OPERATING INSTRUCTIONS
MAINTENANCE INSTRUCTIONS
and
PARTS NOMENCLATURE
for
THE ARCAIR® SLICE® PECU
PORTABLE EXOTHERMIC CUTTING UNIT

ARCAIR COMPANY
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I INTRODUCTION

1.1 PURPOSE AND FUNCTION
The Arcair SLICE Fleet Pack is a portable exothermic cutting unit, PECU. Designed to be used by damage control personnel for rescue and providing access to damaged or burning compartments. With the abilities to penetrate steel, aluminum, stainless steel, cast iron, insulated wiring and piping without the aid of a welding power supply or explosive fuel gases.

1.2 THEORY
The SLICE Fleet Pack PECU is a portable, easy to use variation of the oxygen lance used by the steel mills and foundries for many years. It is based on an exothermic, or chemical reaction, between a carbon steel fuel, the rod, heat and oxygen. It is designed to be used by damage control personnel for rescue and for providing access to damaged or burning compartments. It can cut access holes for fire fighting nozzles through bulkheads, deck plates and water tight doors in a minimum amount of time.

When a good balance is achieved between the surface area and weight of the rod, and the flow of oxygen through the rod, the rod will keep burning after the initial heat is introduced. With the oxygen flowing, all that is needed to ignite the rod is a spark from a 12-volt battery. Once the reaction begins the rod will consume itself, creating enough heat to cut or melt most materials. It can cut through steel, aluminum, stainless steel, cast iron, insulated wiring and piping. It does this without the aid of a welding power supply or explosive fuel gases.

1.3 PERFORMANCE/OPERATIONAL CHARACTERISTICS
The Arcair SLICE PECU operates by using a 12-volt battery to ignite a patented SLICE cutting rod. The rod is placed into a torch attached to one side of a battery. The rod is then lightly touched to a copper striker plate attached to the other side of the battery. With the oxygen flowing, this spark is enough to ignite the rod, and once ignited the rod will continue to burn unless the oxygen trigger on the torch is released. Placing the rod on the material to be cut and dragging it along the surface at the right speed cuts the material. Enough heat is produced by the reaction of the oxygen and the steel rod to cut most any material.

1.4 DIMENSIONS
The Arcair SLICE PECU is comprised of three components: the Fleet Pack, the auxiliary oxygen cylinder case, and the spare parts kit. The major unit is the Fleet Pack that contains the torch assembly, striker assembly, one oxygen cylinder, gloves, goggles, the battery assembly with charger, and other miscellaneous parts. These are all contained in a carrying case that is 8 inches deep, 16 inches wide and 25 inches high and weighs approximately 70 pounds.

The auxiliary case contains two extra oxygen cylinders. Dimensions are 8-3/4 inches deep, 16-7/16 inches wide, and 23-3/4 inches high and with the cylinders weighs approximately 64 pounds.

The Spare Parts kit contains a complete set of extra parts and the back pack harness. The container is 7-1/2 inches deep, 15-7/8 inches wide, and 7-3/8 inches high and weighs approximately 14 pounds.

A fourth component contains the twenty five 3/8" diameter rods and is 2-1/4" in diameter and 38" long and weighs approximately 20 pounds.

1.5 POWER AND UTILITY REQUIREMENTS
A 120 volt AC outlet is required to recharge the battery contained with the Arcair SLICE PECU.

1.6 ITEMS FURNISHED

CAUTION

Do not use the SLICE Torch or the SLICE Striker supplied in the SLICE Fleet Pack PECU with a welding power supply. The power cable on the torch and striker cannot carry the current from a welding power supply. It will melt or catch fire.

1.6.1 Torch and Striker

SLICE Torch
This torch provided with the SLICE Fleet Pack PECU must be used with the SLICE battery assembly or other 12-volt battery only.

SLICE Striker
This striker provided with the SLICE Fleet Pack PECU must be used with the SLICE battery assembly or other 12-volt battery only.

1.6.2 Battery and Charger Assembly

NOTICE
Proper care of the Arcair Battery Assembly is outlined in Section 4.1.
This battery assembly is designed to be used with the Arcair SLICE Fleet Pack PECU. It contains a charging unit and quick disconnect for the SLICE Torch and Striker. Do not use any torch that does not have a connection that mates with this battery assembly.

1.6.3 Cutting Rods
Use only Arcair SLICE cutting rods. These rods provide the most efficient cut. They are safe and they ensure the proper oxygen balance.

1.6.4 Oxygen Cylinders
Three 48-cubic-foot oxygen cylinders are supplied with the PECU. These bottles are shipped empty and must be charged with oxygen before placing the PECU in service.

1.6.5 Accessories
Collet Nut Extension and Shield
This extension and shield should be used for all piercing operations. It will enhance torch life and provides greater operator comfort and safety.

Gloves
You should always wear welding gloves. Gloves made for SLICE use are contained in the PECU. These gloves are especially helpful when operators are piercing since they protect the operators from blowback.

Face And Eye Gear
Eye and face protection must be used when cutting with SLICE equipment. When cutting with the PECU as supplied, use a number 5 or higher welding lens. When piercing use a shaded face shield or welding helmet.

1.6.6 Carrying Case
A light weight aluminum carrying case contains all the items listed above to quickly get the unit to the damaged area.

1.6.7 Auxiliary Carrying Case
An aluminum framed carrying case contains two spare oxygen cylinders and also allows them to be safely and easily transported to the damaged area.

1.6.8 Spare Parts Kit
A spare parts kit contains all the critical parts that could be damaged in an emergency situation and the back pack harness.

1.6.9 Tools and Test Equipment
Two special wrenches are with the PECU. These are designed for use on all fittings on the PECU. They are attached to the Fleet Pack carrying case and should not be removed.

The battery assembly is equipped with a battery test circuit. Place the three position switch to the test mode to determine the battery condition.

1.7 WARRANTY INFORMATION
The Arcair Company warrants that all equipment manufactured by it shall be free from defects in material and workmanship for a period of 90 days, provided that such equipment is operated in a proper and normal manner and is maintained and serviced with generally accepted maintenance procedures and in accordance with Arcair’s operating instructions. The user is strongly urged to read and understand all safety precautions before operation or use of any product.

For apparatus or accessories not manufactured by Arcair, which are part of the equipment furnished by Arcair, Arcair’s only obligation shall be to obtain such warranties or guarantees as are available from the vendors thereof.

Arcair’s liability is limited to the repair or replacement of any defective part or to the correction of any manufacturing defect without charge provided notice of such defect is given to Arcair within the applicable warranty period and Arcair’s inspection confirms the existence of such defect. Normal replacement will be F.O.B. Arcair’s factory or authorized service facility.

The replacement of repair or defective parts, as aforesaid shall be the customer’s only remedy for breach of warranty of Arcair. No allowance will be made for repairs or alterations made without the written consent of Arcair, in which event all Arcair’s warranties may be void and of no effect.

ARCAIR COMPANY SHALL NOT BE OTHERWISE LIABLE IN CONTRACT OR IN TORT (INCLUDING BUT NOT LIMITED TO NEGLIGENCE OR STRICT LIABILITY) FOR ANY DAMAGES INCLUDING BUT NOT LIMITED TO INCIDENTAL DAMAGES, CONSEQUENTIAL DAMAGES, OR SPECIAL DAMAGES IN ANY WAY RELATED TO THIS EQUIPMENT.

THERE ARE NO EXPRESS OR IMPLIED WARRANTIES WHICH EXTEND BEYOND THE WARRANTIES HERE AND SET FORTH. THE MANUFACTURER MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE EQUIPMENT OR PARTS THEREOF.
II SAFETY PRECAUTIONS

2.1 SPECIAL SAFETY PROCEDURES
The SLICE Torch uses industrial-grade oxygen to produce its extremely effective cut. In using this torch, you should apply military/industrial safety procedures.

The following sections detail these procedures. Be sure to also use ANSI/ASC "Safety in Welding and Cutting" (Z49.1-1983) or other such standards. More cautions are noted in this manual.

2.2 OXYGEN SAFETY
(See ANSI Z 49.1-1983 and other industry/military standards for further details)

2.2.1 Contact With Oil/Grease
Never let oil or grease near oxygen cylinders, valves, regulators, hoses, or fittings. Do not handle oxygen cylinders, valves or regulators with oily hands or oily gloves since oxygen, under pressure, explodes when combined with oil and grease.

2.2.2 Proper Name
Always refer to oxygen by it full name, "OXYGEN," not by the word "air." Improper use of the word could lead to use of compressed air.

2.2.3 Cylinder Storage
Never use oxygen near flammable materials. Oxygen itself is not flammable, but does help other things burn.

Store oxygen and flammable gas cylinders separately. Both should be stored in a dry, cool, well-ventilated, and preferably fire resistant-places. Protect cylinders from high temperatures by storing them away from radiators or other sources of heat, including direct sunlight. Cylinders should always be stored in an upright position.

Oxygen cylinders should be chained to a wall, post, or should be put in a cylinder cart in an upright position.

When opening cylinders, stand to the side and open the oxygen cylinder valve slowly until the regulator is pressurized. Then open the valve fully.

2.2.4 Oxygen Cylinders
Be sure that the cylinder valve is tightly closed before handling the cylinder.

If a leak occurs in a compressed gas cylinder, move the cylinder outdoors away from other cylinders, flammable material, or equipment. A leaking oxygen cylinder will increase oxygen concentration (which can't be seen or smelled), creating a fire hazard in the air.

Never try to transfer oxygen from one cylinder to another or to refill an oxygen cylinder. Never try to mix gases in an oxygen cylinder. Potentially explosive mixtures can result.

2.2.5 Oxygen Enrichment
Never spray oxygen in closed areas or on your clothing. Oxygen should never be used to cool the work or operator.

2.2.6 Electric Arcs And Flames
Keep oxygen cylinders away from electrical connections. Do not let the arc or cutting flame touch cylinders, cylinder safety devices, valves, regulators, or hoses. Fires or explosions could result from such contact.

2.2.7 Oxygen Regulator
Never use oxygen from cylinders or a piping system without a regulator attached to the cylinder valve.

Inspect the oxygen regulator for damage, dirt, dust, or oil. If you see any, return the regulator to the manufacturer for repair.

Never use oxygen regulators, hoses or other pieces of apparatus with any gas other than oxygen.

Never tamper with or attempt to repair oxygen cylinder valves or regulators.

DO NOT TRY TO REPAIR OR MODIFY OXYGEN REGULATORS.
2.3 EQUIPMENT SAFETY
(See ANSI Z49.1-1983 and other military/industry standards for further details)

2.3.1 Installation
Equipment must be installed in a way that meets the requirements of the current ANSI/NFPA 70, NATIONAL ELECTRICAL CODE and all local codes.

After attaching a connection, you should check to be sure it is tight before operating the PECU.

CAUTION
While cutting, operators can prevent electrical shock by using dry gloves, clothing in good condition, and electrical-hazard footwear. Avoid touching all live electrical parts. The operator should NEVER connect the positive and negative leads of the system at the same time.

2.3.2 Equipment Maintenance
Cables should be inspected often for damage and wear. They should be wiped clean. Wet, oily, grimy, cracked, abraded, burned or otherwise damaged cables are unsafe to use and must be replaced.

NOTICE
When starting from a battery, be sure to follow the battery manufacturer’s care and maintenance procedures. For the proper care of the Arcair battery assembly, see section 4.1 of this manual.

2.4 OTHER SAFETY PRECAUTIONS
(See ANSI Z49.1-1983 and other military/industry standards for further details)

2.4.1 Combustible Materials
Do all work away from combustible materials. Fire extinguishing equipment should be on standby. Containers that have held flammable materials may explode, catch fire, or release toxic vapor. (See American Welding Society publication F4.1-80)

2.4.2 Fumes
Cutting fumes can be toxic. Adequate ventilation is mandatory when cutting. Do not breathe the gases and fumes caused by cutting. Keep your head out of the fume plume (smoke). Know what you are cutting and what the fumes are. Do not work on a container containing unknown contaminants. Remove all galvanized coatings, paints and contaminants BEFORE cutting. The air in the cutting area and the ventilation system must be checked if operators feel discomfort. If a problem occurs, an industrial hygienist should inspect the cutting area and the ventilation system.

2.4.3 Protective Clothing
Sparks can cause fires. Wear clothing approved for arc welding/cutting. The operator, helpers and observers must be protected. The following protective clothing should be worn.

Eye Protection
Wear glasses or goggles with side shields and tinted to a number 5 shade filter. Helmets or hand shields add protection. Helpers and others must also wear suitable eye protection.

Ear Protection
Wear ear plugs or muffs. Both spatter and noise can cause hearing loss. (See OSHA 29CFR 1919.95)

Body And Head Protection
Leather jackets, gloves, spats and clothing must be worn for body and head protection. Cuffless pants should cover work boots.
2.4.4 Material Preparation

Know what you're cutting! Low-melting-point material (such as aluminum) will spatter excessively and the potential for "blow back" is high. Protect yourself and others. Knock or brush free all loose particles, dust, or residue from the material before cutting. Be careful when cutting materials that may deflect the flame or spatter back at you or onto other "unsafe" areas.

Work done in tight spaces requires special care. Proper ventilation is essential. Be very careful.

2.5 PRECAUTIONARY LABELS

Warning labels are on key equipment parts. Do not remove, change, or cover these labels. Should these labels not be visible, contact your Arcair distributor for new ones.

2.6 SAFETY INFORMATION

This manual contains an overview of safety standards. Operators and supervisors must know the standards before using this equipment.

2.7 SPECIAL U.S. NAVY REQUIREMENT

Aboard ship the PECU shall be used in accordance with the requirements of the Naval Ships Technical Manual (NSTM) 079 Volume 2 (NAVSEA S9086-CN-STM-020), Federal Stock Number 0901-LP-079-0020.