle
- C** Trolley column
- D** Hose hook, 2x
- E** Humidifier holder (optional)
- F** Universal bracket with standard rail (optional)
- G** Dual castors with locking brakes, 4x

Preparation

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How to start the *Evita XL*

Preparing the *Evita XL*

- Connect the power supply
- Connect the gas supply (Air + O₂)
- Install expiratory valve, flow sensor
- Connect the breathing circuit
- Switch on *Evita XL*
- Activate Standby mode
- Enter the humidification type

Checking readiness for operation

- Perform the Device Check
- Perform the Airtight Check
- Test the DC power pack (batteries)

Selecting patient and therapy settings

- Select the patient
- Set the ventilation parameters
- Set the alarm limits

Starting ventilation

- Touch start button in the Start/Standby dialog window

Connecting to the power supply

The mains voltage must correspond to the voltage range indicated on the rating plate.

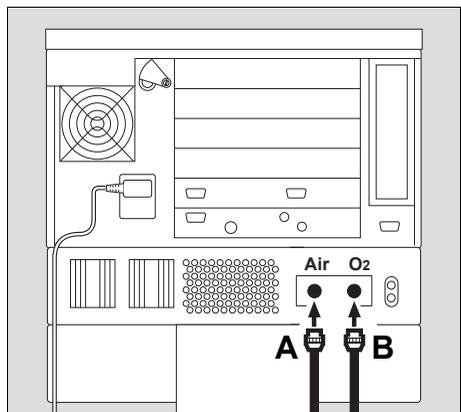
Either: 220 V to 240 V
or: 100 V to 127 V

- Insert plug into the mains power socket.

For operation with DC power pack and external battery (DC power pack option):

- Connect optional external battery with cable.

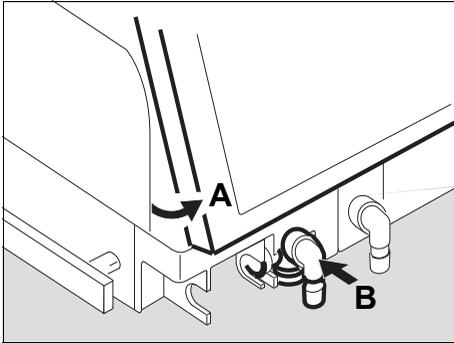
Connecting to the gas supply



- 1 Screw on the compressed air hose (A) to the Air inlet connector and the compressed O₂ gas hose (B) to the O₂ inlet connector on the back panel of *Evita XL*.
- 2 Connect the plugs to the central gas supply wall terminal units.

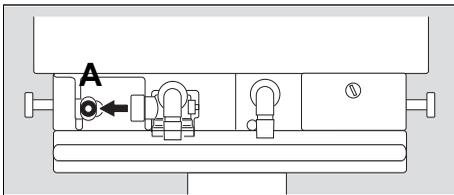
Installing expiratory valve, flow sensor

Installing the expiratory valve

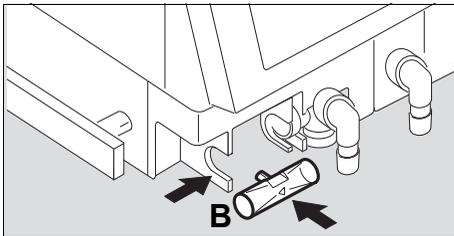


- 1 Press down the segments on the right and left and tilt the control panel (A) upwards.
- 2 Push expiratory valve (B) into the mount until it clicks into position. Check that it is properly engaged by gently pulling on the port.

Mounting the flow sensor

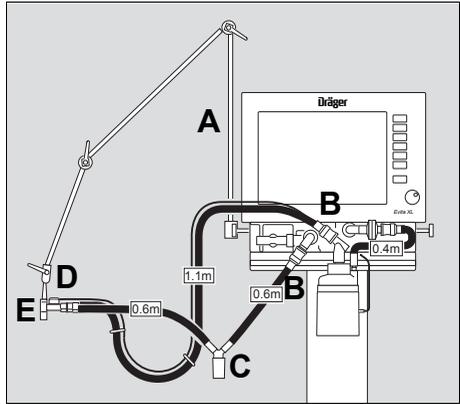


- 1 Push connector socket (A) all the way to the left.



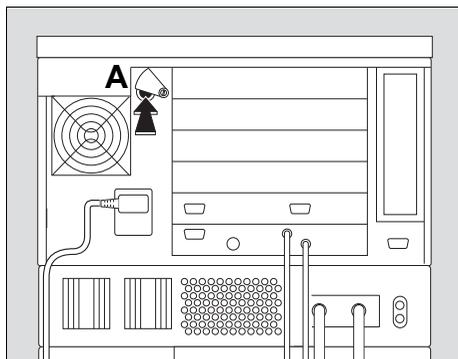
- 2 Place flow sensor (B) into its mount – with the connector facing towards the device – and push into the socket, as far as it will go.
- 3 Push flow sensor to the right and into the rubber lip seal of the expiratory valve, as far as it will go.

Connecting the breathing circuit



- 1 Attach hinged arm (A) to the rail on the left-hand side of the ventilator and tighten screws.
- 2 Connect breathing hoses of appropriate lengths to the ports (B). Observe the required hose lengths (indicated in meters).
- 3 Install water traps (C) in vertical position.
- 4 Connect Y-piece (D), with the rubber sleeve of the Y-piece on the inspiratory side.
- 5 Insert the Y-piece in the opening of the hinged arm (E).
- 6 Connect test lung.

Switching on *Evita XL*



- 1 Press On/Off switch (A) until it engages.

The protective cover pivots down over the On/Off switch to protect against inadvertent switching off.

The Selftest screen with version no., date, and part no. of the software is now displayed.

The Selftest is performed automatically.

- 2 Wait for this test to be completed.

Evita XL then displays the "Start" screen.

Evita XL will start ventilation with the pre-configured settings unless values are changed or Standby mode is activated within 30 seconds.

Activating Standby mode

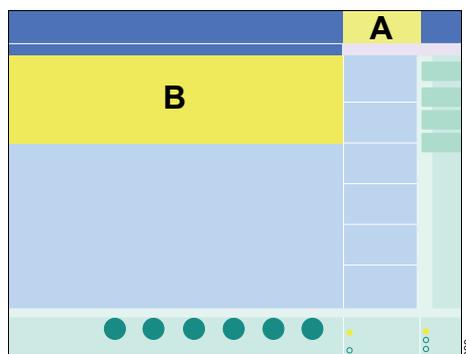
- 1 Touch **Standby** button within 30 seconds and press rotary knob to confirm.

The alarm message **Standby activated !!!** is displayed in the header bar.

To acknowledge this message:

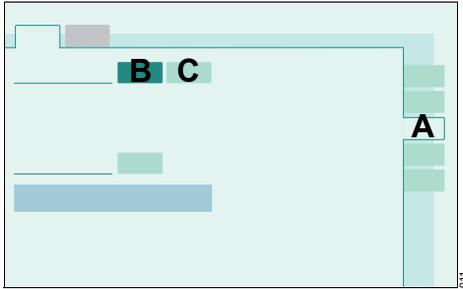
- 2 Touch **Alarm Reset** button to the right of the message and press rotary knob to confirm.

Evita XL is in Standby mode:



Standby is displayed in the header bar of the screen (A). **Standby** is displayed on the screen (B)

Entering the humidification type



- 1 Touch the **Humidifier** tab (A).

Evita XL offers the following selections:

-  **Active Humid.** (B)= Active breathing gas humidifier
-  **HME/ Filter** (C) = Heat and Moisture Exchanger

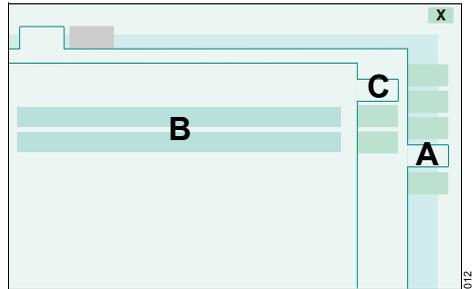
- 2 Touch button corresponding to the type of humidification used. The button turns yellow.
- 3 Press rotary knob to confirm. The button turns green.

Selecting the humidification type is only possible in Standby mode.

Check readiness for operation

Performing the Device Check

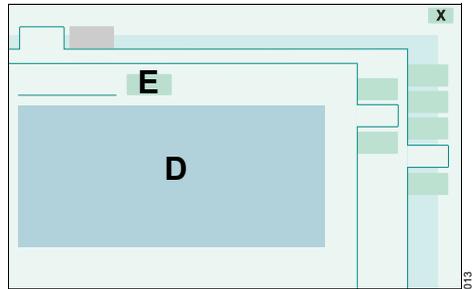
The Device Check can only be performed in Standby mode.



- 1 Touch the **Check** tab (A).

Evita XL displays the date and result (B) of the last Device Check and Airtight Check.

- 2 Touch the **Device Check** tab (C).



Evita XL displays a list of the individual checks (D). The scope of this list depends on the options available on the ventilator.

No Device Check is possible while the ventilator is performing an automatic calibration of the flow sensor or O₂ sensor.

- In this case, wait until calibration is complete and restart Device Check.

Starting the Device Check

- 1 Touch the **Check** button (E).

Evita XL performs the following test steps:

System

- Fit and functionality of expiratory valve
- Fit of flow sensor
- Fit of neonatal flow sensor (optional)
- Type of humidification
- Completeness of breathing circuit
- Fit of temperature sensor (optional)

Function

- Test of the Air/O₂ switchover valve
- Test of the safety valve
- Gas supply
- Test of the back-up alarm (power failure alarm)

Sensors

- Calibration of the flow sensor
- Calibration of the neonatal flow sensor (optional)
- Calibration of the O₂ sensor
- Zero calibration of the CO₂ sensor (optional)
- Position of the CO₂ sensor (optional)

Device Check procedure

Evita XL guides the operator through each test step in a question-and-answer dialog format. Questions are displayed in the information field in the header bar and must be answered by touching the **Yes** or **No** buttons. The instructions for performing the test steps are displayed.

Evita XL indicates a correct result with a checkmark (✓). Faulty results are marked with **F**. Two dashes (- -) appear if a test step is not performed.

In the event of faulty results **F**:

- 1 Eliminate the cause of the problem.
- 2 Touch the **Repeat** button.

Test steps may be skipped by touching the **Next test** button if this is acceptable.

Performing the Airtight Check

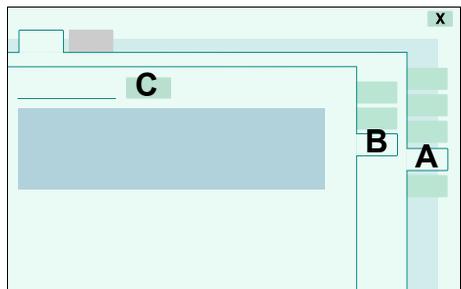
The Airtight Check must be performed after the following actions:

- Device Check
- Change of the breathing circuit
- Change of breathing gas humidification

The Airtight Check can only be performed in Standby mode.

Prerequisite: The **Start / Standby** dialog window must be open.

- 1 Touch the **Check** tab (A).
- 2 Touch the **Airtight Check** tab (B).



- 3 Touch the **Check** button (C)

Testing the DC power pack (batteries)

Changeover test to battery operation

- 1 Pull out the power plug.

If the DC power pack is available, *Evita XL* switches over to internal or external battery mode and does not interrupt operation.

If the DC power pack is not available, the audible power failure alarm is triggered.

- 2 Plug in the power plug again.

The device switches to mains operation.

After successful checking of readiness for operation, *Evita XL* is ready for use.

Operating Concept

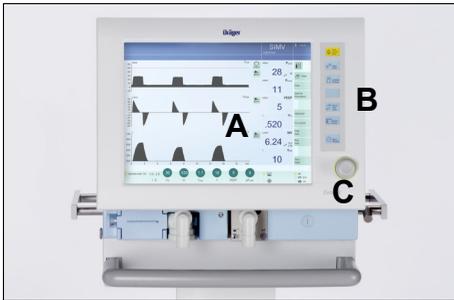
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Control panel

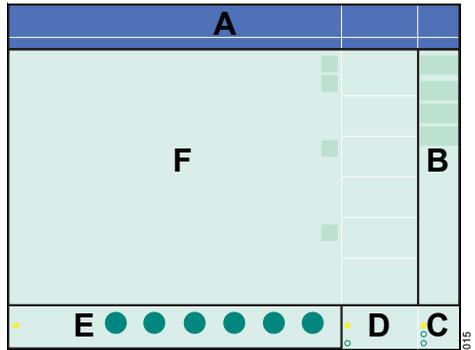
The control panel is characterized by a 15" touch screen, its clear layout and easy operation.

Its main elements are:



- A** Large screen with all the information and controls needed for ventilation.
- B** Fixed function keys beside the screen - for rapid access to major functions.
- C** Rotary knob for selecting and confirming settings on the screen.

Main screen



- A** Header bar with the following fields:
 - Alarms, messages, and instructions for the operator
 - Therapy status: Therapy type (ventilation or O₂ Therapy), ventilation mode, and additional settings
 - Patient category
- B** Main menu bar with buttons for opening dialog windows and activating functions
- C** Power supply display
- D** Field for device status with type of humidification
- E** Therapy bar with therapy controls for the ventilation parameters of the active ventilation mode and its additional settings
- F** Monitoring area with waveforms, loops, trends, and measured values

Main menu bar

The main menu bar contains fixed and freely configurable buttons. Touching a button opens the corresponding dialog window or activates the corresponding function.

Fixed buttons

 for selecting a different set of measured values in the field for measured values.

 **Main** for selecting the main screen.

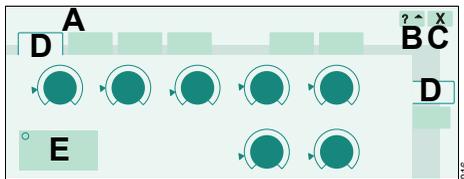
Data ... for displaying all measured values, the logbook, or trends on an additional card.

Special Procedure ... for selecting additional functions, e. g., medication nebulization or oxygenation for bronchial suctioning.

Dialog windows and therapy controls

Dialog windows

Dialog windows consist of one or several pages which are displayed by touching the corresponding horizontal or vertical tab. Dialog windows contain elements for operating the device and inform the operator of current settings. Dialog windows can be opened by pressing a key or by touching a button in the main menu bar.



- A Dialog window title
- B Button for accessing additional information (if applicable)
- C Button for closing the dialog window
- D Tab – touch the relevant tab to open a page
- E Setting assistance field

Therapy bar

The therapy bar on the main screen contains the therapy controls for the active ventilation mode.

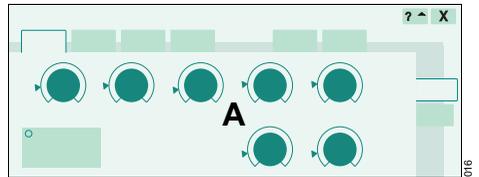


- A Therapy controls

Therapy controls

The therapy controls are used to set the ventilation parameters.

Therapy controls are contained in the therapy bar of the active ventilation mode and in the dialog window for specifying the ventilation settings.



- A Therapy controls

Controls and color scheme

The following controls are available to the operator:

- Tabs
- Therapy controls
- Buttons

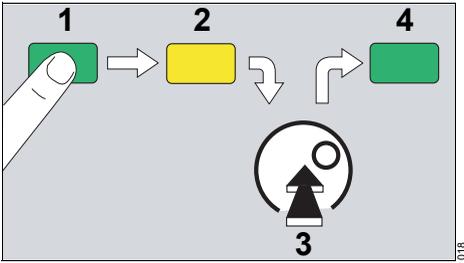
The touch-sensitive screen controls are used in a similar way as real keys and rotary knobs:

- Touching these controls with a fingertip is equivalent to pressing a key or taking hold of a knob.
- Settings are made and confirmed by turning and pressing the rotary knob.

Colors are used to indicate the status of the screen controls:

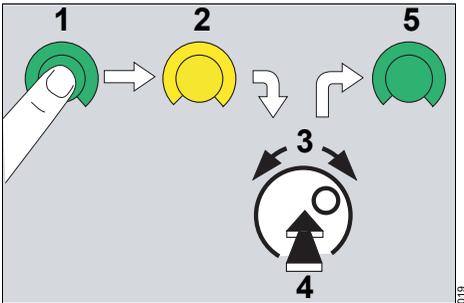
- gray = not available
- yellow = ready for use
- pale green = available, but is not active
- dark green = available and is active

For buttons:



- 1 to select = touch,
- 2 the button turns yellow,
- 3 to confirm = press rotary knob,
- 4 the button turns pale green or dark green.

For therapy controls:



- 1 to select = **touch**,
- 2 the therapy control turns yellow,
- 3 to set = **turn** rotary knob,
- 4 to **confirm** = press rotary knob,
- 5 the therapy control turns pale green or dark green.

Operation

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Selecting the patient

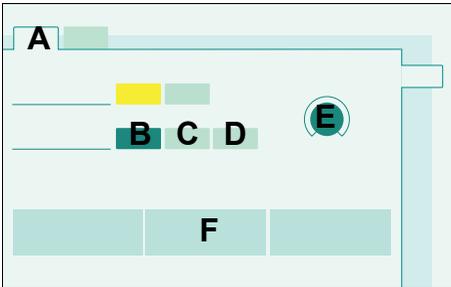
After switching on *Evita XL*, the operator can select between:

- Admitting a new patient
- Using the settings of the previous patient

Admitting a new patient

For a new patient, *Evita XL* determines the start-up settings for the ventilation parameters based on the ideal body weight (factory setting) or based on the patient category. The settings can be configured. Only when a new patient is admitted, the body weight or the patient category can be changed.

Prerequisite: The **Start / Standby** dialog window must be open. *Evita XL* must be in Standby mode.



- 1 Touch **New Patient** tab (A).

Depending on the patient category:

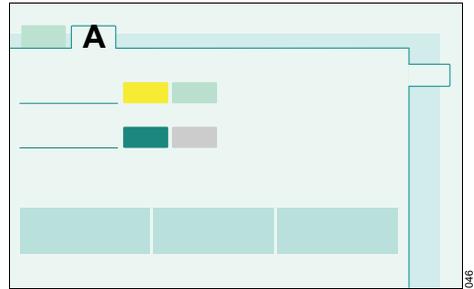
- 2 Touch **Adult** (B), **Ped.** (C), or **Neo.** (D) button.
- 3 Touch **Ideal Body Weight** button (E).
- 4 Turn rotary knob to enter the ideal body weight [kg], press rotary knob to confirm.

Evita XL determines the tidal volume V_T and respiratory rate f based on the ideal body weight and displays these values in the lower part of the dialog window (F). The other ventilation parameters displayed in the lower part of the dialog window are start-up values.

Using the settings of the previous patient

Specific patient settings in effect before *Evita XL* was switched off may be restored, including alarm limits, application mode, and ventilator status. Monitoring is always active after the ventilator has been switched on.

Prerequisite: The **Start / Standby** dialog window must be open. *Evita XL* must be in Standby mode.



- Touch **Previous Patient** tab (A) and press rotary knob to confirm.

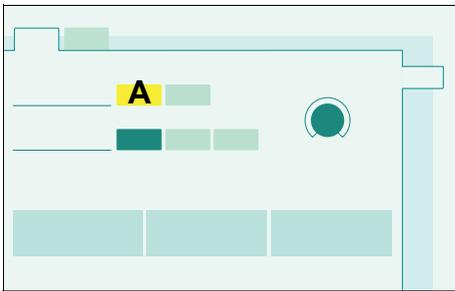
The previous ventilation settings are again effective.

Starting ventilation

Before using on the patient

- Check readiness for operation.
- Check therapy settings:
 - For alarm limits.
 - For ventilation modes and ventilation parameters.

In the **Start / Standby** dialog window:



- Touch **Start** button (A) and press rotary knob to confirm.

Evita XL now starts ventilation.

Setting the ventilation mode

Opening ventilation settings

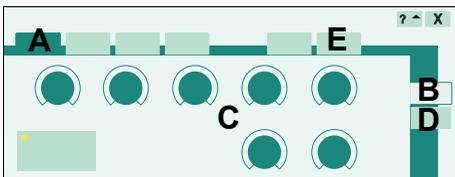
The Ventilator Settings dialog window can be opened as follows:

- Press  **Ventilator Settings** key.

or

- Touch a therapy control in the therapy bar.

Evita XL opens the **Ventilator Settings** dialog window.



The page of the active ventilation mode (A) with the **Basic settings** (B) appears by default. The corresponding therapy controls (C) are displayed. The selected therapy control is yellow and can be set. With the **Add. settings** tab (D), the active ventilation mode can be extended by additional parameters.

The following ventilation modes are factory-configured:

- SIMV
- CMV
- PCV+
- CPAP/ PSupp

Other ventilation modes (optional) can be selected via the **more** tab (E):

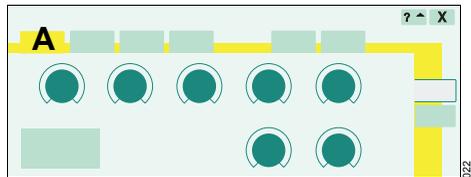
- MMV
- PCV+ Assist
- APRV
- PPS (optional)

The ventilation modes can also be supplemented with additional settings.

Changing the ventilation mode

Prerequisite: The **Basic settings** page must be open in the **Ventilator Settings** dialog window.

- 1 Touch the relevant tab, e. g., **SIMV** (A). The tab turns yellow.

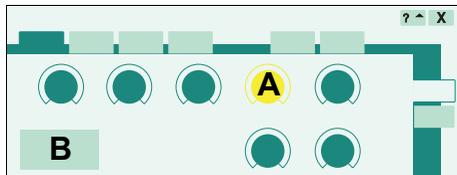


- 2 If necessary, set the ventilation parameters.
- 3 Confirm the ventilation mode by pressing the rotary knob. The color of the tab changes to dark green.

The ventilation mode is active. The settings are effective for the patient.

Setting the ventilation parameters

Prerequisite: The **Basic settings** page must be open in the **Ventilator Settings** dialog window.



- 1 Touch the relevant therapy control, e. g., (A).
- 2 Turn the rotary knob to set the value.
- 3 Press rotary knob to confirm.

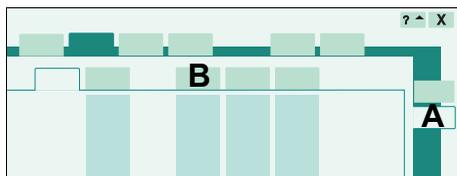
Additional ventilation parameters derived from the ventilation parameter are calculated by *Evita XL* and displayed in the setting assistance field (B).

When the limit set for the parameter has been reached, *Evita XL* displays a message.

Setting additional functions

Prerequisite: The **Ventilator Settings** dialog window must be open.

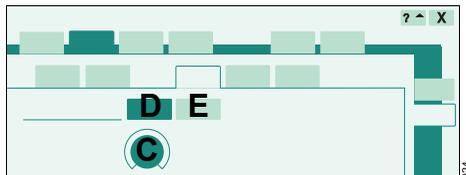
- 1 Touch **Add. settings** tab (A).



The additional settings of the active or selected ventilation mode are displayed.

- 2 Touch the tab for the relevant additional setting, e. g., (B).

The page for setting the associated parameter is displayed.



- 3 Touch therapy control (C).
 - 4 Set the value using the rotary knob and confirm.
- To switch on an additional setting:
- 5 Touch (D) button and press rotary knob to confirm.
- To switch off an additional setting:
- 6 Touch (E) button and press rotary knob to confirm.

The ventilation modes can be combined with additional settings to optimize ventilation.

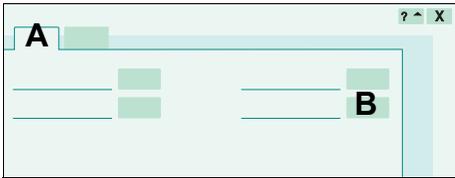
Overview of the availability of additional settings

Ventilation mode	Additional settings						
	ATC (optional)	Apnea ventilation	Flowtrigger	Inspiratory termination	AutoFlow	Sigh	PLV
CMV	X		X		X	X	X
SIMV	X	X	X	X	X		X
MMV	X		X	X	X		X
ILVMaster	X		X			X	X
ILVSlave	X					X	X
PCV+	X	X	X	X			
PCV+ Assist	X		X				
APRV	X	X					
CPAP/ PSupp	X	X	X	X			
PPS (optional)	X	X	X				

Bronchial suctioning

Before suctioning

- 1 Touch **Special Procedure ...** button in the main menu bar.



The **Additional Function** page (A) appears by default.

- 2 Touch **O2 ↑ suction** button (B).
- 3 Press rotary knob to confirm.

The oxygenation procedure is started.

Evita XL ventilates the patient in the set ventilation mode with the appropriately increased O₂ concentration.

The preoxygenation phase with the remaining time in seconds is displayed continuously in the header bar.

Preoxygenation lasts for a maximum of 180 seconds. During this time, *Evita XL* waits for the disconnection necessary for suctioning. If no disconnection is detected within 180 seconds, *Evita XL* terminates the oxygenation procedure.

During suctioning

The time available for suctioning is displayed in seconds in the header bar. If suctioning is completed and the patient reconnected within the time available, *Evita XL* will end the disconnection phase.

After suctioning

After reconnection, *Evita XL* resumes ventilation in the set ventilation mode. For postoxygation, the O₂ concentration is increased for the first 120 seconds.

The postoxygation phase with the remaining time in seconds is displayed in the header bar.

Canceling oxygenation

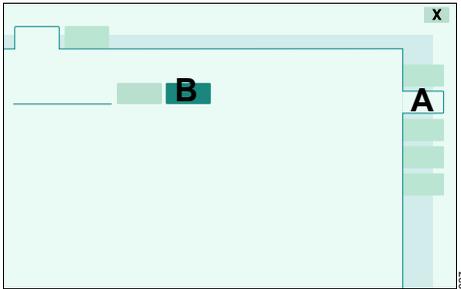
Touch **O2 ↑ suction** button.

NIV – non-invasive ventilation (SW 6.12 or higher)

Selecting NIV

The application mode can only be changed in Standby mode.

- 1 Touch **Tube / Mask** tab (A).



- 2 Touch **Mask (NIV)** button (B).
- 3 Press rotary knob to confirm.

Evita XL displays the application mode in the header bar:

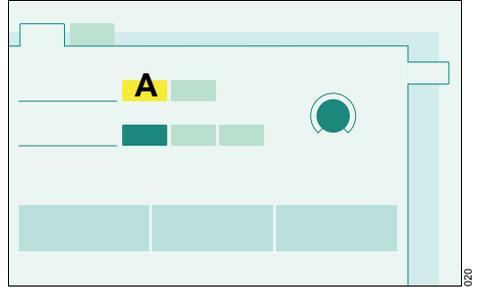
Mask Ventilation

Setting ventilation for NIV

- Set ventilation mode and ventilation parameters.

Starting ventilation with NIV

Prerequisite: The **Start / Standby** dialog window must be open.



- Touch **Start** button (A) and press rotary knob to confirm.

Monitoring during ventilation with NIV

In addition to the monitoring during ventilation in tube mode, certain new limits can be set in NIV.

The following alarm limits may be deactivated in order to avoid artifacts:

- **MV** \surd/\wedge , lower alarm limit for minute volume
- **V_{Ti}** \surd/\wedge , upper alarm limit for inspiratory tidal volume
- **T_{Apnea}** \surd/\wedge , upper alarm limit for apnea monitoring

If the lower alarm limit for minute volume or the upper alarm limit for apnea monitoring is switched off, *Evita XL* displays a permanent message in the header bar.

If the upper alarm limit for inspiratory tidal volume is switched off, *Evita XL* displays a message in the header bar for 15 seconds.

A time lag **T_{disconnect}** between 0 and 60 seconds can be set for the alarm limit **PAW** \surd/\wedge (airway pressure low).

NIV Plus (optional) (SW 7.0 or higher)

The following functions are additionally available with the NIV Plus option:

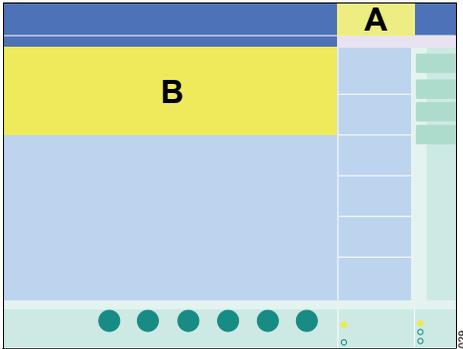
- Standby Plus
- Flow reduction during disconnection
- Extended leakage compensation

Standby Plus mode (SW 7.0 or higher)

If the device is switched from  **Mask Ventilation** application mode to Standby, *Evita XL* switches to Standby Plus.

In Standby Plus mode *Evita XL* starts ventilation as soon as it detects the first breath of the patient.

On-screen displays:



Standby (A) is displayed in the header bar of the screen. **Standby Plus** (B) is also displayed on the screen.

When the mask is put back on, *Evita XL* detects the patient's inspiration and continues ventilation with the previous settings. The  **Mask Ventilation** application mode is active again.

Flow reduction during disconnection

When the mask is removed, *Evita XL* reduces the inspiratory flow in the  **Adult** and  **Ped.** patient categories. The function can be configured.

Extended leakage compensation

With the NIV Plus option, *Evita XL* performs leakage compensation during pressure-controlled ventilation in the

-  **Adult** patient category, up to 180 L/min
-  **Ped.** patient category, up to 60 L/min
-  **Neo.** patient category, up to 30 L/min

Standby mode (SW 6.12 or higher)

Switch to Standby mode or Standby Plus mode for the following actions:

- To keep *Evita XL* ready for operation while the patient is absent
- To switch between ventilation and O₂ Therapy
- To change application mode
- To change between patient categories
- To perform the Device Check and Airtight Check.

Selecting Standby mode

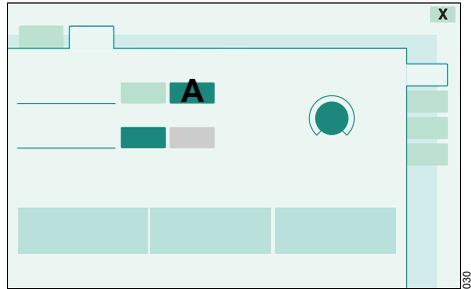
- Press and hold the  **Start/Standby** key for 3 seconds.

Evita XL is in Standby mode.

or

- Press  **Start/Standby** key.

Evita XL opens the **Start / Standby** dialog window.



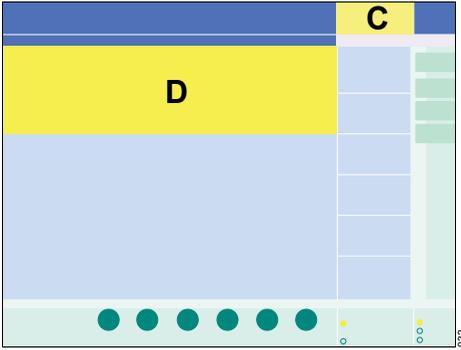
- 1 Touch **Standby** button (A).
- 2 Press rotary knob to confirm.



- 3 Touch **Alarm Reset** button (B) in the header bar.
- 4 Press rotary knob to confirm.

Evita XL is in Standby mode or Standby Plus mode (only with NIV Plus option).

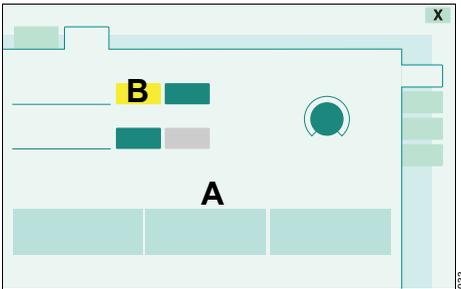
On-screen displays:



Standby (C) is displayed in the header bar of the screen. **Standby** or **Standby Plus** is displayed on the screen (D).

Resuming ventilation

- Check ventilation settings (A).



- 1 Touch **Start** button (B).
- 2 Press rotary knob to confirm.

The main screen is displayed, *Evita XL* starts ventilation.

or

- Press  **Start/Standby** key.

Evita XL starts ventilation.

Switching off *Evita XL*

- 1 Switch *Evita XL* to Standby mode.



- 2 Pivot protective cover upwards.
- 3 Press the On/Off switch (A) until it disengages.

Evita XL is switched off.

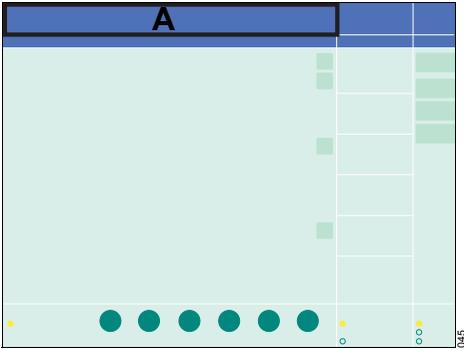
Alarms

NOTE

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On-screen alarm messages

In the event of an alarm, the relevant alarm message appears in the alarm message field (A).

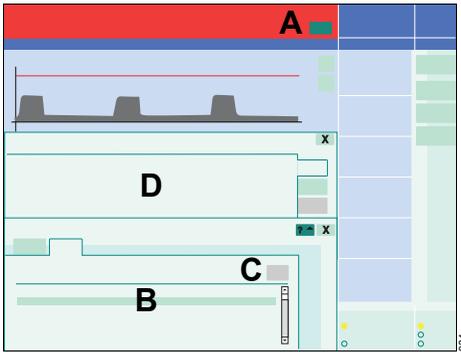


Alarm priorities

Evita XL assigns the alarm message its respective priority. It marks the text with exclamation marks and differently colored backgrounds. *Evita XL* generates the corresponding alarm tone sequences.

Warning	High-priority alarm message	!!!	Red background	five-tone sequence which is sounded twice and repeated every 7 seconds
Caution	Medium-priority alarm message	!!	Yellow background	three-tone sequence which is repeated every 20 seconds
Note	Low-priority alarm message	!	Yellow background	two-tone sequence which is sounded once

Displaying alarm information



- 1 Touch **Alarm Info** button (A).

All currently active alarm messages (B) are displayed.

- 2 Using the rotary knob, select the alarm message (B).
- 3 Touch **?^** button (C).

The cause and remedy (D) of the alarm message are displayed.

- Remedy the fault.

The alarm tone ceases when the fault has been remedied. Medium- and low-priority alarm messages disappear automatically. High-priority alarm messages remain displayed in the color of the header bar and must be acknowledged.

Acknowledging alarm messages

Acknowledging high-priority alarm messages

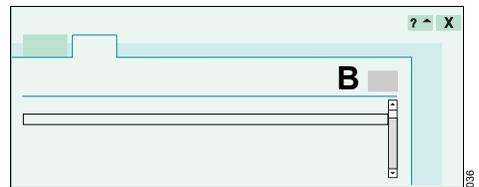


- Touch the **Alarm Reset** button (A) in the header bar and confirm using the rotary knob.

Evita XL saves the alarm message, which can be displayed in the **Data** dialog window on the **Logbook** page.

Acknowledging **Apnea ventilation !!** alarm message

The medium-priority alarm message (Caution) **Apnea ventilation !!** may be obscured by alarm messages of higher priority. The alarm message may therefore also be acknowledged with the **Apnea Reset** button.

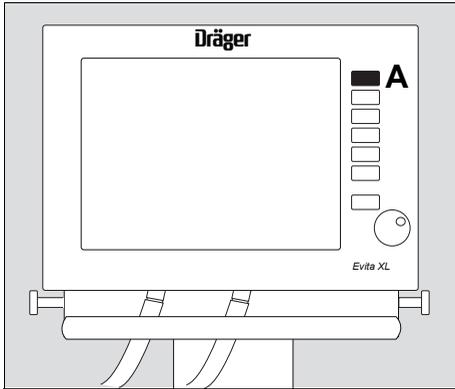


- 1 Touch **Alarm Info** button.
- 2 Touch **Apnea Reset** button (B) and confirm using the rotary knob.

Evita XL continues to ventilate in the previously set ventilation mode.

Silencing audible alarms

The audible alarm can be silenced for a maximum of 2 minutes.



- Press **Audio paused 2 min.** (A) key.

The yellow LED in the key lights up.

The audible alarm will be silenced for 2 minutes.



The symbol (B) and the remaining time are displayed in the header bar.

If the fault that triggered the alarm is not remedied at the end of the 2 minutes, the audible alarm starts again.

If you wish to reactivate the audible alarm earlier:

- Press **Audio paused 2 min.** (A) key again.

Power failure alarm

If the loudspeaker for generating audible alarms fails due to a fault, a continuous tone will be generated by an auxiliary alarm.

The same continuous alarm tone also serves as a power supply alarm in the event of temporary interruption of power supply.

Connect *Evita XL* directly to another power supply or continue ventilation with an alternative system (e. g., resuscitator).

Setting alarm limits

- Press **Alarm Limits** key.

Evita XL opens the **Limits** page (A).



The set alarm limits and the current measured value are displayed.

- (B) = Upper alarm limit
- (C) = Currently measured value
- (D) = Lower alarm limit

The values for the upper and lower alarm limit shown in the buttons are start-up values which are effective whenever the device is switched on.

Setting alarm limits

- 1 Touch the button for the respective alarm limit. The button will turn yellow.
- 2 Turn the rotary knob to set the value.
- 3 Press rotary knob to confirm. The button turns green.

The new alarm limit is effective.

Alarm limits for the optional measured value etCO₂ can be set on the **Limits 2** page (E).

Deactivating alarm limits

- 1 Touch lower alarm limit (D).
- 2 Reduce value using rotary knob until a message is displayed in the header bar.
- 3 Press rotary knob to confirm.
- 4 Continue turning rotary knob until the value is replaced by dashes (–) in the display (D).
- 5 Press rotary knob to confirm.

The lower alarm limit is deactivated.

Alarm messages

NOTE

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The following alarm messages are an extract from all possible alarms only. For a complete list of alarm messages, refer to the Instructions for Use.

Message	Priority	Cause	Remedy
Air supply down !!!	250	Air supply pressure too low.	Make sure that supply pressure is greater than 43.5 psi (3 cmH ₂ O).
Airway obstructed ?!!!	230	The ventilator applies only a very small volume with each mechanical stroke, e. g. because the tube is blocked.	Check condition of patient, check tube
		Patient 'fights' against the mechanical strokes in pressure-controlled ventilation, with the result that the set inspiratory pressure is achieved with only a very small volume applied.	Check condition of patient, check ventilator settings.
		NeoFlow sensor not installed in the breathing system.	Install NeoFlow sensor in the breathing system.
Airway pressure high !!!	205	The upper alarm limit for the airway pressure has been exceeded. The patient is 'fighting' the ventilator or coughing.	Check condition of patient. Check ventilation pattern. Adjust alarm limits if necessary.
		Kinked patient circuit.	Check patient circuit and tube.
Airway pressure low !!!	204	Leak or disconnection.	Inflate cuff and check for leaks. Check breathing circuit for tight connections. Check that the expiratory valve is properly engaged.
Apnea !!!	181	Patient's spontaneous breathing has stopped.	Check condition of patient, if necessary apply controlled ventilation.
		Stenosis	Check condition of patient. Check tube. Check breathing circuit.
		Flow sensor not calibrated.	Calibrate flow sensor.
Apnea ventilation !!	230	Due to detected apnea, the system has automatically switched over to mandatory ventilation.	Check ventilation. Return to the original ventilation mode by touching the 'Apnea Reset' button and confirm. Check condition of patient. Check tube.

Message	Priority	Cause	Remedy
Check settings !!	205	Malfunction while setting the ventilation pattern or the alarm limits.	Check ventilation pattern and alarm limits. The following settings are affected: O ₂ concentration 'O ₂ ', Alarm limit 'PAW high', 'MV low', status external flow source, status oxygenation for endotracheal suction key 'Alarm Silence', button 'Alarm Reset', button 'Insp.hold', button 'Exp.hold', switch off O ₂ monitoring, switch off flow monitoring. Confirmation with rotary knob. Confirm message with 'Alarm Reset' button.
		The ventilation started with the configured initial values after switching on.	Check parameters, patient values, and alarm settings and adjust them if necessary. Confirm message with 'Alarm Reset' button.
Device failure 00.00.000 !!!	253	Device has detected a malfunction.	Switch 'off' and again 'on' the device. If the message disappears ventilation can be continued. If the message does not disappear, disconnect the patient from the device and continue ventilation immediately with another independent ventilator. Call DrägerService.
Ext. battery activated !!!	160	The ventilator is being powered by the external battery due to the absence of mains supply. Only with fully charged batteries the device can be powered up to 120 minutes.	Connect ventilator to the mains supply. Acknowledge the message with 'Alarm Reset' button and confirm.
FiO ₂ low !!!	130	O ₂ sensors not calibrated.	Calibrate O ₂ sensor.
		Faulty fresh-gas mixer function. The ventilation function may be affected. This may lead to deviations in the O ₂ concentration and tidal volume.	Disconnect patient from the device and continue ventilation immediately with another independent ventilator. Call DrägerService.

Message	Priority	Cause	Remedy
Flow measurement out of range !!!	235	Water in flow sensor. Expiratory minute volume exceeds minute volume delivered by the ventilator.	Dry flow sensor or change flow sensor and perform manual calibration.
		Flow sensor not calibrated or faulty. Expiratory minute volume exceeds minute volume delivered by the ventilator.	Calibrate flow sensor, replace if necessary.
		Flow measurement malfunction.	The ventilation function of the device is limited. Check patient condition, check ventilation. If not acceptable disconnect patient from the device and continue ventilation immediately with another independent ventilator. Call DrägerService.
Int. battery activated !!!	160	Due to the lack of power supply and absence of or discharged external battery the device is powered by the internal battery. The maximum remaining time from the internal battery is 10 minutes.	Connect ventilator to the mains supply or to a fully charged external battery within 10 minutes. Acknowledge the message with 'Alarm Reset' button and confirm.
Int. battery discharged !!!	254	Due to the lack of power supply and absence of or discharged external battery the device is powered by the internal battery. The time for operation with power from the internal battery has expired.	Connect ventilator immediately to the mains supply or to a fully charged external battery.
Int. battery only 2 minutes left !!	250	Due to the lack of power supply and absence of or discharged external battery the device is powered by the internal battery. The remaining operating time with power from the internal battery is less than 2 minutes.	Connect ventilator to the mains supply or to a fully charged external battery within 2 minutes.
Leakage !	009	The measured minute volume leak MV_{leak} is 20 % higher than the minute volume measured on the expiration side.	Check that the patient circuit connections are leakproof Check that the tube is correctly fitted.

Message	Priority	Cause	Remedy
MV high !!!	160	The expired minute volume has exceeded the upper alarm limit.	Check condition of patient, check pattern of ventilation, adjust MV alarm limit if necessary.
		Flow sensor not calibrated. Water in flow sensor.	Calibrate flow sensor. Drain water trap of breathing circuit. Dry flow sensor or replace.
MV low !!!	160	The minute volume has fallen below the lower alarm limit.	Check condition of patient, check pattern of ventilation, adjust alarm limit if necessary.
		Stenosis or obstruction Flow sensor not calibrated	Check condition of patient, check ventilation pattern, check tube or mask. Adjust alarm limit if necessary. Calibrate flow sensor.
		Leakage or disconnection.	Check breathing circuit for tight connections. Check whether the expiratory valve is properly engaged. Check whether tube or mask is fitted correctly.
O ₂ measurement out of range !!!	132	O ₂ sensor provides invalid measured values.	Calibrate O ₂ sensor, replace if necessary.
		O ₂ measurement malfunction.	Ventilation can be continued: use external O ₂ monitoring and deactivate integrated O ₂ monitoring. Call DrägerService.
O ₂ supply down !!!	249	O ₂ supply pressure too low.	Make sure supply pressure is greater than 43.5 psi (3 cmH ₂ O).
PEEP high !!!	216	Expiratory system obstructed.	Check hose system and expiration valve (check also for condensate).
		Expiratory resistance is increasing.	Check bacterial filter. Replace if necessary.
		Ventilator faulty.	Disconnect patient from the device and continue ventilation without delay using another independent ventilator. Call DrägerService.
Pressure meas. error !!!	170	Fluid in expiratory valve.	Replace expiratory valve, then clean and dry.
		Pressure measurement malfunction.	Disconnect patient from the device and continue ventilation immediately with another independent ventilator. Call DrägerService.

Message	Priority	Cause	Remedy
Standby activated !!!	255	<i>Evita XL</i> has been switched to Standby.	Acknowledge Standby with 'Alarm Reset' button and confirm.
Tidal volume high !!!	165	The upper alarm limit of the applied inspiratory tidal volume V_{Ti} has been exceeded during three consecutive ventilator breaths.	Check condition of patient. Check pattern of ventilation. Adjust alarm limit if necessary.
		Leak or disconnection.	Check that patient circuit and connections are leakproof.
Vol. not const., pressure limited !!	220	Due to pressure limitation or time limit, the set tidal volume V_T has not been delivered.	Prolong inspiratory time ' T_{Insp} ', increase inspiratory flow 'Flow', increase pressure limitation ' P_{max} '. Touch the 'Alarm Reset' button and confirm to suppress the visual and audible alarms until the cause of the alarm is remedied.

Waveforms and logbook

NOTE

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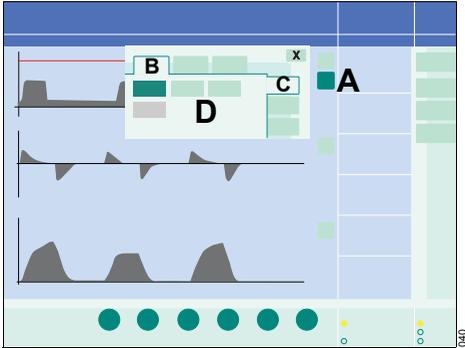
Displaying waveforms

The following real-time waveforms can be displayed:

- PAW (t)
- Flow (t)
- Volume (t)
- etCO₂ (t) (optional)

Selecting real-time waveforms

- 1 Touch  **Main** button in the main menu bar.



- 2 Touch the relevant  button (A).

Evita XL opens a dialog window, the **Curves** page (B) is selected by default.

Selecting other real-time waveforms

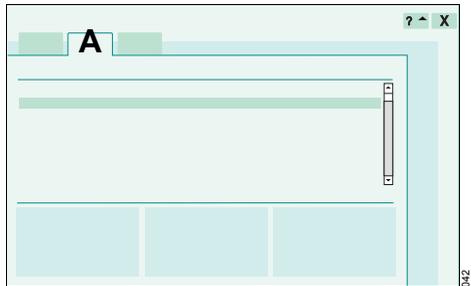
- 1 Touch **Curve only** tab (C).
- 2 Touch button for the parameter (D) to be displayed as a real-time waveform.

Evita XL displays the real-time waveform for this parameter. The dialog window is closed automatically.

In the same way it is possible to select:

- trends
- short trends
- recruitment trends
- loops
- big loops.

Displaying the logbook



- 1 Touch **Data ...** button in the main menu bar.
- 2 Touch **Logbook** tab (A).

Sensor calibration

NOTE

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Flow sensor calibration

Flow sensor calibration is performed automatically at the following intervals:

- During device check
- Automatically, at least once a day
- After replacing the flow sensor

Evita XL cleans the flow sensor automatically before it is calibrated.

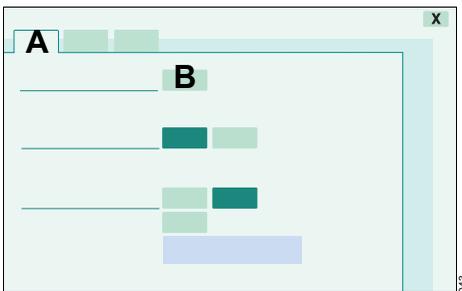
Evita XL also automatically cleans and calibrates the flow sensor after medication nebulization.

The flow sensor calibration can also be performed manually. The flow sensor may be calibrated during ventilation.

Starting manual calibration of the flow sensor

- 1 Press  **Sensor Parameter** key.

The **Flow** page (A) appears by default. Flow monitoring is now switched on.



- 2 Touch **Start** button (B).

Evita XL calibrates the flow sensor.

Evita XL uses the next inspiratory phase for calibration.

A message is displayed in the header bar.

O2 sensor calibration

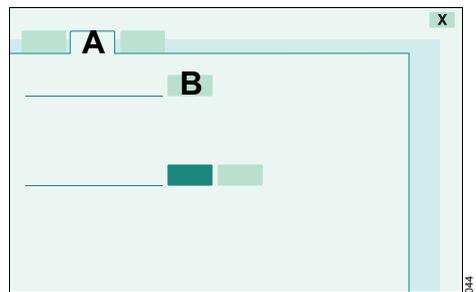
O2 sensor calibration is performed at the following intervals:

- During device check
- Automatically, at least once a day
- After replacing the O2 sensor (wait 15 minutes for the O2 sensor to warm up)
- When measured and set values diverge by more than 2 Vol. %

The O2 sensor calibration can also be performed manually. The O2 sensor may be calibrated during ventilation.

Starting manual O2 sensor calibration

- 1 Press  **Sensor Parameter** key.
- 2 Touch **O2** tab (A).



- 3 Touch **Start** button (B).

Evita XL calibrates the O2 sensor.

A message is displayed in the header bar.

The **Start** button (B) turns pale green when calibration is completed.

Cleaning and disinfection

NOTE

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Components which can be reprocessed	Recommended reprocessing intervals	Machine cleaning and disinfection	Manual		Sterilization
			Cleaning	Disinfection	
<i>Evita XL</i> basic device	after each patient	no	outside	outside	no
Trolley	after each patient	no	outside	outside	no
Hinged arm					
Gas supply hose					
Breathing hoses	after each patient/ weekly	yes	possible	possible	yes
Y-piece					
Water traps					
Collection containers					
Adapter parts for the medication nebulizer					
Reusable expiratory valve and, if necessary, individual parts	after each patient/ weekly ¹⁾	yes	possible	possible ²⁾	yes
Disposable expiratory valve	Dispose of after each patient/weekly				
Spirolog flow sensor	daily	no	outside	yes	no
SpiroLife flow sensor	daily	no	outside	yes	yes
Neonatal flow sensor insert	daily	no	outside	yes	yes
Neonatal flow sensor housing	daily	yes	possible	possible	yes
Temperature sensor	daily	no	outside	outside ³⁾	yes
CO ₂ sensor	daily	no	outside	outside ⁴⁾	no
Reusable cuvette of the CO ₂ sensor	daily	yes	possible	possible	yes
Disposable cuvette of the CO ₂ sensor	Dispose of after each patient/weekly				
Test filter for CO ₂ sensor	daily	no	outside ⁴⁾	outside	no
Breathing gas humidifier	after each patient/ weekly	In accordance with separate Instructions for Use			
Medication nebulizer	In accordance with separate Instructions for Use				
Bacterial filter	In accordance with separate Instructions for Use				

1) Nebulizing may lead to formation of more extensive deposits requiring more frequent replacement.

2) Additionally treat the expiratory valve after disinfection.

3) Do not bath-disinfect.

4) Do not bath-disinfect. Wipe-disinfect, e. g., with 70 % ethanol.

Accessories

NOTE

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	Product	Number	Description
	Spirolog	8403735	Flow sensor (set of 5)
	SpiroLife	MK01900	Flow sensor
	Expiration valve	8410580	Expiratory valve, autoclavable
	Expiration valve	8414776	Disposable expiratory valve, (set of 10)
	O ₂ sensor (capsule)	6850645	Sensor for O ₂ measurement
	VentSet Basic	MP00320	Disposable breathing circuit, 150 cm
	VentSet Coax with holder	MP00317	Disposable coaxial breathing system with Luer Lock elbow and hose holder
	Filter/HME TwinStar [®] 55	MP01805	Filter/HME combination
	HME HumidStar [®] 55	MP01730	Heat and moisture exchanger
	ClassicStar [®] , Size S	MP01573	Air cushion mask
	ClassicStar [®] , Size M	MP01574	Air cushion mask
	ClassicStar [®] , Size L	MP01575	Air cushion mask

	Product	Number	Description
	NovaStar®, Size S	MP01579	Gel mask, reusable
	NovaStar®, Size M	MP01580	Gel mask, reusable
	NovaStar®, Size L	MP01581	Gel mask, reusable
	Aeroneb Pro Nebulizer	MP01017	Nebulizer with electronic micropump
	Cuvette adults, reusable	6870279	Cuvette for CO ₂ measurement - adult, reusable
	Cuvette, pediatric, reusable	6870280	Cuvette for CO ₂ measurement - pediatric, reusable
	Cuvette, adult, disposable	MP01062	Cuvette for CO ₂ measurement - adult, disposable
	Cuvette, pediatric, disposable	MP01063	Cuvette for CO ₂ measurement - pediatric, disposable

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HEADQUARTERS

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The quality management system at
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according to ISO 13485, ISO 9001 and
Annex II.3 of Directive 93/42/EEC
(Medical devices).