

Hand Pulse Technology

The four stainless steel hand sensors are used to pick up tiny EKG signals that run through the body when your heart beats. These electrical EKG signals are so small (on the order of 0.005 volts) that they must be amplified 1000 times to make the signal useful for the central processing unit (CPU) in the console to be able to display your pulse. Because of this, hand pulse technology is very sensitive to user and environmental conditions. To ensure proper operation the user must maintain good, consistent contact on all four sensors. The users skin can not be too dry or too wet. If the skin is too dry the electrical contact is weak and that 0.005 volts may be down to 0.001 volts. If the skin is too wet the two sensors on each grip can become shorted (need to be extremely, dripping wet).

Other factors that can affect the reading are a change of grip on the sensors. Unfortunately this happens when the user is walking at a fast pace or running, and with some users even walking slowly. The slight tightening of the hand muscles also produce small electrical signals that can look like a heart beat. Also in winter time if static electricity charges are built up while walking on the treadmill these charges are conducted into the sensors and interfere with the reading. There is filtering software in the console that tries to discriminate between EKG signals and "Noise" created by other factors. When a lot of noise is present (which also gets amplified 1000 times) the software takes longer to display a heart rate and longer to update the display as heart rate changes. If there is too much noise the display never gets to the correct reading. For some people hand pulse sensors just will not work properly no matter what. This depends on medical conditions and sometimes just no electrical signal in the hands among other factors.

These are limitations of hand pulse technology and even the most expensive systems (which can cost upwards of \$3,000) used in hospitals have the same problems. The difference is that a patient in a hospital is not running on a treadmill. Expensive Health club treadmills also have the same problem as we buy our hand pulse technology from the same company as health club treadmill manufacturers. Hand pulse technology works well on stationary exercise machines like bikes and even ellipticals but are not perfect on a treadmill. On a treadmill it is usually better to use a chest strap transmitter which is extremely reliable and is why we include the chest strap with your treadmill. The hand pulse sensors are best used when walking up to 3-4 MPH.

To test if your hand pulse sensors are working up to specification, hold them while standing on the side step rails, not walking, and see if the reading is more in line with what you would expect. This will eliminate the movement and static electricity factors. If your hands are dry, then wet them slightly (saliva works as a great conductor if this doesn't bother you).

For more information, please contact our SOLE Service Department.

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