

model: A0905-SA-SET
model: AMI 3037-SB-SET

Patent Pending 2009-139649

Air-pack type contact surface pressure
continuously measuring system
Measured by water pressure calibration method

Pressure Measuring System for stockings / bandages



Easy operation: It can measure only by pulling and releasing the cock.

- It can measure many point and persons
- It is possible to measure it with the air pack sensor installed.

<Principle>

An air is enclosed between two contacted surfaces and the pressure of that enclosed air is measured externally from the contacted surface.

Into a flat bag made with a flexible film of a least possible elasticity, an air is enclosed in the thickness of 1mm. The bag with an enclosed air is stuck on to an intended surface by a slip less mounting film in such a manner to cover the bag.

A compressed air is introduced into an out side pressure indicator through a thin tube which is not flattened by pressure loaded. A difference between the air pressure inside the flat bag and the atmospheric air pressure is measured.



Vertical position is possible

Many points measurement



Actual size of Air-pack φ20

Confirmation by actual measurement

Pressure to transformed lower limbs

Choices of stockings

Improvement of bandage technology

Effective pressure of each part

Correlation of physique and pressure

Swelling and change in swelling

It ties to the installed sensor and the cock is pulled and released.



The pressure to an actual skin by strong pressure is detected with the cover tape.
The cover tape is a temporary skin.

There is reproducibility because the air pack sensor is a circle and no difference of the value for the installation.

An air is enclosed in the thickness of 1mm ($\phi 20$ Air-pack) and It becomes thinner by pressurizes.

<Usage>

Contact pressure

Restraint Pressure

Body pressure

Clothes pressure

Flexibility pressure



AMI Techno Co., Ltd.

Specification / Composition

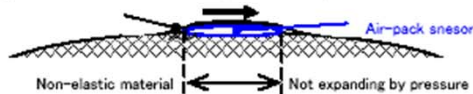
Model	A0905-SA-SET	AMI3037-SB-SET
(Unit)	(kPa)	(hPa)
Measuring range (at Air-pack $\phi 20$)	1~20	1~200
Pressure sensor ① and ③ at connection	less than 75 in the high pressure of the correction clothes.	less than 100 in the high pressure of the correction clothes.
Measuring range (Main unit)	0~35.0	0~350
The properties of temperature	± 0.1	± 1
Accuracy of pressure sensor	± 0.1	± 1
Accuracy at the plane	± 0.3	± 3
Calibration method: Depth pressure ($20 \pm 5^\circ\text{C}$)	1 digit	1 digit
Air infusion amount (Air-pack $\phi 20$)	1mm/0.3ml and 0.5mm/0.15ml	1mm/0.3ml (red) for living body
An air into the air-pack $\phi 20$ with the thickness is 1 mm on living body or 0.5 mm on dummy.		
DC voltage output	35kPa \rightarrow 0.35V / 1kPa \rightarrow 0.01V	No data logging
Dimension / weight	W245 x H75 x D175 / 1.5kg	
Power supply	AC100V \pm 10V / 0.5A	
Air-pack sensor and accessories	Model / Size	
Air-pack sensor/SB- $\phi 20$ / Om	5 pcs	3 pcs
(bag: 20mm/tube: 1mm x 1m, 0.5m diameter)	(①1m/3pcs-②0.5m/2pcs)	(①1m/2pcs-②0.5m/1pcs)
Relay tube	③SB-CC/1.5m ($\phi 3\text{mm} \times 1.5\text{m}$)	1 pcs
Covering tape ④AMI 3037-PTS	200 sheet / set	100 sheet / set
Press Tester (maximum pressure)	⑤SB-PRESS...1 pcs	⑤SB-PRESS...1 pcs
Output cable / Carrying Case	⑥cable/ aluminium case	polypropylene case
Attached document	Manual, parts list	manual, parts list

An intermittent measurement every elapsed time is possible though it is not suitable for the sequential measurement for a long time while pressed. It connects again after time passes and it measures it. The model which can continuously measurement with AMI3037-2/2B, 5S, 10 by outputting the DC voltage.

<Air-pack method>

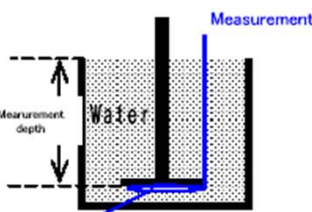
An air is enclosed between two contacted surfaces and the pressure of that enclosed air is measured externally from the contacted surface. Into a flat bag made with a flexible film of a least possible elasticity, an air is enclosed in the thickness of 1mm.

Section

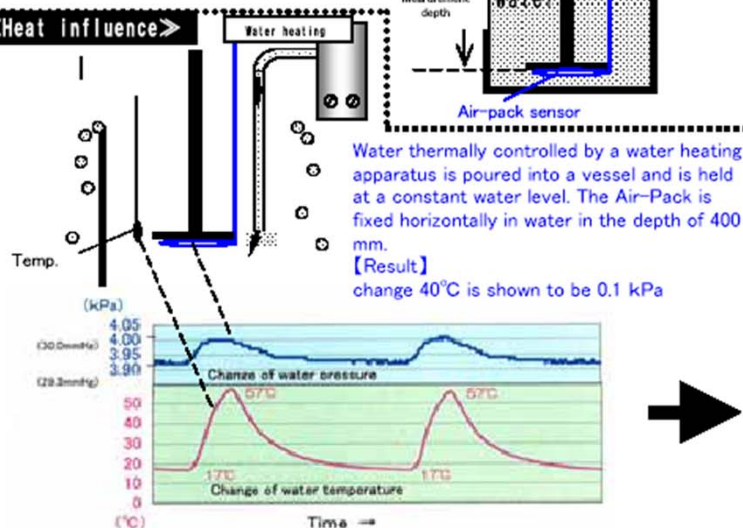


<Calibration method> on the plane

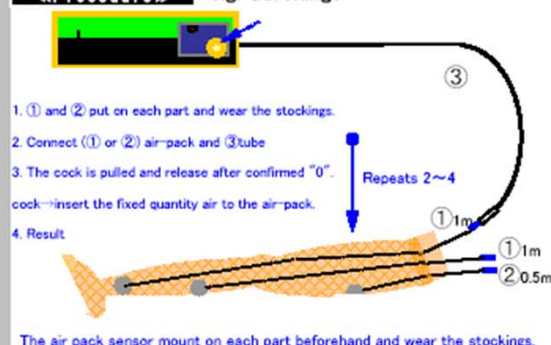
A pressure on horizontal plane corresponding to the water pressure can be got by measuring the water depth.



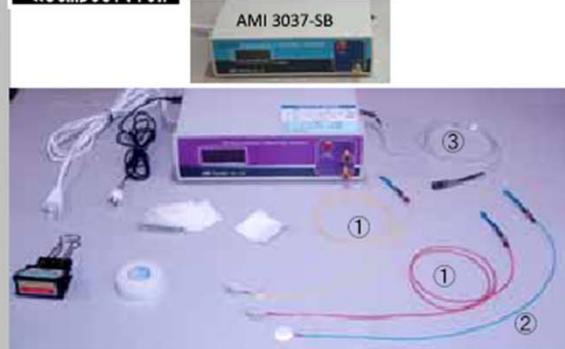
<Heat influence>



<Procedure> e.g. Stockings



<Composition>



<Feature>

- (1) It is easy to stick each part of the living body and between ruggedness of the cloth and reproducibility is good in 20mm (standard) diameter. It comes in contact on the tip of the center part of the bag when it is too large, and the situation is changeable and reproducibility worsens partial pressure it.
- (2) The influence of the air-pack that put some air in 1mm in thickness becomes thinner because of pressure, sinks softly of the living body and the cloth, absorbs, and is extremely little. However, when putting in 1.5mm in thickness and measuring it in the cylinder of $\phi 100$, the value about 1.3 times 1mm in thickness was confirmed. It is because concentrated pressure (concentrated stress) is caused in the thickness projection.
- (3) Directionality doesn't worry in the circle and the installation on the part is easy. Measurements change by the direction when designed besides the circle. For example, the top becomes the mean value of the lowering area high in surroundings in the measurement with the hemisphere face.
- (4) In piping in the tube of 1mm that doesn't collapse, it is unaffected in the piping situation catching the transformation of the bag of the air pack (alteration in volume). Measurements change for a soft material such as silicon rubber in the piping situation.

<Accurate of measurement>

Attention as follows:

Permissible error of measuring instrument + Part error margin +

Tools installation error + Restoration of tools material

Permissible error of measuring instrument: It describes it clearly in the specification. However, it is necessary to consider by adding the error margin in the cover tape and the curved surface.

Part error: Installation position, figure (curvature) of air pack, and softness, etc.

Tools installation error: The value changes partially in how like hitching and a horizontal gap, etc. to match it when setting it to the measurement site when tools are installed. The error margin is somewhat caused though putting the sign and the line in tools in detail, and improving accuracy are necessary.

Restoration of tools material: The installation frequency, and it is washing etc. and difference of the restoration at the restoration time of the material sweat and the expansion, and hitching.

<The reasons why a thermal effect is so small are as follows:>

- ① Although a thermal expansion factor of air is $1/(273 + \text{atmospheric temperature})$, a voluminal swell of the Air-Pack to thickness direction is only a little because its shape is flat.
- ② Because an amount of the enclosed air is smaller than the maximum voluminal capacity of the Air-pack, there is a sufficient remaining capacity inside the Air-pack to be able to absorb a swell of the enclosed air.
- ③ In actual measurement, a swell to the thickness direction of the Air-pack is usually absorbed by its flexibility.



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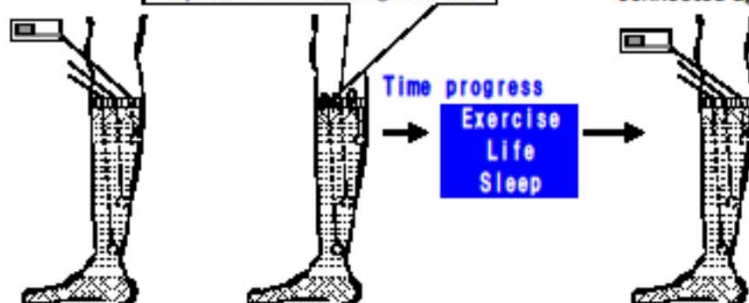
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Measure changes in the hours after exercise and life

To measure each point,

separate it with a measuring instrument

connected again and

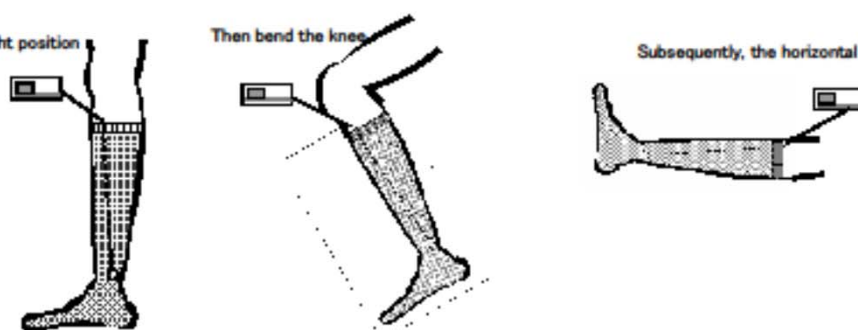


Shift in posture

Upright position

Then bend the knee

Subsequently, the horizontal

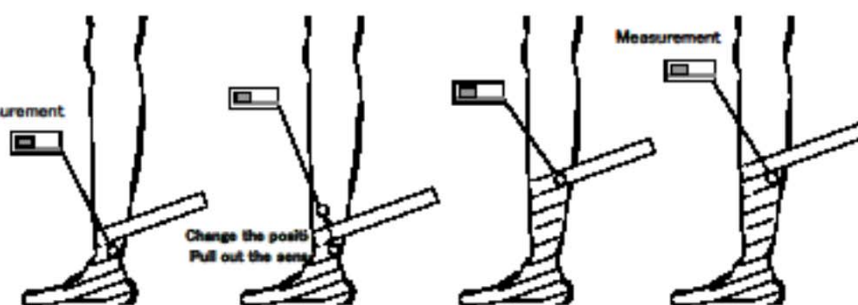


Bandage technology

Measurement

Measurement

Change the position
Pull out the sensor



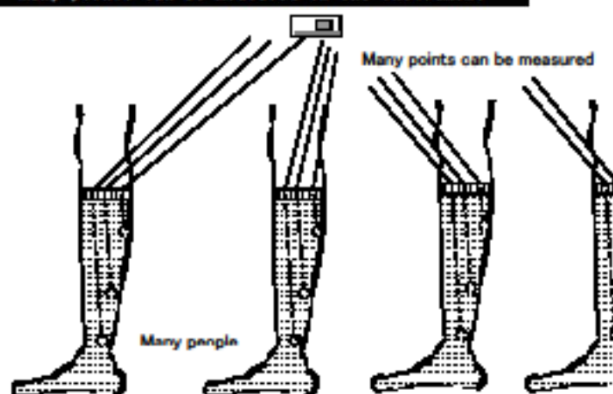
Deformed foot



Many points can be measured in one instrument

Many points can be measured

Many people



1 Power ON (Measuring start with relay tube connected to the main unit.)



AMI3037-SB/A0905 Measuring Procedure

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The POWER button pushed.

-- After conformed display 0 ± 1 , then next step

By power ON, 0 display function operates at the time. Please do not connect an air pack.

<Cautions>

* It is gaseous sterilization when sterilizing an air pack.

2. It is air pack attachment, measuring pressure of a cover tape.

Repeat when multiple points measurement



An air pack is pressed with a press



An air pack is connected with a relay tube. It puts to the back firmly. (A low value is displayed)



Pull up to the red shift of cock. Value releases the cock in the 0 ± 1 .



From a press testing machine to outside an air pack.

If compression of stockings are strong, this is not necessary.

3. It air pack (sensor) attaches with a part.



The tube root of an air pack is stopped on a tape to a part. The direction of the tube is considered for detaching tools.



Pasteboard is removed from a cover tape.



It has with both hands, a center is united, and it sticks and sticks from [of a leg] an axis, and it sticks so that pressure may not be



The circumference is pressed down



When strong pressure can be considered, a tube is also stopped on a whole surface tape.



An air pack is separated

4. It equips with a stocking and a bandage.



Depending on a twist, how to pull up, etc., since wearing influences measured value, it lessens a wearing error as much as possible. It devises putting a mark and a line into the point of measurement and a sample etc. However, in order

5. A relay tube is connected with an air pack.

エアパックのエアが完全に抜けた状態で接続、無圧や弱い圧では平のひらでエアを押し出す



Connection is firmly put to the back (some value comes out),

6. Air is put in (even red pulls a tap and he is detached with 0 ± 1 value).



A living body is red and a hard dummy is a black tap. It pulls until the red of a tap's axis is seen. A tap is detached when a value is set to 0 ± 1 .

<It is once to pull a tap>

When redoing, after once separating an air pack, pressing down the field of an air pack by hand and extracting air, it redoes from 5.
* If air has not fallen out completely, it will enter mostly and a high value will come out.

7. It reads in the place in which the value was stabilized.
... Air pack separation



With the material characteristic of posture change, a function, and tools etc., it may take time somewhat to numerical stability.

* Although continuation measurement cannot be performed for how many hours in this state, it once separates and change can be seen by re-connecting and measuring.

<Press examination>

Purpose: Breakage of the air pack which gets to know the maximum

1. It faces across the whole partial surface of the bag of an air pack with a press testing machine



2. A relay tube is connected with an air pack.



3. Air is put in (even red pulls a tap and he is detached with zero value).



The maximum measured value is displayed (it becomes this value all)

When the air pack is damaged, a value falls rapidly.

* A value falls with time, inserted into a press testing machine.

Connection and disposal of a tube

<Connection> Insert it until stops

<Separation> It pinches by a thumb and index, and it pulled away. Lock will slide and it will escape.

<Dispose of attrition and crack of joint>

Carrot About 5mm of tips is perpendicularly cut off by the d

Multipoint measurement: Multipoint measurement repeats operation of 5, 6, and 7 after air pack separation.
Timechange: The change after time progress once separates an air pack, and operates 5, 6, and 6.