

What you need to know about RIP

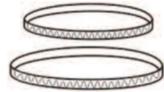
Overview of RIP technology

The driver module generates an oscillating signal at a known frequency.

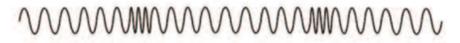


Examples

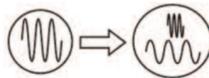
The oscillating signal is applied to the wire woven into the effort belts.



Altered frequencies



The loops of the woven wire change the inductive properties, causing the respiratory effort movements to alter the frequency of the original signal. These altered frequencies are converted into analog signals which are directly related to respiratory effort and the cross-sectional change occurring under the belt.



Cross-sectional change (thorax)

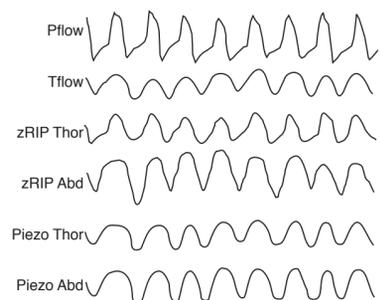


Analog signal

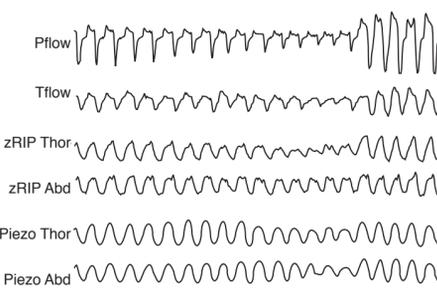


The difference in RIP and piezo waveforms

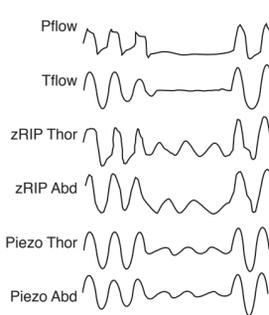
Normal



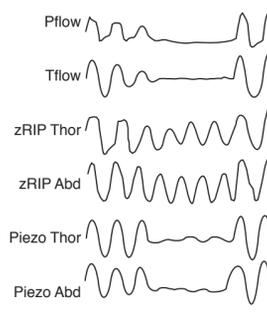
Hypopnea



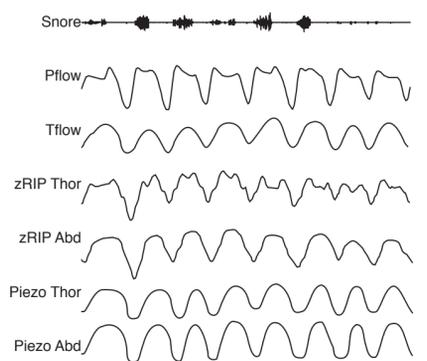
Obstructive apnea



Paradoxical effort



UARS



How to test your zRIP system

When preparing to do a study, confidence in the equipment being applied on your patient is critical. Therefore, it's important to test your equipment before each study. By making use of a sensor tester, such as the Pro-Tech ST-3 sensor tester, all components of the zRIP system can be tested simultaneously, saving you valuable time. To know that your zRIP system is ready and working properly before each patient use, follow these steps:

Test the effort sensor belt

- Connect the zRIP belt to the zRIP module through the abdominal belt input.
Note: This will only test the abdominal channel of the module. To test the thoracic channel, continue as outlined below but use the thoracic belt input instead of the abdominal. Be aware that a wireset **must** be plugged into the abdominal belt input of the module to activate the module for testing or use.
- Connect the module abdominal output to the front jacks of the ST-3 sensor tester.
- Buckle the belt and expand it to its full length.
- Place your hands inside of the belt. With the back of the buckle positioned over the back of one of your hands, maintain minimal tension to keep the belt on your hands.
- Stretch the belt by moving your hands apart smoothly.
- Relax the belt by bringing your hands together smoothly while maintaining minimal tension to keep the belt on your hands.
- The LED on the ST-3 sensor tester should move smoothly from side-to-side as the belt expands and relaxes to indicate that the system is working correctly.
- If the LED display light is moving rapidly without any correlation to the movement of the belt, then follow the instructions below for testing the module and wireset.
- If the module and wireset are working properly, then retest the effort sensor belt with a new module. If the signal is still erratic, then replace the belt.
- If the new module produces the smooth signals and the first module did not, the problem may be with the first module and it should be replaced.
- Testing the above components also can be performed by using a digital multi-meter or ohmmeter. The resistance in a relaxed belt should not exceed 2.5 ohms (Ω).

Test the zRIP module

- Press the test button on the module. A green light will appear to indicate that the batteries are good. If the green light does not appear, the batteries should be replaced.

Test the wireset

- Test the wireset with the ST-3 sensor tester.
- To test the one side of the transformer, plug the 249 or keyhole connector directly into the top of the ST-3 where the continuity wireset is plugged in.
- If there is no problem the LED display will be completely and continuously illuminated and a continuous tone will be heard. An intermittent display or tone indicates that the wireset is bad and should be replaced.
- To test the other side of the transformer, plug the continuity wireset into the Continuity Test port of the ST-3. Use the alligator clip and female socket to test the 1.5 mm safety connectors located on the other side of the transformer.



For any questions related to testing your zRIP system or for more information about zRIP, please call SleepVIP at 1-800-345-6443 or your local Philips Respironics sales representative. View product information at: www.zripsensors.respironics.com.

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