

# SPECIFICATIONS FOR NUAIRE IR AUTOFLOW NU-8500 AUTOMATIC CO<sup>2</sup> WATER-JACKETED INCUBATOR

This document is concise statement of requirements for a quality Automatic CO<sup>2</sup> Water-Jacketed Incubator, which may be used to augment your purchase request/order.

A NuAire sales representative will be pleased to explain the importance of the performance and control affected by each of the following requirements. The IR AUTOFLOW NU-8500 meets all of the requirements in the following specification.

Overall Dimension - Inches [mm]

Height:	Exterior:	39.5 [1003.3]
Width:		25.5 [647.7]
Depth:		26.5 [673.1] (Includes wire & tubing cover channel)

Height:	Interior:	25.5 [647.7]
Width:		21.5 [546.1]
Depth:		21.0 [533.4]

Volume: 6.65 Ft.<sup>3</sup> [188.5 liters]

1. The outer shell is constructed of 16 gauge, type 304 stainless steel with powder coat paint finish.
2. The inner chamber is 16 gauge, type 304-polished stainless steel using coved corner crevice-free construction.
3. All stainless steel shelves, shelf supports, and guide rails are easily removable for decontamination.
4. The outer chamber's walls are lined with a space-age insulation providing a R.5 rating, minimizing heat loss.
5. The large water-jacket [20 gallon {75.7 liters}] surrounding the inner chamber permits the water to circulate within the jacket, producing a temperature uniformity of  $\pm 0.2^{\circ}$  C.
6. A water fill port shall be provided on front of the chamber with a 1/4" NPT opening for a 3/8" tubing connection. An over fill port on front of chamber will assure optimal water levels. A low water level warning system is activated if water levels fall below proper operating conditions.
7. A drain valve is located on bottom front of chamber for complete drainage of the water jacket.

8. A HEPA filtration system shall be provided. Closed loop HEPA filter system is designed to minimize contamination at a recirculation rate of 1 chamber volume change every 30 minutes.
9. Manually adjustable outer front door heater is duty cycle controlled to reduce condensation within the chamber. The heaters are microprocessor controlled to reduce output in an increasing room ambient to avoid an overheating condition. The heater output can then increase back to the set value as the room cools back down.
10. Incubator shall come with four [4] square polished stainless steel shelves, 8 ft. [2.5m] electrical power cord, utility side access port, and heavy duty leg levelers.
11. A state-of-the-art microcomputer based control system is specifically designed to service the precise control requirements of the chamber's environment.
12. The microcomputer is supported with Read Only Memory [ROM] containing executable software, Random Access Memory [RAM] for temporary storage, and Electronically Erasable Programmable Read Only Memory [EEPROM] for control set points and parameters. The EEPROM provides for indefinite storage of these values during periods of power off or power interruption. The microcomputer includes a complete internal diagnostic software package that permits fault isolation detection down to the failed component.
13. The water-jacketed incubator incorporates an integrated digital microprocessor-based, solid-state, non-dispersive infrared CO<sup>2</sup> sensor. Advanced design provides a very stable drift-free output requiring less frequent calibration.
14. The incubator shall be listed by Underwriters Laboratory to meet the requirements of both the U.S. and Canada standards for electrical/mechanical integrity.
15. Relative humidity level up to 95% is achieved in the incubator by the use of a stainless steel pan filled with distilled water and placed in rail guides just above the bottom of the chamber.
16. The incubator is programmed with options that give the user control of System use, CO<sub>2</sub> sensor calibration procedures, alarm parameters, & adaptation to different lab environments.

## 17. Performance Parameters

Temperature Range:	5°C above ambient to 55°C
Temperature Sensitivity:	±0.125° C
Temperature Uniformity:	±0.2° C at 37° C
Temperature Accuracy:	±0.0125° C
CO <sup>2</sup> Range:	0.1 - 20 %
CO <sup>2</sup> Accuracy:	±0.1 %
CO <sup>2</sup> Recovery to 5.0 ± 0.2%:	Less than 3-1/2 minutes
Temperature Display Resolution:	0.1° C
CO <sup>2</sup> Uniformity:	±0.1 %
CO <sup>2</sup> Display Resolution:	0.1 %
Door Heater Control Logic:	Proportional 1-100% [adjustable]
Temperature Sensor Type:	Precision Integrated Circuit
CO <sup>2</sup> Control Logic:	Fixed Algorithm/Manual Environmental Adaptable
CO <sup>2</sup> Sensor Type:	Infrared
RJ-11 Jack - on rear panel for remote alarm connection	

## 18. The following optional equipment and accessories shall be available to support installation and user requirements:

- Automatic CO<sup>2</sup> Tank Switch [Internal]
- Relative Humidity Display
- Internal Coil for Chilled Water
- 4 inner Lexan® Doors
- RS-232 Communication Interface
- Multi-Signal Chart Recorder Outputs (0-5 vdc, 0-10 vdc, & 4-20 mA)
- Platform w/Combination Castor/Leg Levelers
- Surge Protector
- Moisture Proof Duplex Outlet
- Two-Stage Regulators
- Additional Shelves
- CO<sup>2</sup> Tank Alarm