BiPAP® Synchrony™

RESPIRONICS®

User Guide

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1003121
RAG 6/21/00

BiPAP systems are the subject of one or more of U.S. Patents #5148802, #5239995, #531937, #5433193, Canadian Patent #2, 024, 477, European Patent #EP0425092, German Patent #69021681.5-08, and other pending U.S. and foreign patents. BiPAP is a registered trademark of Respironics, Inc.

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Contents

Contents of the Package 5

1 Warnings, Cautions, and Notes 6

Warnings 6
Cautions 7
Notes 7
Intended Use 8
Contraindications 8
Precautions 8
Communication Statements for Optional Modem 9
Industry Canada Notice 10

2 Introduction to the Synchrony 11

Definitions 11
What is Bi-level Ventilation? 13
What is the Synchrony? 14
Symbols 15
How to Contact Respironics 15

3 A Tour of the Synchrony 16

Overview 16
Control Panel 17

Panel Indicators 18
Display Indicators 18
Breathing Circuit Connection 20
Rear Panel 20

4 Using the Synchrony 21
Installing the Air Filters 21
Where to Place the Synchrony 22
Connecting the Breathing Circuit 22
Complete Synchrony Setup 24
Using DC Power 25
Plugging the Synchrony In (Using AC Power) 25
Starting the Synchrony 26
Using the Optional Ramp Feature 26
Operating the Synchrony 27

5 Alarms and What to Do 30
High Priority Alarms 32
Medium Priority Alarms 35
Low Priority Alarms 36

6 Troubleshooting 37
Mask Discomfort and Corrective Actions 38

7 Cleaning and Maintenance 41
Cleaning the Synchrony 41
Cleaning or Replacing the Inlet Filters 42

8 Using Oxygen with the Synchrony 44

9 Using the Optional Modem 46

Sending Data at Startup 46

Sending Data During Therapy 49

10 Specifications 50

Contents of the Package

The BiPAP Synchrony package contains:

- BiPAP Synchrony
- reusable circuit tubing
- power cord
- air filter cover
- reusable foam filter
- ultra-fine filter
- User Guide

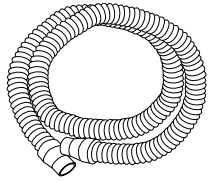
Your home care provider should have pre-assembled the tubing, exhalation port, and mask into a breathing circuit.

If any of the items are missing, please contact your home care provider.

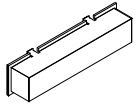
OPTIONS

- DC power cord
- oxygen valve (required for oxygen use)
- bacteria filter
- humidifier
- internal modem
- modem cable
- carrying case

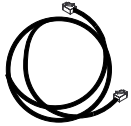
BiPAP Synchrony



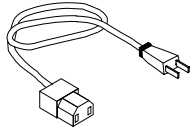
Reusable Circuit Tubing



Air Filter Cover



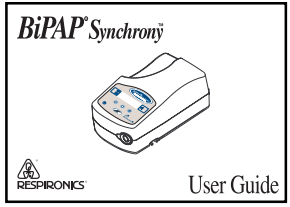
Optional Modem Cable



Power Cord

Disposable Ultra-fine Filter

Reusable Foam Filter



User Guide

1 Warnings, Cautions, and Notes

Warnings

A Warning indicates the possibility of injury to you or the operator of the device.

- This manual serves as a reference. The instructions in this manual are not intended to supersede the instructions of your care giver.
- You should read and understand this entire manual before using the Synchrony.
- The Synchrony is not intended to provide your total ventilatory requirement
- The prescription must only be adjusted by a trained home care provider.
- Use only the breathing circuit provided by your home care provider.
- When using a breathing circuit that contains a mask with an integrated exhalation port or a circuit with a separate exhalation device, do not tape, seal, or otherwise block the vent openings. Doing so could result in suffocation.
- Oxygen supports combustion. Oxygen should not be used while smoking or in the presence of an open flame.
- Do not use the Synchrony in the presence of flammable liquids or gases. Do not clean the Synchrony with flammable fluids.
- If oxygen is used with the Synchrony, the oxygen flow must be turned off when the Synchrony is not in use.
- Do not use the device in ambient temperatures above 95 °F. If the device is used at ambient temperatures above 95 °F, the temperature of the breathing air may exceed 106 °F, which could cause thermal irritation or injury to your airway.
- Do not operate the Synchrony in direct sunlight or near a heating appliance because these conditions can increase the temperature of the air coming out of the Synchrony.
- When the Synchrony is used with a humidifier, position the humidifier such that the water level in the humidifier is lower than you, and the humidifier is on the same level or lower than the Synchrony.
- Repairs and adjustments must be performed by Respironics-authorized service personnel ONLY. Unauthorized service could cause injury, invalidate the warranty, or result in costly damage.
- Periodically inspect electrical cords for damage or signs of wear.
- To avoid electrical shock, unplug the Synchrony before cleaning it.

Warnings continued

- Immediately report any unusual chest discomfort, shortness of breath, or severe headache to your physician.
- If you detect any unexplained changes in the performance of the Synchrony, if the Synchrony is dropped or mishandled, if water is spilled into the enclosure, or if the enclosure is broken, seek the assistance of your home care provider.

Cautions

A Caution indicates the possibility of damage to the device.

Caution: Federal law restricts this device to sale by or on the order of a physician.

- The Synchrony may only be operated at temperatures between 41 °F and 95 °F.
- A properly installed, undamaged reusable foam inlet filter is required for proper operation.
- Do not immerse the Synchrony or allow any liquid to enter the case or the inlet filter.
- Condensation may damage the Synchrony. Always allow the Synchrony to reach room temperature before use.

Notes

- Throughout this manual, you will see the symbol UPGRADE. When you see this symbol, it means that the feature being discussed is only available with the Synchrony S/T upgrade package. Your Synchrony may or may not be provided with this upgrade. Contact your home care provider for details.

Additional Warnings, Cautions, and Notes are located throughout this manual.

NOTE: Illustrations are for reference only. Occasionally, cosmetic changes may be made to the product that do not affect the performance or specifications of the product. These kinds of changes do not warrant a reprinting of this manual.

Intended Use

The Synchrony is intended to provide non-invasive ventilation in adult patients (>30 kg) for the treatment of respiratory insufficiency (a condition in which the patient can maintain ventilation without mechanical support for some period of time) or obstructive sleep apnea. This device may be used in the hospital or home.

The Synchrony is intended for use with nasal masks and full-face masks as recommended by Respironics.

Contraindications

The Synchrony should not be used if you have severe respiratory failure without a spontaneous respiratory drive.

If any of the following conditions apply to you, consult your physician before using the Synchrony ventilator:

- inability to maintain a patent airway or adequately clear secretions.
- at risk for aspiration of gastric contents.
- diagnosed with acute sinusitis or otitis media.
- allergic or hypersensitive to the mask materials where the risk from allergic reaction outweighs the benefit of ventilatory assistance.
- epistaxis, causing pulmonary aspiration of blood.
- hypotension.

Precautions

Immediately report any unusual chest discomfort, shortness of breath, or severe headace to your physician.

If skin irritation or breakdown develops from the mask, refer to the mask instructions for appropriate action.

The following are potential side effects of noninvasive positive pressure therapy:

- ear discomfort
- conjunctivitis
- skin abrasions due to noninvasive interfaces
- gastric distention (aerophagia)

Communication Statements for Optional Modem

Types of Service

The Synchrony optional internal modem is designed to be used on standard device telephone lines. It connects to the telephone line by means of a standard jack called the USOC RJ-11C (or USOC FJ45S). Connection to telephone-company-provided coin service (central office implemented systems) is prohibited. Connection to party lines service is subject to state tariffs.

Telephone Company Procedures

The goal of the telephone company is to provide you with the best service it can. In order to do this, it may occasionally be necessary for them to make changes in their equipment, operations or procedures. If these changes might affect your service or the operation of your equipment, the telephone company will give you notice, in writing, to allow you to make any changes necessary to maintain uninterrupted service. In certain circumstances, it may be necessary for the telephone company to request information from you concerning the equipment that you have connected to your telephone line. Upon request of the telephone company, provide the FCC registration number and the ringer equivalence number (REN); both of these items are listed on the equipment label. The sum of all the RENs on your telephone lines should be less than five in order to assure proper service from the telephone company. In some cases, a sum of five may not be useable on a given line.

If Problems Arise

If any of your telephone equipment is not operating properly, you should immediately remove it from your telephone line, as it may cause harm to the telephone network. If the telephone company notes a problem, they may temporarily discontinue service. When practical, they will notify you in advance of the disconnection. If advance notice is not feasible, you will be notified as soon as possible. When you are notified, you will be given the opportunity to correct the problem and informed of your right to file a complaint with the FCC. Contact your telephone company if you have questions about your phone line. In the event repairs are ever needed on the Synchrony, they should be performed by Respironics, Inc. or an authorized representative of Respironics, Inc. For information contact Respironics at the location shown on page 13.

Industry Canada Notice

NOTICE: The Industry Canada Label identifies certified equipment. This certification means that the equipment meets telecommunications network protective, operational, and safety requirements as prescribed in the appropirate Terminal Equipment Technical Requirements documents. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. The precaution may be particularly important in rural areas.

CAUTION: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Ringer Equivalence Number (REN): The REN assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.

2 Introduction to the Synchrony

Definitions

Apnea—A condition marked by the cessation of spontaneous breathing.

CPAP—Continuous Positive Airway Pressure. The Synchrony produces a single pressure level.

EPAP—Expiratory Positive Airway Pressure

High Priority Alarm—Alarm signal requiring an immediate response.

IPAP—Inspiratory Positive Airway Pressure

Low Priority Alarm—Alarm signal requiring operator awareness.

Medium Priority Alarm—Alarm signal requiring a prompt response.

Low Minute Ventilation—A condition in which you are not receiving a specified volume of air on a per minute basis.

OSA—Obstructive Sleep Apnea.

Pressure Control (PC)—This is an optional bi-level mode which responds to your inhalation by increasing the pressure. The length of the inhalation is controlled by the Synchrony. If you do not start inhaling within a set time, the Synchrony will automatically start inhalation.

Ramp—Ventilator Ramp, a feature that may increase your comfort when therapy is started. The Synchrony output starts at a low pressure (EPAP) and is increased at each breath until IPAP is reached.

Rise Time—Rise time is the time it takes for the Synchrony to change from EPAP to IPAP. You can adjust this time for your comfort. See Figure 2-1.

RR—Respiratory Rate

Spontaneous (S)—This is a bi-level mode which responds to both your inahalation and exhalation by increasing pressure when you start to inhale and descreasing pressure when you start to exhale. There is no automatic delivery of a breath should you not inhale.

Spontaneous/Timed (S/T)—This is an optional bi-level mode which responds to both your inahalation and exhalation by increasing pressure when you start to inhale and descreasing pressure when you start to exhale. If you do not start inhaling within a set time, the Synchrony will automatically start inhalation. When the Synchrony starts inhalation, it controls the time of inhalation and automatically decreases the pressure for exhalation within a set time.

UPGRADE

Timed (T)—This is an optional bi-level mode in which the Synchrony controls both inhalation and exhalation independent of spontaneous breathing.

UPGRADE

What is Bi-level Ventilation?

Bi-level ventilation with the Synchrony Ventilatory Support System helps you to breathe by supplying two levels of air pressure. The Synchrony provides a higher pressure—known as IPAP (Inspiratory Positive Airway Pressure)—when you inhale, and a lower pressure—known as EPAP (Expiratory Positive Airway Pressure)—when you exhale. The higher pressure makes it easier to inhale and the lower pressure makes it easier for you to exhale.

The Synchrony can also provide a single pressure level, known as CPAP (Continuous Positive Airway Pressure).

If you require a higher level of ventilatory support, the Synchrony can be upgraded to provide modes of ventilation that reinforce your breathing with machine-triggered breaths.

NOTE: Throughout this manual, you will see the symbol UPGRADE. When you see this symbol, it means that the feature being discussed is only available with the Synchrony S/T upgrade package. Your Synchrony may or may not be provided with this upgrade. Contact your home care provider for details.

The Synchrony Provides Two Levels of Ventilation.

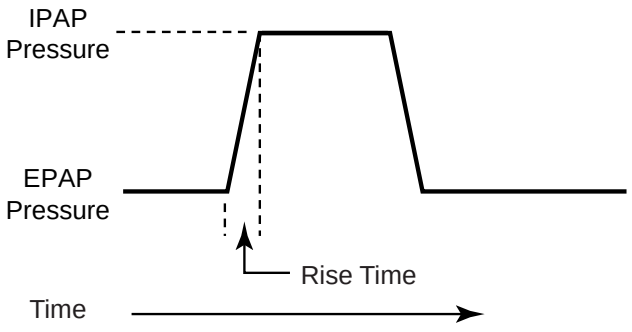


Figure 2-1 BiPAP Breathing Levels

You can adjust the Rise Time to make the pressure change more comfortable. See page 27.

What is the Synchrony?

The Synchrony, shown in Figure 2-2, supplies air pressure through a breathing circuit. The circuit, shown in Figure 2-3, consists of:

- circuit tubing to deliver the air from the Synchrony to your interface (e.g., mask)
- a mask or other interface to deliver the prescribed pressure to your nose or nose and mouth, depending on which interface has been prescribed for you
- an exhalation port to vent exhaled air from the circuit

NOTE: The exhalation port may be part of the mask or may be part of a separate exhalation device.

The system senses your breathing effort and changes pressure levels when you inhale and exhale depending on the mode of operation.

The Synchrony can operate on AC or DC power. The DC power option is not intended as a battery backup. When DC power is obtained from a vehicle battery, the Synchrony should not be used while the engine of the vehicle is running.

Figure 2-2 The Synchrony

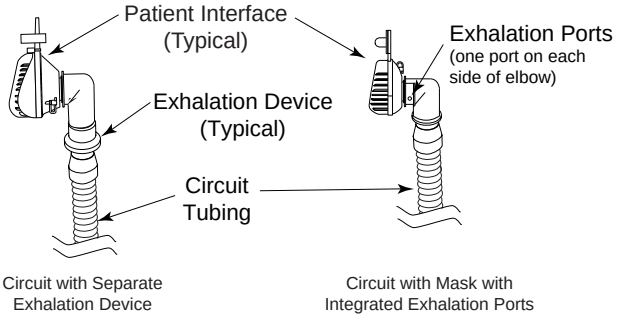


Figure 2-3 Typical Breathing Circuits

Symbols

The symbols shown at right are used on the Synchrony and throughout this manual.

Symbol	Meaning
	AC Power Indicator
	DC Power Indicator
	Alarm Indicator
	Type BF Applied Part
	Class II for Protection Against Electric Shock
	Attention, consult accompanying documents
	Standby Key (Start/Stop)
	Up Key
	Down Key
	Enter Key
	Ramp Start/Alarm Silence Key

How to Contact Respironics

To have your unit serviced, contact your home care provider. If you need to contact Respironics directly, call **1-800-345-6443** or use the following address:

RESPIRONICS®
1001 Murry Ridge Lane
Murrysville, Pennsylvania
15668-8550 U.S.A.

3 A Tour of the Synchrony

Overview

Figure 3-1 shows the location of:

- control panel
- breathing circuit connection
- carry handle
- optional oxygen valve

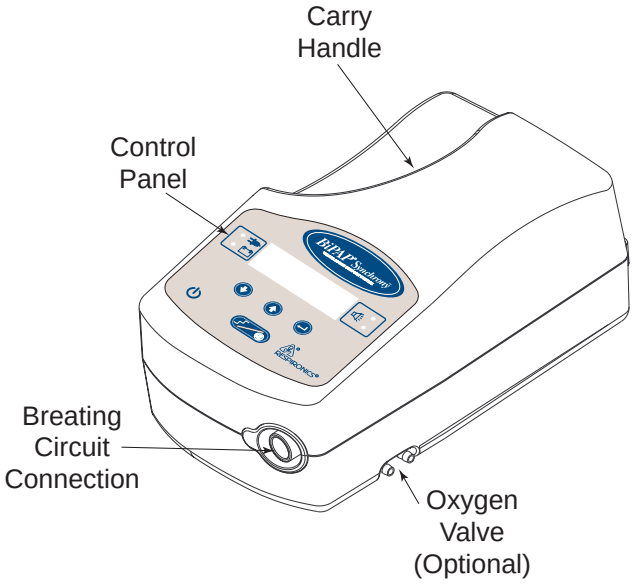


Figure 3-1 The Synchrony Front and Top

Control Panel

The control panel contains the controls and indicators you will need when you are using the Synchrony:

- AC power indicator
- DC power indicator
- Standby key
- Control keys (Down, Up, Enter)
- Ramp/Alarm Silence key
- Yellow LED Alarm indicator
- Red LED Alarm indicator
- Display screen

The **AC** and **DC power indicators** light when the Synchrony is connected to AC or DC power.

The **Standby key** starts and stops the Synchrony.

The **Control keys** allow you to display information and set controls.

The **Ramp/Alarm Silence key** starts the ventilation ramp (see page 24) and silences an audible alarm for one minute.

The **LED Alarm Indicators** alert you when a problem occurs. See Chapter 5 for an explanation of what to do when an alarm is activated.

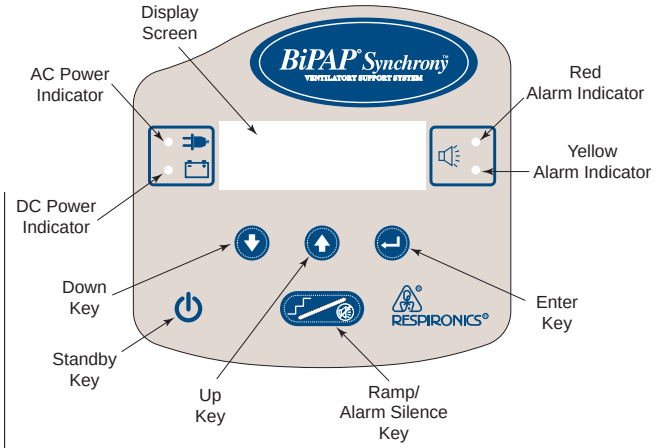


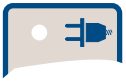
Figure 3-2 The Synchrony Control Panel

The **Display** shows you the current pressure control settings and displays alarm messages.

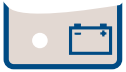
NOTE: If the display backlight is off, the first press of a control key (↓, ↑, or ↵) turns the backlight on and does nothing else. When you are instructed to press a key, this manual assumes that the backlight is already on. When you are instructed to press a key, this manual assumes that the backlight is already on.

Panel Indicators

AC Power indicator—a green LED that lights when AC power is connected.



DC Power indicator—a green LED that lights when DC power is connected.

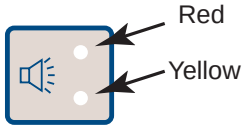


Red Alarm Indicator:

- When flashing indicates a high priority alarm.
- When on continuously indicates a loss of power or a silenced high priority alarm.

Yellow Alarm Indicator:

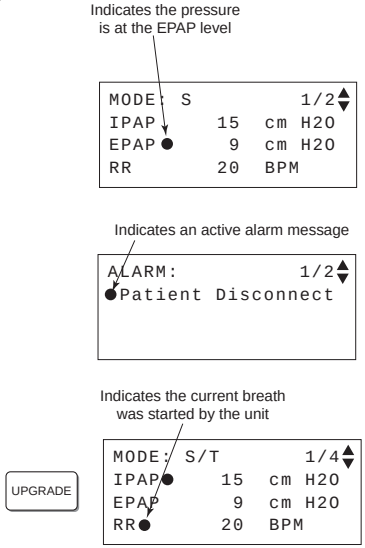
- When flashing indicates a medium priority alarm.
- When on continuously indicates a low priority alarm or a silenced medium priority alarm.



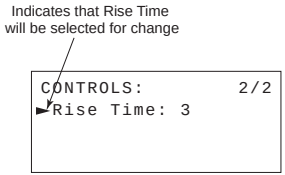
Display Indicators

The display uses indicators to show you the pressure levels and guide you through the screens.

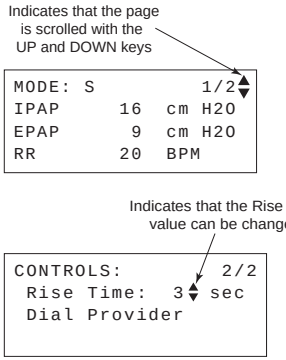
Activity Indicator (●)—This indicator shows which pressure level you are receiving during therapy. It also shows when the Synchrony starts a timed breath (upgrade only) and when an alarm is still active for the displayed message.



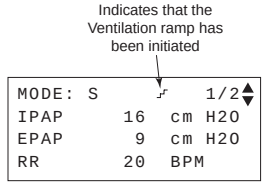
Selection Indicator (►)—This indicator appears next to an item that can be selected with the ENTER (↵) key. The indicator is moved by pressing the UP (▲) or DOWN (▼) key.



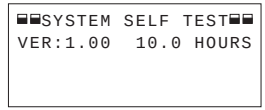
Navigation Indicator (▲▼)—This indicator, next to a page number, shows that the ▲ and ▼ keys can be used to change pages. If it appears next to a value, it flashes and shows that the UP and DOWN keys can be used to change the value.



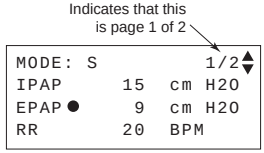
Ramp Indicator (⌐╱)—This indicator shows when Ventilation Ramp has been started by pressing the RAMP/SILENCE (🔇) key.



Progress Indicator (▬)—This indicator empties from top to bottom to indicate the progress of certain tasks.



Page Number—The current page and total number of pages in a series of screens is indicated in the upper right of the screen.



Breathing Circuit Connection

Figure 3-3 shows where the circuit tubing connects to the Synchrony.

Rear Panel

Figure 3-4 shows the rear panel.

The **DC inlet** is where the DC plug is connected if you are running the Synchrony from a battery source.

The **communications port** is used by the home care provider.

The **DC cord retainer** holds the DC cord. Used to keep the plug from coming out of the Synchrony.

The **telephone jack** is where the telephone line is plugged in (if you have the optional modem) when you are asked to send the home care provider data from the Synchrony.

The **AC inlet** is where the AC receptacle is connected if you are running the Synchrony from house voltage.

The **air filter cover** retains the air filters and helps to ensure quiet operation.

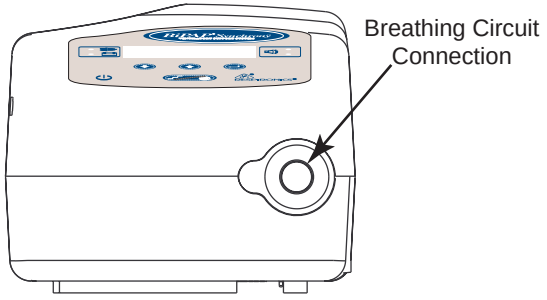


Figure 3-3 Breathing Circuit Connection

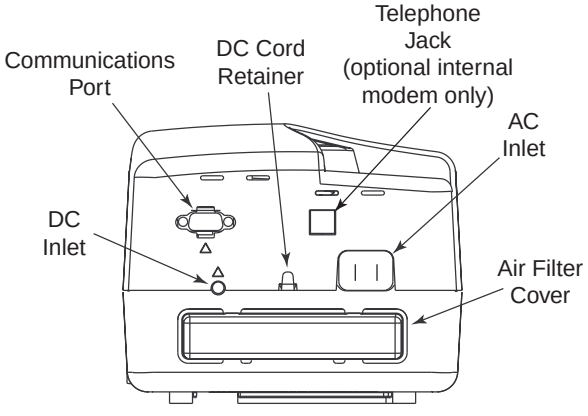


Figure 3-4 Rear Panel

4 Using the Synchrony

Installing the Air Filters

CAUTION: A properly installed, undamaged foam filter is required for proper operation.

The Synchrony uses a **gray foam filter** that is washable and reusable, and an optional **white ultra-fine filter** that is disposable. One filter of each kind is supplied with the Synchrony.

If your home care provider did not install the inlet air filters, you must install at least the gray foam filter before using the Synchrony.

STEP 1 Place the foam filter on top of the ultra-fine filter (if using the ultra-fine filter).

STEP 2 Push the filters down into the air inlet recess at the rear of the Synchrony as shown in Figure 4-1.

STEP 3 Place the bottom of the air filter cover into the bottom of the air inlet opening, making sure that the catches engage the lip of the opening.

STEP 4 As shown in Figure 4-2, swing the top of the cover into place and press down on it to engage the cover catches in the air inlet opening.

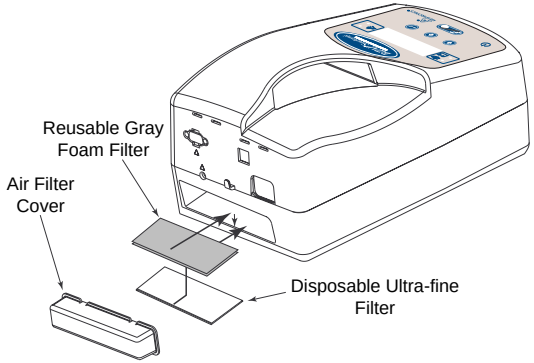


Figure 4-1 Filters Installed

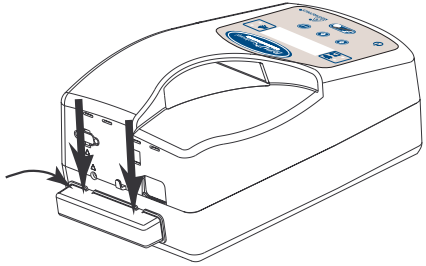


Figure 4-2 Filter Cover Installed

See **Chapter 7** to clean or replace the filters.

Where to Place the Synchrony

Place the Synchrony on its base somewhere within easy reach of where you will be using it. Make sure that the air inlet on the rear of the unit is not blocked. Place the unit on a hard, flat surface. If you block the air flow around the unit, the unit may not work properly.

If you are using a humidifier, be sure to place the humidifier and unit on a placemat or other waterproof material to protect your furniture from moisture. Position the humidifier such that the water level in the humidifier is lower than you, and the humidifier is on the same level or lower than the ventilator. See the humidifier instructions for the complete setup.

Connecting the Breathing Circuit

STEP 1 Connect one end of the circuit tubing to the outlet of the bacteria filter (if using one) and connect the inlet of the bacteria filter to the large connector on the Synchrony as shown in Figure 4-3.

If you are not using a bacteria filter, connect the end of the circuit tubing directly to the outlet connector on the Synchrony.

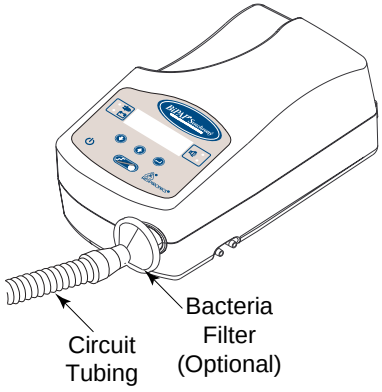


Figure 4-3 Connect the Tubing to the Outlet

NOTE: Follow the recommendations of your home care provider for using the optional bacteria filter.

STEP 2 Connect the open end of the circuit tubing to the exhalation port as shown in Figure 4-4. If you are using a mask that has the exhalation port built into the mask, connect the tubing directly to the mask and skip to Step 4.

STEP 3 Connect the exhalation port to the mask connector as shown in Figure 4-5.

STEP 4 Attach the headgear to the mask—see the instructions that came with your headgear.

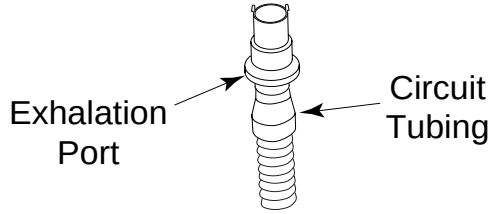


Figure 4-4 Connect the tubing to the Exhalation Port

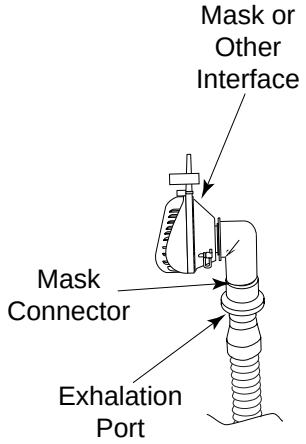


Figure 4-5 Connect the Mask

Complete Synchrony Setup

Figure 4-6 shows the completed breathing circuit setup for the Synchrony.

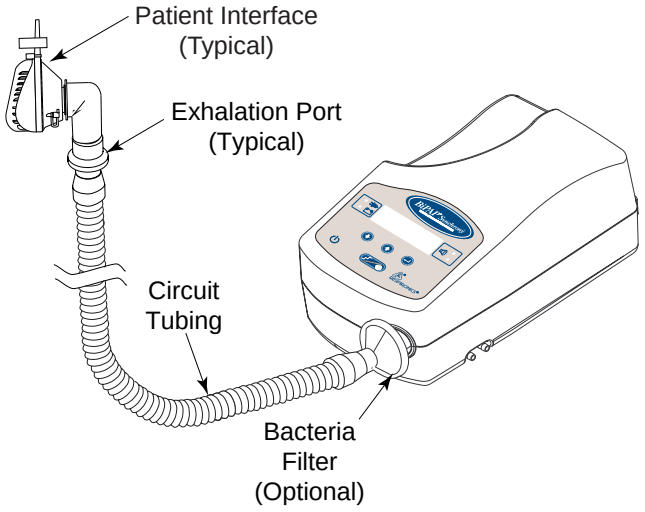


Figure 4-6 Synchrony Complete Breathing Circuit

Plugging the Synchrony In (Using AC Power)

STEP 1 Plug the receptacle end of the AC cord into the AC inlet of the Synchrony as shown in Figure 4-7.

STEP 2 Insert the plug end of the AC cord into the wall outlet as shown in Figure 4-7.

WARNING: Never plug the Synchrony AC cord into an outlet that is controlled by a wall switch.

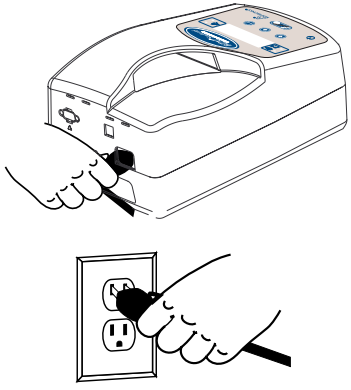


Figure 4-7 Plugging in the AC

Using DC Power

STEP 1 Plug the receptacle end of the DC cord into the DC inlet of the Synchrony as shown in Figure 4-8.

STEP 2 Leaving some slack in the DC cord, push the DC cord into the DC cord retainer.

STEP 3 Insert the adaptor end of the DC cord into the appropriate DC outlet. See the instructions that came with the DC cord for proper DC connections.

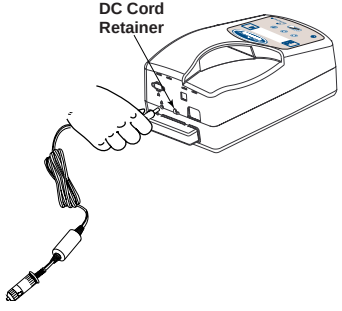


Figure 4-8 Plugging in the DC

Starting the Synchrony

STEP 1 Press the STANDBY (⏻) key. The Synchrony will sound two beeps, briefly light the alarm indicators, and display the startup screen followed by the self-test screen. This is the internal test performed by the Synchrony.

STEP 2 Put on your mask assembly when the air starts to flow.

NOTE: If the Synchrony does not sound the two beeps or illuminate the alarm indicators, do not try to use the Synchrony. Contact your home care provider.

STEP 3 Make sure that no air is leaking from your mask into your eyes. If it is, adjust the mask and Softcap or headgear until air stops leaking into your eyes. See the instructions that came with your mask.

STEP 4 If you are using the Synchrony while sleeping, try placing the tubing from the Synchrony over your headboard. This may reduce tension on the mask.

NOTE: A small amount of mask leak is normal and acceptable. Large mask leaks or eye irritation from an air leak should be corrected as soon as possible.

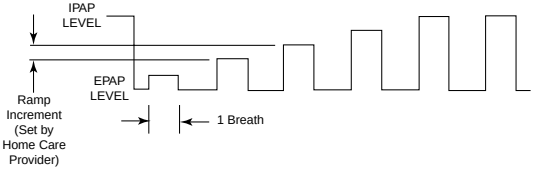
STEP 5 Relax. Take normal, relaxed breaths through your nose.

NOTE: If you are having trouble with your mask, see **Chapter 6** for some suggestions.

Using the Optional Ramp Feature

The Synchrony is equipped with an optional ramp feature that your home care provider can turn on or off. The Ramp feature starts the pressure at the EPAP level. The pressure is increased at each breath until IPAP is reached.

To start the Ramp feature, follow Steps 1 to 5 above, then press . The Ramp indicator will be shown at the top of the display. The diagram below illustrates how the ramp changes the pressure levels:



The ramp feature can provide more comfort for you because of the gradual increase to full pressure.

Operating the Synchrony

When the Synchrony is operating, you can use two screens: the Monitoring screen and the Control screen.

Monitoring Screens

The screen that you see normally is called the Monitoring screen. It shows you the current pressure measurements and breathing rate.

The CPAP mode Monitoring screen is shown in Figure 4-9. If your Synchrony is not using the optional modem, the screen will show "1/1" in the upper right.

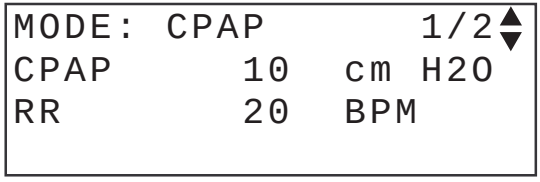


Figure 4-9 CPAP Monitoring Screen

The S, S/T, PC, and T mode Monitoring screen is shown in Figure 4-10.

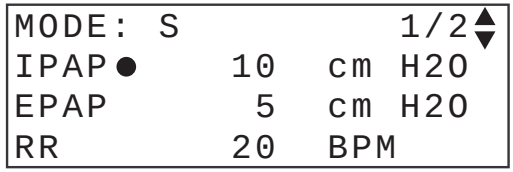


Figure 4-10 S, S/T, PC, and T Mode Monitoring Screen

For the S/T, PC and T modes, "S" is replaced with "S/T," "PC," or "T."

Note the ● indicator next to IPAP. It indicates the pressure is currently at the IPAP level. It will move from IPAP to EPAP as the pressure changes. Another indicator will appear next to the RR if the Synchrony starts a breath (The unit will start a breath only in the optional S/T, PC, and T modes).

The upper right of the screen indicates that this is Page 1 of 2, and the ▲▼ indicator shows that the ▲ or ▼ key will move to Page 2 of 2.

Control Screens

If the modem is being used, you can press the ↓ key while in the Monitoring screen. The Synchrony displays Page 2 of 2, called the Control screen. In the CPAP mode, the Control screen contains one option as shown in Figure 4-11.

```
CONTROLS:          2/2

►Dial Provider
```

Figure 4-11 CPAP Control Screen.

The selected control is the Dial Provider command. With this command selected, when you press ↵, the Synchrony automatically dials your home care provider to send information about the Synchrony.

NOTE: The word "Provider" may be replaced with the name of your provider or the provider's phone number.

The modem settings have been preset by your home care provider. See Chapter 9 for instructions on installing the telephone line into the rear panel of the Synchrony.

In the S, S/T, PC, and T modes, the Control screen contains two options (one if the modem is not being used), as shown in Figure 4-12.

```
CONTROLS:          2/2
►Rise Time: 3
 Dial Provider
```

Figure 4-12 S, S/T, PC, and T Mode Control Screen

The selected control is the Rise Time parameter. With this command selected, when you press ↵, the parameter is available for change. See Page 10 for a description of Rise Time.

The next page shows you how to change the Rise Time.

NOTE: If the display backlight is off, the first press of a control key (↓, ↑, or ↵) turns the backlight on and does nothing else. When you are instructed to press a key, this manual assumes that the backlight is already on. When you are instructed to press a key, this manual assumes that the backlight is already on.

To change the Rise Time:

STEP 1 Use ▲ or ▼ to select the Rise Time parameter.

```
CONTROLS:          2/2
►Rise Time: 3
 Dial Provider
```

STEP 2 Press ↵. The result is shown below.

```
CONTROLS:          2/2
 Rise Time: 3 ▲▼
```

STEP 3 Press ▲ or ▼ to change the value. The range is 1 to 6; a setting of 1 is the fastest rise time, 6 is the slowest.

```
CONTROLS:          2/2
 Rise Time:  6 ▲▼
 Dial Provider
```

Allow the Synchrony to run several cycles to see if it feels more comfortable.

STEP 4 Press ↵ when complete.

```
CONTROLS:          2/2
►Rise Time: 6
```

5 Alarms and What to Do

This chapter describes the Synchrony alarms and what you should do if you get an alarm.

The Synchrony provides three alarm levels: high, medium, and low priority.

High priority alarms require immediate response. The alarm signal consists of a flashing red alarm indicator and a sound that is either continuous, beeps, or repeats a pattern of three beeps followed by two beeps. The display has the message “ALARM” at the top of the screen.

Medium priority alarms require prompt response. The alarm signal consists of a flashing yellow alarm indicator and a sound that repeats a pattern of three beeps. The display has the message “WARNING” at the top of the screen.

Low priority alarm require your awareness. The alarm signal consists of a continuous yellow alarm indicator and a sound that repeats a pattern of two beeps. The display has the message “INFO” at the top of the screen.

The alarms indicators are LEDs located on the right side of the front panel, as shown in Figure 5-1.

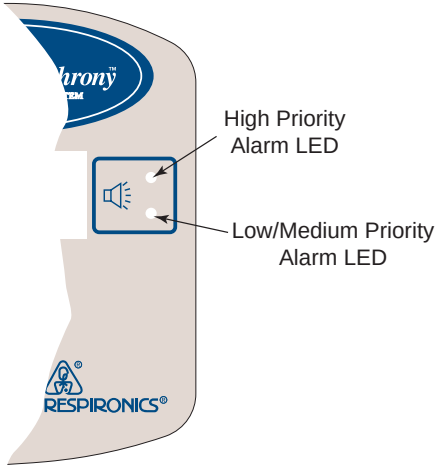


Figure 5-1 Alarm Indicator Locations

The following example applies to most alarm conditions. You should follow these steps unless otherwise directed by the alarm tables.

STEP 1 Look at the alarm indicators and listen to the alarm sound.

(Note color and whether LED is flashing or solid)

STEP 2 Look at the display for text.

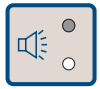
```
ALARM              1/1
●Patient Disconnect
```

● indicator shows what alarm is activated.

If more than one alarm is listed, the ● indicator shows which alarm is still active.

STEP 3 Press the RAMP/SILENCE key.

```
ALARM              1/1
●Patient Disconnect
                ►CLEAR
```



Alarm CLEAR Screen is displayed
Alarm LED is solid

STEP 4 Look up the alarm in the alarm tables and perform Your Action. For High and Medium Priority Alarms, the ● indicator will go off when the alarm condition is corrected.

```
ALARM              1/1
 Patient Disconnect
                ►CLEAR
```

● indicator is off
Alarm LED is solid

STEP 5 Press the Enter key to clear the alarm.

```
MODE: S            1/4▲▼
IPAP       15 cm H2O
EPAP        6 cm H2O
RR         20 BPM
```

Alarm is reset
Display returns to screen that was showing at time of alarm

Alarm LED	Alarm Sound	Display Message	What the Unit Does	Possible Cause	Your Action
Red Flash	● ● ●	Blank Screen	Shuts down	Synchrony Failure	Cannot be silenced; remove power from unit and contact home care provider.
Red Solid	▬▬▬	Blank Screen	Shuts down	Power was lost while the unit was providing therapy.	Press ⏻ to silence, restore power.
Red Flash	●●● ●●	Apnea	Operates	An apnea event occurred during therapy.	Report alarm to home care provider.
Red Flash	●●● ●●	Low Pressure Support	Operates	Malfunctioning unit.	Check for the following: dirty inlet filters, blocked air intake, excessive leak in circuit. If alarm continues, call your home care provider.

Alarm LED	Alarm Sound	Display Message	What the Unit Does	Possible Cause	Your Action
Red Flash	●●● ●●	`High Pressure`	Operates	Malfunctioning unit.	Nothing. If alarm continues call your home care provider.
Red Flash	●●● ●●	`Invalid Prescription Call Provider`	Shuts down	The prescription data is corrupted.	Do not use the unit, call your home care provider.
Red Flash	●●● ●●	`Low Minute Ventilation`	Operates	Decreased breathing pattern or breathing rate.	If you are having respiratory distress or breathing difficulties, call your home care provider.
				Excessive leak or blockage.	Check for the following: dirty inlet filters, blocked air intake, excessive leak in circuit. If alarm continues, call your home care provider.

Alarm LED	Alarm Sound	Display Message	What the Unit Does	Possible Cause	Your Action
Red Flash	●●● ●●	Low Pressure	Operates	Excessive leak or blockage.	Check for the following: dirty inlet filters, blocked air intake, excessive leak in circuit. If alarm continues, call your home care provider.
Red Flash	●●● ●●	Patient Disconnect	Operates	Breathing circuit is disconnected or has a large leak.	Reconnect the circuit or fix the leak.
Red Flash	●●● ●●	Ventilator Inoperative (Displays Codes)	Shuts down	Internal device failure.	Remove power from the unit. Call your provider.
Red Flash	●●● ●●	Ventilator Inoperative Battery Failure	Shuts down	Battery is discharged.	Remove DC power source from the unit, replace the battery, restore power to the unit; or seek reliable AC power source.

Alarm LED	Alarm Sound	Display Message	What the Unit Does	Possible Cause	Your Action
Yellow Flash	●●●	`Battery Voltage Too High`	Operates	Wrong or malfunctioning battery or charger.	Remove DC power from the unit, use on AC or call home care provider.
Yellow Flash	●●●	`Low Battery`	Operates	Battery nearly discharged.	If on battery, find another; if on AC, exchange the battery and charge.

Low Priority Alarms

Alarm LED	Alarm Sound	Display Message	What the Unit Does	Possible Cause	Your Action
Yellow Solid	●●	`Battery in Use`	Operates	On start-up, information message that battery is being used to provide power.	Press ↵ to confirm that you wish to operate on battery power.
Yellow Solid	●●	`Call for Service (Codes are displayed)`	Operates	Minor internal error.	Continue to use, write down error code, call your home care provider.
Yellow Solid	●●	`Momentary Loss of Power`	Operates	Power was lost for less than 30 seconds while the unit was providing therapy.	Press ↵ to clear the information message.
Yellow Solid	●●	`Power Failure, Battery in Use`	Operates	Line (AC) power was lost, the unit is now operating on battery (DC) power.	Check AC power, seek reliable power source.

6 Troubleshooting

This chapter lists problems you could experience with your Synchrony or mask, and presents possible solutions.

Problem	Why it Happened	What You Can Do
Does not operate when you press ⏻.	If the power LED is off—no power at the outlet or the Synchrony is unplugged.	Check the outlet power and verify that the Synchrony is plugged in.
	If the power LED is on—problems in the Synchrony.	Contact your home care provider for service.
The air out of the mask is much warmer than usual.	Inlet filters may be dirty. The Synchrony may be operating direct sunlight or near a heater.	Clean or replace the inlet air filters as described in Chapter 7. If the Synchrony is in direct sunlight or near a heater, move it. If the problem persists, contact your home care provider.
	The room temperature may be too high.	Lower the room temperature. If the problem persists, contact your home care provider.

Mask Discomfort and Corrective Actions

Problem	Why it Happened	What You Can Do
Mask feels uncomfortable to wear.	1. Improper headgear adjustment.	Check the headgear adjustment as described in the headgear instructions.
	2. Improper mask fitting.	Contact your home care provider for a refitting or a different size of mask.
Significant air leakage around the mask.	1. Improper headgear adjustment.	Check the headgear adjustment as described in the headgear instructions.
	2. Improper mask fitting.	Contact your home care provider for a refitting or a different size of mask.
Redness occurs when the mask cushion comes in contact with the skin.	1. Improper mask fitting.	Contact your home care provider for a refitting or a different size of mask.
	2. Improper mask cleaning.	Be sure to thoroughly rinse after cleaning to remove residue. See the mask cleaning instructions.

Problem	Why it Happened	What You Can Do
Redness occurs when the mask cushion mask accessory comes in contact with the skin.	3. Irritation or allergic reaction to mask material.	Use a barrier between your skin and the mask, such as 3M's Microfoam® or Squibb's Duoderm®.
Sore or dry eyes.	1. Mask not positioned properly.	Check the headgear adjustment as described in the headgear instructions.
	2. Improper mask fitting.	Contact your home care provider for a refitting or a different size of mask.
Runny nose.	Nasal reaction to air flow.	Call your doctor.

Problem	Why it Happened	What You Can Do
Throat or nose dryness.	1. Air is too dry. 2. Improper mask fitting.	1. Increase the room humidity. 2. Consult with your doctor or home care provider about using a Respironics humidifier with the Synchrony.
Nasal, sinus or ear pain.	Sinus or middle ear infection	Stop using the Synchrony and contact your doctor.

7 Cleaning and Maintenance

Cleaning the Synchrony

Before cleaning or performing any routine maintenance, always be sure the Synchrony is not operating and disconnect the Synchrony from the power source.

NOTE: The following cleaning instructions are for the Synchrony only. To clean the accessories, refer to each accessory's instruction sheet.

CAUTION: Do not immerse the Synchrony or allow any liquid to enter the enclosure, inlet filter, or any openings.

Clean the front panel and exterior of the enclosure as needed using a cloth dampened with water and a mild detergent. Allow the Synchrony to dry completely before plugging in the power cord.

Gently wash the reusable circuit tubing in a solution of warm water and a mild detergent. Rinse thoroughly and allow to air dry.

Cleaning or Replacing the Inlet Filters

The Synchrony has two removable filters at the air inlet. The gray foam filter is washable and reusable. The optional white ultra-fine filter is disposable.

NOTE: Dirty inlet filters may cause high operating temperatures and may affect Synchrony performance. Regularly examine the inlet filters as needed for integrity and cleanliness.

Step 1 Verify that the Synchrony is not operating, and disconnect the power cord from the wall outlet.

Step 2 As shown in Figure 7-1, remove the filter panel by pressing down on the top of the panel to release the tabs, then swinging the panel out from the Synchrony's body.

Step 3 Remove the filters from the enclosure as shown in Figure 7-2. The top filter is the reusable gray foam filter. The bottom filter is the optional disposable white ultra-fine filter.

Step 4 Check the filters to see if they are dirty or torn.

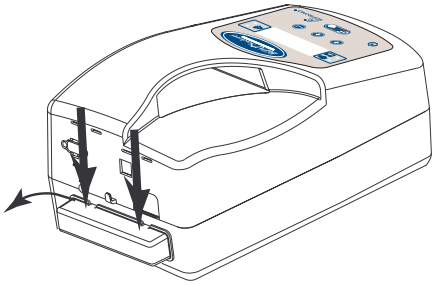


Figure 7-1 Removing the Air Filter Cover

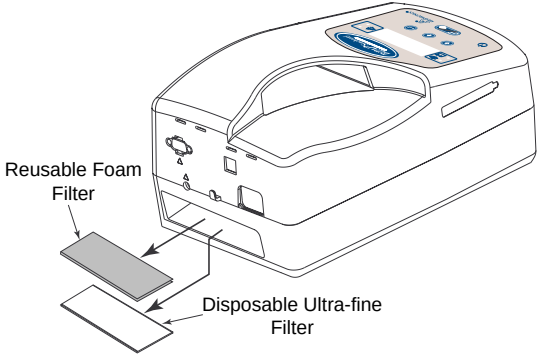


Figure 7-2 Removing the Air Filters

Step 5 If needed, wash the foam filter in warm water and a mild detergent. Rinse the filter thoroughly to remove all detergent residue. Allow the filter to completely dry before reinstalling it. If the foam filter is torn, replace it.

Step 6 If the ultra-fine filter is dirty or torn, replace it.

Step 7 Reinstall the filters, with the ultra-fine filter on the bottom. Slide the filters into the air inlet at the rear of the Synchrony and push them down into the recess.

Step 8 Replace the filter panel.

Contact your home care provider to order filters.

NOTE: To clean the breathing circuit accessories, refer to each accessory's instruction sheet.

8 Using Oxygen with the Synchrony

If your doctor has prescribed oxygen to be used with your Synchrony, follow these instructions to connect oxygen to the breathing circuit.

WARNING: If you are using oxygen, your Synchrony must be equipped with the optional oxygen valve, shown in Figure 8-1. Failure to use the oxygen valve could result in a fire hazard. Contact your home care provider if you require an oxygen valve.

WARNING: Oxygen supports combustion. Oxygen should not be used while smoking or in the presence of an open flame.

WARNING: Turn off the oxygen supply when the Synchrony is not in use.

To add oxygen to the circuit, the oxygen source must comply with the local regulations for medical oxygen. The oxygen flow into the oxygen valve cannot exceed 15 lpm and the pressure cannot exceed 50 psi.

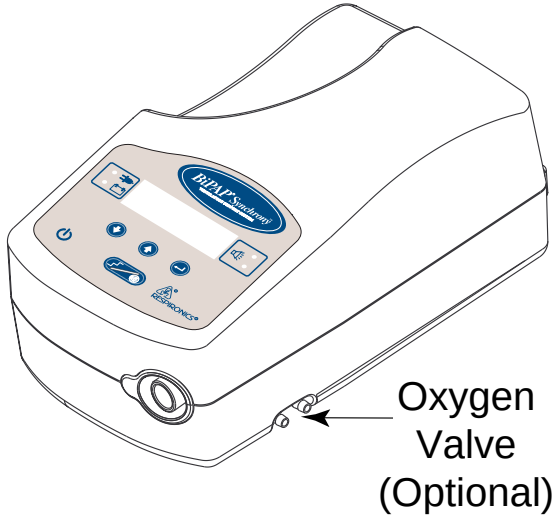


Figure 8-1 Optional Oxygen Valve

Oxygen tubing from the oxygen valve can be connected either to the mask or to an oxygen enrichment adaptor. If using the adaptor, you must place it in the breathing circuit between the air outlet of the Synchrony and the breathing circuit tubing.

Step 1 As shown in Figure 8-2, attach oxygen tubing to the rear oxygen valve port. The oxygen valve prevents oxygen from entering the Synchrony enclosure when the Synchrony is stopped.

Step 2 Connect another section of oxygen tubing to the front valve port, then to the oxygen enrichment adaptor in the breathing circuit or to one of the sample ports on the mask.

Step 3 Turn the Synchrony on before turning on the oxygen supply.

Step 4 Turn the oxygen flow on.

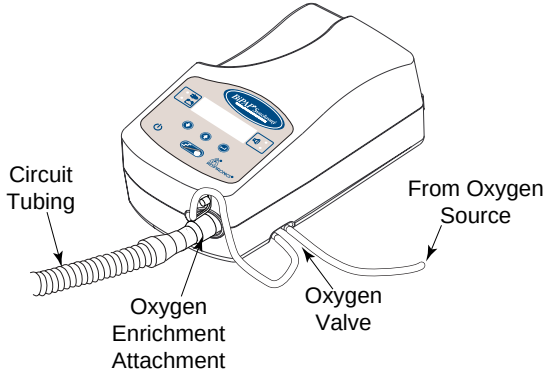


Figure 8-2 Attaching oxygen tubing to the Synchrony

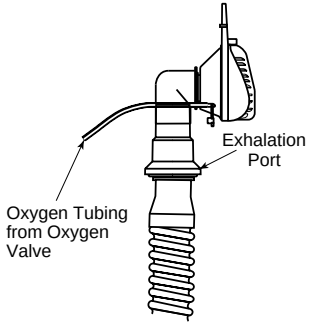


Figure 8-3 Attaching oxygen tubing to mask port

9 Using the Optional Modem

If the optional modem has been installed in your Synchrony, you may be asked to dial your home care provider and have the Synchrony send information using your telephone line. You can send the data when the machine is starting up or during therapy.

Sending Data at Startup

STEP 1 Plug a telephone line from the rear of the Synchrony to a convenient telephone outlet. See Figure 9-1.

STEP 2 Connect the Synchrony to a power source and press ⏻.

STEP 3 When the Self-Test screen appears (See Figure 9-2), press ▲.

STEP 4 When the Dial Provider screen appears (Figure 9-3), press ▲ to select the Dial Provider command, then press ↵ to contact the provider and download information.

(Continued on next page)

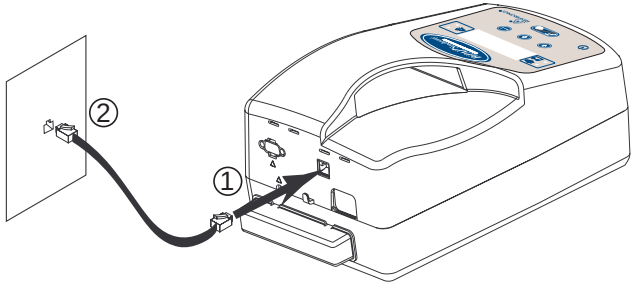


Figure 9-1 Connecting the Telephone Line

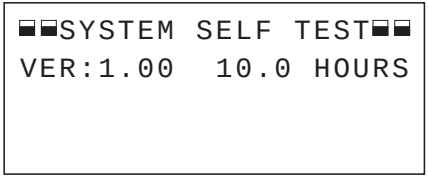


Figure 9-2 Self-Test Screen

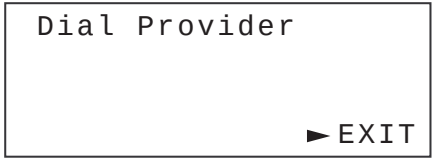


Figure 9-3 Dial Provider Screen

STEP 5 The SENDING REPORT screen appears as shown in Figure 9-4.

The STATUS changes from “Dialing” to “Connected” to “Complete” under normal circumstances.

If you press ↵ when ABORT is displayed in the SENDING REPORT screen, the call will stop and the STATUS line will go to STATUS: Complete.

STEP 6 When the data has been sent, the STATUS line will change to Complete, and the ABORT line will change to EXIT as shown in Figure 9-5.

STEP 7 Press ↵ to EXIT the SENDING REPORT screen and return to the Dial Provider screen (Figure 9-3). Press ↵ again to return to the self-test screen.

If a problem occurs while attempting to send the data, the STATUS line will tell you what the problem is. See the following table for a list of the possible STATUS messages and what you can do.

Figure 9-4 Sending Report Screen

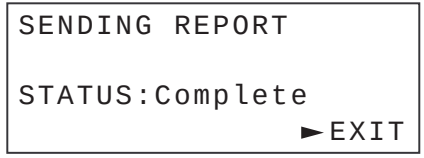


Figure 9-5 Call Complete

NOTE: If it is convenient, you may leave the Synchrony connected to the telephone outlet. It will not interfere with your telephone.

STATUS Message	Possible Cause	What to Do
No Modem	Modem is not installed properly.	Call your home care provider.
No Dial Tone	A phone is off the hook or telephone line is not working.	Press ↵ to exit, check the telephone line connection. Lift the receiver of your telephone to make sure that you have a dial tone.
Line Busy	The caregiver's line is in use.	The unit will try to make the connection again after a slight delay. Press ↵ if you wish to stop the redialing. Your home care provider has set the modem to try several times before stopping.
Send Failed	1. If occurs shortly after first try, the Synchrony unit does not have a phone number entered into it. 2. If occurs after many "Line Busy" and "Retry" messages, the Synchrony unit tried too many times, with the line busy.	1. Press ↵ to exit, contact your home care provider. 2. Press ↵ to exit; try again later.

Table 9-1 Problems with Calling the Home Care Provider

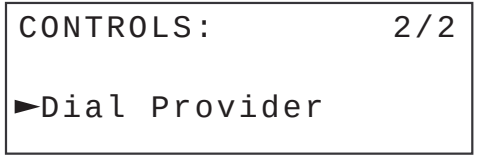
Sending Data During Therapy

STEP 1 Connect a telephone line to the Synchrony as shown in Figure 9-1.

STEP 2 Press ⬇. The Synchrony displays the CONTROLS screen, as shown in Figure 9-6.

STEP 3 If the Dial Provider command is already selected (as shown by the ► indicator, press ↵. Otherwise, press ⬇ to select the command, then press ↵.

STEP 4 Follow Steps 5 to 7 on the page 45.



CPAP Controls

S, S/T, T, PC Controls

Figure 9-6 Controls Screens

10 Specifications

Environmental

	Operating	Storage
Temperature	41 °F to 95 °F	-4 °F to 140 °F
Humidity	15 to 95% Relative (non-condensing)	15 to 95% Relative (non-condensing)
Atmospheric Pressure	83 kPa to 102 kPa (5600 feet to sea level at standard pressure)	50 kPa to 106 kPa (20000 feet to sea level at standard pressure)

Physical

Dimensions: 12" L x 7" W x 6" H

Weight: Approximately 6 lb

Electrical

AC Voltage: 100 to 240 V ~, 50/60 Hz

DC Voltage: 12 V ⎓

AC Current: 1.25 A maximum

DC Current:	5.5 A maximum
Protection against electric shock:	Class II
Degree of protection against electric shock:	Type BF Applied Part
Degree of protection against harmful ingress of water:	Ordinary Equipment, IPX0
Modes of Operation:	Continuous
Electromagnetic Compatibility:	The BiPAP Synchrony Ventilatory Support System meets the requirements of EN 60601-1-2.
Fuses:	There are no user-replaceable fuses.

PRESSURE

Outlet:	4 to 30 cm H_2O

CONTROL ACCURACY

Parameter	Range	Accuracy
IPAP	4 to 30 cm H_2O	± 2 cm H_2O*
EPAP	4 to 15 cm H_2O	± 2 cm H_2O*
CPAP	4 to 20 cm H_2O	± 2 cm H_2O*
Rate	0 to 30 BPM (PC and S/T); 4 to 30 BPM (T)	Greater of 1 BPM or ± 10% of setting when measured over a four minute period.
UPGRADE **Timed Inspiration**	0.5 to 3.0 sec	± 10% of setting + 0.1 sec
Rise Time	1 to 6, corresponding to 100 to 600 msec	± 25%*
Ventilation Ramp	Disabled, 0.5, 1.0, 2.0, 3.0 cm H_2O per breath	± (0.1 + 0.25 of setting) cm H_2O/breath. Measured over the full duration of the programmed ramp.

*Measured at the patient end of circuit with a Whisper Swivel II exhalation port and no flow. Dynamic pressure accuracy is ± 5 cm H_2O measured at the patient end of the circuit with a Whisper Swivel II and varying flow conditions.

CONNECTORS

Respironics circuit connectors comply with ISO 5356-1.

ACCURACY OF MEASURED AND CALCULATED PARAMETERS

PARAMETER	ACCURACY
Respiratory Rate	Greater of ±1 BPM or ±10% of reading when measured over a four minute period
Exhaled Tidal Volume	± (25 + 0.15 of reading) ml
Exhaled Minute Ventilation	15% of reading + 1 L/min
Leak Rate	15% of reading + 5 L/min

Index

A

AC Indicator 17, 18
AC Power
  Inlet 20
  Plugging 25
Accuracy Specifications 52
Activity Indicator 18
Air Filter
  Cover 20
Air Filters
  Installing 21
Alarm Indicators
  High Priority Alarm 18
  Medium/Low Priority Alarm 18
Alarms
  General Instructions 31
  High Priority Defined 11
  Low Priority Defined 11
Apnea
  Defined 11

B

Bacteria Filter 22
Bi-Level Ventilation 13
Breathing Circuit
  Complete 24
  Connection 16, 22

C

Carry Handle 16
Cautions 7
Circuit Tubing 14
Cleaning and Maintenance 41
Cleaning The Synchrony 41
Cleaning/Replacing the Inlet Filters 42–43
Comfort control 17
Communication Statement 9
Communications Port 20
Connections
  AC Inlet 20
  Breathing Circuit 20, 22
  Communications Port 20
  DC Inlet 20

Rear Panel 20
Telephone Jack 20
Contacting Respironics 15
Contents 5
Contraindications 8
Control Keys 17
Control Panel 16
Controls and Indicators 17
Details 17
Control Screens
S, S/T, PC, T Mode 28
Controls
Control Keys 17
Down Key 17
Enter Key 17
Ramp/Silence Key 17
Standby Key 17
Up Key 17
Corrective Actions
Mask 38
Synchrony 37
CPAP
Defined 11
Monitoring Screen 27

D

Data
Sending to Care Giver 46
DC cord retainer 20
DC Indicator 17, 18
DC Inlet 20
DC Power 25
Definitions
Apnea 11
CPAP 11
EPAP 11
High Priority Alarm 11
IPAP 11
Low Minute Ventilation 11
Low Priority Alarm 11
OSA 11
Pressure Control Mode 11
Ramp 11
Rise Time 11
Spontaneous Mode 11
Spontaneous/Timed Mode 12
Timed Mode 12
Dialing with Modem 28
Display 17
Display Indicators 18
Activity 18

Navigation 19
Progress 19
Ramp 19
Selection 19
Down Key 17

E

Electrical Specifications 50
Enter Key 17
Environmental Specifications 50
EPAP 13
Defined 11
Exhalation Port 23
Expiratory Positive Airway Pressure 13

F

Filters
Air Filter Cover 20
Bacteria (Optional) 22
Cleaning/Replacing 42–43
Gray Pollen 21
Installing 21
Ultra-Fine 21

G

Gray Pollen Filter 21

H

Handle 16
High Priority Alarm Defined 11
Humidifier
Placement 22

I

Indicators 18
AC 17, 18
Activity 18
DC 17, 18
Display 18
Medium/Low Priority Alarm 18
Navigation 19
Progress 19
Ramp 19
Selection 19
Inlet Filters
Cleaning/Replacing 42–43
Inspiratory Positive Airway Pressure 13
Installing the Air Filters 21
Intended Use 8
Interface 14
Introduction 11
IPAP 13
Defined 11

L

Limited Warranty 60
Location 22
Low Minute Ventilation
  Defined 11
Low Priority Alarm
  Defined 11

M

Maintenance 41
Mask 14
Mask Discomfort
  Corrective Action 38
Medium/Low Priority Alarm Indicator 18
Modem 46
  Communication Statement 9
  Sending Data 46
Monitoring Screen
  CPAP 27
  S, S/T, PC, T Mode 27

N

Navigation Indicator 19

O

Operating 27
Optional Oxygen Valve 16
OSA, Defined 11
Oxygen
  Connecting 44
  Optional Valve 16, 44
  Valve 45

P

Package Contents 5
Physical Specifications 50
Plugging the Unit In 25
Pressure Assist Mode Defined 11
Pressure Specifications 51
Problems 37
Progress Indicator 19
Provider
  Dialing with Modem 28

R

Ramp
  Using 26
Ramp Defined 11
Ramp Indicator 19
Ramp/Silence Key 17

Rear Panel 20
Respironics, How to Contact Us 15
Rise Time
  Controlling 28
  Defined 11

S

S, S/T, PC, T Mode
  Control Screens 28
  Monitoring Screen 27
Screens
  CPAP Monitoring 27
  Monitoring 27
  S, S/T, PC, T Mode Monitoring 27
Selection Indicator 19
Sending Data 46
Specifications
  Accuracy 52
  Electrical 50
  Environmental 50
  Physical 50
  Pressure 51
Spontaneous Mode
  Defined 11
Spontaneous/Timed Mode
  Defined 12
Standby Key 17
Starting the Synchrony 26
Symbols 15
Synchrony
  Breathing Circuit 14
  Cleaning 41
  Introduction 11
  Operating 27
  Starting 26
  Touring 16
  Using 21
  What it is 14
  Where to Locate 22

T

Telephone
  Connecting the Modem 46
Telephone Jack 20
Timed Defined 12
Touring 16
Trigger Sensitivity 53
Troubleshooting 37
Tubing 14
  Breathing Circuit 20, 22

U

Ultra-Fine Filter 21
Up Key 17
Using the Synchrony 21

V

Ventilation, Bi-Level 13

W

Warnings 6–7
Warnings, Cautions, and Notes 6–7
Warranty 60

Limited Warranty

Respironics, Inc. warrants that the BiPAP Synchrony System shall be free from defects of workmanship and materials and will perform in accordance with the product specifications for a period of one (1) year from the date of sale by Respironics, Inc. to the dealer. If the product fails to perform in accordance with the product specifications, Respironics, Inc. will repair or replace – at its option – the defective material or part. Respironics, Inc. will pay customary freight charges from Respironics, Inc. to the dealer location only. This warranty does not cover damage caused by accident, misuse, abuse, alteration, and other defects not related to material or workmanship.

Respironics, Inc. disclaims all liability for economic loss, loss of profits, overhead or consequential damages which may be claimed to arise from any sale or use of this product. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty is given in lieu of all other express warranties. In addition, any implied warranties—including any warranty of merchantability or fitness for the particular purpose—are limited to one year. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

To exercise your rights under this warranty, contact your local authorized Respironics, Inc. dealer or contact Respironics, Inc. at:

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1-412-731-2100