HTP-1500

Heat Therapy Pump

Operating & Service Manual

Rev. P905

Intended Use

The HTP-1500 Heat Therapy Pump is intended for use in situations where a physician determines localized heat therapy is necessary or desirable.

Caution

Federal Law restricts this device to sale by or on the order of a physician. The Operator must understand this Operating Manual and all cautions and warnings herein prior to use.

UL Classification Class I -Type B

Medical electrical equipment with respect to electrical shock, fire, mechanical and other specific hazards only in accordance with UL 2601 and Can/CSA C22.2 No. 601.1 51DF.

Ordinary protection from ingress of water continuous use. Refer to the instructions included with the specific pad being used for proper use and care information.

Contents

HTP-1500 Pump connected to a ST-017 Soft-Temp® Pad

Description

The HTP-1500 is a water circulating heat therapy pump. It is intended for use only with Adroit Medical Systems Soft-Temp® pads. The pump and pad are designed to provide an even and consistent therapeutic temperature to a localized area. The pump is not intended for use with adult or pediatric size blankets.

Indications For Use

Indications for the use of therapeutic localized heat therapy are extensive. Many conditions call for the application of heat to assist in the healing process or to provide relief from pain and discomfort. The general principal of localized heat therapy is that it increases blood flow at the treatment area. Heat therapy is commonly used for aches and pains in joints and muscles. Typical applications include:

- Arthritis
- Back Pain
- Chronic Pain
- Muscle Spasm
- Muscle Cramp
- Stiff Joints
- Edema
- Inflammation
- Wound Drainage
- Traumatized Tissue
- Hypothermia

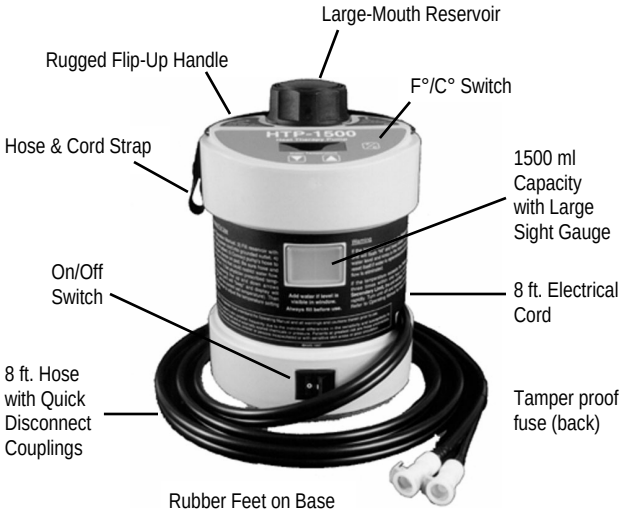
(*Refer to Clinical References on page 17)*

In orthopedic cases, the usual treatment for an injury during the first 48 hours is cold therapy, followed by heat therapy thereafter. Cold therapy helps reduce swelling (edema) and the pain associated with it. A common saying for the treatment of a sprained ankle is '24 cold and 72 warm. In general, the idea is after the swelling is reduced, the application of heat can begin.

Features

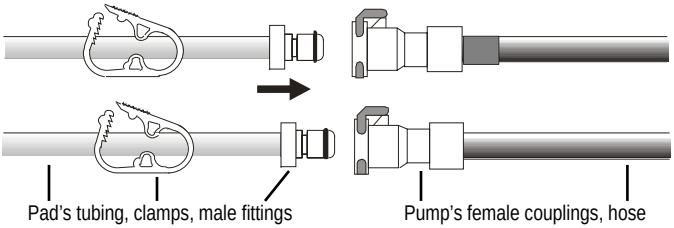
The HTP-1500 is easy and convenient to use. A few of its most notable features are listed below, others are noted in the illustration.

- Uses tap water!
- Digital Interface with large display.
- Hose wraps around the pump for storage.
- Large reservoir opening for easy filling.
- Three internal temperature safety sensors.
- Onboard BioMed Testing. *Allows technician to check Primary and Secondary Limit Switch without dismantling the unit..*



Instructions For Use

1) Read this manual thoroughly.
2) Fill reservoir with water, tap or distilled.
3) Plug power cord into grounded outlet.
4) Position pad on patient.
5) Connect pump's hose to pad and make sure the pad clamps are open. Inspect hose and pad for kinks that could restrict water flow.



6) Turn unit on (only after a pad is attached) and observe system startup.
7) Set the prescribed temperature by first pressing the Up and Down Arrow simultaneously. The unit will beep, flash "SP" and the current set temperature. Second, press either the Up or Down Arrow to the new temperature and release.

Status Displays

F/C Switch

The ºF/ºC switch can be used at anytime to alternate the temperature display between Fahrenheit and Celsius.

Startup Display
When the unit is turned on, it will beep once and display all characters followed by the software version number, ie: “8888” / “P905”.

Next the display will flash “SP” (Set-Point) and the current Set-Point Temperature for 10 seconds. The default Set-Point is always the last setting used.
Note: The factory Set-Point on a new unit is 105F unless requested otherwise by the customer.

Changing Set-Point Display
To change the pump's Set-Point, press and hold the Up and Down Arrows simultaneously. The unit will beep three times, display "SP" and then flash the current Set-Point. While the display is flashing, press either arrow to the desired setting and release. The unit will beep 1 time when it exits the Set-Point mode.

Degree Symbol Display
The degree symbol can be ON, OFF or Flashing Rapidly. When it is ON, the pump is heating the water. It is also ON when changing the Set-Point. When it is OFF, the water is at set temperature. When the degree symbol is Flashing, the Set-Point has been reached and the unit is heating to maintain the Set-Point Temperature.

Heater OFF Display
The pump's heating element can be turned off by changing the Set-Point to below 75°F (24°C). The display will read OFF, but water will flow through the system. The default Set-Point on a new unit is OFF.

Over-Temperature Displays
There are three Over-Temperature displays, “CHEC FLO” (Check Flow), “HI 1” and “HI 2”.

The “CHEC FLO” display may occur within the first few minutes of service if a pad has not been fully connected to the pump’s hose or the pad has been folded too tightly. An audible beep accompanies this display.

The “HI” displays indicate that the Primary or Secondary Limit Switch has been triggered. An audible beep accompanies both displays.

Refer to the Trouble Shooting section to learn more about the “CHEC FLO” and “HI”. displays.

Warranty

The HTP-1500 comes with a 1 Year Limited Warranty from date of purchase. The unit is warranted free of defects in material and workmanship. An extended Limited Lifetime Warranty is available to hospital customers who purchase Adroit pads on a regular basis, the specific conditions of which may vary depending on the terms of sale.

Adroit Medical Systems disclaims all implied warranties including, but not limited to, the implied warranties of merchantability and of fitness of its products for a particular purpose.

Repairs (also see BioMed Testing on page 13)

If the pump is not operating properly, refer to the Trouble Shooting section of this manual for possible causes. If the problem cannot be resolved please contact Customer Service at (800) 267-6077. Please have the unit's Serial Number when calling (located on the bottom). A technician will assist in determining the cause of the problem or in scheduling service for the unit. Please note that Adroit Medical Systems reserves the right to service and repair the HTP-1500. Repairs performed by personnel not affiliated with Adroit Medical Systems will void all warranties and may result in damage or malfunction of the unit.

There Are No User Serviceable Parts Inside

Cleaning

Ensure that the HTP-1500 is not plugged into an outlet before cleaning the unit's exterior.

The exterior surface and the hose may be cleaned as necessary using soap and water or a mild disinfectant such as Cidex®. Do not use bleach.

The reservoir and internal plumbing can be cleaned with rubbing alcohol or a liquid germicidal agent. To do so, drain the pump's reservoir, attach any size pad and change the pump's Set-Point

Temperature to OFF (below 75°F). Fill the reservoir with at least two cups of cleaning solution and turn the unit ON. Allow the pump to circulate for 15 minutes. After cleaning the interior turn the unit off and drain the reservoir; also, disconnect and discard the pad.

Note: Distilled water will not promote algae growth or mineral buildup. However, use of tap water will not harm the functionality of the pump or void the unit's warranty. It is recommended that the water be changed monthly and that the unit be cleaned thoroughly at least annually.

Accessories

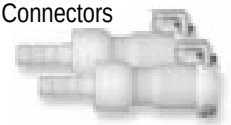
HTPS	Stand with or w/o Pad Cradle
HTPBB	Bed Bracket
TFR-1	Temp. & Flow Rate Test Unit A2.1
	Replacement Connectors


HTPS Stand

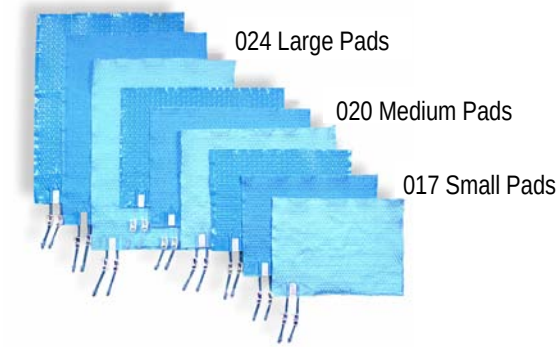
HTPBB Bed Bracket

TFR-1
Test Unit

A2.1 Connectors



Standard Pads		All-Plastic	Alternate	
ST-024	18" x 24"	WD-024	ST-224	
ST-020	14" x 20"	WD-020	ST-220	*(Home Care Pad)*
ST-017	12" x 17"	WD-017	ST-217	



Pads are Single Patient Use. All-Plastic pads may be cleaned with a cold sterilant for discretionary re-use. Refer to FDA Compliance Policy Guide 7124.16

Cautions

Controller Operation

When power switch position is changed from Off to On, the following sequence occurs: (1) There is a 2 second period during which nothing happens except for the pump running. (2) All display segments light for 1 second. The display will read 8888 followed by the software version number, i.e., P730. (3) The audible alarm sounds for 1 second. (4) The display alternates between "SP" and the current Set-Point Temperature for 10 seconds. The default Set-Point Temperature is the same setting from when the unit was last powered off. (5) The temperature is displayed and the system begins controlling the temperature to the Set-Point. Note: If the unit does not function as outlined or if any display segment does not light or the alarm not sound, remove the unit from service.

Water Level

When a pad is filling observe the unit’s water level and ensure that the water level does not fall below the bottom of the viewing window. Add water if necessary by removing the reservoir cap and filling the reservoir. The water level should be monitored during use and water added as necessary.

General Caution Statements

•Isolation from supply mains can be achieved by disconnection of the mains supply plug from the mains outlet.
• Avoid operating the HTP-1500 in the presence of other devices emitting electromagnetic interference.
• The BioMedical Department, or other qualified individual, should test the control temperature, flow rate. electrical leakage and ground resistance every three months or more frequently as required by facility policy.

Warnings

• The Set-Point Temperature must be set as prescribed by a physician.
• Observe patient's skin condition frequently, at least every 20 minutes, due to the individual differences in sensitivity and susceptibility to injury from heat and/or externally applied chemicals or pressure. Patients at greatest risk are those unconscious, on prolonged therapy, diabetics, children, and persons incapacitated or with sensitive skin areas or poor circulation.
• In surgery, heating may affect toxicity of certain prep solutions which have been reported to cause skin injury when remaining on patients' skin during application of prolonged heat.
• For moist heat therapy, use water only on a pad's white non-woven fabric surface.
• There is a risk of explosion if used in the presence of flammable anesthetics.

• Do not place a towel or other dry absorbent sheet between the patient and the pad unless using all-plastic pads. All plastic pads require a towel or dry absorbent sheet placed between the patient and the all-plastic pad to provide a sanitary barrier and absorb moisture. Pads with non-woven fabric surfaces do not require an absorbent sheet.
• Do not place additional heat sources between the patient and pad. Prevent excessive and or prolonged tissue pressure and shearing forces, especially over boney prominences. Skin damage may result.
• Power cord has "HOSPITAL GRADE" plug. Grounding reliability can only be assured when connected to an equivalent receptacle marked "HOSPITAL GRADE". (For use in home use a grounded electrical outlet. A surge protector can also provide added electrical safety to the unit.)
• Electric Shock Hazard. Do Not Remove Housing. Service to be performed by qualified personnel only.
• Risk Of Fire. Replace fuse only with the same type and rating.
• The HTP-1500 is not recommended or warranted for use with pads other than the Soft-Temp® brand.

Specifications

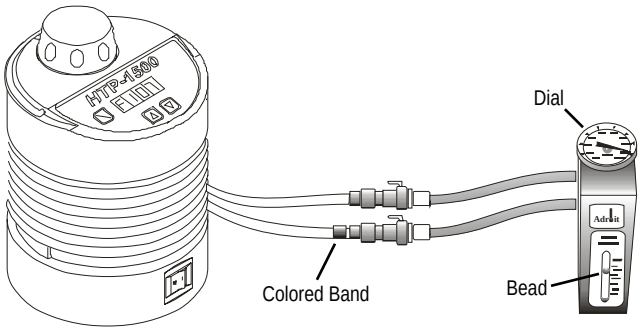
Height	10" (25.5cm)
Diameter	7" (17.8cm)
Weight (empty)	6lb,10oz. (2.48kg)
Reservoir Capacity	51oz (1,500ml)
Flow Rate (with pad attached)	15 gph or more
Set-Point Range	75°F to 107°F (24°C to 42°C)
Set-Point Accuracy	± 2°F
Safety Limit, Primary	110°F ± 2°F (43°C ± 1°C)
Safety Limit, Secondary	115°F ± 5°F (46°C ± 3°C)
Ambient Operating Temperature	60° to 90°F (15.6° to 32.2°C)
Storage Temperatures (empty)	-30° to 160°F (-34°C to 71°C)
Power Cord	18 AWG, 3 conductor, 8ft (243cm) Type SJT with hospital grade plug
Fuse	3 amperes
Current Leakage	<50 microamperes
Ground Resistance	<0.2 ohm
Electrical Requirements: Voltage (VAC)	120
Frequency (Hz)	60
Current (amps)	2
Power required (watts)	180

BioMed Testing

The HTP-1500 allows the user to easily test Temperature, Flow Rate and the Primary and Secondary Limit Switches. Testing the Flow Rate requires a TFR-1 Temperature / Flow Rate Testing Unit (See Accessories). The Limit Switches can be tested without dismantling the unit and no special equipment is required.

Checking the Temperature and Flow Rate

Attach the TFR-1 to the HTP-1500 as shown. Note that the pump hose with the "colored band" attaches to the TFR's "out" tube. Temperature is indicated by the dial on top of the TFR-1 and Flow is measured by the bead on the front.



Checking The Primary Limit Switch

First, make sure the Set-Point Temperature is 107° F. With a pad attached, allow the unit to

reach 107°F. Once this Set-Point is achieved, press the Down Arrow and the °F/°C and hold for five seconds. The display will flash “PriL CHEC” (Primary Limit Check) and the unit will then begin heating above 107°F. When the temperature reaches 110°F. the display will flash “HI 1” and the unit will beep slowly. The heating element will shutoff. Turn the unit off to exit test mode.

If the unit is not turned off, it will remain in test mode, continue to beep and circulate water until the display temperature drops to 102°F. At that point, the unit will stop beeping, begin heating and the test will repeat itself.

Beginning the test with the Set-Point at 107°F is a convenience of time and is not critical. The test can be started from any Set-Point Temperature.

Checking the Secondary Limit Switch

To enter the Secondary Limit first access the Primary Limit then press the Up Arrow and the °F/°C and hold for 5 seconds. The display will flash “SECL CHEC” (Secondary Limit Check) and begin heating above 110°F. When the temp reaches 115°F (±5°F) the display will flash “HI 2” the unit will be beep rapidly. The heater will shutoff and water will stop circulating. The unit will continue flashing “HI 2” and beeping until it is turned off.

Please note that once the Secondary Limit Switch has been triggered, it will need to cool before the pump will be operational again. This may take several hours. If the unit is turned back on before the Secondary Limit has cooled, the display will continue to flash "HI 2" and beep rapidly; will not it heat or circulate water.

Trouble Shooting

Most operating problems are related to a restriction in water flow. Usually a pad is simply not connected to the pump's hose or the pad has been folded too tightly. Below is a list of potential problems with possible causes. If the pump cannot be returned quickly to normal operation, remove it from service immediately and call Customer Service at 800-267-6077 to speak to a technician.

Problem	Cause
CHEC FLO Display	Out of water. Fill reservoir. Check pad connection.
HI 1 Display/Slow Beep	Pump ran out of water or pad has become kinked. Add water and check hose and pad.
HI 2 Display/Fast Beep	Pad has become kinked. Remove unit from service and allow to cool for several hours.
Gurgling Noise	Pump ran out of water, air is trapped in system. Fill reservoir and turn unit Off and On several times; air will bubble-out through the reservoir.

Leaking Connectors	Check connection, press firmly together.
Unit Not Heating	Primary Limit Switch was triggered and has not re-set . Call Customer Service.
Unit Not Pumping	Secondary Limit Switch was triggered and has not yet reset itself. Pump needs to cool off for several hours.

Use Good Judgment: Remove Unit From Service Immediately If It Does Not Respond To Corrective Action Or If Patient Could Be At Risk Of Injury.

In conditions where a pad is convoluted or folded, it can become kinked, preventing water from flowing properly. It is advisable to power the unit on with a pad attached to ensure proper water flow before the pad is applied to the patient.

Clinical References &
Recommended Reading

A New look at heat treatment for pain disorders, part1
McCarberg B, MD American Pain Society Nov 2004 14(6)

Continuous low-level heat wrap therapy is effective for treating wrist pain.
Michlovitz S. PT, PH.D. CHT. Archives of Physical Medicine and Rehabilitation
Sept 2004 85(9) 1409-1416

Therapeutic Uses of Heat and Cold Study Guide for Nurses. HealthStream
Nashville 2004

Grandma may have been right: Heat works best. Occupational Health Management Jan 2003 v13 i1 p8(3)

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US Pharmacy Review 2004

Local heat reduces renal colic pain. Cristen Page, MD Journal of Family Practice Nov 2003 52(11) 838-40

Local active warming: an effective treatment for pain, anxiety and nausea caused by renal colic. Kober A, et al. Journal of Family Practice Sept 2003 170 (3): 741-4

Get a "Grrrip!" Diabetes and Your Hands. Lori B. Siegel, MD FACP, and
Stephen R. Hauang, MD American Diabetes
Association Apr 2003 diabetes.org

Using heat therapy for pain management. Anne Chandler RGN Nursing Standard Nov 2002 17(9)40-2

Continuous topical heat treatment on trapezius muscle blood flow using power doppler ultrasound. Erasala GN, et al. Proceedings, Annual Conference and Exposition of the American Physical Therapy Association June 2001Topical heat provides pain relief of delayed onset muscle soreness of the distal quadriceps muscle. Weingand KW, et al. Medicine and Science in Sports and Exercise May 1999

How to detect and treat hypothermia in the elderly. The Brown University
Long-Term Care Quarterly Nov 1996 8(21):3

Hazards associated with the use of electric heating pads. FDA / CPSC Public Health Advisory Dec 1996

Thermal Agents in rehabilitation. Michlovitz SL 3rd Ed. 1986

Therapeutic heat and cold: Lehmann JF 3rd Ed. 1982

References provided for education only and are not intended to substitute a doctor's orders. Always consult with your physician about the proper use, limitations, and expected benefits of Heat Therapy.

Notes

Indications for use are found
on page 1 and 2 of this manual.

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