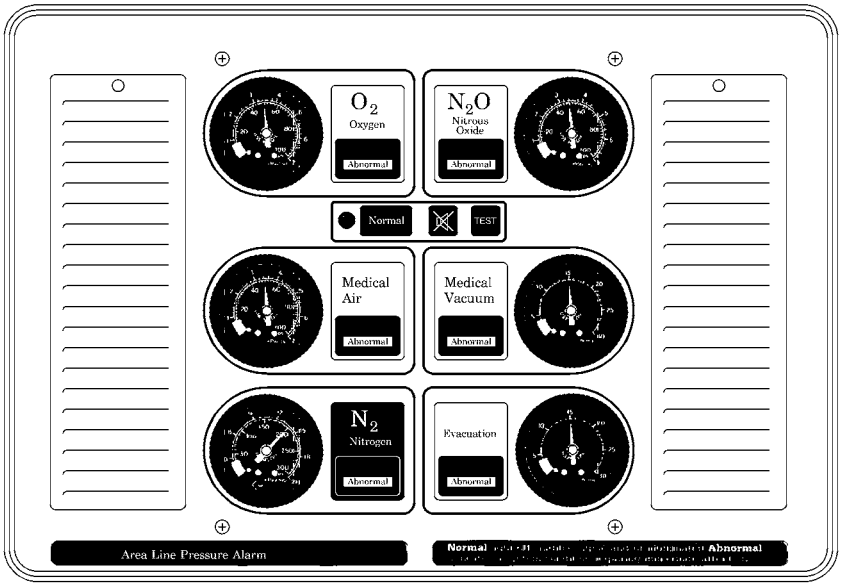
OPERATION & MAINTENANCE MANUAL

BEACONMEDÆS™

Area Line Pressure Alarm



Product No. 0321

For Parts or Technical Assistance **0178-1737-000 Rev. A**

Technical Support: 1-888-4MEDGAS (463-3427)
Customer Service: 1-888-4MEDGAS (463-3427)

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Cross Connection Prevention

After installation, perform a pipeline system check to certify that there are no cross connections, in accordance with National Fire Protection Association 99.

User Responsibility

This Product will perform in conformity with the description thereof contained in this operating manual and accompanying labels and/or inserts, when assembled, operated, maintained and repaired in accordance with the instructions provided. This Product must be checked periodically. A defective Product should not be used. Parts that are broken, missing, plainly worn, distorted or contaminated should be replaced immediately. Should such repair or replacement be come necessary, BeaconMedæs recommends that a telephonic or written request for service advice be made to BeaconMedæs. This Product or any of its parts should not be repaired other than in accordance with written instructions provided by BeaconMedæs and by BeaconMedæs trained personnel. The product must not be altered without the prior written approval of BeaconMedæs The user of this Product shall have the sole responsibility for any malfunction which results from improper use, faulty maintenance, improper repair, damage, or alteration by anyone other than BeaconMedæs.

PRECAUTIONS

Warnings

After installation of an alarm panel, make absolutely certain that the alarms are correctly connected to their respective gas lines in accordance with NFPA 99.

Do not use liquid cleaning solutions on this unit. Liquid solutions may enter the unit and cause system damage or present an electric shock hazard. See Page 5.

The “Testing the Switch Gauges” procedure requires a change of switch gauge trigger points during the test. Readjust the alarm trigger points after completing this procedure. See Page 6.

Caution

No repair should ever be under taken or attempted by anyone not having general experience in the repair of devices of this nature. See Page 5.

1/INTRODUCTION

This manual gives the recommended operating instructions for the BeaconMedæs Area Line Pressure Alarm Panel. Every procedure listed is performable by the operator of this equipment. For service information, refer to the BeaconMedæs Area Line Pressure Alarm Panel Service Manual.

Note: If line pressure should fall or rise to set alarm limits the gauge needle will interrupt current flow and cause an alarm condition.

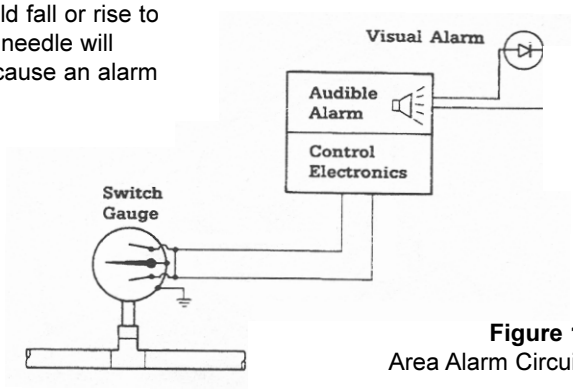


Figure 1
Area Alarm Circuit

2/GENERAL INFORMATION

2.1 Description

The area line pressure alarm panel is a wall mounted unit that monitors the gas pressure (or vacuum) in up to six separate lines and sounds an alarm if preset limits are violated (Figure 1).

One panel holds up to six gauges. Each gauge is labeled with a color-coded label for the gas it monitors. In the event of an alarm, a red indicator (labeled ABNORMAL) glows next to the gauge for the affected gas (Figure 2).

Each switch gauge is wired in a closed loop: if a wire breaks, or is disconnected from the circuit board or switch, the alarm panel sounds an alarm (Figure 3).

The panel has a test switch that exercises the electronics assembly. Remove the louvered panels to test the switch gauges. This means that the unit can be tested for functionality without major disassembly or special test equipment.

Use only approved service procedures and genuine replace ment parts for repairs. Complete service information and a list of available replacement parts are provided in the Service Manual.

2.2 Dry Contact Relays

The alarm panel contains seven dry contact relays for interface to remote equipment. The connection to these relays is made at the circuit board. One relay indicates normal conditions; the other six will indicate alarm conditions.

These relays can operate as normally open or normally closed switches depending on how the connections are made. Refer to the installation instructions or service manual for the wiring diagram.

2.3 Specifications

Gases Monitored: From one to six of the following gases can be monitored. O_2, N_2O, N_2, AIR, CO_2, VAC, EVAC.

Dimensions
Alarm Panel:
14 in. x 9 3/4 in.
(35.6cm x 24.6cm)

Enclosure (rough-in box):
12 5/8 in. x 8 3/8 in. x 3 5/8 in.
(32.5cm x 21.3cm x 9.5 cm)

Color Coding
Standard, USA color coded labels for all readouts.
Optional Canadian and ISO color coded labels available.

Power Requirements
Standard 120 V~, 60 Hz, 25 watts (max.)
Export Only 220 V~, 50 Hz, 25 watts (max.)

Note: The 120 V~ model is listed by Underwriters Laboratories. The 220 V~ model has not been investigated.

Leakage Current
Less than 100 uA

Circuit Type
Closed loop-alarm on ground contact or open circuit

Control Unit
Microprocessor-Motorola 6805 Series

Gauge Accuracy:

Gas	Indicating Gauge	Switch Gauge
Nominal 50 psi Medical Gases	±2 psi (25-75 psi) ±3 psi elsewhere	±2 psi (33-66 psi) ±3 psi elsewhere
Nominal 180 psi Gas	±6 psi (75-225 psi) ±9 psi elsewhere	±6 psi (100-200 psi) ±9 psi elsewhere
Vacuum Switch	±.6 in. Hg (7.5-22.5 in. Hg) ±.9 in. Hg elsewhere	±.6 in. Hg (10-20 in. Hg) ±.9 in. Hg elsewhere

Gauge Overpressure Limit

	Indicating Gauge	Switch Gauge
Oxygen	110 psig	150 psig
Nitrous Oxide	110 psig	150 psig
Air	110 psig	150 psig
Carbon Dioxide	110 psig	150 psig
Nitrogen	330 psig	400 psig
Vacuum	(Do not pressurize)	45 psig

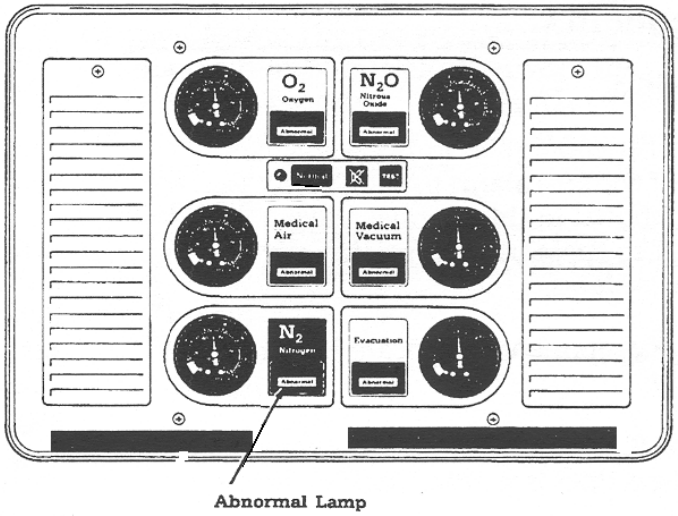
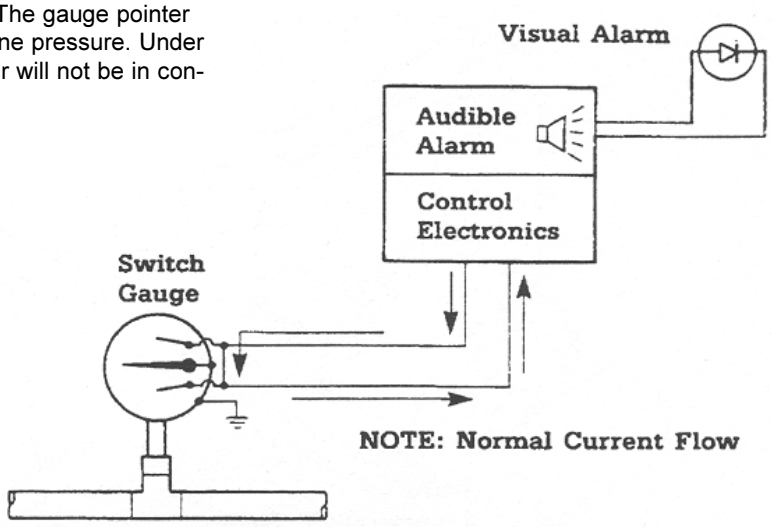
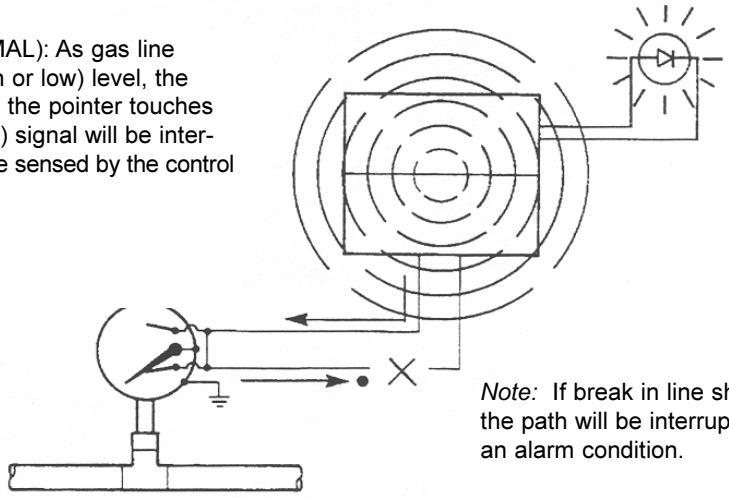


Figure 2
Six Gas Area Alarm Panel

Switch Gauge Operation (NORMAL): The gauge pointer moves in response to change in gas line pressure. Under normal pressure conditions, the pointer will not be in contact with the gauge alarm contacts.



Switch Gauge Operation (ABNORMAL): As gas line pressure goes to an abnormal (high or low) level, the pointer will move accordingly. Once the pointer touches one of the contacts, the normal (5V) signal will be interrupted and an alarm condition will be sensed by the control elements.



Note: If break in line should occur the path will be interrupted causing an alarm condition.

Figure 3
Closed Loop Configuration

2/SETUP AND OPERATION

3.1 Pre-Use Checkout

WARNING: After installation of an alarm panel, make absolutely certain that the alarms are correctly connected to their respective gas lines.

After the builder has installed the alarm panels, they must be tested for potential cross connections, in accordance with NFPA 99. Only qualified service personnel are capable of performing this test.

3.2 Controls and Indicators

(Figure 5)

Alarm Silence - Press this button to silence the alarm. The alarm remains silenced unless a new alarm condition occurs. If multiple abnormal conditions exist, the alarm will continue to sound until all have been corrected.

Test - Press this button to test the electronics of the panel. When this button is pressed, the NORMAL and all the ABNORMAL lights should glow. The alarm tone should sound.

Normal - This green light glows when all of the gas pressures and vacuum levels are within preset limits. It turns off when an abnormal pressure, vacuum level or system failure is detected.

Abnormal - When this indicator glows next to a pressure gauge, it means that the gas pressure or vacuum is outside the preset limits. An alarm tone also sounds whenever one of these lights comes on. Once the abnormal condition is rectified, the alarm automatically resets, unless other alarm conditions exist.

4/OPERATOR MAINTENANCE

4.1 Repair Policy

Note: Service, other than what is described in this manual, must be performed by a "Technically Competent" individual as described in the Service Manual for this product.

Do not use malfunctioning equipment. Make all necessary repairs, or have the equipment serviced by an Authorized BeaconMedæs Service Representative. After repair, test the equipment to ensure that it is functioning properly, in accordance with the manufacturer's published specifications .

To ensure full reliability, have all repairs and service done by an Authorized BeaconMedæs Service Representative. If this cannot be done, replacement and maintenance of those parts listed in this manual may be undertaken by a competent, trained individual having experience in the repair of devices of this nature.

CAUTION: No repair should ever be undertaken or attempted by anyone not having general experience in the repair of devices of this nature.

Replace damaged parts with components manufactured or sold by BeaconMedæs. Then test the unit to ascertain that it complies with the manufacturer's published specifications.

Contact BeaconMedæs Technical Support for service assistance. In all cases, other than where BeaconMedæs's warranty is applicable, repairs will be made at BeaconMedæs's current list price for the replacement part(s) plus a reasonable labor charge.

4.2 General Maintenance

The alarm panel is designed to provide extended service life with a minimum of maintenance. All of the indicators use light emitting diodes (LEDs). Once a month, test these indicators and the electronics by pressing the TEST switch (Figure 5). If the alarm tone does not sound, or if an indicator does not light up, have the panel repaired by a qualified service person. The indicator lights are not intended to be replaced by the operator. Once a year have a qualified service person verify the accuracy of the alarm trigger points.

Keep the panel clean by wiping it off with a soft, dry cloth. Do not scrub the panel with abrasive or liquid cleansers, or with liquid sterilizing agents.

WARNING: Do not use liquid cleaning solutions on this unit. Liquid solutions may enter the unit and cause system damage or present an electric shock hazard.

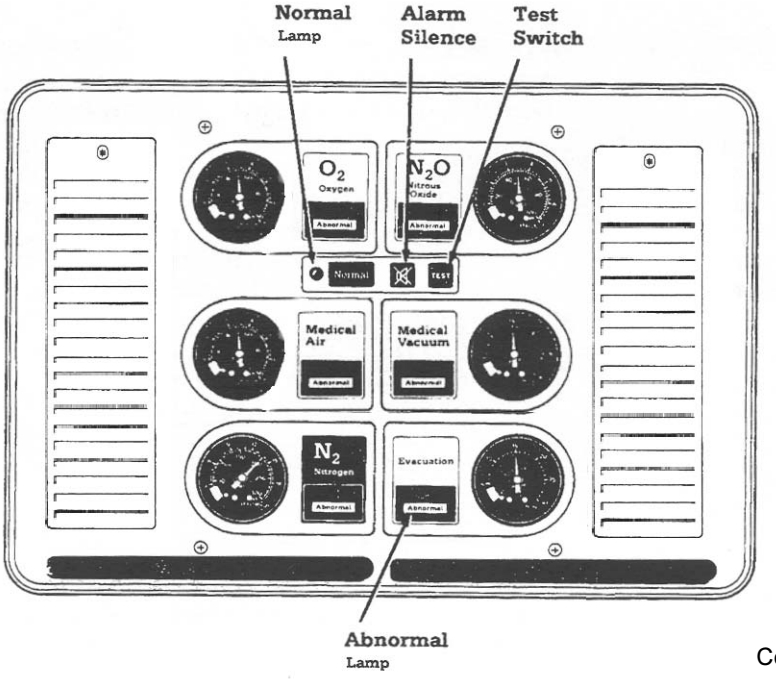


Figure 5
Controls and Indicators

4.3 Testing the Switch Gauges

Use the following procedure to test the switch gauge circuitry. See Figures 6 through 8.

WARNING: This procedure requires a change of pressure switch settings during the test. Readjust the alarm trigger points after completing this procedure.

Tools required:
- #2 Phillips screwdriver
- 1/16 hex wrench
- Transparent tape

1. Remove the left and right louvered panels by removing the Phillips head screws located at the top of each panel (Figure 6).

2. Verify that the readings indicated on each switch gauge and the associated line pressure gauge match to within:

   6 psig for the nominal 50 psi gases, 18 psig for the 180 psi gases and 2 inches Hg. for the vacuum system.

3. Place a suitable length of transparent tape across the face of each switch gauge. The tape should be long enough so that the ends of the tape clear the front panel (Figure 8).

4. Mark the exact location of the contact assembly's brass pins on the transparent tape (Figure 8B).

5. Using the 1/16 hex wrench individually turn each low (left side) contact so it just touches the gauge needle (Figure 8C).

6. The alarm must sound on contact. If no alarm sounds, the panel needs repair (Figure 8D).

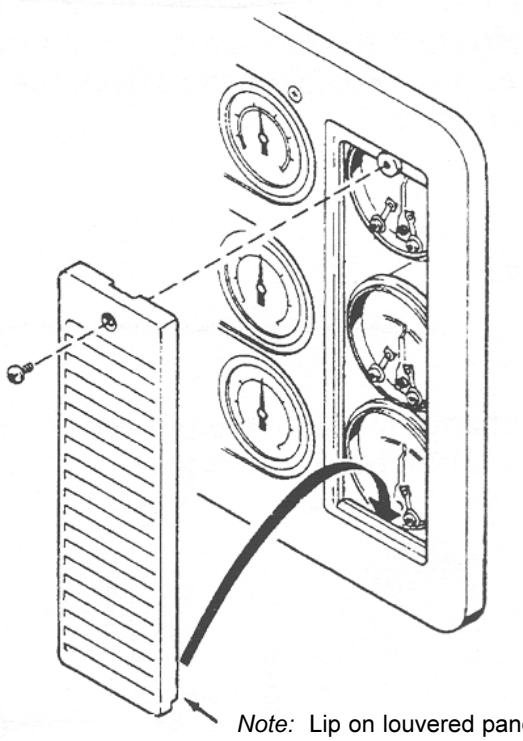
Note: If remote alarms or monitors are connected, these devices will be activated.

7. Return each contact assembly to its original position (mark placed on transparent tape. (Figure 8E).

8. Repeat steps 5 through 7 to test high (right side) pressure contacts.

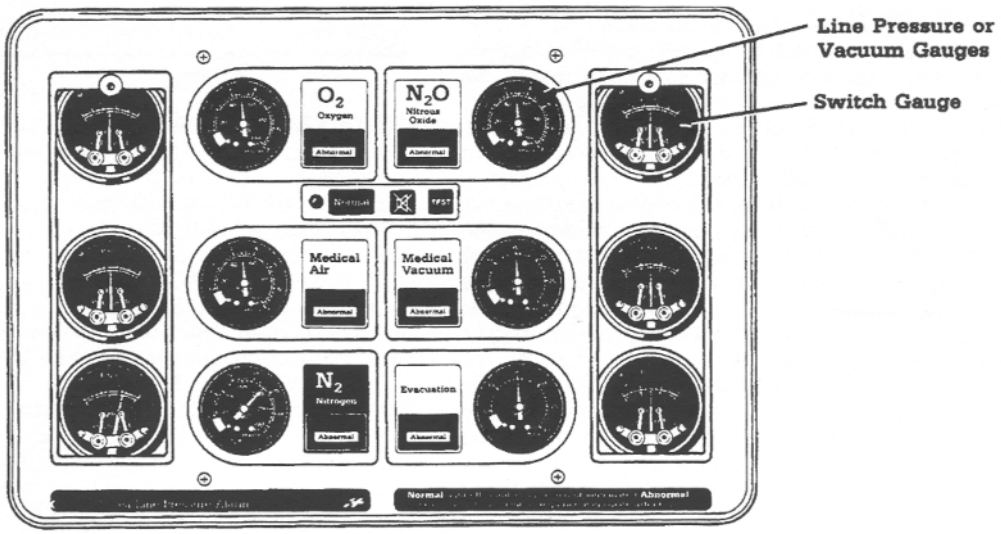
9. Remove tape and reattach the louvered access panels.

Note: This test only checks switch gauge electronics; it does not verify alarm trigger points. If the switch gauge trigger points require adjustment, refer to the section "Setting Alarm Trigger Points" in the Service Manual.



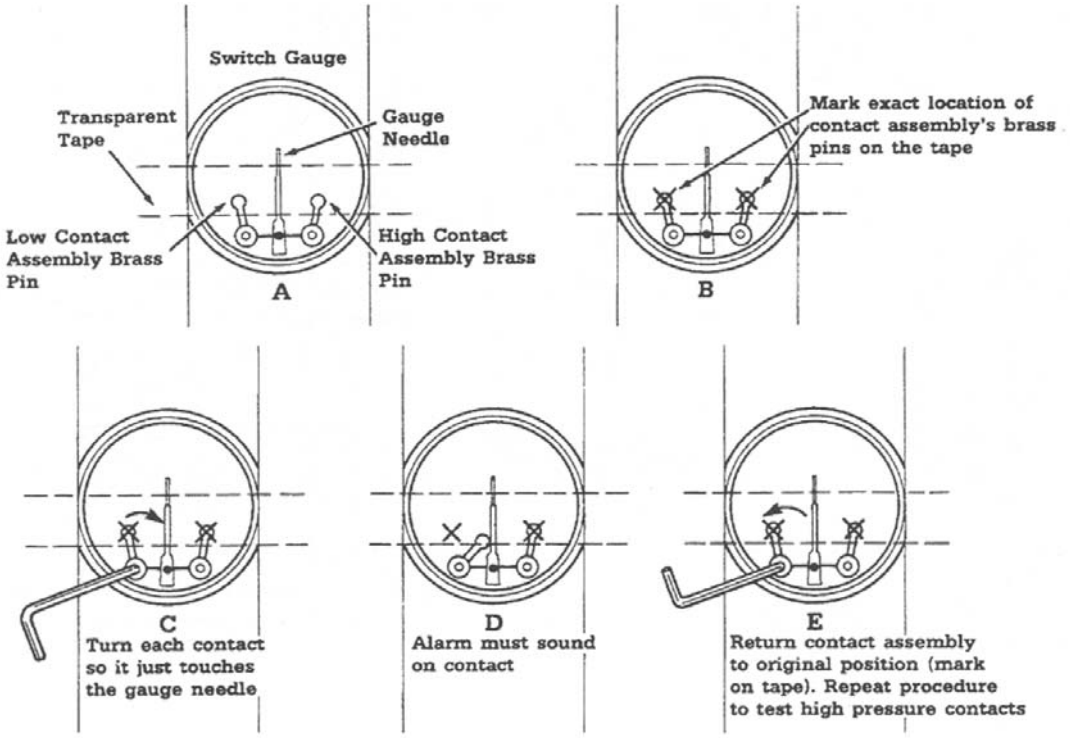
Note: Lip on louvered panel not shown. When replacing, make sure lip is properly positioned.

Figure 6
Louvered Panel Removal



Note: Each line pressure or vacuum gauge has a corresponding switch gauge.

Figure 7
Gauge Location



Note: For clarity, shorting bars are not shown.

Figure 8
Pressure Switch Testing

WARRANTY

BeaconMedæs warrants the Area Line Pressure Alarm to be free of defects in materials or workmanship when installed and operated in accordance with instructions. The warranty period is 30 months from shipment date or 24 months from startup, whichever period terminates earlier.

This warranty covers all necessary parts and labor required for correction of the defect whether by any or all of repair, replacement, or credit, which election shall be made by BeaconMedæs at it's sole discretion.

This warranty requires the owner to ensure that the equipment is 1) started up or placed in service by an authorized representative of BeaconMedæs, 2) certified in accordance with NFPA 99, most recent edition, by a properly qualified certification agency, and 3) maintained in strict accordance with Operation and Maintenance Instructions provided with the product.

Warranty claims will be honored only after examination by BeaconMedæs and only when such examination shall disclose to BeaconMedæs's reasonable satisfaction that such equipment has not been damaged in shipment or installation, improperly installed, operated outside of any published operating limits (including but not limited to temperature, pressure, humidity, or ventilation), improperly or inadequately maintained, field modified in any way, improperly repaired, or in any other way improperly applied or used.

All claims against this warranty require prompt notification, within the warranty period, of any seeming defect. Failure to promptly notify BeaconMedæs of the seeming defect will invalidate all warranties.

This warranty excludes damage or defect caused by shipping, acts of God, fire, war, labor difficulties, action of government, or other cause beyond the reasonable control of BeaconMedæs.

This warranty is given in lieu of all other warranties, expressed or implied, including implied warranties of fitness for a particular purpose and merchantability. In no event shall BeaconMedæs be liable for damages in excess of the value of the defective product, nor shall BeaconMedæs be liable for any direct, special or consequential damages, loss of profit of any kind, or for loss of use of the products.

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