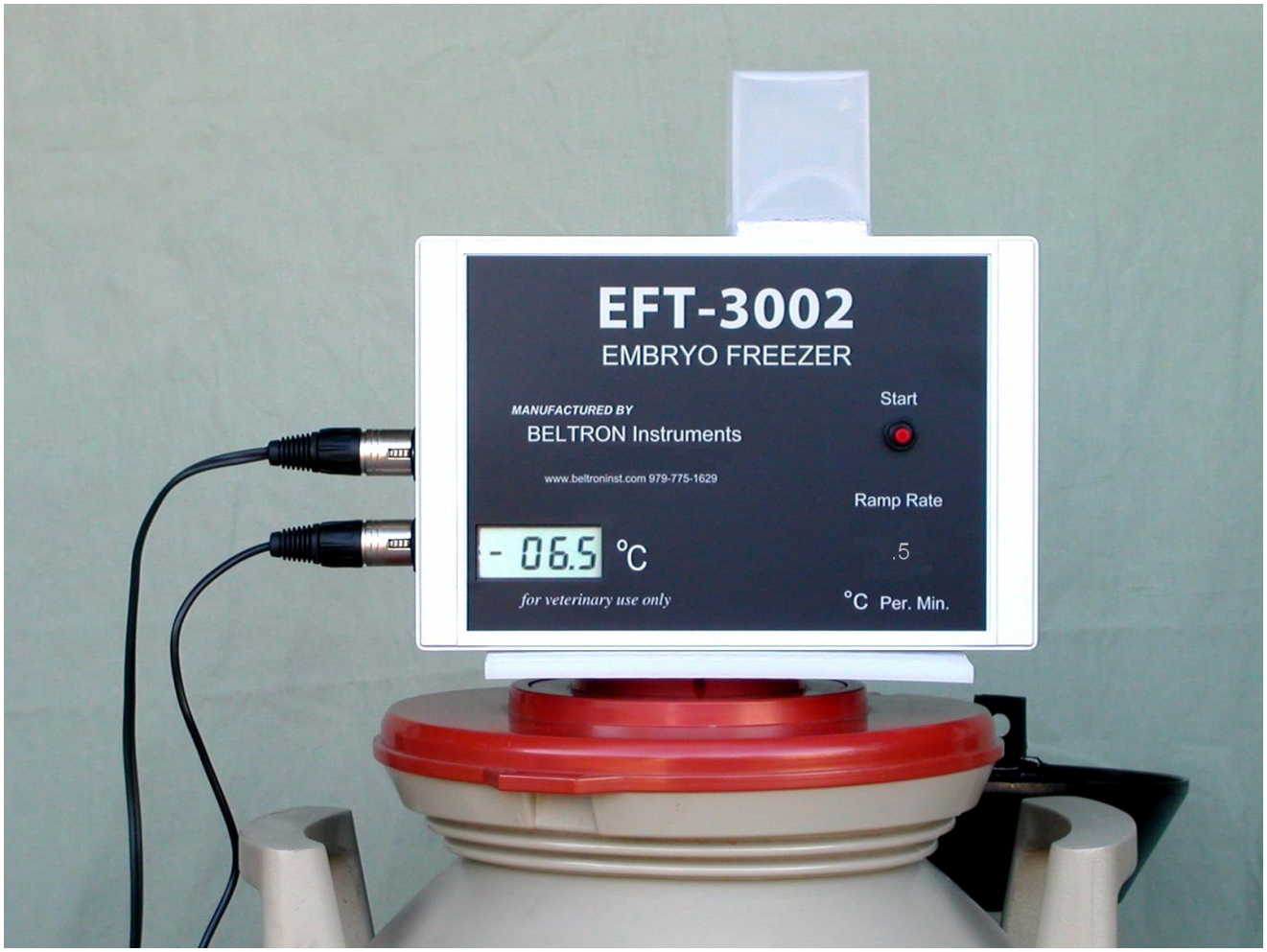
# EFT-3002

PORTABLE
EMBRYO FREEZER

# INSTRUCTION MANUAL




*MANUFACTURED BY*

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# EFT-3002

## ELECTRICAL & CONNECTIONS

The EFT-3002 uses 12 volts DC and comes from the manufacturer with a power supply using a North American standard power cord. Adapters for other countries can be used. The power supply is able to operate from mains voltages of between 100 and 130 volts 50-60Hz.

Battery operation is also possible. Two power input connectors are available. Either connector can be used for operation or both at once for fail-safe operation in case of power failure from one power source.

## HEAT TRANSFER MEDIA

The EFT-3002 is designed to use ethanol, isopropyl alcohol ( available in most pharmacies ) or ethylene glycol as the freezing chamber heat transfer media. Alcohol with a purity of 90% are best. During exposure to air the alcohol will absorb moisture, this contamination will cause the alcohol to become thick at low temperatures. In extreme cases this could cause straws to become frozen into the freezing chamber.

Do not reuse the alcohol if ice crystals have formed on the surface.

The use of other heat transfer liquids is not recommended. Fluids such as acetone, methanol, and isopentane should be avoided because of their caustic effects on plastic parts contained in the freezer. The use of non-approved fluids will void all warranty from the manufacturer and dealer. Do not transport the unit with alcohol in the freezing chamber.

# EFT-3002

## INTRODUCTION & DESCRIPTION

The EFT-3002 has been specifically designed for the deep freezing of embryos in 1/4 or 1/2 cc straws. Using advanced electronic technologies and liquid nitrogen cryology, the EFT-3002 provides a safe and reliable method for freezing mammalian embryos to a low temperature suitable for plunging into liquid nitrogen for long term storage. Relying on the freezing capability of liquid nitrogen, the EFT-3002 can freeze samples without the use of fluorocarbon-compressor based refrigeration equipment.

The use of alcohol in the freezing chamber provides a more stable and uniform conduit for the temperature transfer than an air filled chamber, but the unit will operate without alcohol if you desire.

The cooling rate of the EFT-3002 is set to -0.5 degree C per minute.
The controller is mechanically limited to approximately -0.8 degrees per minute to increase the safety of the freezing cycle.

The start temperature is factory set at -6.5 degrees C but can be adjusted to a lower temperature by pressing the start button. When the temperature reaches the desired temperature press the start button again and the temperature will stabilize at the new level. Final bath temperature will be approximately -35 degrees C.

## UNPACKING & INSPECTION

The EFT-3002 is shipped in a durable carrying case with a soft lining. Each case is designed for protection of the freezing components an should perform safely under normal handing conditions.

As with any electronic equipment, care should be exercised in transport and operation to avoid dropping or exposure to water.

As part of your initial inspection of the unit from the manufacturer, visually inspect the outside of the case for transport damage. Report any damages to the shipper immediately. Visual inspection of the freezing components should follow. Apply power to the freezer, the temperature display should indicate the units temperature.
If the freezer appears to be working, ***run through a mock freezing program checking the start temperature and that the freezing rate***.

Report any problems with the operation to the supplier immediately.

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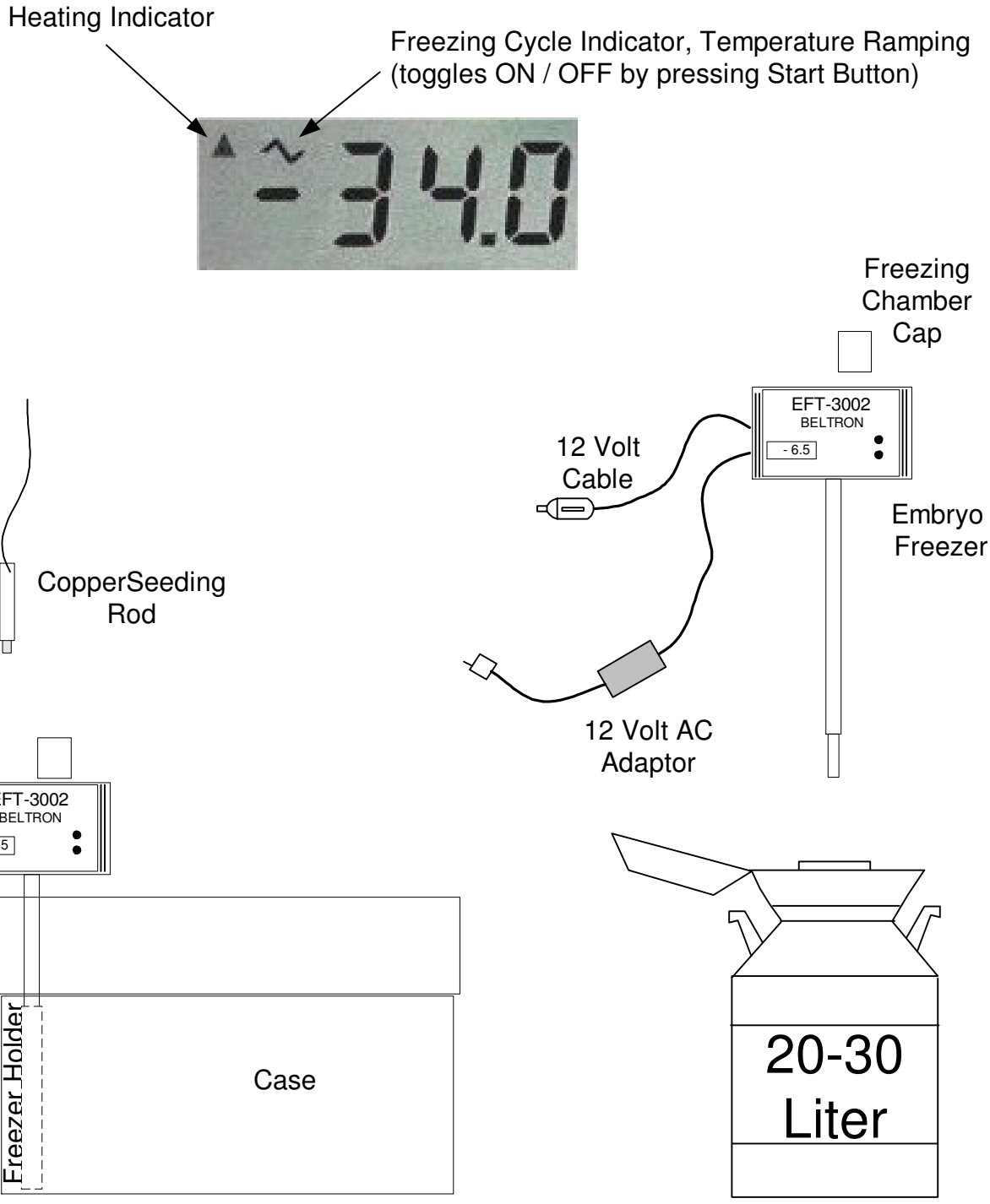
# EFT-3002

## PORTABLE
## EMBRYO FREEZER



# Portable Embryo Freezer EFT-3002

## SPECIFICATIONS

| | | | | |
|---|---|---|---|---|
| Mains Voltage Adapter: | | 100-240 Volts A.C. 50-60 Hertz | | |
| DC Input: | Two Available | 12 volts DC @ 2.5Amps | | |
| Fuse: | | 3.5 Amp Self Resetting ( not user replaceable) | | |
| Weight: | Freezer | 4.2 Pounds | 1.9 Kilograms | |
| | Case | 14 Pounds | 6.4 Kilograms | |
| | Shipping | 21 Pounds | 9.5 Kilograms | |
| Dimensions: | Freezer Body | Length | 6.5 Inches | 16.5 cm |
| | | Width | 9.5 Inches | 24 cm |
| | | Depth | 3.75 Inches | 9.5 cm |
| | Freezer Rod | Length | 19.5 Inches | 49.5 cm |
| | | Diameter | 1 Inch | 2.5 cm |
| | Case | Length | 27 1/2 Inches | 70 cm |
| | | Width | 7 1/2 Inches | 19 cm |
| | | Depth | 12 1/2 Inches | 32 cm |

| | |
|---|---|
| Straw Capacity: | 32, Assuming One Straw Per. Hole, 96 straws max. |
| Ramp Rate: | .5 Degrees Celsius Per. Minute( mechanically limited to Approx. .8 Degrees per. Minute with no power) |
| Environmental Limits: | -50 to +50 Degrees Celsius<br>0 to 95% Humidity non- condensing |
| Start Temperature: | -6.5 Degrees Celsius $\pm$.05 degree Celsius |
| End Temperature: | Approx. -35 Degrees Celsius |
| Safety Compliance: | CE, UL, GS |
| Included Accessories: | Freezing Chamber Cap, Alcohol Bottle, Copper Seeding Rod |

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## WARRANTY SERVICE & REPAIR

This product carries a 5 year warranty on parts and materials. Beltron Instruments warrants this equipment as free from defects in material and workmanship, when used in accordance with the operating instructions under normal conditions.

For a period of 5 years from date of delivery, any part found to be defective will be repaired or replaced, free of charge, at the discretion of Beltron Instruments.

All repairs are to be performed by Beltron Instruments or its authorized service representatives.

All shipping charges must be prepaid by the customer.

Return shipping will be paid by Beltron.

Any damages resulting from misuse or the use of unapproved fluids will make this warranty void.

The above stated warranty is the full and only warranty by the manufacturer.

For warranty service or repair send to your Beltron representative or directly to Beltron Instruments

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# EFT-3002

## OPERATING INSTRUCTIONS

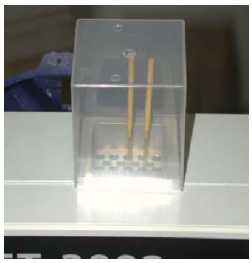

***When you first receive the freezer run through a mock freezing program checking the start temperature and that the freezing rate***

**1. Slowly insert freezer into liquid nitrogen "$LN_2$" tank**
***Caution:*** **Direct contact with liquid nitrogen can cause severe damage to skin.**

**2. Attach the power cord.** It can be powered from 110v, 220v or 12v.
Any combination of two power sources can be attached simultaneously as a backup.
Tip: The freezer can also be operated in a vehicle using the 12V power. Freezing chamber temperature will be displayed.

**3. *Fill freezing chamber with 90% or better alcohol,*** enough to cover holes in freezing chamber. ( a little more than half a freezing chamber cap full )
***Tip:*** Using alcohol that has been kept in the freezer will reduce the cool down time and save liquid nitrogen.

**4. *Place cap on freezing chamber.*** The controller will automatically allow the freezing chamber to cool down to the start temperature ( -6.5C). This will take approximately 45 minutes from room temperature. Once the temperature has stabilized for 3 minutes you may place the prepared embryos into the freezer with the straw ID extending above the chamber.
***Tip:*** Check the display ramp indicator to verify that the start button has not been pressed.
If it has, just disconnect power and the freezer will reset to the start temperature.



**5. *Place the embryo straws into the freezing chamber.***

**6. *Seed each of the straws*** by touching with the frozen copper rod.

**7. *Start the freezing process*** by pressing the red button. NOTE: *Do Not depress the start button until all of the embryo straws are in the chamber.* Ramping can be stopped by pressing the start button again. The temperature will then ramp down according to the selected ramp rate until it has dropped to the finish temperature ( colder than -30 degrees C ). The freezer can be removed from the LN2 tank and placed in the PVC tube in the carrying case. The embryos are then ready to be transferred to liquid nitrogen storage.
***Tip*:** If power is lost after this step **DO Not Panic.** Leave power off and allow to freeze for 45 minutes, most of your embryos should survive.

**8. *The embryos can now be transferred*** to a properly labeled cane that has been submersed in $LN_2$ in the same tank. Be sure to shake the excess alcohol off of the straws prior to plunging them into $LN_2$ to prevent the straws from freezing together.
After the straws have been removed, disconnect power from the freezer and place the protective cover over the chamber and invert the freezer to collect the alcohol. Or if you want to run another program just remove power from the freezer until display goes blank, then back on. In about 30 minutes the freezing chamber's temperature will have returned to its start temperature.