
MAGNA-CLAVE OPERATOR'S MANUAL

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1. FUNCTION OF MAGNA-CLAVE CONTROLS

1.01 The **MAGNA-CLAVE** was designed to operate conveniently and trouble free. To use an autoclave safely and efficiently, one should be thoroughly familiar with its features and operation. A description of each **MAGNA-CLAVE** control and its function is as follows.

1.02 **Door Clamp Ring** (Figure 1) - A patented door clamp ring provides maximum safety by locking the **entire** rim of door. When activated by the door handle, the door clamp ring expands in diameter, thus, allowing the door to open.

1.03 **Open Door Button** (Figure 1) - The open door button energizes the door interlock solenoid. It must be depressed before moving the door handle up into the open position. The button is operative only when the **Open Door** light is illuminated.

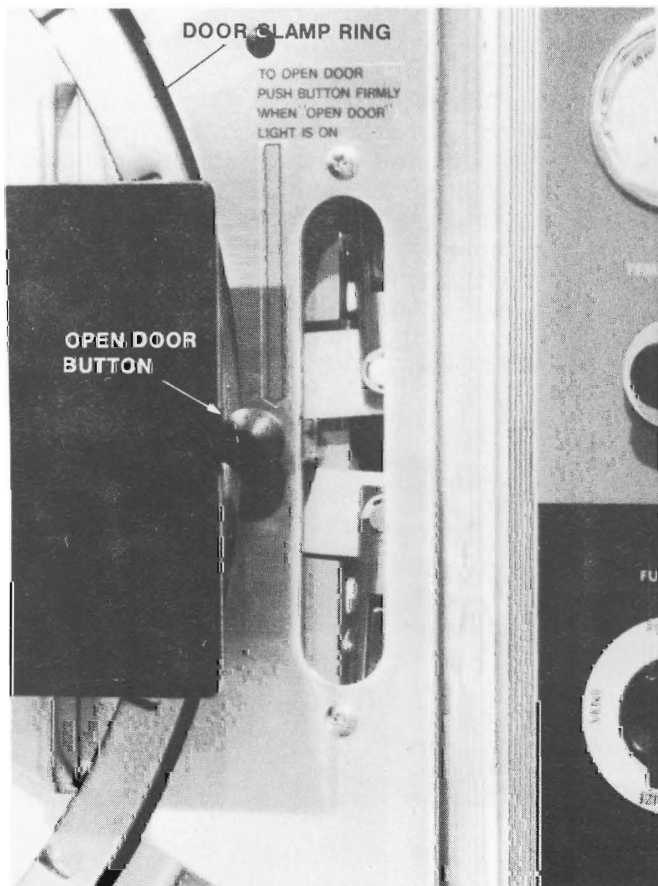


FIGURE 1 — DOOR CLAMP RING AND OPEN DOOR BUTTON

1.04 **Door Handle** (Figure 2) - When door handle is in down position, the door is locked and the rim is completely sealed. When door handle is in upward position, the door clamp ring is expanded. To open door, move door handle to upward position by the following method:

- Ensure that **Power On** light is illuminated
- **Open Door** light must be illuminated
- Depress **Open Door** button

WARNING: DO NOT ATTEMPT TO MOVE DOOR HANDLE UPWARD UNTIL:

- **Open Door** light is illuminated
- **Pressure gauge** indicates "0"
- **Function control** is in **Vent** or **Fill** position

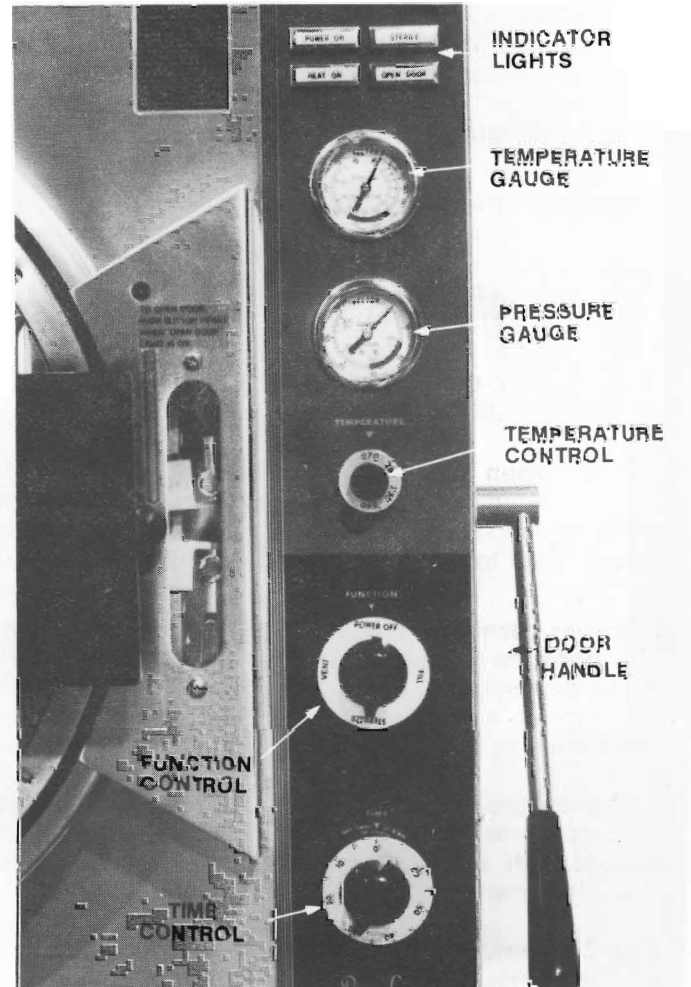


FIGURE 2 — MAGNA-CLAVE CONTROLS

1.05 **Indicator Lights** (Figure 2) - The four indicator lights are described as follows:

- (a) **Power On** - The **Power On** light indicates that electrical power is being supplied to the autoclave. It is illuminated when the **Function** control is in either the **Fill**, **Sterilize**, or **Vent** position. When the **Power On** light is illuminated, the wall heaters of the autoclave are energized, thus, heating the chamber to a warm, standby condition.
- (b) **Heat On** - The **Heat On** light indicates that electrical power is being supplied to the main heating elements to generate steam inside the boiler. When the **Function** Control is in the **Sterilize** position and the door handle in the down position (door locked),

the **Heat On** light will be illuminated and the main heating elements will be energized. The light will remain illuminated until the steam temperature inside the chamber reaches the setting on the **Temperature** control. It will then cycle off-and-on with the main heating elements to maintain the desired temperature.

(c) **Sterile** - The **Sterile** light is illuminated when the **Function** control is in the **Sterile** position, the desired temperature has been reached, and the **Time** control indicates "0". At beginning of cycle, the **Time** control should be set at the desired time for sterilization. When the **Time** control turns to "0", the **Sterile** light will illuminate and the buzzer or chime* will sound indicating end of sterilizing cycle.

*Determined by date of manufacture of unit.

WARNING: THE DOOR CANNOT BE OPENED AND NO ATTEMPT SHOULD BE MADE TO OPERATE THE DOOR HANDLE UNTIL THE "OPEN DOOR" LIGHT IS ILLUMINATED AND THE "OPEN DOOR" BUTTON IS DEPRESSED.

(d) **Open Door** - The **Open Door** light is illuminated when the **Function** control is in the **Vent** or **Fill** position and pressure in the chamber is at a low enough level to allow the door to be safely opened.

1.06 Temperature Gauge (Figure 2) - The **Temperature** gauge measures the steam temperature in the discharge line from the chamber. It is marked with a green area from 250°F to 270°F to indicate normal sterilizing temperatures.

1.07 Pressure Gauge (Figure 2) - The **Pressure** gauge measures pressure within the chamber. It is marked with a green area between 15 and 31 PSI (pounds per square inch).

1.08 Temperature Control (Figure 2) - Temperature and pressure inside the chamber are controlled by the **Temperature** control. It may be set from approximately 240°F to 270°F. Markings on the control indicate approximate settings. For a more precise setting, refer to page 4, paragraph 2.03 (f) - Set Temperature.

1.09 Function Control (Figure 2) - All operations of the **MAGNA-CLAVE** are controlled by this control. They are as follows:

- **Power Off** - All power is turned off; door cannot be opened.
- **Fill** - Water from reservoir is allowed to enter chamber; wall heating elements are energized.
- **Sterilize** - Power is applied to all heating elements as required; door cannot be opened.
- **Vent** - Unused water and steam in chamber are returned to reservoir after sterilizing cycle is completed. The door can be opened when the pressure decreases to a safe level and the **Open**

Door light is illuminated. The wall heaters remain energized to reduce pressure build-up time for successive sterilizing cycles and to promote drying of the sterilized material.

1.10 Time Control (Figure 2) - The **Time** control is manually set at the beginning of each sterilizing cycle. Timing begins when the preset temperature is reached and continues until it reaches "0".

NOTE: Do not set the time control for an interval of less than five minutes.

1.11 Buzzer or Chime - When the **Time** control returns to "0", a buzzer or chime will sound indicating end of cycle. The buzzer sounds continuously and the chime sounds every 10 to 20 seconds until the **Function** control is turned to **Vent**. The **Time** control must be set at the beginning of each sterilizing cycle. If it is not set, the buzzer or chime will indicate end of sterilizing cycle when the preset temperature is reached, thus, not allowing the sterilizing cycle to be completed.

1.12 Water Reservoir (Figure 3) - The water reservoir provides an ample water supply for cooling the discharged steam and water. The reservoir should be filled with distilled or demineralized water. It should be filled to the line marked at rear of reservoir and should never drop **more than** four inches below the line. A rubber drain hose attached to the brass fitting beneath the autoclave facilitates proper drainage and cleaning. For installation information refer to YL2-094075 - Installation of the **MAGNA-CLAVE**.

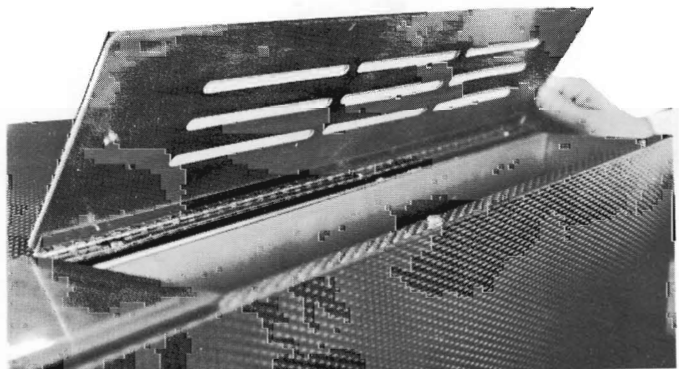


FIGURE 3 — WATER RESERVOIR

1.13 MAGNA-CLAVE Stand (Figure 4) - A matching **MAGNA-CLAVE** stand provides a convenient storage compartment to house trays or supplies.

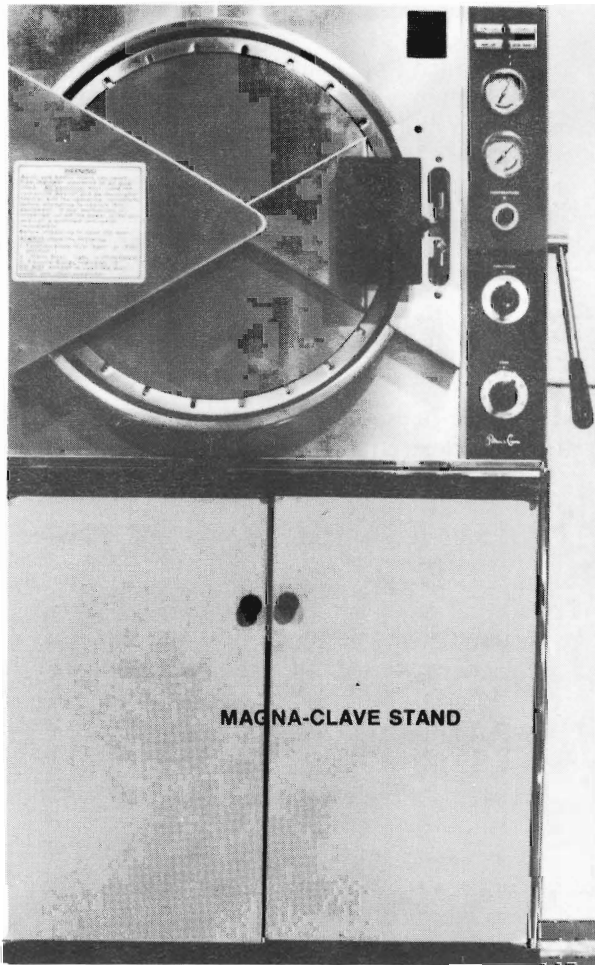


FIGURE 4 — MAGNA-CLAVE STAND

2. OPERATION

WARNING: DO NOT ATTEMPT TO BY-PASS ANY OF THE SAFETY INTERLOCK SYSTEMS DESCRIBED BELOW. FAILURE TO DO SO COULD RESULT IN PERSONAL INJURY.

GENERAL

2.01 When the **Function** control is in the **Power Off** position, all electrical power is off and the door cannot be operated. An additional safety interlock is incorporated to prevent the door from being opened when there is an unsafe level of pressure in the chamber. Another interlock prevents the main heaters from becoming energized to generate steam unless the door is **fully locked**. The **Open Door** light will illuminate when it is safe to open the autoclave door. When the **Function** control is in the **Fill** position, water flows from

the reservoir into the chamber. When the water level indicator (Figure 5) in the chamber is covered, the **Function** control should be turned to **Sterilize** to stop the flow of water. To generate steam, the door must be closed and locked. The **Time** control should be set at the beginning of the sterilizing cycle. Timing will begin when the preset temperature has been reached and will continue until the **Time** control returns to "0".

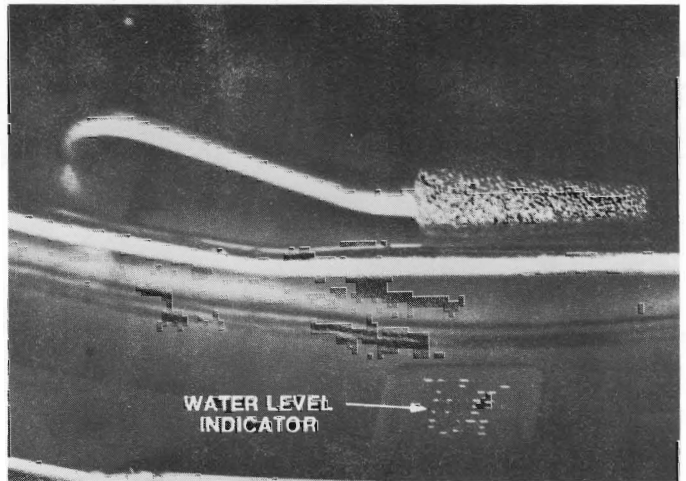


FIGURE 5 — WATER LEVEL INDICATOR

2.02 When the sterilizing cycle has been completed, the **Sterile** light will illuminate and the chime or buzzer will sound. The preset temperature will be maintained even though the **Time** control has completed its cycle. Turning the **Function** control to **Vent** will cut off the **Sterile** light and the chime or buzzer. Steam and unused water will then be returned to the reservoir from the chamber, and pressure inside the chamber will be reduced to near zero. When the chamber pressure reaches a safe level, the **Open Door** light will become illuminated.

WARNING: NEVER ATTEMPT TO OPEN DOOR UNLESS OPEN DOOR LIGHT IS ILLUMINATED AND PRESSURE GAUGE INDICATES "0".

To aid in absorbing moisture, the door can now be slightly opened. The chamber heaters will remain energized and materials can be left inside the chamber until dry. Drying time is determined by the size of material and manner in which it was packed. Drying times have not been established due to the varying conditions. When the **Function** control is left in the **Vent** position, the **MAGNA-CLAVE** will remain in a warm, stand-by condition.

OPERATING PROCEDURES FOR NORMAL STERILIZATION

WARNING: BURNS AND BODILY INJURY CAN OCCUR IF A STERILIZING CYCLE IS INTERRUPTED OR "ABORTED" IN THE FOLLOWING MANNER:

- Autoclave has been in **Sterilize** mode for five minutes or more after a cold start.

- **Function control is then turned to Vent and Open Door light is illuminated. If this situation develops, DO NOT open door even though Open Door light is illuminated. Wait ten minutes before attempting to open door.**

2.03 The operating procedures for normal sterilization are as follows:

(a) **Unlock Door** - Turn **Function** control to **Vent** or **Fill**. Depress and hold **Open Door** button on front of **MAGNA-CLAVE** and lift door locking handle on right side of unit.

(b) **Fill** - Turn **Function** control to **Fill**. When water in chamber covers water level indicator, rotate **Function** control to **Sterilize**.

(c) **Load** - Load chamber. Refer to page 4, part 3 - Preparation of Materials.

(d) **Lock Door** - Close door and push down the door locking handle on right side of **MAGNA-**

CLAVE.

(e) **Set Time Control** - Rotate **Time** control clockwise to desired sterilizing time. The **Time** control will start when the preset temperature is reached.

NOTE: If **Time** control is not set at beginning of sterilizing cycle, the chime or buzzer will sound and the **Sterile** light will illuminate as soon as the preset temperature is reached.

(f) **Set Temperature** - Turn **Temperature** control to the desired temperature. When a more precise setting is desired, turn **Temperature** control fully clockwise. When temperature gauge reaches desired temperature, rotate **Temperature** control slowly counterclockwise until the **Heat-On** light goes off. Once the control is set, it is not necessary to move it unless a change in sterilizing temperature is desired.

(g) **Vent** - After the chime or buzzer sounds and **Sterile** light illuminates, turn the **Function** control to **Vent**.

(h) **Unlock Door** - After ensuring that **Open Door** light is illuminated and that pressure gauge indicates "0", lift door locking handle while depressing **Open Door** button on front of **MAGNA-CLAVE**.

(i) **Drying** - After unlocking door, allow door to stand partially open with **Function** control still in the **Vent** position.

OPERATING HINTS

2.04 The **MAGNA-CLAVE** may be preheated by turning the **Function** control to **Vent** 30 minutes before the autoclave is needed. This will allow the desired sterilizing temperature to be obtained much faster.

2.05 Water should only be added to the reservoir when the **Function** control is in the **Vent** or **Power Off** position. Demineralized or distilled water must always be used. The minimum water level should always reach the level indicating mark on back of reservoir.

2.06 Do not attempt to turn the **Function** control from **Sterilize** to **Fill** or from **Vent** to **Sterilize**. There are mechanical stops which prevent the **Function** control from being turned in this manner.

2.07 Improper sterilization may result if chamber is overloaded or too crowded.

2.08 The **Time** control must be set at beginning of each cycle to the desired sterilizing time. If the **Time** control is not properly set, the buzzer or chime will sound and the **Sterile** light will illuminate, thus, indicating the end of the sterilizing cycle and not allowing completion of the cycle.

NOTE: Do not set the time control for an interval of less than five minutes.

3. PREPARATION OF MATERIALS

3.01 For maximum effectiveness in sterilizing, the materials should be prepared as follows:

- Instruments - Clean instruments thoroughly, wrap in muslin, and place on trays.
- Syringes and Needles - Take syringe apart and wash thoroughly. Wrap each part separately in muslin and cover entire tray with double thickness muslin.
- Fabrics and Glassware - Lay all jars or vessels on their sides. To sterilize fabrics in enamelware or glass jars, turn container on its side and cover with a loosely fitting cover.
- Solutions - The flask must be filled no more than two-thirds full. Close end of flask with cotton or paper caps. At completion of sterilization period, turn **Function** control to **Vent** while carefully watching pressure gauge. As soon as chamber pressure falls slightly, turn **Function** control to **Power Off** and allow **MAGNA-CLAVE** to cool down until pressure gauge indicates "0". When **Open Door** light is illuminated, return **Function** control to **Vent** and open door. Allowing the **MAGNA-CLAVE** to cool in this manner will ensure that solutions inside do not boil over as a result of too rapid a decrease in pressure.

3.02 Refer to Table A for recommended periods of exposure for various materials.

TABLE A

Recommended Periods of Exposure

Material to be Sterilized vs. Time in Minutes		PSI	15	20	25
		F°	250	260	267
		C°	121	127	131
Fabrics -	Loosely Woven - Wrapped in muslin		30	20	—
Fabrics -	Tightly woven		40	30	—
Instruments -	In Tray - Muslin cover		15	10	7
Instruments -	Individually wrapped in muslin		20	15	10
Syringes & Needles			15	10	7
Drums -	Loosely woven contents		30	20	—
Drums -	Tightly woven contents		40	30	—
Utensils -	Loosely woven contents		30	20	10
Rubber Gloves -	In muslin packs		15	—	—
Rubber Covers -	In muslin packs		15	—	—
Brushes & Miscellaneous Articles - Wrapped			15	—	—
Solutions -	1000 cc Flasks		30	25	—

4. CARE AND MAINTENANCE

4.01 It is highly recommended that the autoclave be cleaned a **minimum** of once a week with Pelton's Original Formula Omni-Cleaner (Part No. WZ1-091295) and distilled or demineralized water. The Omni-Cleaner is a mildly acidic concentrate used to clean and descale autoclaves. Minerals, especially chlorides, are corrosive to stainless steel, therefore, tap water with a high mineral content should **not** be used. When sterilizing saline solutions, it is **imperative** that the autoclave be cleaned **after each use**. By establishing proper cleaning habits, the autoclave will provide higher performance and longer life.

4.02 The following procedures should be used when cleaning the autoclave.

- Mix twelve ounces of Original Formula Omni-Cleaner in one gallon of water.
- Drain water from reservoir. Refill reservoir with solution of Omni-Cleaner and water. (The reservoir will not be full; however, the level will be adequate.)
- Run one, 20 minute sterilizing cycle to remove all grease and grime from system. If autoclave is extremely dirty, it may require a second cleaning. **Do not sterilize instruments while cleaning autoclave.**

- Drain cleaning solution from reservoir and chamber. Rinse thoroughly with clean, mineral-free water and run a rinse cycle for fifteen minutes.
- Drain rinse solution and wipe inside of boiler thoroughly. If scale or lime deposits remain on inside of chamber, ensure that autoclave is cool, and clean with water, plastic or nylon scouring pads, and a non-chlorinated detergent.

NOTE: Detergents containing chlorine are corrosive to stainless steel and should not be used.

- Refill reservoir with clean, mineral-free water. The **MAGNA-CLAVE** is now ready for use.

4.03 Draining Reservoir - The reservoir drain hose is located inside the right-hand door of stand, near the top. For **MAGNA-CLAVES** which do not have a stand, the hose will be located under the front edge and to the left of unit. The drain hose may be drained by removing it from its clip and unscrewing the tip end. The hose should be drained into a 10-quart capacity container. When the reservoir is completely drained, replace tip and clip drain hose in place.

4.04 Cleaning Fill Filter - Pull out fill tube and filter assembly from inside of chamber and clean filter with a stiff brush and a non-chlorinated detergent. Replace the fill tube and filter assembly, ensuring that the filter lies flat against bottom of chamber. If the filter does not lie flat against bottom of chamber, an excessive amount of water will be left in the chamber after the sterilizing cycles. Failure to clean this filter regularly will result in excessive time to fill and vent the chamber.

4.05 Cleaning Exterior Surface - The exterior surface of the **MAGNA-CLAVE** can be cleaned with water and a non-chlorinated detergent. Do not use detergents containing chlorine, steel brushes, stainless steel, or steel wool when cleaning an autoclave. Always rub in direction of the metal grain pattern. If the surface becomes contaminated, clean with a 5% solution of warm, oxalic acid.

5. OPTIONAL ACCESSORIES

5.01 Trays - A basket tray and shallow flat tray are standard equipment. A bedpan tray is available as an option.

5.02 Temperature Recorder - A recording thermometer which provides a permanent record of the steam temperature can be factory or field installed. The steam temperature is recorded on a circular chart for a 24-hour period.

6. INSPECTIONS

GENERAL

6.01 The **MAGNA-CLAVE** is a pressure vessel that falls under various state and/or local laws which differ in inspection requirements. Some laws require a pressure vessel to be completely inspected periodically. The inspection period varies due to individual laws. This inspection is usually performed by a qualified inspector commissioned by the National Board of Boilers and Pressure Vessels. Insurance companies may also require a similar type inspection. The governmental agency in your area and/or your insurance company will determine the inspection requirements for your **MAGNA-CLAVE**.

INSPECTING THE CHAMBER

6.02 Inside Chamber Inspection - A thorough inspection inside the chamber should be made every six months. If cracks or fissures are found, call a qualified serviceman. **Do not operate a unit with cracks in chamber.**

WARNING: DO NOT PERFORM THE FOLLOWING TEST WITH ANY PRESSURE IN CHAMBER.

6.03 Door Interlock Check - The door interlock check should be performed as follows:

- With the unit cold, open door and push down on door locking handle.
- Rotate **Function** control counterclockwise to **Sterilize**.
- Depress and hold **Open Door** button and pull up on door locking handle as if to open door. **Do not force door handle.** Use no more force than it takes to open the door normally.
- If door locking handle can be pulled all the way up and the clamp ring expanded, turn the **Function** control to **Power Off** and call a qualified service man immediately. **Never operate a MAGNA-CLAVE in this condition.**
- If door locking ring cannot be opened, rotate the **Function** control to **Vent**, depress **Open Door** button, lift door locking handle up, and open door locking ring. The **MAGNA-CLAVE** is now ready for use again.

For additional information concerning the **MAGNA-CLAVE** write or call THE PELTON & CRANE COMPANY, P. O. Box 241147, Charlotte, N. C. 28224 (704) 523-3212, or your full service dealer. When ordering service or parts, always include the serial number of your unit.