



## 3190 - Breathing Rate Belt

Revision: 5 | DS053

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## Introduction

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Thank you for purchasing the Breathing Rate Belt. We pride ourselves on producing high quality products that meet with the demands of the busy classroom environment. If you have any problems using this sensor, please read this documentation in full before contacting the Data Harvest support team.



## Overview

The Breathing Rate Belt is used with either the Wireless Differential Gas Pressure Sensor, or the Smart Q Differential Gas Pressure Sensor (10 kPa range) to measure breathing rate.

The Breathing Rate Belt is a wide nylon belt that can be wrapped around a person's abdomen or chest region.

Fitted inside the Belt (positioned under the Data Harvest label) is an inflatable air bladder, which is moulded to two rubber tubes. One of these tubes finishes with a hand pump bulb that is used to inflate the air bladder. The other tube is used attached to the Differential Gas Pressure Sensor to monitor the change in pressure as the test subjects chest expands and contracts during breathing.

The Differential Gas Pressure Sensors have two ports to give an output relative to the difference of pressure between the two ports. The second port is left open to atmosphere so that pressure will be measured relative to atmospheric pressure.

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## Pack Contents

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This product is supplied with the following items:

- 1 x Breathing Rate Belt

## Additional Accessories

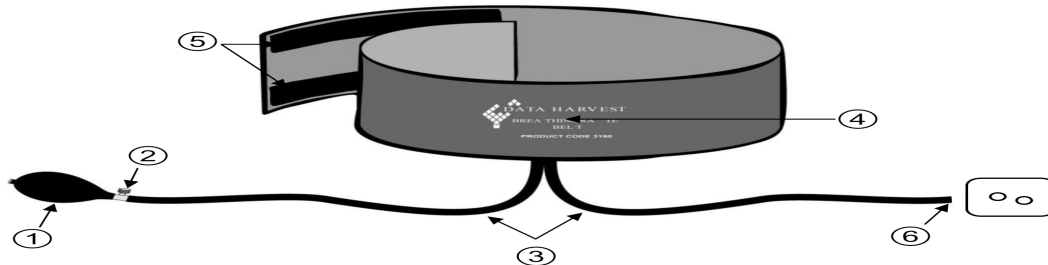
To get the most from your Breathing Rate Belt, the following items should be considered:

- [Wireless Differential Gas Pressure Sensor](#)
  - [SmartQ Differential Gas Pressure Sensor](#)
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## Operational Overview

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The diagram below shows the specific parts of the sensor. Read further to explore the functionality of each part of the sensor.



1. Hand pump bulb
2. Release valve
3. Rubber tubes
4. Air bladder (fitted inside the belt)
5. Velcro® strips
6. Attachment tube

### Hand pump bulb (1)

PLEASE AD A DESCRIPTION HERE

### Release valve (2)

PLEASE AD A DESCRIPTION HERE

### Rubber Tubes (3)

PLEASE AD A DESCRIPTION HERE

### Air Bladder (4)

PLEASE AD A DESCRIPTION HERE

### Velcro Strips (5)

Adjust to secure the breathing rate belt around the persons chest.

### Attachment tube (5)

Attach this part of the rubber tube to P1 on the Differential Gas Pressure sensors.

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## Usage Information

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1. Check the bladder in the Breathing Belt is fully deflated. Wrap the Breathing Rate Belt round the chest of the person whose breathing rate is going to be measured. Arrange the Belt so the Data Harvest printed label is positioned in front resting over the base of the rib cage (as shown in the diagram Fig 1.0).
  2. Place the end of the Belt with the long length of looped Velcro against the test subjects back (fabric side down). Bring the other end (with the short length of hooked Velcro) over to fasten the Velcro strips together and hold the Belt firmly in place.
    - **Note:** If the Belt is fastened when the test subject is slumped over in a chair or breathing out then it will be too slack to give good results. Ideally the Belt should be fitted while the test subject is breathing in slightly to get a 'snug' enough fit.
  3. Push the open-ended rubber tube into the port marked P1 on the Gas Pressure Sensor.
    - **Note:** If connected to P1, values will be in the positive range, if the other port is used values will be negative.
  4. Close the thumbscrew valve on the pump bulb by turning it clockwise as far as it will go.
  5. With the test subject in position e.g. sitting upright in a chair, squeeze the pump bulb to pump air into the Belts bladder until the Belt is pressed firmly against the abdomen but is still comfortable.
  6. Allow the test subject to sit for a couple of minutes to get used to the apparatus and the tension of the belt.
  7. **Start the EasySense2 app; select one of the logging modes e.g. EasyLog from the Home page. Select Test Mode from the Tools menu.**
  8. Check the value from the Gas Pressure Sensor – the aim is to get a value of around 5 kPa in mid breath position, alternatively increasing and decreasing over a range of about 2 to 3 kPa from this value when the test subject is breathing in and out normally. This value will be varied by how tightly the belt was initially wrapped round the subject. If the range is less than 1 kPa it may be necessary to tighten the Belt or to pump more air into the bladder.
  9. Once normal breathing results in a pressure range of 2 to 3 kPa or more you will be ready to begin an investigation.
  10. If more than one recording is to be conducted on the same graph select Overlay.
  11. If the investigation requires exercise to be undertaken disconnect the Pressure Sensor from its connection to the sensor cable (not the Belt connection) to allow the test subject to move around.
  12. When the investigation is complete release the air pressure in the bladder by slowly turning the thumbscrew valve counter clockwise. Remove the Belt. You may need to apply gentle pressure to the air bladder to completely deflate the Belt.
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## Practical Investigations

- It may be necessary to remove the talc coating from the inside of the open ended rubber tube when first used – this is best done using damp cotton wool bud.
- Check that the test subject is comfortable with the belt on. If not then the results may be compromised, as physiological stress will create abnormal breathing patterns. Avoiding selecting students as test subjects who are sensitive to hyperventilation or who are nervous by nature.
- Coughing, sneezing, laughing, moving and talking will affect the reading. The test subject should be relaxed and motionless.
- Avoid the test subject viewing the data on the computer screen to ensure they do not subconsciously alter their breathing rate.
- If the test subject experiences dizziness, nausea or a headache, stop the investigation and remove the Belt immediately.

The Breathing Rate Belt can be used to investigate a number of scientific experiments such as:

- Comparing breathing patterns of different student groups e.g. athletes and non-athletes, wind-instrument players, female and males, different ages, etc.
- Relaxation Studies
- Recovery time after exercise

## Online Videos

Learn how to use data logging in the classroom with our Secondary Science Academy demonstration videos, which will walk you through using the new EasySense2 app and show you how to get hands-on with the latest Bluetooth wireless sensors. The video experiments will show you how to get the best out of your science lessons.

New online content is being continuously uploaded onto our YouTube channel, including practical worksheets as well as videos.

See our website for further information and links.



### Explore Bluetooth Sensors

Are you looking to make the jump to our smart wireless sensors? Or have you recently purchased them and want to know more about how they work?

[View video playlist](#)

### Explore EasySense2

The core of our science platform is our EasySense2 software. In these videos you will learn everything from the basics of our software to the most in-depth features.

[View video playlist](#)



## Explore Science Practicals

See our Smart Wireless Sensors in action with a range of practical experiments. This is the best way to get started with the new Bluetooth sensors!

[View video playlist](#)



## Specifications

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Please read the following table for sensor specifications.

Feature	Detail
Chest Size	780 to 1100 mm

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## Limited Warranty

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For information about the terms of the product warranty, see the Data Harvest website at: <https://data-harvest.co.uk/warranty>

## Product Repairs

When returning goods to Data Harvest, please download and complete the repair return [form](#) to ensure you have sent us all the information we require, and send it to us alongside the item to be repaired. The second page of this form includes a return address label.

If you have purchased a Data Harvest manufactured product via a different company, please also supply proof of purchase.

## Postage Charges

- In the event of a fault developing, the product must be returned in suitable packaging to Data Harvest for repair or replacement at no expense to the user other than postal charges.
- There will be no postal charge for the return of repaired goods to any mainland UK address (for other areas, additional shipping charges may apply).

## Out of Warranty Repairs

Please visit <https://data-harvest.co.uk/repairs> for the most up to date charges for out of warranty repairs.

## Warranty on Repaired Items

Once an item has been serviced and repaired, the product will have 1 year warranty against further failure of the component repaired.

## International Returns

Please contact the authorised Data Harvest representative in your country for assistance in returning equipment for repair.

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## Compliance

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This product complies to the following standards

### Waste Electrical and Electronic Equipment Legislation

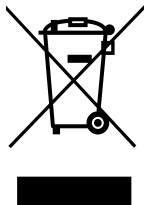
Data Harvest Group Ltd is fully compliant with WEEE legislation and is pleased to provide a disposal service for any of our products when their life expires. Simply return them to us clearly identified as 'life expired' and we will dispose of them for you.

### FCC Details

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

### CE

This product conforms to the CE specification. It has been assessed and deemed to meet EU safety, health and environmental protection requirements as required for products manufactured anywhere in the world that are then marketed within the EU.



## Troubleshooting

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If you experience any problems with your product, please try the following troubleshooting tips before contacting the Data Harvest support team.

Feature	Detail
PLEASE ADD HERE	PLEASE ADD HERE

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## Notices

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Please read the following notices with regards to using your item

1. **Safety:** Be careful that breathing investigations do not become competitions. Investigations on lung ventilation can be potentially dangerous to students with asthma or bronchitis.
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## Contact Information

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To contact Data Harvest directly, please use any of the following channels

### Traditional Communications

Data Harvest Group Ltd.  
1 Eden Court, Eden Way,  
Leighton Buzzard,  
Bedfordshire,  
LU7 4FY  
United Kingdom

**Tel:** +44 (0) 1525 373666

**Fax:** +44 (0) 1525 851638

**Sales email:** [sales@data-harvest.co.uk](mailto:sales@data-harvest.co.uk)

**Support email:** [support@data-harvest.co.uk](mailto:support@data-harvest.co.uk)

### Online Communications

We have active social media support channels using the following platforms

- [Facebook](#)
- [Twitter](#)
- [YouTube](#)

### Office Opening Hours

Monday to Thursday - 08:30 to 16:45

Friday - 08:30 to 13:30

Saturday & Sunday & UK Bank Holidays - Closed

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## PDF Translations

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The PDF formatted download of this manual is by default provided in the English (United Kingdom) language. If an alternative translation is available, it will be listed here.

We have for your convenience included a webpage translation feature to the online documentation which will allow you to translate and print individual pages of this documentation.

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