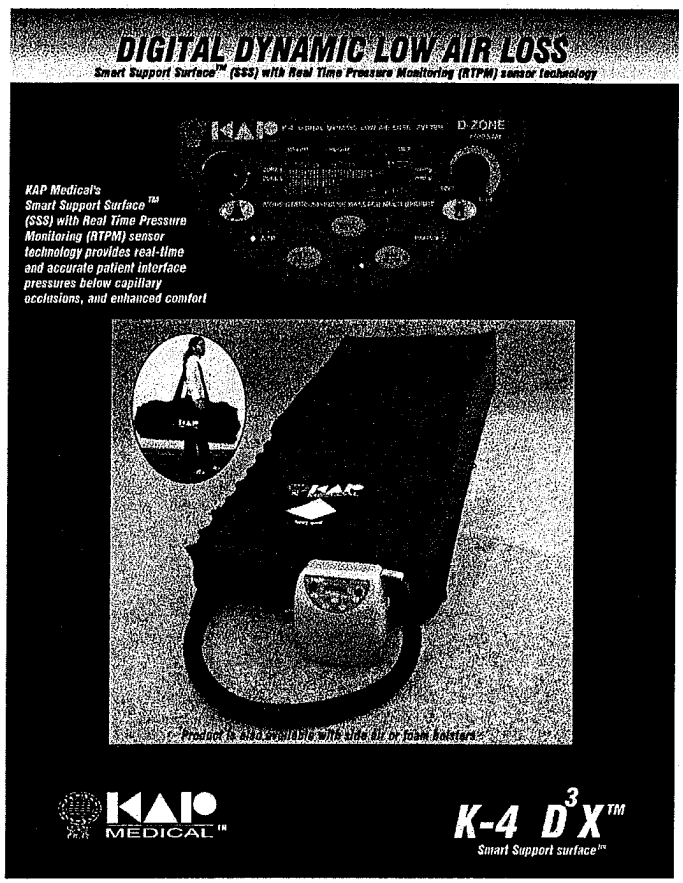
OPERATING INSTRUCTIONS



SMART SUPPORT SURFACE™ (SSS) Using Real Time Pressure Monitoring (RTPM) Sensor Technology

MODEL K-4

D3X™

Alternating Pressure with True Low Air Loss System

OPERATING INSTRUCTIONS MANUAL

ALL K-4 MODELS

GATEWAY TO THE FUTURE

KAP MEDICAL™

An FDA Registered Company, Products are FDA listed.

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USA **MADE IN USA**

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DANGER:

♦EXPLOSION HAZARD♦
DO NOT USE IN THE PRESENCE OF
FLAMMABLE ANESTHETICS

Caution:

- Do not use in the presence of smoking materials or open flame. Air flowing through air mattress will support combustion.
- Risk of electrical shock, do not remove control unit cover.
- Refer servicing to qualified service personnel.

Warning:

- Never drop or insert any object into any opening of the control unit.

MANUFACTURER'S LIABILITY

KAP MEDICAL will be liable for any effects on safety, reliability and performance of the K-4 DIGITAL DYNAMIC LOW AIR LOSS SYSTEM whenever changes, readjustments, or repairs have been carried out by a factory authorized service center or a technician of KAP MEDICAL, or whenever the control unit and mattress system has been used according to the following operating instructions.

KAP MEDICAL's liability under the warranty is the repair or replacement provided and, in no event, shall KAP MEDICAL's liability exceed the purchase

price paid by the customer of the product. Under no circumstances shall KAP MEDICAL be liable for any loss, direct, indirect, incidental, or special damage arising out of or in connection with the use of this product.

EXPLATION OF SYMBOLS USED ON THIS DEVICE

SYMBOL	EXPLANATION
WEIGHT, HEIGHT, TIME, ZONE 1, ZONE 2, mmHg	The digital display will display the following: Weight & Height: Patient weight and height settings, Zone 1 & Zone 2: Current zone pressures displayed in mmHg. Also displays current mode function and patient comfort pressure levels. Below the time: It displays the count down time (time remaining for max flow or A/P mode).
Comfort Knob	Used to set patient comfort pressure levels between (3 and 31 mmHg.
SOFT - FIRM	Soft 1: lowest pressure setting (6 ± 3 mmHg), Firm: Highest pressure setting (31 ± 2 mmHg)
"+" "-" Knob	Used to set weight, height, and various mode parameters
Stand By	Control unit Off, with orange led lit indicating the unit still has power internally
MAX FLOW	Max flow for rapid inflation of mattress.

MASSAGE	Massage mode to obtain rapid alternating pressure changes in both zones.
DYNAMIC (A/P) Alternating Pressure	A/P mode to obtain low and high (A/P) pressure in every other air cell of the mattress. High/low Pressure can be set.
A/P TIME	Turn "+/-" knob to set A/P time (1 to 99 minutes) to choose desired A/P time.
Alarm Silence	Alarm silence mode to activate or deactivate buzzer.
POWER FAIL	Light flashes along with the buzzer noise in the event of power outage.
CPR LABEL / Disconnect Connectors	CPR label on the unit: Before administering CPR to the patient disconnect mattress hose from the control unit.
LOCK	Press and hold lock key until it beeps and the light is on, this locks out all control unit function keys including power.
PATIENT SET-UP	Enter patient weight and height, the control unit will automatically set the patient comfort pressure level.
MODE	Mode key will set the desired theraputic function, such as: Pulse, Massage, Multi, and upright / auto upright. Multi: combination of the above therapy. Auto Upright: Automatically detects patient fowler position and boosts pressures to keep the patient from bottoming out .

	Indicates the point of attachment of the equipment to earth (Grounding Point)
	Attention: Instructs end user / care giver / operator to refer to the manual
	Indicates that the degree of protection against electrical shock is TYPE BF
	Not for use in presence of flammable anesthetics
	Risk of electrical shock, do not remove back.

K-4SYSTEM (Figure - 1 Page 13) :

The K-4(D-ZONE) System is a digitally controlled dynamic (alternating) low air loss system used to provide pressure reduction. It consists of a control unit (A) which is used to inflate a mattress replacement system (B). The control unit is designed to provide continuos static or alternating pressure at required patient comfort levels. The ABS/PVC blend enclosure houses a high output air blower (40 CFM), an alternating pressure valve, a bright back lit digital display and a microcontroller which controls all of the above components, and provides desired patient comfort pressure levels.

The mattress replacement system (B) is comprised of a magnetic quick coupling hose assembly (V), a durable cordura base (C) with a "2" safety convoluted foam base, 8" (inflated) air cushions (T) with holes and covered with a vapor permeable, water proof, low friction and

low shear nylon quilted top sheet (E) with zipper or straps to fasten the top sheet to the mattress base. The complete mattress system has 10 straps (F) in several areas so it can be easily fastened to any size hospital bed.

K-4 DIGITAL DYNAMIC LOW AIR LOSS SYSTEM FEATURES

CONTROL UNIT (A) {Figure -2 Page 14} :

- High flow (40 CFM) air output and quiet operating control unit, Max flow mode (W) inflates mattress in 10 ~ 20 seconds depending on the size of the mattress. Has 15 minute Max Flow timer.
- State of the art microcontroller technology unit for accurate patient comfort pressure values and dynamic times.
- Highly visible and bright back lit 4x20 character LCD digital display panel (G) displaying current mode (H), A/P time, count down timer (I), and desired patient comfort pressure level (Z).
- Ergonomically designed and easy to operate attractive patient comfort control (K) and mode parameter setting (L) knobs, to set mode parameters and comfort levels. The knobs retract into the display panel cavity to avoid tampering and also to protect the knobs from damaging.
- 3~31 mmHg pressure levels of patient comfort control with bar graph (Z) display.
- Static (non alternating) mode.
- Dynamic (A/P, alternating) mode (M) with 1 to 99 minutes adjustable alternating pressure

times. The high and low A/P pressures can be individually set.

- Alarm Silence mode (AS) to mute audio chime.
- Integrated handle/hanger (P) for easy carrying and hanging the control unit from the foot board of the bed.
- 14' long detachable 16 AWG hospital grade power cord (Q).
- Durable, attractive and rugged 1/2" flow magnetic (R) connector for quick connection and disconnection (CPR deflation).
- Control unit has a short circuit / over voltage protection with dual fused IEC connector (S).

SUPPORT SURFACE MATTRESS (B) {Figure - 1 Page 13} :

- Self contained 5 pressure zone mattress replacement system (B) with easily detachable components for cleaning. Head section does not alternate.
- Detachable urethane coated, nylon taffeta, flame retardant / water repellent, mildew resistant, low friction and low shear. 8" high (inflated) lateral tubular 20~21 air cushions (T) with holes for low air loss.
- Detachable zippered or strapped highly breathable urethane coated, 70 Denier nylon, flame retardant / water repellent, highly vapor permeable, anti-microbial, low friction and low shear quilted reusable top sheet (E).
- 2" convoluted safety foam enclosed in the base (C) to support the patient in the event of loss of air pressure in the mattress.
- The mattress has a magnetic connector hose assembly (V) with easy to use quick connect and disconnect connector (R).

TECHNICAL SPECIFICATIONS

ELECTRICAL SPECIFICATIONS

(Auto Switch Universal Power Input)

Input Voltage AC:	88 ~ 132 / 176 ~ 264V
Input Frequency:	47 ~ 63 Hz
Current:	2A
Power Consumption:	220 W
Circuit Protection:	Dual Fused
(Fast Acting Fuse):	250V, 5A
Mode Of Operation:	Continuous

PERFORMANCE SPECIFICATIONS

Max Flow:	40 CFM
Max Flow Pressure:	35 ± 4 mmHg
Max Flow Timer:	15 minutes
Support Surface Inflation Time:	<1 minute

Patient Comfort Control Pressures

Min Pressure:	6 ± 4 mmHg
Max Pressure:	35 ± 6 mmHg
A/P Time:	1 to 99 Min

MECHANICAL SPECIFICATIONS

Control Unit (A)

Dimensions, LxWxH:	12" x 5 3/4" x 10.5" (29.54cm x 14 x 27cm)
Weight:	14 lbs. (6 Kgs)
Power Cord:	14' Long detachable 16 AWG Hospital Grade
Connection:	1/2" flow quick disconnect magnetic connector
Packaging:	1 Piece per Box

Support Surface (B)

Description	Inflated Dimensions LxWxH	Weight
Various Sizes and custom sizes available, 36", 39", 42", 48", 54", 60", 76" wide mattress.		
Mattress:	80"x36"x10" (203x89x25.5cm)	24 lbs. 11 Kgs.

ENVIRONMENTAL SPECIFICATIONS

Operating Conditions:

Ambient Temperature:	40° ~ 104° F 10° ~ 40° C
Relative Humidity:	30% ~ 75% Non-Condensing
Atmospheric Pressure:	700 hPa to 1060 hPa

Storage And Shipping Conditions:

Ambient Temperature:	-40° ~ 158° F -40° ~ 70° C
Relative Humidity:	10% ~ 100%
Atmospheric Pressure:	500 hPa to 1060 hPa

Protection Against Harmful Ingress Of Liquids:
Ordinary Protection (IPXO)

SAFETY AGENCY APPROVALS

ETL Listed:

To standard for safety of Medical Electrical Equipment

Conforms To: UL STD 2601-1 with respect to Electrical Shock, Fire and Mechanical Hazards

Certified To: CAN/CSA STD C22.2 No. 601.1

CE Mark: CE

SAFETY INSTRUCTIONS

- To avoid damaging your K-4 control unit (A), before operating be sure the AC power (X) available at your location matches the power requirements printed on the boiler plate label on the back of the control unit.

- To avoid electric shock, always plug in the power cord of the control unit into a properly grounded power source (X).

- Do not insert items into any openings of the control unit (A). Doing so may cause fire or electrical shock by shorting internal components.

- Do not spill liquids or food on or into the control unit (A). In the event of any spillage, immediately turn off the control unit and disconnect it form the power source (X). Send the control unit for servicing by a factory authorized service technician.

- Care should be taken such that the inlet air vent of the control unit (A) is not blocked, and kept away from any heat sources or radiators during the operation of the unit.

- Care should be taken such that the power cord (Q) of the control unit is not pinched or any objects placed on the power cord, and also ensure it is not located where it can be stepped on or tripped over.
- Do not attempt to service the control unit except as explained in this operating instructions manual, contact factory for servicing instructions. Always follow operating and service instructions closely.

♦ <u>WARNING:</u> Before opening the control unit (A) enclosure, make sure the control unit is turned off and unplugged from its power source (X). The control unit enclosure should only be opened by a factory authorized qualified service technical personnel. ♦

SYSTEM SET-UP

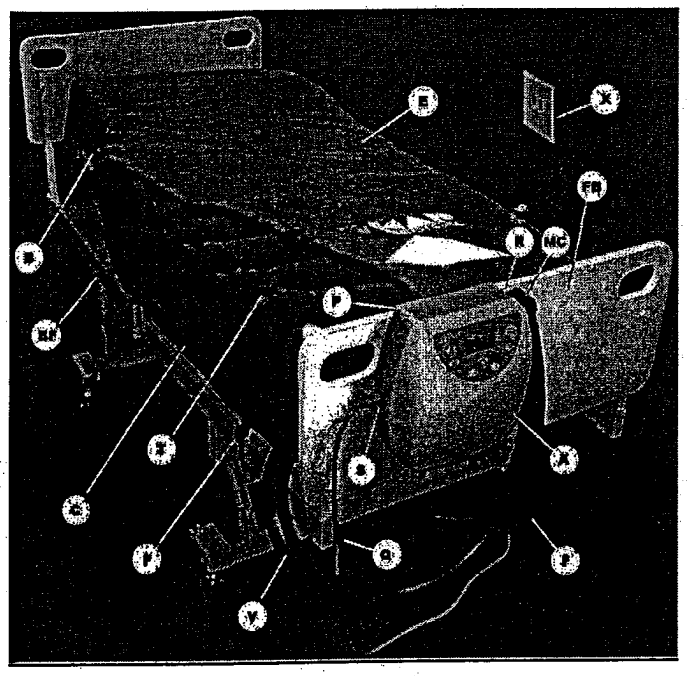

Figure - 1

PLEASE NOTE:

The K-4 A/P LAL SYSTEM should always be used on beds that are equipped with standard hospital side rails.

Please raise all 4 side rails on the bed and lock them in position after the patient is on the mattress.

CONTROL UNIT SET-UP

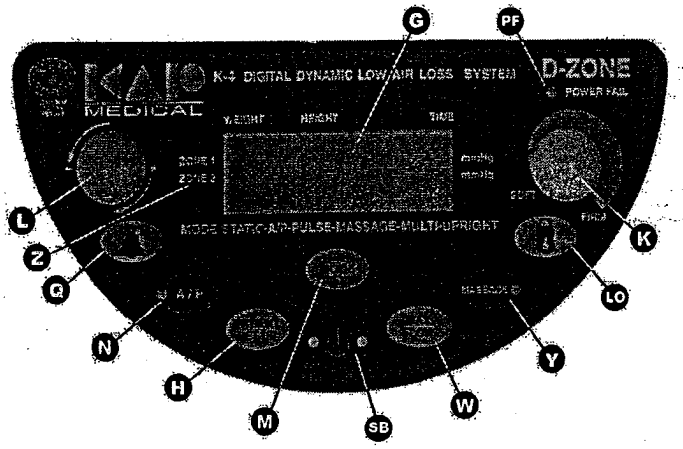

Figure - 2

Refer To The Diagram On Page 13

1. Before using the K-4 DIGITAL DYNAMIC LOW AIR LOSS Mattress Replacement System, remove any non K-4 mattress replacement system from the bed frame (BF).

2. Unroll the K-4 mattress (B) and place it on the bed frame (BF). Note: Make sure hose end of the mattress is towards the foot of the bed.

3. There are ten nylon black straps with buckles (F), two strap at the head of the mattress, two on the foot of the mattress, and three on the each side of the mattress. Loop each strap around the bed frame and fasten it securely to the bed frame using the buckle.

4. Pull the hanger (P) on the back of the control unit (A) and suspend the control unit from the foot board (FB) of the bed frame (BF). If the bed frame you are using does not have a foot board, place the control unit (A) on its feet on a flat surface underneath the bed near the foot of the bed frame (BF). Note: Care should be taken such that the air inlet vent or (air filter) on the control unit is not covered, and the control unit is not placed on the floor in such a manner that it is a hazard for flow of traffic.

5. Press On/Std. By switch (SB) to "Stand By" (Off) position. Uncoil the power cord (Q) and plug the cord into the appropriate AC power source (X) which is properly grounded. The unit will go through the system initialization routine and once it is complete

the display will read stand by and the orange stand by led lights up. Note: Care should be taken such that the power cord (Q) of the control unit is not pinched or any objects placed on the power cord, and also ensure it is not located where it can be stepped on or tripped over.

6. Connect the matting hose connector (MC) on the mattress hose assembly (V) into the magnetic connector (R) located on the top right side of the control unit (A) respectively and lock them in place. Note: Press mating connectors in place until the connectors are flat. Also care should taken such that the mattress hose is freely suspended with out being pinched or kinked.

OPERATING INSTRUCTIONS

Refer To The Diagram On Page 13

1. Make sure the mattress hose assembly (V) is connected securely to the control unit (A).

INITIAL POWER UP

2. During initial power up (when power cord (Q) is plugged into the power source), the control unit (A) will display "KAP MEDICAL D-ZONE ALTERNATING LOW AIR LOSS SYSTEM" for a brief moment and then displays "LIFETIME OPERATION, HOURS AND MINUTES" and go through a system initialization routine for few seconds. Once the routine is complete the display (G) will

display "KAP MEDICAL STAND BY" on the digital display.

3. If the unit is in stand by mode (SB) the display will read "KAP MEDICAL STAND BY", once the power switch (SB) is turned on and then press MAX FLOW mode (W) the blower will come on full blast.

4. If the power comes on after a power outage, the control unit will go through it system initialization routine for few seconds, and then display the current mode function and the current comfort control level. The control unit will resume the desired function.

MAX FLOW (W)

5. This mode is used to rapidly inflate the mattress. During this mode a series of beeps will sound every 3 minutes as a reminder that MAX FLOW mode has been activated. MAX FLOW mode will be activated for 15 minutes. After 15 minutes the unit will resume the previously set mode and display the current settings. During the MAX FLOW mode the mattress will not exceed more than 35 ± 5 mmHg pressure. Note: The audible beep can be muted if desired by activating alarm silence mode.

6. The mattress (B) will inflate to its normal size in 10 ≈ 20 seconds. (Inflation time depends on the size of the mattress). Note:

7. To set MAX FLOW mode (W) gently press the switch until the green LED lights up. The

display will read "MAX FLOW" and the count down time (I) " I 5.00" on the top and the comfort control level (T) bar graph will be displayed to full scale on the bottom row with 35 mmHg.

MODE (M)

STATIC

8. To set STATIC mode gently press A/P switch (N) the green LED turns off. The display will read "STATIC" time will be "NONE" and the comfort control level bar graph will display the desired patient comfort pressure level on the bottom.

9. In the STATIC mode all the air cushions in the mattress will be maintain at a constant desired patient comfort pressure.

DYNAMIC (A/P) (N) Alternating Pressure

I O. To set DYNAMIC (ALTERNATING) mode (N) gently press the A/P switch (N) the green LED lights up. The display will read DYNAMIC (A/P) time will be " I .OO" on the bottom row and the comfort control level bar graph will display the desired patient comfort pressure level will be displayed in mmHg. The DYNAMIC (A/P) time can be set by turning the knob (L) to a desired time Min I minute and Max 99 minutes, the corresponding A/P time will be displayed below on the display panel. Using the comfort control knob (K) set the patient comfort level in mmHg and using mode parameter knob (L) set the low A/P pressure

level, (Low A/P pressure level can be set from 10% to 75% of the high A/P pressure level which is the patient comfort level setting. For example: If the patient comfort level setting is 30 mmHg and the low A/P level is set to 10%, the low A/P pressure value will be set to 3 mmHg).

11. In the DYNAMIC (A/P) mode the odd air cushion in the mattress will be maintain at a constant desired patient comfort pressure, and the even air cushions will deflate to the set low A/P pressure value, and visa versa for the second half of the cycle and continue back and forth.

Alarm Silence (AS)

12. During "MAX FLOW" mode the unit will beep twice every 3 minutes to indicate the caregiver that the unit is in "MAX FLOW" mode, and also in the event of the control unit sensing an abnormal condition, such as low pressure or power outage an audio visual signal will be activated to alert the care giver. If desired the care giver can mute the audible signal by activating the Alarm Silence mode (AS) to keep the patient from being disturbed.

13. To set Alarm Silence (AS) press the "Alarm Silence" key until the blue LED lights up.

14. To deactivate the "Alarm Silence" press "Alarm Silence" key until the blue LED turn off.

Lock Out (LO)

15. During "Lock Out" mode all the control unit functions and keys including the power key will be locked out to avoid tampering of the patient settings.

16. To activate lock out (LO) press and hold "Lock Out" key until the blue LED lights up.

17. To deactivate "Lock Out" press and hold "Lock Out" key until the blue LED turn off.

PATIENT COMFORT CONTROL LEVEL (Z)

18. The K-4 standard mattress is designed for patients weighting between 50 ≈ 350 lbs. (22 Kgs. ≈ 160 Kgs.). By turning the comfort control knob (K) towards the SOFT position reduces the pressure setting, and by turning the knob towards the FIRM position increases the pressure. The patient comfort pressure ranges from SOFT 6 ± 4 mmHg to FIRM 32 ± 6 mmHg, The mattress inflation and deflection pressure is monitored by the microprocessor and processor depending on the desired patient comfort level increases or decrease the speed of the air pump to provide the appropriate air low into the mattress to maintain the desired pressure in the mattress.

19. Once the mattress is inflated to its normal size with the patient lying on it, set the COMFORT CONTROL LEVEL knob to the desired patient comfort position. Custom patient comfort level can be achieved by

adjusting the comfort control level knob to softer or firmer settings. Wait few minutes for the mattress pressure to stabilize, verify the appropriate pressure required to support the patient by performing a simple "four finger check". Make sure that the patient is lying flat on his or her back in the middle of the mattress. Place four fingers of your hand directly underneath the sacral region of the patients body, there should be a minimum of 3 to 4 finger width clearance between the bottom of the patient and the safety foam base. Repeat this procedure until the desired patient comfort pressure is achieved.

Note: The K-4 mattress system is a five pressure zone system. Head, Back, Torso, Leg and Foot, each zone has different pressure to conform to the anatomy of the human body. Also Head section (two air cushions) does not alternate.

RECOMMENDED PRESSURE SETTINGS

20. For rapid inflation of the mattress press "Max Flow" key until "Max Flow" green LED turns on.

21. For extra firm support during Patient ingress / egress, or Patient wound care, or Patient turning, or Patient cleaning it is recommended to set the comfort control knob to max comfort control settings.

22. During patient Upright (fowler) positioning (Automatic Upright is available) or in case of Patients who's weight to height ratio is below

the normal average, it is recommended to set the comfort control knob to 10% more than their actual weight settings.

PATIENT SET-UP (H)

1. Press patient set-up key to enter the menu using the knob (L) please enter the patient weight and press mode to accept value, using the knob (L) dial in the patient height and press mode to accept value, press mode again to activate auto pressure profile mode. In this mode the microcontroller will automatically set the patient comfort level for the weight and height dialed in.

2. This mode can be overridden by simply turning the comfort knob (K) to the custom patient pressure comfort level.

MASSAGE (Y)

1. Press massage key, the unit will rapidly change pressure in every other air cushion of the mattress. (high pressure in odd cells and low pressure in even cells and visa versa).

MODE (M)

A. PULSE:

Press pulse mode and set desired pulse time using knob (L). For every set time the pressures in 5 zones of the mattress will be lowered to 50% of the comfort level set, for few seconds and back to set

pressures. Will repeat for every set pulse time.

B. MULTI:

If 10 min. multi mode is selected the unit will perform 10 min. each of static, A/P, Pulse, and massage therapies, and repeat the cycle over and over.

C. MASSAGE:

Same as massage on page 22.

D. UPRIGHT / AUTO UPRIGHT:

1. This mode is selected during the patient is in fowler position (when the bed frame is articulated to fowler position). In upright mode the unit will maintain 31 ± 4 mmHg in the Torso section of the mattress in order to float the patient without the patient being bottomed.

2. Optional auto fowler mode is available. When the head section of the bed frame is articulated the unit will automatically go into fowler mode without the caregiver's or the patient's assistance.

MECHANICAL LOCKOUT

1. The control unit settings can be protected from being tamped temporally by pressing the knobs until they retract into the display cavity

and stay in flush with the display. To deactivate the tampering function gently press the knobs once the knobs will extend slowly out of the display cavity.

FAILURE MODES

LOW PRESSUE ALARM

2. In the event of the control unit sensing an abnormal condition, such as low pressure (mattress hose disconnection) the microprocessor will activate an audio visual signal to alert the care giver by flashing "LOW PRESSURE" on the display and turning on the buzzer. Once the failure mode is corrected the audio visual signal will cease and unit starts operating its set mode.

POWER FAIL (PF)

3. In the event of the control unit sensing an abnormal condition, such as power outage the microprocessor will activate an audio visual signal to alert the care giver by flashing the orange "POWER FAIL" LED and turning on the buzzer. The display goes blank during this failure mode. Once the failure mode is corrected the audio visual signal will cease and unit starts operating its set mode.

CPR FUNCTION

Refer To The Diagram On Page 13 & 14

NOTE : The mattress should be deflated before performing CPR on the patient.

1. To deflate the mattress or for CPR function, disconnect the mattress hose assembly (V) from the control unit magnetic connector (R) by pulling the mattress connector (MC) straight out from the control unit magnetic connector (R).

2. In Case of CPR emergency, for quick deflation of the mattress use a pair of scissors or knife to cut the hoses on the mattress. Also unzip the top sheet from the foot to the head by pulling the zipper located at the patient right foot corner near the exit location of the hose assembly. Disconnect few air cushions which are directly below the patient chest from the mattress by pressing the quick release button on the connector in one hand and pulling the air cushion connector in the other hand.

CLEANING PROCEDURE

WARNING

CONTROL UNIT

- Before attempting to clean the U.S., or the International control unit, turn off the unit and disconnect the control unit power cord from the power source. ♦
- ♦ DO NOT HEAT, STEAM AUTOCLAVE, OR IMMERSE THE CONTROL UNIT IN LIQUIDS ♦

1. Ware eye goggles and rubber gloves before staring the cleaning procedure.

2. The following germicidal detergent / disinfectant is recommended by the EPA as hospital disinfectants.
   a. Hi-Tor Germicidal Detergent
      By Huntington Laboratories, Inc.
      Indiana
      EPA # 303-91

Note: A fresh spray bottle of disinfectant / detergent solution should be prepared every day to clean the control unit.

3. By following the preparation instructions provided with the germicidal detergent /disinfectant solution, prepare the required amount of disinfectant solution or mild detergent solution.

4. Pour required amount of the germicidal solution into a spray bottle.

5. Using a brush or a cloth wipe off dust. If necessary, spray the exterior of the top and the bottom enclosures, power cord and the cord plug with the prepared disinfectant / detergent solution. Using a damp cloth wipe down the sprayed surface cleanly. Note: Do not spray excess amount of solution on the control unit.

6. Once the control unit is clean, wipe the unit, the power cord and the cord plug down dry with a clean dry cloth.

7. Place the control unit to dry in a cool and dry area for an hour before operating the unit again. If the control unit is not used

immediately place the control unit in a plastic bag and store it in a storage area.

8. After the cleaning operations are completed remove and dispose the rubber gloves appropriately. Wash your hands thoroughly with antibacterial soap.

MATTRESS

9. Ware eye goggles and rubber gloves before staring the cleaning procedure.

10. Follow steps 2 through 4 above to prepare disinfectant solution.

11. Using damp cloth wipe down the air cushions and the mattress base. Once the air cushions and the base is clean, wipe them down dry with a clean dry cloth.

12. Air cushions should washed periodically, top sheet will require more frequent washing. Set wash cycle to Heavy load and warm water. Once the water is full add manufacturer suggested quantity of laundry detergent and/ or standard hospital disinfectants. If the air cushions or the top sheet becomes soiled with human waste, or blood clean immediately by wiping down. Use hospital recommended laundry detergent and/ or disinfectant per manufacturer's instructions. Note: Use non-chlorine bleach detergent.

13. Once the washing cycle is complete, make sure excess water from inside the air cushions is completely removed. Set the dryer to

lowest heat settings, and operate the dryer until the air cushions or the top sheets are completely dry.

14. Leave the mattress to dry in a cool and dry area for an hour before using. If the mattress is not used immediately roll the mattress and insert it into a plastic bag and store it in a storage area.

15. After the cleaning operations are completed remove and dispose the rubber gloves appropriately. Wash your hands thoroughly with antibacterial soap.

CARE AND STORAGE

1. When control unit is not in use, turn off the unit, disconnect the power cord from the power source and wrap the cord around the control unit. Wrap the control unit and the power cord in a plastic bag and cable tie it so that dust cannot enter the bag.

2. Roll the mattress and place it in a plastic bag and tie wrap the bag.

3. Store the control unit and the mattress in a storage area designated to medical electronic product storage.

TROUBLESHOOTING GUIDE

THE FOLLOWING INFORMATION IS FOR FACTORY AUTHORIZED SERVICE FACILITIES

AND FACTORY QULAFIED SERVICE PERSONNELL ONLY

KAP MEDICAL will make available on request service manual, circuit diagrams, component lists, calibration instructions, quality control acceptance test procedures, or other information which will assist the factory qualified technical personnel to repair those items deemed repairable by the manufacturer.

PROBLEM	CAUSE	SOLUTION
A. Mattress Not Inflating / Not Alternating Properly	1. Mattress hose disconnected	1. Connect hose connectors and lock them in place
	2. Air hose kinked or split	2. Unkink hose or replace split hose
	3. Major leak in the air cushions or overlay pad	3. Replace leaking air cushions or overlay pad
	4. kinked or split manifold	4. Unkink manifold or replace split manifold
	5. Control unit not working	5. Send control unit back to factory for

	6. Valve malfunction	repair 6. Send control unit back to factory for repair
B. No Power	1. Control Unit OFF 2. Power cord disconnected 3. No power in the power source 4. Power outage 5. Blown fuse	1. Check power source and turn on unit 2. Connect power cord to the power source 3. Check power source has power and turn it "ON" 4. Wait till the power source has power 5. Replace blow fuse with an equivalent fuse

PREVENTIVE MAINTENANCE

It is important to periodically test the K-4 DYNAMIC LOW AIR LOSS SYSTEM to verify the

proper functionality. If the control unit air pressure reading is out of specification, it can result in poor or reduced patient support.

PLEASE CLEAN FILTER EVERY 3 MONTHS. Remove 2 filter screws and separate filter foam. Wash filter foam using soap and water, dry and replace filter back on the unit and fasten screws.

NOTE: All preventive maintenance service, performance and electrical tests, or repairs should be performed only by factory authorized and qualified technical personnel.

Preventive Maintenance Schedule

The following tests should be performed every 6 to 9 months and data should be recorded, a history record on each unit should be maintained.

1. Electrical Tests

   The following or similar Hi-pot Tester and Electrical Current Leakage Analyzer should be used to perform electrical tests.

   a. ROD-L Hi-pot Tester (120 / 240 Models)
   b. Bio-Tek Analyzer, (120V AC Models)
   c. Bio-Tek Analyzer, (220 / 240V AC Models)

   To perform the leakage current test on the unit please follow the manufacturer's or factory authorized test instructions for setting-up and performing the electrical tests.

Caution: Risk of electric shock, proper precautionary measures should be taken while performing electrical tests.

A. Hi-pot Test

If no alarm sounds, or no red "fail" light appears, the test is complete in about 60 seconds. The control unit passes Hi-pot test.

B. Leakage Current Test

Switch function switch to leakage current position and test the following power configurations.

Polarity Switch	Ground Switch
1. Normal Polarity	Closed Ground
2. Reverse Polarity	Closed Ground
3. Reverse Polarity	Open Ground
4. Normal Polarity	Open ground

120 V Models
PASS ≤ 100 μA
FAIL > 100 μA

220 / 240 Models
PASS ≤ 500 μA
FAIL > 500 μA

C. Ground Impedance Test

Switch the polarity switch to "OFF" and function switch to ground wire resistance position.

120V and 220 / 240V Models

PASS ≤ .1 Ω

FAIL > .1 Ω

2. Performance Tests

The following Flow and Pressure gauges should be used to perform functional tests.

a. Flow gauge, 0 ~ 50 CFM
b. Pressure gauge, 0 ~ 50 mmHg
c. Quick disconnect dual hose assembly

To perform the functional tests on the control unit please follow the factory authorized test instructions for setting-up and performing the functional tests.

A. Flow Test

Connect the dual hose connector to the control unit and the flow gauge. Turn on the unit and set the comfort control knob to max weight position, record flow reading.

PASS ≥ 30 CFM

B. Pressure Test

Connect the dual hose connector to the control unit and the pressure gauge. Turn on the unit and set the comfort control knob to Soft / Firm position, record reading. Set mode knob to Max Flow position and record data.

Note: Since the test is performed with out the mattress connected to the control unit, the minimum pressure in one of the air out let ports will be zero.

120 and 220 /240 V AC Models

Soft Position
PASS - 4 ~ 12 mmHg

Firm Position
PASS - 26 ~ 36 mmHg

Max Flow Position
PASS - 28 ~ 38 mmHg

C. Alternating Pressure Test

Connect the dual hose connector to the control unit and the pressure gauge. Turn on the unit and set the comfort control knob to Soft / Firm weight position, and the mode knob to Dynamic position and record alternating air pressure value in both zones.

120 and 220 / 240 V AC Models

Soft Position
Zone-1: PASS - 4 ~ 10 mmHg
Zone-2: PASS - 0 ~ 8 mmHg

Firm Position
Zone-1: PASS - 26 ~ 36 mmHg
Zone-2: PASS - 0 ~27 mmHg

ACCESSORIES

K-4MS : K-4 Control Unit & Mattress System
K-4MS39, K-4MS48, K-4MS54, K-4MS60, K-4MS76 : K-4 Control Unit & Bariatric Mattress
K-4 : K-4 Control Unit
K-4M : Mattress Replacement System
K-4M39, K-4M48, K-4M54, K-4M60, K-4M76: K-4 Bariatric Mattress Replacement System
K-136, K-139, K-148, K-154, K-160, K-176: Standard and different size bariatric quilted Breathable Top Sheet

♦ Note: To place an order or if you have any questions regarding the K-4 control unit and its warranties, please call the KAP MEDICAL customer service at 909 340 4360, email: sales@kapmedical.com. ♦

WARRANTY

KAP MEDICAL warrants the K-4 control unit and the mattress for a period of ONE (1) year from the original date of purchase.

KAP MEDICAL standard warranty is extended to the original buyer purchasing the equipment directly from KAP MEDICAL or through its authorized dealers. All warranty periods, where applicable, commence on the date of purchase from KAP MEDICAL or its authorized dealers.

KAP MEDICAL's sole obligation and liability under this warranty is limited to (at KAP MEDICAL's option) the repair or replacement by KAP MEDICAL's authorized personnel of any parts or assemblies, which upon test and examination by KAP MEDICAL, prove to be defective. This equipment may be returned prepaid to KAP MEDICAL after notification has been given and approval obtained for the return. Please call your KAP MEDICAL sales representative or the Customer Service phone number below to arrange for warranty services.

KAP MEDICAL's liability under the warranty is the repair or replacement provided and, in no event, shall KAP MEDICAL's liability exceed the purchase price paid by the customer of the product. Under no circumstances shall KAP MEDICAL be liable for any loss, direct, indirect, incidental, or special damage arising out of or in connection with the use of this product.

The control unit warranty does not cover normal maintenance such as cleaning, periodic electrical

tests, performance tests, and updating of equipment or parts thereof. This warranty shall be void and not apply if the control unit, including any of it's parts, is modified without KAP MEDICAL's written authorization, is attempted to be repaired by personnel not authorized by KAP MEDICAL, is not maintained in accordance with the prescribed preventive maintenance schedule, is used with accessories or parts not authorized by KAP MEDICAL, or is damaged due to misuse, mishandling, abuse, negligence, accident, fire, or inadequate packaging by owner for shipment of the control unit for service, upgrade, repair, retrofit, or product return. All reasonable freight charges for valid factory approved warranty returns will be reimbursed. KAP MEDICAL makes no guarantee of clinical results.

♦ THE WARRANTY STATED ABOVE (INCLUDING ITS LIMITATIONS) IS THE ONLY WARRANTY MADE BY KAP MEDICAL AND IS IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. KAP MEDICAL SHALL NOT BE LIABLE FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES OF ANY KIND.

P/N: 400033	K-4 Operating Manual	NO. Of Pages: 38	Rev: New	Designer. R. Gowda	File Name: 400033
REVISION					
LAL	LTR	ER/ECO #	Descriptn	DATE:	APVD. BY.
N/A	N/A	01-0017	New Release	11-2-01	R. Gowda

ORIGINAL

11/2/01

NOV 02 02

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