NATIONAL ELECTROSTATICS CORP.

Instruction Manual No. 2IT061460 for
Operation and Service of

Non-Fluorocarbon
ACF Cooling System
2IA061460

3/2009
JBS/SHP

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IMPORTANT SAFETY INFORMATION
READ BEFORE OPERATION AND SERVICE

This unit must only be operated and serviced by qualified personnel who have read the instruction manual and are familiar with the hazards associated with pressurized equipment. Proper care and judgment must always be observed.

OPERATION:

1. Before connecting service lines to pressurized units, ensure that all gas/liquid connectors, tubes and components are in place and securely fastened.

2. Use caution when connecting pressurized input/output lines. Only apply pressurized lines for the gas/liquid at the rating specified for this unit.

3. Ensure the correct gas/liquid is connected to the correct point on the unit.

WARNING: Where conductive fluids (such as water) are used, ensure that pressurized lines do not traverse an electrical potential difference.

4. When operating unit under pressure, ensure all connectors, lines and components are leak tight.

5. Never attempt to operate the unit in any manner not described in the instruction manual.

SERVICE:

1. When pressurized inputs are turned off and/or the unit is shut off, dangerous pressures may remain in the equipment. Follow a proper pressure relief procedure before unfastening any pressurized component.

2. Service is best done by NEC trained technical personnel, either at the site during installation or by returning to the NEC factory. Call NEC at 608-831-7600 for a Return Materials Authorization (RMA) number and ship unit to 7540 Graber Road, Middleton, WI 53562.

3. If service of this unit is to be done at the user's site, this service may only be performed by trained and qualified personnel and must follow instructions in this manual or from NEC technical personnel.

4. Consult NEC supplied assembly drawings, part lists and schematic diagrams for service details.

I. DESCRIPTION

The ACF (Air-Cooled Fluid) Cooling System is designed to provide cooling to high voltage devices, such as ion sources, or for any application where electrical isolation is required.

The major components of the system are: a pump, an air-cooled heat exchanger, a fan, a fluid reservoir, and a flow switch. This particular model of the ACF Cooling System is designed to be used with non-fluorocarbon, insulating coolants such as LOBS (low odor base solvent)

II. INSTALLATION

The ACF Cooling System is enclosed in a 19" wide, 8-3/4" high rack mounted chassis. Therefore, it is most convenient to mount it by screwing the front panel into a standard, 19", electronics frame or equivalent cabinet. This unit is designed to operate only in the conventional orientation. When installing this unit see that the air intake on the front panel is not blocked to impede the flow of air.

The swagelok connectors on the back panel are designed for 3/8" O.D. tubing. Polyethylene tube cooling lines are recommended. Insert the tubing into the fitting. Make sure that the tubing rests firmly on the shoulder of the fitting and that the nut is finger-tight. While holding the fitting body steady with a backup wrench, tighten the nut 1-1/4 turns.

The ACF Cooling System operates on 120 VAC (50 or 60 Hz) power. The AC power input voltage selector card, located in the rear panel power receptacle (PR1), should be left in the 120 VAC position. The AC line voltage strapping is indicated by a white dot on the power receptacle cover. If one restraps for 240 VAC operation the unit will not work (although no damage will be done to the unit). The ACF Cooling System requires a 3.0 Ampere 3AG Slo-Blo fuse which is located in the fuse holder behind the power receptacle cover. Connect the unit to a grounded 50 or 60 Hz service circuit. The AC power cord has the following color code:

Power Cord Wire Color	Function
Black	Hot (Line)
White	Neutral
Green	Ground

WARNING: Do not operate ACF Cooling System without a good external ground attached to rear panel ground stud.

The ACF Cooling System should be powered in parallel with the device to be cooled so that it goes on automatically. A light on the front panel indicates when power is on.

This cooling system is equipped with a 0.15 gal/min (0.6 l/min) SPST 20 watt flow switch. Terminals on the back panel allow the user to monitor or interlock the cooling system.

The ACF Cooling System is designed to operate with LOBS. To fill unscrew the reservoir cap on the top of the unit. Additional coolant may be added after the unit is operated and the volumes in the pump, heat exchanger, plumbing, etc., are filled. Coolant level can be observed through the level indicator on the front panel.

OPERATION

DO NOT OPERATE WITHOUT COOLANT. Damage to the pump will result from dry running. When the unit is energized verify that the cooling fan is blowing by placing your hand over the exhaust port. Coolant flow can be verified by the flow switch state or by observing turbulence in the coolant through the level indicator. Check for leaks around the fittings. A leak tight system should run indefinitely on its initial supply of coolant.

III. SPECIFICATIONS

Size:	48 cm x 22 cm x 30 cm (19" x 8.75" x 12")
Weight:	10 kg
Coolant:	LOBS, Multitherm, or equivalent
Capacity:	1.9 liter reservoir
Max. Heat Load:	75 W
AC Power Input:	110 to 125 VAC 350 VA max., 47-63 Hz
AC Power Fusing:	3.0 Ampere 3AG Slo-Blo

IV. **DOCUMENTATION**

NEC Drawing No. 2IA061460
Parts List No. 2IA061460

NEC Drawing No. 2HS062670