

HOT-TUB^(tm)

IV FLUID HEATED STORAGE BIN

(Version 1.2)

Manufactured by:

Delta Vehicle Systems, Inc.

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WARNING:

This product is designed to be installed and serviced **ONLY** by a qualified automotive electrician. Working with automotive batteries can be extremely hazardous. Always make sure you are wearing protective clothing and eyewear whenever working on any motor vehicle. Be sure your work area is properly ventilated.

This product is sold incomplete and requires the fabrication of a Plexiglas door and installation of fiberglass insulation. Please make sure your company is equipped to perform these tasks.

By using this product you are certifying that you have proper medical authority to use intravenous fluids.

BACKGROUND

In the emergency medical service, when an ambulance crew comes upon the scene of a medical emergency, the EMT's and Paramedics will apply an intravenous fluid line to the sick or injured patient when medically appropriate. Unfortunately, the IV fluid is usually stored in cabinets without any temperature control. This is especially problematic during cold weather. It is known that injecting cold IV fluid into patients in shock is detrimental to patient outcome. The DELTA VEHICLE SYSTEMS HOT- TUB HEATED IV FLUID STORAGE BIN addresses this problem by creating a thermostatically controlled storage system for IV fluids. It keeps the IV fluid close to human body temperature.

FEATURES

- A) Recessed Design- takes up almost no space in the ambulance
- B) Extremely Lightweight- Less than 2 pounds (1 kilogram)
- C) Low Current Consumption- Only 3 amps
- D) Simple Installation- only 2 wires- one to 12 volts and one to ground
- E) Totally Automatic- requires no attention from the ambulance crew
- F) Solid State and Maintenance Free- for years of reliable service
- G) Holds 4- 500 ml. IV fluid bags
- H) Built In Surge Suppression- Protection from "load dump"
- I) Five Year Limited Warranty

THEORY OF OPERATION

The HOT-TUB is a painted aluminum pan designed to hold 4 IV bags of 500 ml. each. Mounted on the chassis is a bead thermistor that senses the temperature of the pan. When the temperature is too low, the thermistor sends a signal to the green PC board where the thermostatic control is located. This turns on a power transistor mounted on the PC board. The power transistor activates the large gold power resistor mounted on the bottom of the pan. This in turn, heats the pan.

INSTALLATION REQUIREMENTS

A) The HOT-TUB is sold incomplete to the ambulance builder. It is designed to be mounted into a rectangular hole, cut into the counter area, facing the “action wall”.

B) Fiberglass insulation is required to insulate the bottom of the pan. This will keep the heat in and allow the system to consume less electricity. Be sure not to allow any aluminum covering of the fiberglass to come into contact with the electronic parts of the HOT-TUB.

C) You will need to fabricate a small Plexiglas door to cover the pan. It should be mounted on hinges and have finger holes to simplify opening.

D) Electrical installation is extremely simple. Just tie the RED wire to 12 volts and the BLACK wire to ground. If necessary, you can run it through a circuit breaker of 5 amps or more.

E) The HOT-TUB is designed for 12 volt vehicles only. Do not apply any other voltage to the system. If you have other requirements, contact DELTA VEHICLE SYSTEMS for more information.

OPERATING INSTRUCTIONS:

The HOT-TUB is a simple reliable storage bin for IV fluids. There are few things you need to know.

A). The system is designed for ambulances that are either in continuous use, or are connected to a shoreline power supply. When specifying a battery charger, be sure that you have 3 amps available for this product in addition to any other loads. That way the HOT-TUB will always be ready for service.

B) **The HOT-TUB is NOT a quick heater.** If an ambulance has been stored outdoors for a long period of time in cold weather, the HOT-TUB may need several hours to get the fluids to their desired temperature. If they become frozen, it will take much longer.

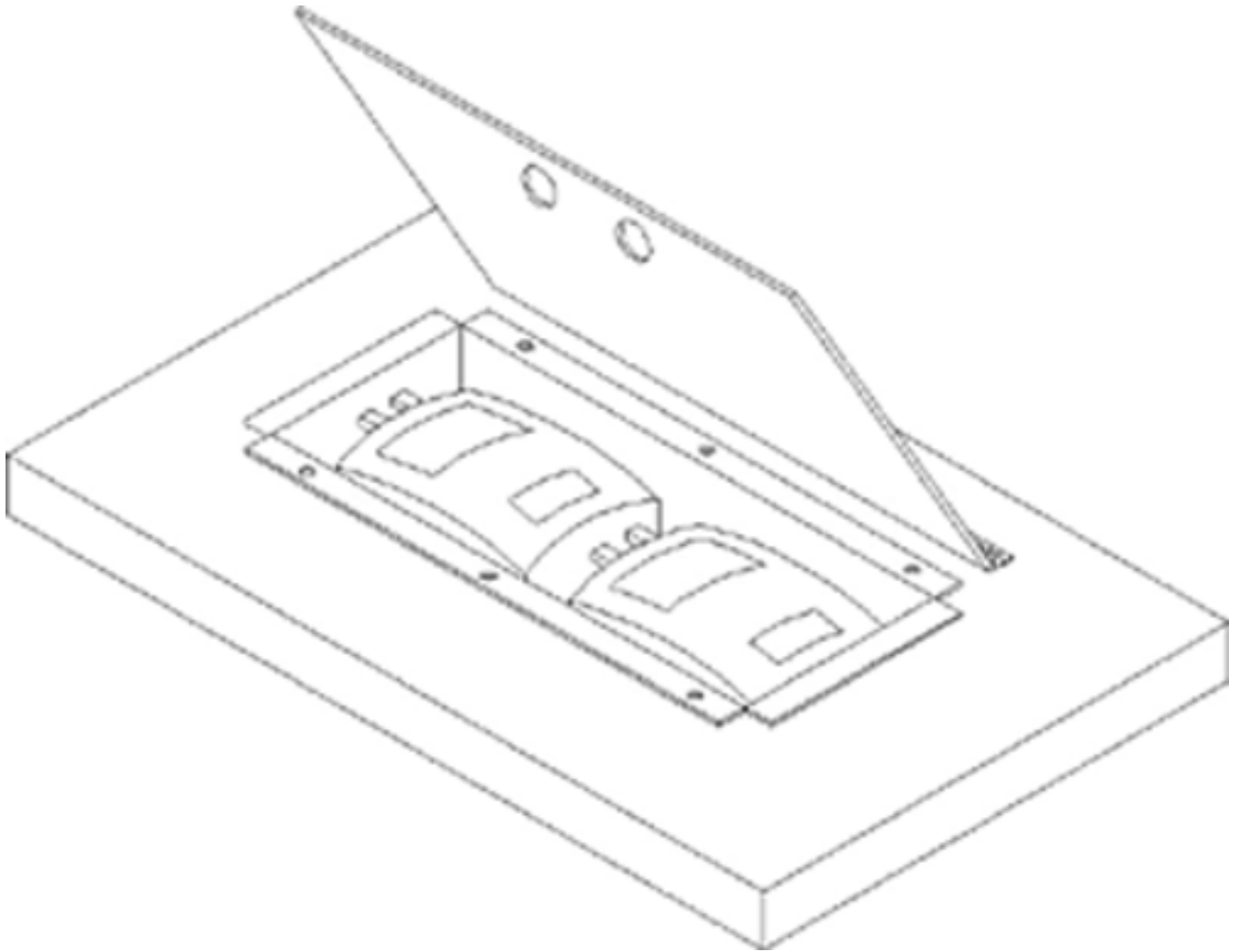
C) The interior of the HOT-TUB can be cleaned with a mild soap, for example, dishwashing liquid and warm water on a paper towel. You can also use medical germicides, if desired.

TROUBLESHOOTING

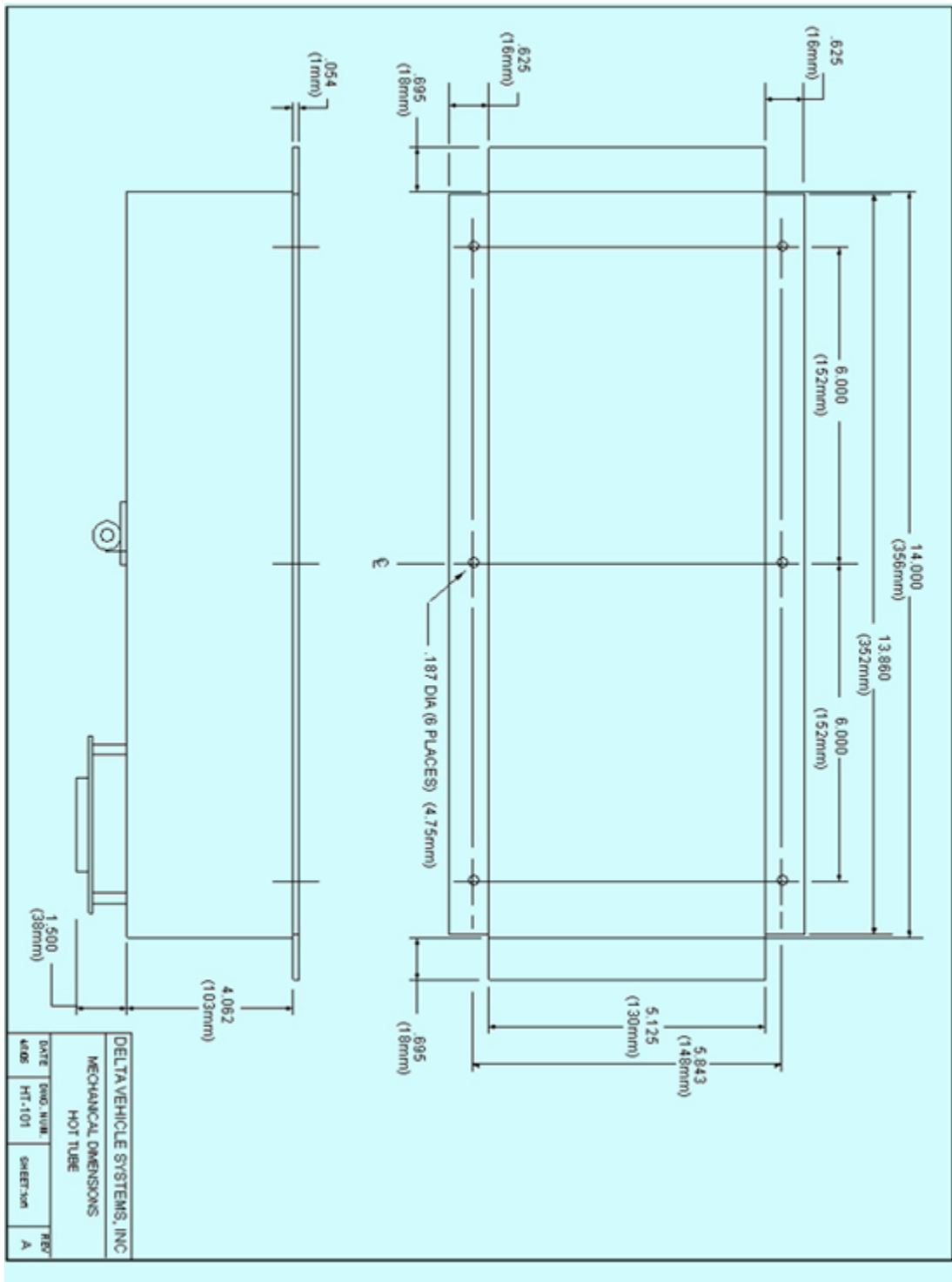
The HOT-TUB is a very simple and reliable system. To check that it is working properly, simply touch the bottom-center of the pan. It should be slightly warm to the touch, about 100 degrees Fahrenheit (37 Celsius). If it is not, make sure there is power going to the PC board, mounted under the pan. If it still doesn't work, remove it from the counter top. Inspect for frayed or broken wires. If problems persist, contact DELTA VEHICLE SYSTEMS for assistance.

LIMITED WARRANTY

The HOT-TUB is warranted by DELTA VEHICLE SYSTEMS for a period of 5 years from the date of installation by the ambulance builder. During that period, DELTA VEHICLE SYSTEMS will repair or replace, at its option, any defective parts necessary to return the unit to original operating condition. This warranty excludes any damage caused by fire, accident, abuse or unauthorized repair. No responsibility is assumed for any incidental or consequential damage resulting from the use of this product. Delta Vehicle Systems reserves the right to improve specifications without notice.



**The HOT-TUB IV warmer
shown installed**



Mechanical Installation Print