

**OPERATOR'S
MANUAL**

Castle[®]

2420

**Field Hospital
Surgical Light**

Castle

CASTLE COMPANY
P.O. BOX 23077
ROCHESTER, NEW YORK 14692

DESCRIPTION OF SYMBOLS & NOTES IN MANUAL

The following symbols with related notes appear in this manual.



"Warning" notes alert the user to the possibility of personal injury.



"Caution" notes alert the user to the possibility of damage to the equipment.



"Notes" alert the user to pertinent facts and conditions.



Users must read and understand the contents of this manual before using the equipment.

The 2420 Series Lights are medical devices intended only for use by qualified or trained persons. Misuse of this device may result in physical harm to the patient and/or user. It is imperative that this manual be read and understood before using the equipment.

Castle Warranty

Castle Company warrants the 2420 Series Lights to the original owner. Refer to the warranty statement supplied with the lights and in this manual for warranty provision.

Castle Company, Rochester, New York.

RETAIN THIS MANUAL FOR FUTURE REFERENCE !

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This manual contains proprietary information of the Castle Company, Rochester, N.Y. Permission is hereby granted to make copies in part or in whole of the manual for education and training purposes. However, it should be born in mind that Castle equipment is a dynamic product, and manuals are updated to reflect improved design and operation. As time elapses from manual issue, the manual may become out of date.

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IMPORTANT

SPECIAL SAFETY INSTRUCTIONS ARE LISTED ON THIS PAGE. READ THEM CAREFULLY BEFORE OPERATING THE LIGHT. FOLLOW ALL RECOMMENDATIONS.



"Warning" notes alert the user to the possibility of personal injury.

1. USERS MUST READ AND UNDERSTAND (Pg. ii)

Users must read and understand the contents of this manual before using the equipment.

The 2420 Series Lights are medical devices intended only for use by qualified or trained persons. Misuse or misapplication of this device may result in serious physical harm to the patient and/or user. It is imperative that this manual be read and understood before using the equipment.

2. STEPS FOR SAFETY (Pg. 1)

Observe these steps that follow for the safety of the patient and operating personnel when using the light. Failure to follow these safety steps could result in injury to the patient and user.

3. HIGH INTENSITY LIGHTING (Pg. 5)

As in all high intensity lighting systems, a portion of the system's radiant output can cause a temperature increase and subsequent drying. Even though the effect is minimal, turn off the light or direct onto another area when not required, especially during lengthy procedures.

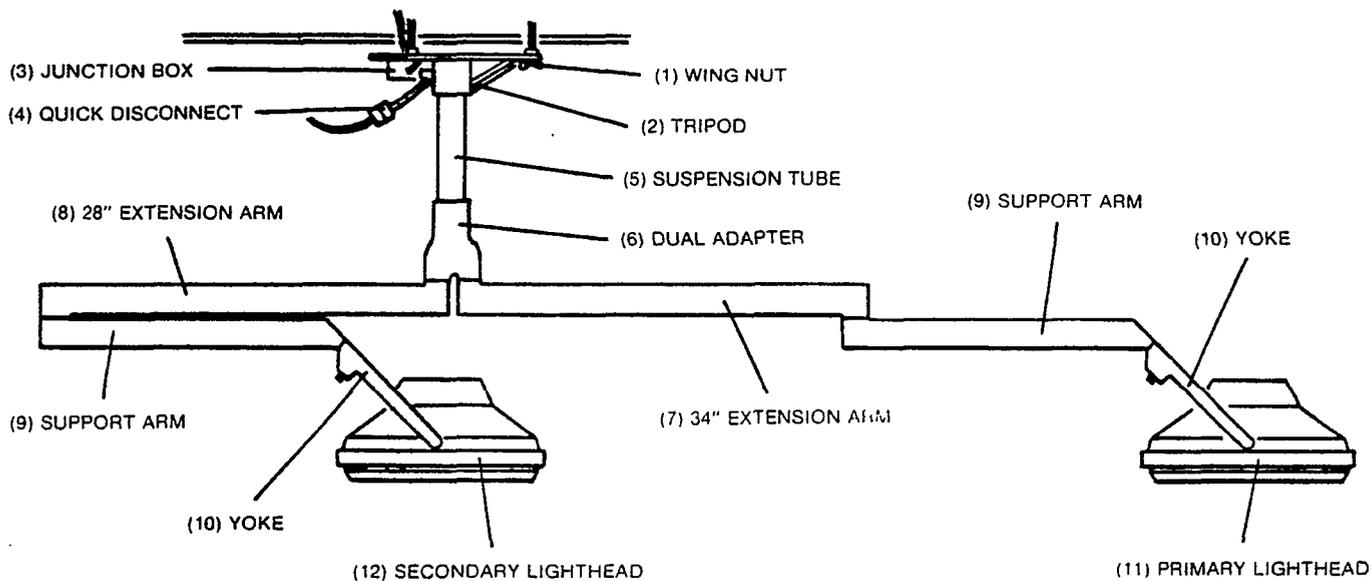
4. DISCONNECT OR TURN OFF (Pg. 6, 7)

Disconnect or turn OFF power source to the light before any maintenance to avoid hazardous electrical contact. Allow 15 minutes cool-off period to avoid touching hot lighthouse parts.

5. HEAT FILTER AND LENS IN PLACE (Pg. 6, 7)

The blue-green heat filter and lens cover must be in place to prevent ultraviolet and infrared rays from reaching the patient or operator.

RETAIN THIS MANUAL FOR FUTURE REFERENCE !
(See Index Page ii)



- | | | | |
|-------|---------------------|---|---|
| (1) | WING NUTS | - | Mount tripod to ceiling studs. |
| (2) | TRIPOD | - | Ceiling mount for light. |
| (3) | JUNCTION BOX | - | Power connection to light. |
| (4) | QUICK DISCONNECT | - | Field connection to light. |
| (5) | SUSPENSION TUBE | - | Provides single point suspension from ceiling. |
| (6) | DUAL ADAPTER | - | Mechanical connection for extension arms. |
| (7) | 34" EXTENSION ARM | - | Horizontal rotation for primary lighthead. |
| (8) | 28" EXTENSION ARM | - | Horizontal rotation for secondary lighthead. |
| (9) | SUPPORT ARM | - | Horizontal and vertical rotation for lightheads. |
| (10) | YOKE | - | Angular rotation for lightheads. |
| (11) | PRIMARY LIGHTHEAD | - | Light source for primary surgical site. |
| (12) | SECONDARY LIGHTHEAD | - | Light source for secondary surgical site or support light source for primary surgical site. |

MAIN COMPONENTS AND FUNCTIONAL DESCRIPTION

STEPS FOR SAFETY



Observe the steps that follow for the safety of the patient and operating personnel when using the light. Failure to follow these safety steps could result in injury to the patient and user.

1. Although great emphasis, research, and consideration have gone into the design for safety of this product, abuse or misuse could cause potential unsafe conditions.
2. The doctor or other personnel must move the light out of the way before a patient gets up from the table.
3. Never let a patient use the light for a support to get up from the table.
4. Never use the light with the lens cover removed or hanging by the retainer.
5. Do not lean on light.
6. Do not move this equipment in a violent fashion.

GENERAL SAFETY PRECAUTIONS

1. Read all instructions.
2. Do not touch hot surfaces. Use handles.
3. Use close supervision when equipment is used on or near children.
4. Do not operate after equipment malfunctions or has been damaged.
5. Use this equipment only for its intended use, as a surgical light, as described in this manual.
6. Unplug or turn off equipment when not in use.
7. Do not use equipment with damaged or broken electrical parts or connections.
8. The use of any accessory attachments not sold or recommended by Sybron Corporation may be hazardous.
9. Do not expose electrical components to liquids.

2420 FIELD HOSPITAL SURGICAL LIGHT
1. General Description

TECHNICAL DATA - ELECTRICAL

Electrical Rating

MODEL	VOLTS	PHASE	Hz.	AMPS	WATTS
2420	120	1	50/60	2.50	300

TECHNICAL DATA - OPTICAL

2420 Field Hospital Surgical Light

Lamp - 150 Watt Quartz Halogen, Double Contact Bayonet Base

Heat Filter - Blue-Green, Color Correcting

Reflector - Dichroic Coated, Color Correcting

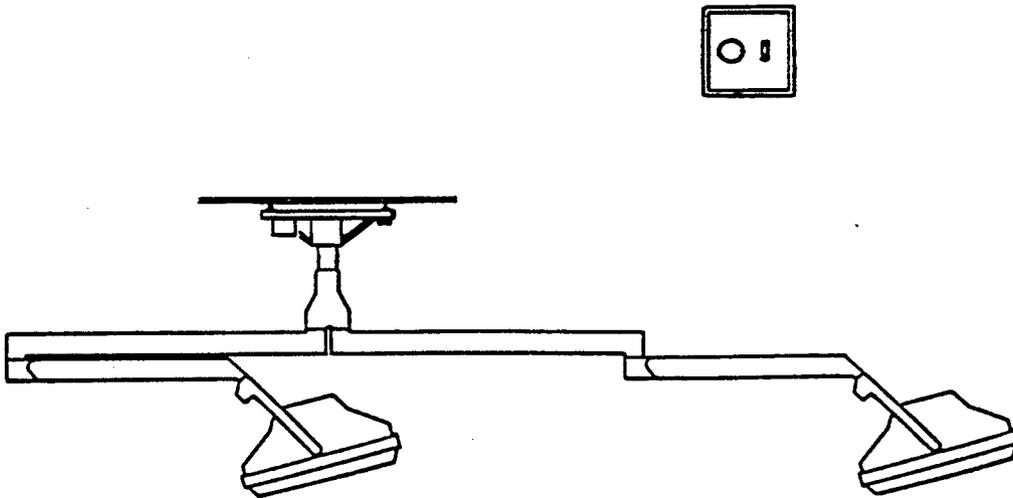
Lens - Diffused Cover

TECHNICAL DATA - PHYSICAL

Double Ceiling Model

Ceiling Tripod Mount Load Capacity
(at each of 3 studs) 350 Lbs. (158.6 Kgs.) min.
Weight 34 Lbs. (14.4 Kgs.)

LIGHT MODELS



2420 FIELD HOSPITAL SURGICAL LIGHT

2420 FIELD HOSPITAL SURGICAL LIGHT

1. General Description

GENERAL

The 2420 Series Surgical Light consists of light-heads, support arms and mounting structure. Support arm pivots enable the lighthouse to be positioned for surgical procedures. Lighthouse pivots provide tilt and rotational adjustments.

The lighthouse assembly contains the optical system of the light. The reflector directs a high intensity light pattern onto the patient. A blue-green filter surrounding the light source color-corrects the light and filters heat. The 2420 is equipped with a dichroic coated reflector to further color-correct and cool the light beam for surgical procedures. A frosted lens cover diffuses the light beam.

LIGHT OPERATION

1. Press the ON-OFF switch on the underside of the light arm to ON.
2. Adjust angle and position of illumination using integral handles for horizontal and vertical rotation.
3. Critical adjustments can be made with the optional sterilizable handle.

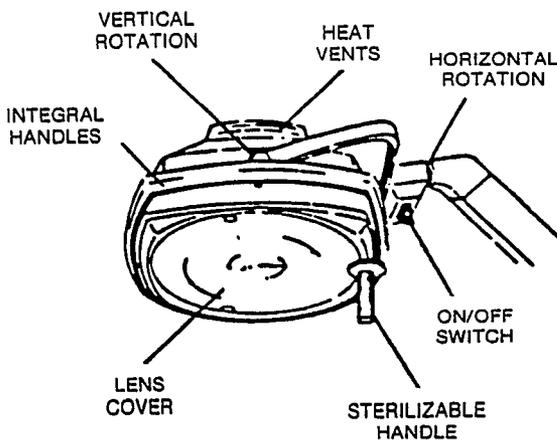


The sterilizable handle is attached by threading it into the lighthead. Seat the handle firmly in place.

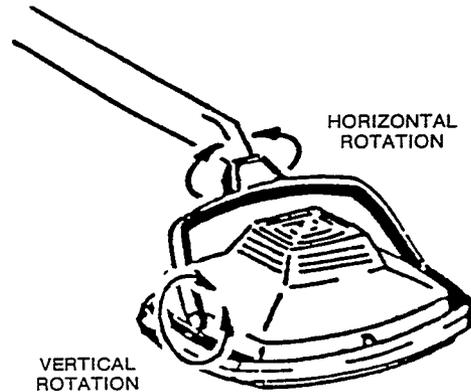
4. Move lighthead away from area before patient rises from the table.



As in all high intensity lighting systems, a portion of the system's radiant output can cause a temperature increase and subsequent drying. Even though the effect is minimal, turn off the light or direct it onto another area when not required, especially during lengthy procedures.



ON/OFF SWITCH & HANDLES



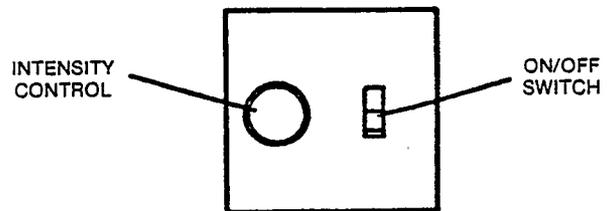
LIGHTHEAD ADJUSTMENT

OPERATION WITH INTENSITY CONTROL

1. Rotate Intensity Control Knob to a middle position.
2. Snap Intensity Control ON-OFF Toggle Switch to ON.
3. Press lighthead ON-OFF Switch to ON.
4. Rotate Control Knob clockwise to increase light intensity or counterclockwise to decrease.
5. To turn OFF lighthead, turn the lighthead and the Intensity Control ON/OFF Switches to OFF.



Do not turn the light off by turning the control knob to the extreme dim position. This leaves the control electrically energized.



INTENSITY CONTROL

3. Operator's Maintenance

CLEANING EXTERIOR SURFACES



Disconnect or turn OFF power source to the light before any maintenance to avoid hazardous electrical contact. Allow a 15 minute cool-off period to avoid touching hot lighthouse parts.

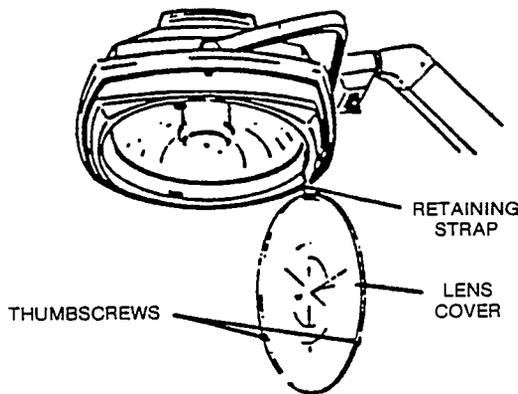
Use mild cleaning agents that will not damage painted, plated or plastic surfaces.

CLEANING OPTICAL SURFACES



Handle optical surfaces; lens cover, heat filter and reflector with extreme care. Clean only when required due to dust or smudges.

1. Loosen thumb screws and lower the lens cover. The cover will be suspended by a retaining strap.



LENS COVER

2. Gently clean inside of reflector with cotton dampened with distilled or demineralized water. The cotton will conform to the contour of the reflector. Clean in direction of flutes.
3. Clean the outside of the blue-green heat filter in the same manner.



Do not use acid solutions, including chlorinated cleaners. Do not use any scrubbing or abrasive action to avoid damage to the reflector coating.

The water should be deionized or distilled.

4. Clean the inside and outside of the lens cover using anti-static cloth.



The lens cover has a center fusion spot. This is on the inside surface.

5. Replace the lens cover.



The blue-green heat filter and lens cover must be in place to prevent ultraviolet and infrared rays from reaching the patient or operator.

REPLACEMENT LAMPS

2420 Field Hospital Surgical Light

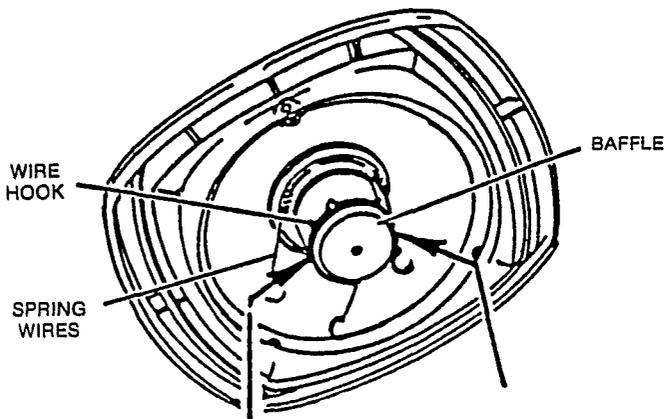
150 Watt, Quartz Halogen, Double Contact,

REPLACING LAMPS



Disconnect or turn OFF power source to the light or at optional Intensity Control before any maintenance to avoid hazardous electrical contact. Allow a 15 minute cool-off period to avoid touching hot lamp-head parts.

1. Loosen lens cover thumb screws. The lens cover will hang from a retaining strap.
2. Rotate the light to face the operator at a little above eye level.
3. Hold the baffle firmly and unhook the three spring wires from the baffle.
4. Remove the heat filter/baffle assembly as shown. Avoid touching the blue-green glass.
5. Press down and turn the lamp counterclockwise to remove.



REMOVING HEAT FILTER



Read handling note printed on wrapper of new lamp.

Skin oils will damage and shorten life of lamp. If accidentally touched, wipe lamp with alcohol or distilled water.

6. Hold new lamp by wrapper and insert in socket.
7. Press down and turn clockwise to insert.
8. Clean inside and outside of blue-green heat filter with cotton dampened with deionized or distilled water.
9. Replace heat filter/baffle assembly in upper recessed area, spring wires and lens cover.



The blue-green heat filter and lens cover must be in place to prevent ultraviolet and infrared rays from reaching the patient or operator.

REPLACING HEAT FILTER



Disconnect or turn OFF power source to the light before any maintenance to avoid hazardous electrical contact. Allow a 15 minute cool-off period to avoid touching hot lamp parts.

1. Loosen the lens cover thumb screws. The lens cover will hang from a retaining strap.
2. Rotate the light to face the operator and position a little above eye level.
3. Unhook the three heat filter spring wires.
4. Remove the blue-green heat filter/baffle assembly for bench work.
5. Remove filter clips and replace heat filter.



The heat filter is cone shaped. Position the larger diameter into the baffle assembly.

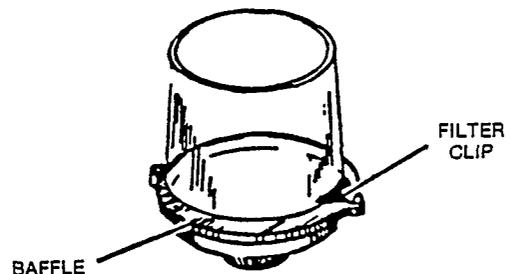
6. Replace filter clips. Tighten screws until clips are snug. Do not overtighten.
7. Clean inside and outside of blue-green heat filter with cotton dampened with deionized or distilled water.
8. Replace heat filter assembly, spring wires and lens cover.



Ensure that the heat filter is positioned in the upper recessed area.



The blue-green heat filter and the lens cover must be in place to prevent unfiltered rays from reaching the operator or patient.



REPLACING HEAT FILTER

NOTES

RECOMMENDED SPARE PARTS

It is recommended that the parts listed below be maintained in stock to insure availability when needed.

QUANTITY	PART NO.	DESCRIPTION
4	49455	Lamp, 120V, 150W
2	65065	Clip, Heat Cylinder Retaining
1	61853	Cylinder, Heat Filter

APPENDIX A

SALIENT CHARACTERISTICS

1. The unit is designed to operate on BOTH 120 and 220 volt (nominal) power sources. The voltage is changed by a screwdriver operated manual switch in the auto-transformer.
2. The unit is designed for use within a finished floor to finished ceiling height of 81 to 86 inches (205.74 to 218.44 cm).
3. Each lighthead is independently capable of being positioned at any point horizontally within a 52 inch (137.16 cm) radius of the ceiling mount.
4. The unit is capable of being positioned at any height between approximately 43-1/2 and 73 inches (110.43 and 185.42 cm) above the finished floor, when installed at a ceiling height of 81 inches (205.74 cm).
5. Each lighthead is 14 inches (35.6 cm) across and has a lens area of 103 square inches (665 square cm).
6. The lighthead is sufficiently vented to limit the external temperature of surfaces not normally in human contact to 185 degrees Fahrenheit.
7. The handle temperature does not exceed 20 degrees Fahrenheit above ambient temperature.
8. The irradiance factor does not exceed 5.0 micro-watts per square centimeter per foot-candle at 36 inches from the face of the lens.
9. When installed, the light has no unyielding structure extending below 5'-10" from the finished floor.
10. The lighthead wiring from ceiling to each lamp socket is 16-2/size, type THHN or higher temperature rating.
11. The light can be installed in the hardwall shelter by one person in ten minutes or less, after the shelter has been wired and the ceiling inserts are in place.

APPENDIX B

PERFORMANCE CHECKS

- Turn ON Switch at Intensity Control.
- Turn Intensity Control Knob Clockwise.
- Turn ON Switch at each Lighthouse. The lights should come on.
- Vary Intensity to see if illumination varies correctly.
- If all the above are positive, the lights are operational.

APPENDIX C

STORAGE INSTRUCTIONS

Commercial Shipping — In Corrugated Carton

- INDOOR STORAGE - In Commercial corrugated carton.
- OUTDOOR STORAGE - None. DO NOT STORE OUTDOORS.
- HEIGHT - Six (6) cartons high.
- HUMIDITY - 5 to 95% Relative Humidity.
- TEMPERATURE - 50 to 100 Degrees F.
- FACILITY - No special facility.
- INSPECTION - Periodically perform a visual inspection check.
Suggest once a year.

Military Shipping — In Military Box

- INDOOR STORAGE - In military box.
- OUTDOOR STORAGE - In military box and sealed containers.
- HEIGHT - Four (4) boxes high.
- HUMIDITY - No restriction.
- TEMPERATURE - -20 to 110 Degrees F.
- FACILITY - No special facility.
- INSPECTION - Periodically perform a visual inspection check.
Suggest once a year.

SYBRON NEW EQUIPMENT WARRANTY

Sybron Corporation warrants to the original owner of equipment of its manufacture that its products are free from defects in material and workmanship under the conditions and for the periods hereinafter specified.

1.0 START OF WARRANTY

1.1 Portable Equipment

Unless otherwise specified, coverage for this type of equipment under this warranty will begin with the initial operation or thirty (30) days after receipt of the equipment, whichever date is the earlier, and continue for the period(s) specified in Section 2.1 below.

1.2 Installed Equipment

Unless otherwise specified, coverage for this type of equipment under this warranty will begin with final checkout by a Sybron Service Representative (See Section 4.4 below) or eighteen (18) months after receipt of the equipment, whichever date first occurs, and continue for the period(s) specified in Section 2.0 below.

2.0 PERIODS OF WARRANTY

2.1 Standard Warranty

Unless otherwise specified, the equipment is warranted to be free of defective material and workmanship for one (1) year from the start of the warranty period.

Unless otherwise specified, service labor required to repair or replace will be provided by Sybron, upon request, without further charge for a period of one (1) year from the start of the warranty period.

2.2 Special Extended Coverage

With proper care, some components (see below) of equipment can be expected to last well beyond the standard warranty period. Therefore, Sybron will extend its standard warranty period, on items listed below, provided that the purchaser shall have had continuously in effect a preventive maintenance contract with Sybron to inspect and maintain the equipment. This contract must start within 90 days from the start of the warranty period and run continuously. Otherwise the standard warranty (2.1 above) prevails.

- a. Sterilizer shells and door plates -
Ten (10) years for parts and five (5) years for repair or replacement labor.
- b. Surgical light suspension mechanism -
Five (5) years for parts and two (2) years for repair or replacement labor.

2.3 Warranty on Repairs or Replacement During Warranty

The warranty on equipment or parts repaired or replaced pursuant to this warranty, and all obligations of Sybron to provide repair or replacement labor with respect thereto, shall continue only for the balance of the original warranty period.

SYBRON

Applies Only To Domestic U.S. And Canadian Shipments

3.0 CORRECTIVE ACTION

Equipment or parts that prove defective during the warranty period will, at Sybron's sole option, be repaired or replaced. The cost of all parts used in such repair or replacement shall be borne by Sybron. Work will be performed within a reasonable period and at a mutually convenient time. Most often it will be practical for Sybron to service installed equipment on the owner's premises. However, Sybron may have to require that repair or replacement of defective products or components take place off the premises in which event transportation charges shall be paid by purchaser. Sybron is not responsible for removal, loading, installation or similar expenses in connection with its warranty obligations.

4.0 LOSS OF COVERAGE

Under the following conditions, Sybron will not honor the provisions of coverage of this warranty:

- 4.1 Problems related to environmental conditions beyond the control of Sybron.
- 4.2 Repairs necessary as the result of abuse, neglect, incorrect repairs or adjustments, or improper operation by others.
- 4.3 Damage caused by others including that occurring during shipment, storage or installation.
- 4.4 Failure to have pre-operation inspection. Experience has proven that for satisfactory performance, Sybron should inspect all of its equipment that requires installation and certain other equipment so specified in the Operators Manual, before it is placed in service. Failure to have this inspection performed by a Sybron Representative prior to operating the equipment, will void this warranty. This inspection is made at no additional cost to the purchaser.
- 4.5 Failure to provide written notice of start of warranty to Sybron within ninety (90) days unless inspected under the provisions of 4.4 above.

5.0 CONDITIONS NOT WARRANTED

5.1 No Warranty on Expendable Parts

Certain parts are normally regarded as expendable. These parts and the labor to install them are not covered under this warranty. By way of illustration and not by way of limitation, some parts considered expendable are seals, gaskets, lubricants, filters (gas and liquid), de-ionizers and bulbs.

5.2 Location

This warranty shall apply only to equipment located within the United States, the Commonwealth of Puerto Rico and the Dominion of Canada.

5.3 No Special, Indirect or Consequential Damages

Sybron shall under no circumstances be liable for any special, indirect or consequential damages owing to failure of the equipment or any part thereof.

The sole responsibility of Sybron under this warranty shall be limited to repair or replacement of the equipment or parts thereof as provided hereunder.

5.4 NO WARRANTY OF FITNESS OR MERCHANTABILITY

SYBRON MAKES NO WARRANTY OF FITNESS OR MERCHANTABILITY AND NO OTHER WARRANTY, ORAL OR WRITTEN, EXPRESS OR IMPLIED, EXCEPT AS SPECIFICALLY SET FORTH HEREIN.

5.5 No Other Warranties

No agent of Sybron is authorized to make any warranty other than that which is specifically set forth herein.

Above Applies Only To Domestic U.S. And Canadian Shipments

SYBRON SERVICE PARTS WARRANTY

Sybron warrants to the purchaser that parts sold by it are free from defects in material or workmanship if installed for the purpose intended and in the recommended way. If they prove to be defective for the reasons above, they will be exchanged at no additional cost.

The period(s) of warranty is (are) as follows:

1.0 During the Warranty Period on New Equipment

Parts will be replaced per the new product warranty provided by Sybron.

2.0 After Warranty Period on Original Equipment

- 2.1 If installed by the owner, or his agent, one (1) year from date of shipment by Sybron.
- 2.2 If installed by Sybron, from its stock or from the purchaser's stock, one (1) year from date of installation. Labor to replace the part will also be provided at no cost for a period of ninety (90) days from installation.

3.0 Conditions Not Warranted

- 3.1 Sybron shall under no circumstances be liable for any special, indirect or consequential damages owing to failure of the part.
- 3.2 **NO WARRANTY OF FITNESS OR MERCHANTABILITY**
SYBRON MAKES NO WARRANTY OF FITNESS OR MERCHANTABILITY AND NO OTHER WARRANTY, ORAL OR WRITTEN, EXPRESS OR IMPLIED, EXCEPT AS SPECIFICALLY SET FORTH HEREIN.

Castle

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