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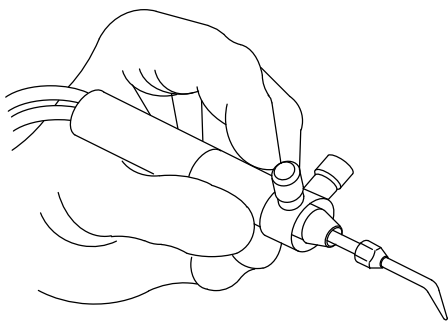
Processes



Oxy-Fuel

Soldering
Welding
Heating
Brazing

The Little Torch[®]



OWNERS MANUAL

TABLE OF CONTENTS

SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING	1
1-1. Symbol Usage	1
1-2. Welding, Cutting, Brazing, Heating Hazards	1
1-3. California Proposition 65 Warnings	6
1-4. Principal Safety Standards	6
SECTION 2 – CONSIGNES DE SÉCURITÉ – LIRE AVANT TOUTE UTILISATION	7
2-1. Symboles utilisés	7
2-2. Soudage, coupage, brasage, risques de surchauffe	7
2-3. Proposition californienne 65 Avertissements	14
2-4. Principales normes de sécurité	14
SECTION 3 – INTRODUCTION	15
SECTION 4 – HAZARDOUS EVENTS	15
SECTION 5 – ASSOCIATED HAZARDS OF RECOMPRESSING PURE OXYGEN	15
SECTION 6 – THE TORCH SYSTEM	16
6-1. Torch	16
6-2. Gases	16
6-3. Tips	16
6-4. Hose	16
SECTION 7 – FREQUENTLY ASKED QUESTIONS	17
SECTION 8 – USING THE TORCH WITH DISPOSABLE-TYPE CYLINDERS	18
8-1. Disposable Compressed Gas Cylinders	19
8-2. Installing Regulators On Cylinders – Models 249-499B And 249-500B	19
8-3. Installing Hoses	19
8-4. Activating The System	20
8-5. Purging The System	20
8-6. Testing The Equipment For Leaks	20
8-7. Selecting And Installing A Tip	20
8-8. Lighting Procedures (When Using Disposable Cylinders)	20
8-9. Extinguishing The Torch Flame	21
8-10. Shutting Down The System	21
8-11. Bleeding The System	21
SECTION 9 – USING THE TORCH WITH HIGH PRESSURE, INDUSTRIAL-TYPE CYLINDERS	21
9-1. Industrial-Type Cylinder Information	22
9-2. Installing Regulators	22
9-3. Installing Hoses	22
9-4. Activating The Regulators	23
9-5. Adjusting Regulator Pressures And Purging The Hoses	23
9-6. Testing The Equipment For Leaks	23
9-7. Selecting And Installing A Tip	24
9-8. Lighting And Adjusting Torch When Using Acetylene Or Hydrogen Fuel Gas	24
9-9. Lighting And Adjusting Torch When Using Alternate Fuel Gases (Propane, Propylene, Natural Gas)	25
9-10. Extinguishing The Torch Flame And Securing Equipment	25
9-11. Shutting Down The System	25
9-12. Bleeding The System	25
SECTION 10 – HOSE REPLACEMENT	26
10-1. Removing Old Hose	26
10-2. Installing New Hose	26

TABLE OF CONTENTS

SECTION 11 – REGULATORS	27
11-1. Cylinder Valve Identification For Regulator Selection	27
SECTION 12 – TECHNICAL DATA	28
12-1. Tip Specifications	28
12-2. Fuel Gas And Flame Characteristics	29
SECTION 13 – ACCESSORIES	30
WARRANTY	

SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

OXY FUEL 2025-04



Protect yourself and others from injury — read, follow, and save these important safety precautions and operating instructions.

1-1. Symbol Usage



DANGER! – Indicates a hazardous situation which, if not avoided, will result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.



Indicates a hazardous situation which, if not avoided, could result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

NOTICE – Indicates statements not related to personal injury.

 Indicates special instructions.



This group of symbols means Warning! Watch Out! **ELECTRIC SHOCK**, **MOVING PARTS**, and **HOT PARTS** hazards. Consult

symbols and related instructions below for necessary actions to avoid these hazards.

1-2. Welding, Cutting, Brazing, Heating Hazards



The symbols shown in this section are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Principal Safety Standards. Read and follow all Safety Standards.



Only qualified persons should install, operate, maintain, and repair this equipment. A qualified person is defined as one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project and has received safety training to recognize and avoid the hazards involved.



During operation, keep everybody, especially children, away.



Do not use this equipment unless you are trained in its proper use or are under competent supervision. Follow the procedures described in this manual every time you use the equipment. Failure to follow these instructions can cause fire, explosion, asphyxiation, property damage, or personal injury. This equipment must be used in accordance with all Federal, State, and local regulations as well as DOT (Department of Transportation) and CGA (Compressed Gas Association) regulations. Contact your gas supplier for more information on the proper use of compressed gases.

 In this document, the phrase “welding and cutting” also refers to other oxy-fuel operations like brazing and heating.



READ INSTRUCTIONS.

- Read and follow all labels and the Owner's Manual carefully before installing, operating, or servicing equipment. Read the safety information at the beginning of the manual and in each section.
- Use only genuine replacement parts from the manufacturer.
- Perform installation, maintenance, and service according to the Owner's Manuals, industry standards, and national, state, and local codes.



HOT PARTS can burn.

- Do not touch hot parts bare handed.
- Allow cooling period before working on equipment.
- To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.



FUMES AND GASES can be hazardous.

Welding and cutting produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- Ventilate the work area and/or use local forced ventilation at the flame to remove welding and cutting fumes and gases. Some gases (natural gas and acetylene) are lighter than air and will collect in high areas. Other gases (propane and butane) are heavier than air and will collect in low areas. Heavier-than-air gases are more difficult to diffuse and are more likely to accumulate. The recommended way to determine adequate ventilation is to sample for the composition and quantity of fumes and gases to which personnel are exposed.
- If ventilation is poor, wear an approved air-supplied respirator.
- Read and understand the Safety Data Sheets (SDSs) and the manufacturer's instructions for adhesives, coatings, cleaners, consumables, degreasers, fluxes, and metals.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding and cutting fumes and gases can displace air and lower the oxygen level, causing injury or death. Be sure the breathing air is safe. Test atmospheres in confined areas for explosive and toxic gases before using oxy-fuel equipment.
- Do not weld or cut in locations near degreasing, cleaning, or spraying operations. The heat from welding or cutting flame can react with vapors to form highly toxic and irritating gases.
- Do not weld or cut on coated metals, such as galvanized, lead, or cadmium-plated steel unless the coating is removed from the affected area, the area is well ventilated, and while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded or cut.
- Do not weld or cut on sealed air conditioning or refrigeration systems unless all refrigerants have been removed from the system.



BUILDUP OF GAS can injure or kill.

- Shut off compressed gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.



LIGHT RAYS can burn eyes and skin.

Light rays from the welding and cutting process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- Wear approved face protection fitted with a proper shade of filter lenses to protect your face and eyes from light rays and sparks when welding, cutting, or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear welding goggles, or wear welding helmet/welding face-shield over approved goggles/safety glasses with side shields.
- Use protective screens or barriers to protect others from flash, glare and sparks; warn others not to watch the welding or cutting.
- Wear body protection made from leather or flame-resistant clothing (FRC). Body protection includes oil-free clothing such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.



WELDING AND CUTTING can cause fire or explosion.

Welding and cutting on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding or cutting operations. The torch flame, flying sparks, hot workpiece, and hot equipment can cause fires and burns. Check and be sure the area is safe before doing any welding or cutting.

- Do not use this welding and cutting equipment with gases and pressures other than those for which it is intended. Oxygen is not flammable; however, the presence of pure oxygen will drastically increase the speed and force with which burning takes place. Oxygen must never be allowed to contact grease, oil, or other petroleum-based substances; therefore, be sure there is no oil or grease on the regulator, cylinder, valves, or equipment. Do not use petroleum-based pipe sealants. Do not use sealants on metal-to-metal seals, such as hose and CGA cylinder connections; use PTFE-based sealant (PTFE tape) on pipe threads. Do not use or store near excessive heat (above 125° F/51.5° C) or open flame. Do not refer to oxygen as air and do not use oxygen as a substitute for compressed air. Do not use oxygen to clean clothes or work area, for ventilation, or to operate pneumatic tools. Open oxygen cylinder valves slowly. Be sure regulator adjusting handle is in the full out (off) position before opening oxygen cylinder valve.
- Inspect all equipment before use. Do not use damaged, defective, or improperly adjusted welding and cutting equipment. Make sure levers and valves work properly, threads on equipment are clean (no grease or oil) and not deformed, gauges are intact and easy to read, regulator is clean and free of oil or dirt, and fittings are properly sized for the cylinder. Make sure hoses are clean (no grease or oil) and ferrules are properly installed so the fitting does not slip inside the hose. Be sure all connections are tight.

- It is recommended that a reverse-flow check valve or a flashback arrestor be installed between the torch handle and the regulator. Check valves do not prevent the propagation of a flame upstream (flashback) but are designed to prevent the unintentional backflow of gases into the cutting attachment, torch, hoses, or regulator which could cause an explosion or fire. A flashback arrestor can be installed on the torch handle or regulator outlet instead of a check valve. Smith flashback arrestors have a reverse flow check valve and prevent the propagation of a flame upstream. If a flashback arrestor is installed, a check valve is not necessary. Using a flashback arrestor and a check valve can reduce gas flow and affect torch operation. To help prevent the reverse flow of gases, be sure the cylinders contain enough gas to complete the work.
- Understand the properties and applications of a gas, and how to safely use a gas, before placing it in service.
- Perform work only in an area with a fireproof floor (concrete). Do not heat concrete because it can expand and explode violently.
- Perform work on a fireproof surface. Use heat resistant shields to protect nearby walls and flooring.
- Do not use if grease or oil is present on equipment or if equipment is damaged. Have equipment cleaned/repared by a qualified person.
- Do not open a cylinder valve quickly or the regulator can be damaged and cause a fire.
- Do not open acetylene cylinder valve more than 1–1/2 turns. (For all gases except acetylene, open cylinder valve fully to backseat the cylinder valve.) Keep cylinder wrench on the cylinder for quick shut-off.
- Do not slightly open or “crack” fuel cylinder valve to blow debris from the valve outlet. Remove the debris using nitrogen, air, or a clean, oil-free rag.
- Always purge gas from the system before lighting torch. Purge gas in a well-ventilated area and away from flame or sparks.
- Keep torch flame or sparks away from cylinder, regulator, and gas hose.
- Use only the gases recommended by the manufacturer of the oxy-fuel equipment being used.
- Never light a torch with matches or a lighter. Always use a striker.
- Do not use acetylene above 15 psi (103 kPa) flowing. It is acceptable to use acetylene regulators that indicate a static pressure up to 22 psi (151 kPa).
- Do not withdraw acetylene from a cylinder at a rate exceeding 1/7 of the cylinder capacity per hour (50 SCFH for a 350 ft³ cylinder). Maximum withdrawal rate for a half-full 100 lb propane cylinder at 70°F is 75 SCFH (2124 lph).
- When required flows (SCFH) exceed the recommended withdrawal rate from one cylinder, then additional cylinders must be manifolded to provide safe and efficient operation.
- When using liquid oxygen, tips may require greater gas volume than a single cylinder is capable of producing. External evaporators or manifolding multiple cylinders may be necessary to supply sufficient gas flows.
- Do not use long gas hoses or hoses with multiple connections because they restrict gas flow and reduce gas pressure. These conditions can cause backfires and flashbacks, and reduce equipment efficiency.
- Do not use torch if you smell gas. Check oxy-fuel system for leaks with an approved leak detection solution or leak detector. Never test for gas leaks with a flame.

- Remove all flammables within 35 ft (10.7 m) of the welding or cutting operation. If this is not possible, tightly cover them with approved covers.
- Do not weld or cut where flying sparks can strike flammable material.
- Protect yourself and others from flying sparks and hot metal.
- Be alert that welding and cutting sparks and hot materials from welding and cutting can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding or cutting on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not cut or weld on tire rims or wheels. Tires can explode if heated. Repaired rims and wheels can fail. See OSHA 29 CFR 1910.177 listed in Safety Standards.
- Do not weld or cut on containers that have held combustibles, or on closed containers such as tanks, drums, or pipes unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Do not weld or cut where the atmosphere can contain flammable dust, gas, or liquid vapors (such as gasoline).
- Wear body protection made from leather or flame-resistant clothing (FRC). Body protection includes oil-free clothing such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Do not use fuel gases to clean clothes or work area.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding or cutting.
- After completion of work, inspect area to ensure it is free of sparks, glowing embers, and flames.
- Follow requirements in OSHA 1910.252 (a) (2) (iv) and NFPA 51B for hot work and have a fire watcher and extinguisher nearby.



CYLINDERS can explode if damaged.

Compressed gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding or cutting process, be sure to treat them carefully.

- Protect compressed gas cylinders from excessive heat, mechanical shocks, physical damage, slag, open flames, and sparks.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping. Do not lay acetylene cylinders on their sides or acetone will flow out of the cylinder and damage the equipment.
- Keep cylinders away from any arc welding, cutting, or other electrical circuits.
- Never drape a welding or cutting torch over a gas cylinder.
- Never weld or cut on a pressurized cylinder – explosion will result.
- Use only correct compressed gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition. Do not use compressed gas cylinder unless an approved gas regulator is attached to the gas valve.
- Turn face away from valve outlet when opening cylinder valve. Do not stand in front of or behind the regulator when opening the valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Use the proper equipment, correct procedures, and sufficient number of persons to lift, move, and transport cylinders.
- Store compressed gas and oxygen cylinders in separate locations.
- Store empty cylinders with valves closed and caps in place.

- Do not modify or repair cylinders or valves. Store leaking acetylene cylinders outdoors in a safe area. Identify leaking cylinders and return them to the supplier.
- Dispose of used disposable cylinders according to the manufacturer's recommendations. Do not throw cylinders in fire.
- Follow instructions provided by the gas supplier and on compressed gas cylinders, associated equipment, and in Compressed Gas Association (CGA) publication P-1 listed in Safety Standards.



FLYING METAL or DIRT can injure eyes.

- Welding, cutting, chipping, wire brushing, and grinding cause sparks and flying metal.
- Wear welding goggles, or wear welding helmet/welding face-shield over approved goggles/safety glasses with side shields.

1-3. California Proposition 65 Warnings



WARNING: This product can expose you to chemicals including lead, which are known to the state of California to cause cancer and birth defects or other reproductive harm.

For more information, go to www.P65Warnings.ca.gov.

1-4. Principal Safety Standards

Safety in Welding, Cutting, and Allied Processes, American Welding Society standard ANSI Standard Z49.1. Website: www.aws.org.

Safe Practices for the Preparation of Containers and Piping for Welding and Cutting, American Welding Society Standard AWS F4.1. Website: www.aws.org.

Recommended Practices for Safe Oxyfuel Gas Cutting Torch Operation, American Welding Society Standard C4.2/C4.2M, and *Recommended Practices for Safe Oxyfuel Gas Heating Torch Operation*, American Welding Society Standard C4.3/C4.3M. Website: www.aws.org.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association. Website: www.cganet.com.

Acetylene, CGA Pamphlet G-1 from Compressed Gas Association. Website: www.cganet.com).

Safety in Welding, Cutting, and Allied Processes, CSA Standard W117.2 from Canadian Standards Association.

Website: www.csagroup.org.

Safe Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1 from American National Standards Institute. Website: www.safetysafetyequipment.org.

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B from National Fire Protection Association. Website: www.nfpa.org.

OSHA Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910.177 Subpart N, Part 1910 Subpart Q, and Part 1926, Subpart J. Website: www.osha.gov.

OSHA Important Note Regarding the ACGIH TLV, Policy Statement on the Uses of TLVs and BEIs. Website: www.osha.gov.

Applications Manual for the Revised NIOSH Lifting Equation from the National Institute for Occupational Safety and Health (NIOSH). Website: www.cdc.gov/NIOSH.

SECTION 2 – CONSIGNES DE SÉCURITÉ – LIRE AVANT TOUTE UTILISATION

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-  Pour écarter les risques de blessure pour vous-même et pour autrui — lire, appliquer et ranger en lieu sûr ces consignes relatives aux précautions de sécurité et au mode opératoire.

2-1. Symboles utilisés

-  **DANGER!** – Indique une situation dangereuse qui si on l'évite pas peut donner la mort ou des blessures graves. Les dangers possibles sont montrés par les symboles joints ou sont expliqués dans le texte.

-  Indique une situation dangereuse qui si on l'évite pas peut donner la mort ou des blessures graves. Les dangers possibles sont montrés par les symboles joints ou sont expliqués dans le texte.

AVIS – Indique des déclarations pas en relation avec des blessures personnelles.

 Indique des instructions spécifiques.



Ce groupe de symboles veut dire Avertissement! Attention! DANGER DE CHOC ELECTRIQUE, PIECES EN MOUVEMENT, et

PIECES CHAUDES. Reportez-vous aux symboles et aux directives ci-dessous afin de connaître les mesures à prendre pour éviter tout danger.

2-2. Soudage, coupage, brasage, risques de surchauffe

-  Les symboles représentés ci-dessous sont utilisés dans ce manuel pour attirer l'attention et identifier les dangers possibles. En présence de l'un de ces symboles, prendre garde et suivre les instructions afférentes pour éviter tout risque. Les consignes de sécurité présentées ci-après ne font que résumer les informations contenues dans les principales normes de sécurité. Lire et observer toutes les normes de sécurité.

-  L'installation, l'utilisation, l'entretien et les réparations ne doivent être confiés qu'à des personnes qualifiées. Une personne qualifiée est définie comme celle qui, par la possession d'un diplôme reconnu, d'un certificat ou d'un statut professionnel, ou qui, par une connaissance, une formation et une expérience approfondies, a démontré avec succès sa capacité à résoudre les problèmes liés à la tâche, le travail ou le projet et a reçu une formation en sécurité afin de reconnaître et d'éviter les risques inhérents.

-  Pendant le fonctionnement, maintenir à distance toutes les personnes, notamment les enfants de l'appareil.

-  Ne pas utiliser cet équipement à moins d'avoir été formé à son usage adéquat ou d'être sous la supervision d'une personne qualifiée. Respecter les procédures décrites dans le présent manuel pour toute utilisation de l'équipement. Le non-re-

spect de ces procédures peut causer des risques d'incendie, d'explosion, d'asphyxie, de dommages matériels ou de blessures. Cet équipement doit être utilisé dans le respect de toutes les réglementations fédérales, provinciales et municipales, ainsi que celles du Ministère des Transports et de l'association CGA (Compressed Gas Association). Pour plus d'information sur l'utilisation adéquate de gaz comprimé, communiquez avec votre fournisseur de gaz.

 Dans ce document, l'expression « soudage et coupage » fait également référence à d'autres opérations oxy-combustibles comme le brasage et le chauffage.



LIRE LES INSTRUCTIONS.

- Lire et appliquer les instructions sur les étiquettes et le Mode d'emploi avant l'installation, l'utilisation ou l'entretien de l'appareil. Lire les informations de sécurité au début du manuel et dans chaque section.
- N'utiliser que des pièces de remplacement provenant du fabricant.
- Effectuer l'installation, l'entretien et toute intervention selon les manuels d'utilisateurs, les normes nationales, provinciales et de l'industrie, ainsi que les codes municipaux.



LES PIÈCES CHAUDES peuvent provoquer des brûlures.

- Ne pas toucher des parties chaudes à mains nues.
- Laissez refroidir avant d'intervenir sur l'équipement.
- Ne pas toucher aux pièces chaudes, utiliser les outils recommandés et porter des gants de soudage et des vêtements épais pour éviter les brûlures.



LES FUMÉES ET LES GAZ peuvent être dangereux.

Le soudage et le coupage produisent des vapeurs et des gaz. Respirer ces fumées et ces gaz peut être dangereux pour votre santé.

- Garder la tête à l'extérieur des vapeurs et des fumées et ne pas les respirer.
- Ventiler le lieu de travail ou avoir recours à une ventilation aspirante installée près de la flamme pour évacuer les vapeurs et les gaz de soudage et de coupe. Certains gaz (gaz naturel et de l'acétylène) sont plus légers que l'air et s'accumulent en hauteur. D'autres gaz (propane et butane) sont plus lourds que l'air et s'accumulent à un niveau inférieur. Les gaz plus lourds que l'air sont plus difficiles à diffuser et sont plus susceptibles de s'accumuler. Pour déterminer la bonne ventilation, il est recommandé de procéder à un prélèvement pour la composition et la quantité de fumées et de gaz auxquels est exposé le personnel.
- Si la ventilation est médiocre, porter un respirateur à adduction d'air approuvé.
- Lire et comprendre les fiches de données de sécurité et les instructions du fabricant concernant les adhésifs, les revêtements, les nettoyeurs, les consommables, les produits de refroidissement, les dégraisseurs, les flux et les métaux.
- Ne travailler dans un espace confiné que s'il est bien ventilé, ou en portant un appareil respiratoire à adduction d'air pur. Ne soudez pas ou ne coupez pas près de zones où sont effectuées des opérations de dégraissage, nettoyage ou pulvérisation. Les vapeurs de soudage et de coupage peuvent déplacer de l'air et abaisser le niveau d'oxygène, cause de lésion ou de mort. Assurez-vous que l'air ambiant est sain pour la santé. Tester les atmosphères dans les espaces clos pour les gaz explosifs et toxiques avant d'utiliser l'équipement d'oxycoupage.
- Ne soudez pas ou ne coupez pas près de zones où sont effectuées des opérations de dégraissage, nettoyage ou pulvérisation. La chaleur et les rayons d'arc peuvent réagir avec les vapeurs et former des gaz hautement toxiques et irritants.
- Ne soudez pas ou ne coupez pas des métaux enrobés tels que des métaux galvanisés, contenant du plomb ou de l'acier plaqué au cadmium, à moins que l'enrobage ne soit ôté de la surface de soudage, que l'endroit où vous travaillez ne soit bien ventilé, ou, si nécessaire, que vous ne portiez un respirateur alimenté en air. Les revêtements et tous les métaux renfermant ces éléments peuvent dégager des fumées toxiques en cas de soudage.
- Ne pas souder ou couper sur des systèmes de climatisation ou de réfrigération fermés à moins que tous les réfrigérants aient été retirés du système.



LES ACCUMULATIONS DE GAZ risquent de provoquer des blessures ou même la mort.

- Fermer l'alimentation du gaz comprimé en cas de non utilisation.
- Veiller toujours à bien aérer les espaces confinés ou se servir d'un rateur d'adduction d'air homologué.



LES RAYONS DE L'ARC peuvent provoquer des brûlures dans les yeux et sur la peau.

Les rayons d'arc issus des procédés de soudage et de coupage produisent des rayons visibles et invisibles intenses (ultraviolets et infrarouges) qui peuvent entraîner des brûlures aux yeux et à la peau. Des étincelles sont projetées pendant le soudage.

- Portez un casque de soudage approuvé muni de verres filtrants appropriés pour protéger visage et yeux contre les rayons et les étincelles d'arc pendant le soudage, le coupage ou la surveillance (voir ANSI Z49.1 et Z87.1 énuméré dans les Normes de Sécurité).
- Porter des lunettes de soudage, ou porter un écran facial/casque de soudage sur des lunettes/lunettes de sécurité approuvées avec écrans de protection latéraux.
- Avoir recours à des écrans protecteurs ou à des rideaux pour protéger les autres contre les rayonnements les éblouissements et les étincelles ; prévenir toute personne sur les lieux de ne pas regarder l'arc.
- Porter une protection corporelle en cuir ou des vêtements ignifuges (FRC). La protection du corps comporte des vêtements sans huile, comme p. ex., des gants de cuir, une chemise solide, des pantalons sans revers, des chaussures hautes et une casquette.



Le SOUDAGE ET le COUPAGE présentent un risque d'incendie ou d'explosion.

Les récipients fermés, comme les réservoirs, les fûts ou les tuyaux, peuvent éclater lorsqu'ils sont soumis à des travaux de soudure ou de coupage. De tels travaux peuvent produire des étincelles. La flamme de la torche, les étincelles, les pièces de travail chauffées, et les équipements chauds peuvent causer des brûlures et des incendies. S'assurer que le lieu ne présente pas de danger avant d'effectuer le soudage ou la coupe.

- Ne pas utiliser cet équipement de soudage et de coupage avec des gaz et des pressions autres que celles pour lesquelles il est prévu. L'oxygène est pas inflammable, cependant, la présence d'oxygène pur augmentera considérablement la vitesse et la force avec laquelle la combustion a lieu. L'oxygène ne doit jamais être autorisé à entrer en contact avec de la graisse, de l'huile ou d'autres substances à base de pétrole. Par conséquent, assurez-vous qu'il n'y a pas d'huile ou de graisse sur le régulateur, le cylindre, les valves ou l'équipement. Ne pas utiliser de produits d'étanchéité de tuyaux à base de pétrole. Ne pas utiliser de produits d'étanchéité sur les joints métal-métal, tels que les raccords de tuyaux et de cylindres CGA; utiliser un produit d'étanchéité à base de PTFE (ruban PTFE) sur les filetages des tuyaux. Ne pas utiliser ou entreposer à proximité d'une chaleur excessive (supérieure à 125° F/ 51,5° C) ou d'une flamme ouverte. Ne pas appeler l'oxygène de l'air et ne pas utiliser l'oxygène comme un substitut à l'air comprimé. Ne pas utiliser l'oxygène pour nettoyer les vêtements ou la zone de travail, pour la ventilation, ou pour faire fonctionner des outils pneumatiques. Ouvrir les valves de bouteille d'oxygène lentement. Inspecter tous les équipements avant utilisation.

- Inspecter tous les équipements avant utilisation. Ne pas utiliser des équipements de soudage et de coupage endommagés, défectueux ou mal réglés. S'assurer que les leviers et les robinets fonctionnent bien, que les filets d'équipements sont propres (aucune graisse ou huile) et inaltérés, que les cadrans sont intacts et faciles à lire, que les régulateurs sont propres (sans saleté ou huile), et que les raccords sont de bonne taille pour la bouteille. S'assurer que les flexibles sont propres (sans graisse ou huile) et que les bagues d'extrémité sont adéquatement installées pour que les connecteurs ne glissent pas à l'intérieur des boyaux. S'assurer que tous les raccords sont serrés.
- L'installation d'un clapet anti-retour ou d'un intercepteur de rentrée de flamme entre la poignée de la torche et le régulateur est recommandée. Les clapets anti-retour ne font pas obstacle à la propagation d'une flamme en amont (retour de flamme), mais sont conçus pour empêcher le reflux non intentionnel des gaz dans l'équipement de coupe, torche, tuyaux ou un régulateur, qui pourrait provoquer une explosion ou d'incendie. Un intercepteur de rentrée de flamme peut être installé sur la poignée de la torche au lieu d'un clapet anti-retour. Les pare-flashback Smith ont un clapet anti-retour d'écoulement inverse et empêchent la propagation d'une flamme en amont. Si un intercepteur de rentrée de flamme est installé, un clapet anti-retour n'est pas requis. L'utilisation d'un intercepteur de rentrée de flamme et d'un clapet antiretour peut réduire le débit de gaz et affecter le fonctionnement de la torche. Pour aider à prévenir le débit de gaz en sens inverse, s'assurer que les bouteilles d'alimentation contiennent suffisamment de gaz pour faire le travail au complet.
- Bien s'assurer de comprendre les propriétés et les applications d'un gaz, et comment l'utiliser en toute sécurité avant de le mettre en service.
- Ne travailler que dans des lieux où le plancher est à l'épreuve du feu (béton). Ne pas chauffer le béton, car c'est un matériau expansible qui peut exploser violemment.
- Effectuer des travaux sur une surface anti-feu. Utiliser des boucliers résistants à la chaleur pour protéger les murs et les planchers à proximité.
- Ne pas l'utiliser si de la graisse ou de l'huile est présente sur l'équipement ou si l'équipement est endommagé. Faire nettoyer/réparer l'équipement par une personne qualifiée.
- Ne pas ouvrir rapidement le robinet de bouteille sinon le régulateur pourrait être endommagé et causer un incendie.
- Ne pas ouvrir la vanne de la bouteille d'acétylène plus de 1-1/2 de tour. (Pour tous les gaz, à l'exception de l'acétylène, ouvrir la valve de la bouteille entièrement). Garder la clé sur le cylindre pour une fermeture rapide.
- Ne pas entrouvrir la valve de la bouteille de carburant pour souffler les débris de la sortie de la valve. Retirer les débris à l'aide d'azote, d'air ou d'un chiffon propre et exempt d'huile.
- Toujours purger le gaz du système avant d'allumer la torche. Purger le gaz dans un endroit bien aéré et à l'abri des flammes ou des étincelles.
- Garder la flamme ou les étincelles de la torche à l'écart de la bouteille, du régulateur et du tuyau de gaz.

- Utiliser uniquement les gaz recommandés par le fabricant de l'équipement d'oxycoupage utilisé.
- Ne jamais allumer une torche avec des allumettes ou un briquet. Toujours utiliser un dispositif à friction.
- Ne pas utiliser de l'acétylène au-dessus de 15 psi (103 kPa). Il est acceptable d'utiliser des régulateurs d'acétylène qui indiquent une pression statique allant jusqu'à 22 psi (151 kPa).
- Ne pas retirer l'acétylène d'un cylindre à un taux supérieur à 1/7 de la capacité du cylindre par heure (50 SCFH pour un cylindre de 350 pi³). Le taux de prélèvement maximal pour un cylindre de propane à moitié plein de 100 lb à 70 °F est de 75 SCFH (2 124 l/h).
- Lorsque les débits requis (SCFH) dépassent le taux de prélèvement recommandé d'un cylindre, des cylindres supplémentaires devront être raccordés pour assurer un fonctionnement sécuritaire et efficace.
- Lors de l'utilisation d'oxygène liquide, les becs pourront nécessiter un volume de gaz plus important qu'un seul cylindre n'est pas en mesure de produire. Des évaporateurs externes ou des cylindres multiples pourront être nécessaires pour fournir des débits de gaz suffisants.
- Ne pas utiliser de longs tuyaux de gaz ou des tuyaux à connexions multiples, car ceux-ci limitent le débit de gaz et réduisent la pression de gaz. Ces conditions peuvent provoquer des retours de flamme et des retours de courant de soudage, et réduire l'efficacité de l'équipement.
- S'il y a odeur de gaz, n'utilisez pas la torche. Contrôler le système de gaz oxygéné pour détecter toute fuite à l'aide d'une solution de détection de fuites ou d'un détecteur de fuites approuvé. Ne jamais tester les fuites de gaz avec une flamme.
- Écarter tout produit inflammable situé à moins de 35 pieds (10,7 m) de l'arc de soudage ou de coupage. Si cela n'est pas possible, bien les recouvrir en utilisant des bâches approuvées.
- Ne soudez pas ou ne coupez pas dans un endroit où des étincelles pourraient atteindre des matières inflammables.
- Se protéger et d'autres personnes de la projection d'étincelles et de métal chaud.
- Assurez-vous qu'aucune étincelle ni matière chaude provenant du soudage ou du coupage ne peut se glisser dans de petites fissures ou tomber dans d'autres pièces contiguës.
- Afin d'éliminer tout risque de feu, soyez vigilant et gardez toujours un extincteur à portée de main.
- Si vous soudez ou coupez sur un plafond, un plancher ou une cloison, soyez conscient que cela peut entraîner un incendie de l'autre côté.
- Ne pas couper ni souder sur les jantes de pneus ou les roues. Les pneus peuvent exploser s'ils sont chauffés. Les jantes et les roues réparées peuvent avoir une défectuosité. Vous reporter à la liste OSHA 29 CFR 1910.177 dans les normes de sécurité.
- N'effectuez pas de soudage ou de coupage sur des conteneurs ayant stocké des combustibles ou sur des conteneurs fermés tels que des réservoirs, tambours, ou conduites, à moins qu'ils n'aient été préparés correctement conformément à AWS F4.1 (voir les Normes de Sécurité).

- Ne soudez pas ou ne coupez pas si l'air ambiant est chargé de particules, gaz, ou vapeurs inflammables (vapeur d'essence, par exemple).
- Porter une protection corporelle en cuir ou des vêtements ignifuges (FRC). La protection du corps comporte des vêtements sans huile, comme p. ex., des gants de cuir, une chemise solide, des pantalons sans revers, des chaussures hautes et une casquette.
- Ne pas utiliser de gaz carburant pour nettoyer les vêtements ou la zone de travail.
- Avant le soudage ou coupage, retirez tout combustible de vos poches, par exemple un briquet au butane ou des allumettes.
- Une fois le travail achevé, assurez-vous qu'il ne reste aucune trace d'étincelles incandescentes ni de flammes.
- Suivre les consignes de OSHA 1910.252 (a) (2) (iv) et de NFPA 51B pour travaux de soudage et prévoir un détecteur d'incendie et un extincteur à proximité.



LES BOUTEILLES peuvent exploser si elles sont endommagées.

Les bouteilles de gaz comprimé sont sous haute pression. Une bouteille endommagée peut exploser. Du fait que les bouteilles de gaz font normalement partie du procédé de soudage, les manipuler avec précaution.

- Protégez les bouteilles de gaz comprimé contre la chaleur excessive, les chocs, les dommages physiques, le laitier, les flammes nues et les étincelles.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber ou de se renverser. Ne pas poser les bouteilles d'acétylène sur le côté, sinon de l'acétone coulera de la bouteille et endommagera l'équipement.
- Les bouteilles ne doivent pas être près de la zone de soudage à l'arc ou de coupage ni de tout autre circuit électrique.
- Ne placez jamais une torche de soudage ou de coupage sur une bouteille de gaz.
- Ne soudez ou coupez jamais sur une bouteille pressurisée – une explosion en résulterait.
- Utiliser seulement des bouteilles de gaz comprimé, régulateurs, tuyaux et raccords convenables pour cette application spécifique ; les maintenir ainsi que les éléments associés en bon état. Ne pas utiliser de bouteille de gaz comprimé, à moins qu'un régulateur de gaz approuvé soit fixé à la valve de gaz.
- Ne pas tenir la tête en face de la sortie en ouvrant la soupape de la bouteille. Ne pas se tenir devant ou derrière le régulateur lors de l'ouverture de la vanne.
- Maintenir le chapeau de protection sur la soupape, sauf en cas d'utilisation ou de branchement de la bouteille.
- Utiliser le bon équipement, les bonnes procédures et suffisamment de personnes pour soulever, déplacer et transporter les bouteilles.
- Stocker les bouteilles de gaz et d'oxygène comprimé dans des endroits séparés.
- Stocker les bouteilles vides avec les valves fermées et les bouchons en place.
- Ne pas modifier ou réparer les bouteilles ou les valves. Stocker les bouteilles d'acétylène qui fuient à l'extérieur dans une zone sûre. Identifier les bouteilles qui fuient et les retourner au fournisseur.

- Éliminer les bouteilles à usage unique usagées selon les recommandations du fabricant. Ne pas jeter les bouteilles dans le feu.
- Lire et suivre les instructions sur les bouteilles de gaz comprimé, l'équipement connexe et le dépliant P-1 de la CGA (Compressed Gas Association) mentionné dans les principales normes de sécurité.



DES PIÈCES DE METAL ou DES SALETES peuvent provoquer des blessures dans les yeux.

- Le soudage, l'écaillage, le passage de la pièce à la brosse en fil de fer, et le meulage génèrent des étincelles et des particules métalliques volantes.
- Porter des lunettes de soudage, ou porter un écran facial/casque de soudage sur des lunettes/lunettes de sécurité approuvées avec écrans de protection latéraux.

2-3. Proposition californienne 65 Avertissements



AVERTISSEMENT : ce produit peut vous exposer à des produits chimiques tels que le plomb, reconnus par l'État de Californie comme cancérigènes et sources de malformations ou d'autres troubles de la reproduction.

Pour plus d'informations, consulter www.P65Warnings.ca.gov.

2-4. Principales normes de sécurité

Safety in Welding, Cutting, and Allied Processes, American Welding Society standard ANSI Standard Z49.1. Website: www.aws.org.

Safe Practices for the Preparation of Containers and Piping for Welding and Cutting, American Welding Society Standard AWS F4.1. Website: www.aws.org.

Recommended Practices for Safe Oxyfuel Gas Cutting Torch Operation, American Welding Society Standard C4.2/C4.2M, and *Recommended Practices for Safe Oxyfuel Gas Heating Torch Operation*, American Welding Society Standard C4.3/C4.3M. Website: www.aws.org.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association. Website: www.cganet.com.

Acetylene, CGA Pamphlet G-1 from Compressed Gas Association. Website: www.cganet.com.

Safety in Welding, Cutting, and Allied Processes, CSA Standard W117.2 from Canadian Standards Association. Website: www.csagroup.org.

Safe Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1 from American National Standards Institute. Website: www.safetysupply.com.

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B from National Fire Protection Association. Website: www.nfpa.org.

OSHA Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910.177 Subpart N, Part 1910 Subpart Q, and Part 1926, Subpart J. Website: www.osha.gov.

OSHA Important Note Regarding the ACGIH TLV, Policy Statement on the Uses of TLVs and BEIs. Website: www.osha.gov.

Applications Manual for the Revised NIOSH Lifting Equation from the National Institute for Occupational Safety and Health (NIOSH). Website: www.cdc.gov/NIOSH.

SECTION 3 – INTRODUCTION



⚠ Inspect all equipment before use. Do not use damaged, defective, or improperly adjusted welding and cutting equipment. Make sure levers and valves work properly, threads on equipment are clean (no grease or oil) and not deformed, gauges are intact and easy to read, regulator is clean and free of oil or dirt, and fittings are properly sized for the cylinder. Make sure hoses are clean (no grease or oil) and ferrules are properly installed so the fitting does not slip inside the hose. Be sure all connections are tight and there are no leaks in the system.

This booklet offers basic information regarding the Little Torch. Given reasonable care, the torch will provide trouble-free use for many years.

SECTION 4 – HAZARDOUS EVENTS



The following events are very hazardous and can occur in any oxy-fuel system. It is important to understand these hazards and know how to prevent them.

Backfire: The momentary recession of the flame into the torch, potentially causing a flashback or sustained backfire. It is usually signaled by a popping sound, after which the flame may either extinguish or reignite at the end of the tip.

Sustained Backfire: The recession of the flame into the torch body with continued burning characterized by an initial popping sound followed by a squealing or hissing sound, potentially burning through inside the torch body.

Flashback: The recession of the flame through the torch and into the hose, regulator, and/or cylinder, potentially causing an explosion.

SECTION 5 – ASSOCIATED HAZARDS OF RECOMPRESSING PURE OXYGEN



⚠ Open oxygen cylinder valves slowly. Opening an oxygen cylinder valve quickly can cause a fire or explosion. Be sure regulator adjusting handle is in the full out (off) position before opening an oxygen cylinder valve.

Recompressing high pressure oxygen in a low pressure cavity may create heat, resulting in combustion. For combustion to occur, oxygen, fuel, and kindling temperatures must be present. All of these components may be present when oxygen is recompressed by opening the tank valve too quickly.

Oxygen: High purity oxygen accelerates the rate of combustion, increases heat output, and lowers the combustible point at which various materials will burn.

Fuel: The fuel for combustion may be the regulator itself if enough heat is produced to reach the kindling temperature of the regulator's components.

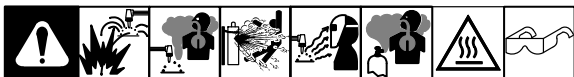
Kindling Temperatures: Enough heat may be generated to ignite the regulator components by the friction created when recompressing high-pressure oxygen. This heat is known as the heat of recompression.

⚠ If an internal fire or sustained backfire occurs (indicated by a whistling sound or inverted flame), do the following:

- Turn off the torch oxygen valve immediately.
- Turn off the torch fuel valve.
- Turn off the oxygen cylinder valve.
- Turn off the fuel gas cylinder valve.

Do not relight the torch until the equipment has cooled to the touch and the sustained backfire cause has been determined and corrected.

SECTION 6 – THE TORCH SYSTEM



6-1. Torch

The torch is designed to meet the requirements of industry for a small, lightweight torch to fusion weld, braze, heat, and solder materials ranging from 3/16 in. (5 mm) metal to ultra-fine wires. The six tips available provide a wide range of flame sizes and the versatility to perform many different tasks. Lightweight construction and highly flexible hose provide pinpoint welding with maximum control.

6-2. Gases

The torch uses oxygen and these commonly available pressurized fuel gases: acetylene, hydrogen, propane, propylene, or natural gas. The smallest tip (size 2) can only be used satisfactorily with acetylene and hydrogen fuel gases.

NOTICE – When using natural gas, a minimum of 1 psig (6.9 kPa) is required at the torch. Higher pressures are necessary for use with heating tips.

6-3. Tips

There are six standard tips available for the torch. Because of their extraordinarily small orifices, tip sizes 2 and 3 are fitted with a synthetic sapphire to ensure accurate gas flow. Three twin flame tips are available to provide even heat to both sides of the object being heated. There are also two different heating tips available, one tip is for use with acetylene or hydrogen and another tip is designed for propane or natural gas. Refer to the pressure recommendation chart provided in this booklet for the tips being used.

6-4. Hose

⚠ Replace hoses at the first sign of any defects, flaws, or damage. The hoses should otherwise be replaced every four years. Inspect hoses for damage or leaks before each operation. Do not allow hoses to come in contact with hot metal, molten solder, or corrosive chemicals. Do not expose hoses to fluxing agents as these agents will deteriorate the hose materials and cause them to leak.

⚠ Use an approved oil-free leak detection fluid to locate possible leaks.

⚠ Use only industrial grade hose. Grade T hose is acceptable for all fuel gases. Grade R hose is for acetylene only.

The torch hose supplied with the Little Torch is of a special material designed to be compatible with the various fuel gases. The maximum length of hose used should not exceed 12 ft (3.7 m). The hose may be attached to standard welding gas hoses 3/16 in. or larger diameter with special brass fittings if the gas cylinders must be located a further distance from the torch. The brass B-type fittings for connecting the hoses can be purchased from most welding equipment dealers.

For your protection, use only genuine Smith hose and replacement parts. Smith replacement hoses come with step-by-step replacement instructions and a tool for securing the brass ferrules over the hose ends. Repairs and replacement parts are available through your Smith authorized service agent.

SECTION 7 – FREQUENTLY ASKED QUESTIONS



How do I replace the torch hose?

Step-by-step instructions, a ferrule (brass hose retainer band), and ferrule replacement tool accompany all replacement hose assemblies.

What are the part numbers for replacement hose assemblies?

- Hose Pair 13254-4-8

Why is it hard to light size 2 tips or keep it lit?

This condition is typically due to excessive gas pressures. A maximum of just 2 psig (13.7 kPa) outlet pressure is recommended for both gases and the use of an open flame makes lighting the tiny flames much easier.

Does the torch require adaptors to fit cylinder regulators?

For most regulators the answer is no. The hose assemblies have standard size B, 9/16 in. welding hose-type connections and will attach to most industrial welding gas regulators.

Can the orifices in the torch tips be cleaned?

If the orifices are obstructed by flux, the tips can often be cleaned by boiling them in water for about 10 minutes. Other methods used to clean dirty tips involve the use of a jeweler's type steam cleaner or an ultrasonic cleaner.

What fuel gases will work with the torch?

The torch may be operated with most commercially used welding gases including acetylene, propane, hydrogen, propylene, and butane. It may also be used with city gas (natural gas) at a minimum pressure of 1 psig (6.9 kPa) at the torch.

NOTICE – Most city gas lines only produce 1/4–1/2 psig (1.7–3.4 kPa).

What fuel gas should I use with the torch?

Most operators use either acetylene or propane; however both gases offer specific advantages and disadvantages. Acetylene produces a very

concentrated, pinpoint high temperature flame (about 6000°F/3316°C) whereas the other gases tend to spread the heat produced throughout the outer flame. The acetylene flame produces soot during combustion and the LP gases tend to burn much cleaner. Acetylene gas is lighter than air and in the event of a gas leak it will tend to dissipate in the atmosphere with any air flow. LP gas is heavier than air and will collect in low spots, thereby creating potential breathing and combustion hazards.

What are the flame sizes and orifice diameters of the tips?

Tip Size	Orifice Diameter	Orifice Drill Size	BTUs/Hr	Recommended Pressures (Both Gases)		Overall Flame Length	
				psig	kPa	in.	mm
2	.006	97	130	2	13.8	1/8	3
3	.011	85	1,150	4	27.6	1-1/2	38
4	.020	76	2,300	5	34.5	5-1/2 (thin)	140
5	.029	69	3,800	6	41.4	5-1/2	140
6	.037	63	6,585	6	41.4	6-1/2	165
7	.047	56	9,200	8	55.2	7	178

What are the applications for twin flame tips?

The flexible twin flame tips may be used where both sides of an object can be heated. They can speed up the soldering or brazing process and provide even heating for complete, more even solder flows. Tip tubes are flexible and may be bent to position the flames as desired.

What are the applications for the multi-flame (rosebud) heating tips?

They may be used where a larger, more widely dispersed flame is needed for brazing, soldering, or heating. They are used predominantly in the jewelry industry for annealing, reticulation, and casting of gold and silver. Both acetylene and the propane models are capable of casting up to 3 oz (85 g) of gold or silver. These tips are also used for enameling and plastics polishing.

Can the torch gas valves be replaced if they are damaged or worn out?

Yes, the complete valve assembly may be replaced for either gas. Using an open end wrench, remove the valve assembly from the torch body. The white PTFE packing rings under the valves should also be replaced (part no. 7348). Valve assembly part numbers are as follows: oxygen (green) No. 7345; fuel (red) No. 7346.

SECTION 8 – USING THE TORCH WITH DISPOSABLE-TYPE CYLINDERS



⚠ Inspect equipment before use. Do not use if grease or oil is present on equipment or if equipment is damaged. Have equipment cleaned/repared by a qualified person.

-  **Do not slightly open or “crack” fuel cylinder valve to blow debris from the valve outlet. Remove the debris using nitrogen, air, or a clean, oil-free rag.**
-  **Do not use petroleum-based pipe sealants. Do not use any sealants on metal-to-metal seals, such as hose and CGA cylinder connections. Use PTFE-based sealant (PTFE-tape) on pipe threads.**
-  **Do not use heating tips with disposable cylinders.**

8-1. Disposable Compressed Gas Cylinders

Use only compressed gas cylinders that are approved by the Department of Transportation (DOT) with this equipment. The torch will operate on the throw-away disposable cylinders that are found in most hardware, retail, or welding outlets.

-  **Dispose of used disposable cylinders according to the manufacturer’s recommendations. Do not throw cylinders in fire.**
-  **Do not completely empty disposable cylinders. When the flame indicates a loss of pressure, immediately shut down the system and replace the cylinder.**
-  **Never tamper with or attempt to repair disposable cylinders. If damaged, return cylinder to the supplier. Always check the regulator cylinder connection for leaks.**

8-2. Installing Regulators On Cylinders – Models 249-499B And 249-500B

1. Before attaching the regulators to the disposable cylinders, be sure the regulator and torch valves are in the Off position.
2. Attach the oxygen regulator (identified by the word “Oxygen” stamped on side of regulator) to the oxygen cylinder. The disposable oxygen cylinder and the oxygen regulator both have left-hand threads. Turn regulator by hand counterclockwise and tighten securely.
3. Attach the fuel gas regulator to the disposable fuel gas cylinder. The regulator and the cylinder both have right-hand threads. Turn regulator by hand clockwise and tighten securely.
4. Check the regulator–cylinder connections for leaks.

8-3. Installing Hoses

-  **Replace hoses at the first sign of any defects, flaws, or damage. The hoses should otherwise be replaced every four years. Inspect hoses for damage or leaks before each operation. Do not allow hoses to come in contact with hot metal, molten solder, or corrosive chemicals. Do not expose hoses to fluxing agents as these agents will deteriorate the hose materials and cause them to leak.**

-  **Do not splice or use damaged oxy-fuel hoses.**

1. Use only the hoses that are supplied by Smith. These hoses transport low-pressure gases from the regulator to the torch tips. The hoses are color coded (green) for oxygen and (red) for fuel gas.
2. Attach the green hose to the oxygen regulator (right-hand threads) and tighten firmly with a wrench.
3. Attach the red hose to the fuel gas regulator (left-hand threads) and tighten firmly with a wrench.

 *If the hoses are not color coded, attach the hose connection with machined grooves on the nut to the fuel gas regulator (left-hand threads). Attach the hose*

connection with no grooves on the nut to the oxygen regulator (right-hand threads). Tighten both connections firmly with a wrench.

4. Close both the oxygen and fuel gas valves on torch body.

8-4. Activating The System

Open the regulator valves completely by turning knobs clockwise. Notice the arrows on top of the knobs.

8-5. Purging The System

⚠ Always purge gas from the system before lighting torch to prevent a possible mixed-gas explosion. Purge gas in a well ventilated area and away from flame or sparks.

1. With the tip removed from the torch, open the torch oxygen valve for 3–4 seconds to purge line.
2. Close the torch oxygen valve.
3. Repeat steps 1 and 2 for the fuel gas.

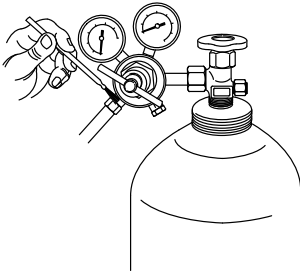
8-6. Testing The Equipment For Leaks

⚠ Use an approved oil-free leak detection fluid to locate possible leaks.

⚠ Do not stand in front of or behind the regulator when opening the cylinder valve. Never open a cylinder valve suddenly as this can damage a regulator or cause an oxygen regulator fire.

With the system pressurized and the torch body valves closed, check every connection and joint from the cylinder valve to the torch tip with an approved leak detection solution (Figure 1). If leaks are detected, eliminate them before proceeding. If leaks cannot be eliminated, do not put the equipment into service until it has been repaired or replaced.

📖 If the torch is not going to be in use for more than one half hour, turn the regulator valves to the Off position.



161-013

Figure 1. Testing Equipment For Leaks

8-7. Selecting And Installing A Tip

1. Fully open the oxygen and fuel gas regulators (turn handles clockwise).
2. Select the desired tip. Tip sizes are represented by a number (2–7) stamped on the copper section. Size 7 produces the largest flame.

📖 It is recommended that the size 2 tip not be used for gas other than acetylene or hydrogen.

3. Install tip and tighten with a wrench. (Do not overtighten.)

8-8. Lighting Procedures (When Using Disposable Cylinders)

Follow the set-up instructions explained in Sections 8-2 thru 8-7 before lighting the torch.

⚠ When lighting torch, keep the tip pointed away from people and combustibles.

1. Open the torch fuel gas valve approximately 1/8–1/4 turn (counterclockwise) and ignite the fuel gas using an approved friction spark lighter or Bunsen burner.

⚠ Do not use matches or a cigarette lighter to ignite the gas.

2. Slowly open the torch oxygen valve (counterclockwise) until the flame is neutralized. This is accomplished by adding oxygen until the bright cone off the end of the tip just reaches its shortest length.
3. Increase the fuel gas flow by opening torch valve another 1/8 turn.

⚠ Do not use acetylene above 15 psi (103 kPa) flowing.

4. Increase the oxygen until the flame is neutralized. If necessary, continue this procedure until the maximum volume of fuel and oxygen are being used and the desired flame is achieved.

8-9. Extinguishing The Torch Flame

1. Turn the torch oxygen valve to the closed position (clockwise).
2. Turn the fuel-gas torch valve to the closed position (clockwise).

8-10. Shutting Down The System

1. Extinguish torch flame (see Section 8-9).
2. Turn the oxygen regulator valve knob to the closed position (counterclockwise). Notice arrow on knob.
3. Turn the fuel gas regulator valve knob to the closed position (counterclockwise). Notice arrow on knob.

8-11. Bleeding The System

1. Remove the tip from the torch.
2. Open the torch oxygen valve 1/2 turn until all pressure has been released from the hose and regulator, then close the torch oxygen valve.
3. Open the torch fuel gas valve 1/2 turn until all pressure has been released from the hose and regulator, then close the torch fuel gas valve.
4. Secure equipment and store in safe area.

SECTION 9 – USING THE TORCH WITH HIGH PRESSURE, INDUSTRIAL-TYPE CYLINDERS



⚠ Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping. Maintain a clear path from the cylinders to the work area.

⚠ Inspect equipment before use. Do not use if grease or oil is present on equipment or if equipment is damaged. Have equipment cleaned/repaired by a qualified person.

⚠ Do not slightly open or “crack” fuel cylinder valve to blow debris from the valve outlet. Remove the debris using nitrogen, air, or a clean, oil-free rag.

⚠ Do not use petroleum-based pipe sealants. Do not use any sealants on metal-to-metal seals, such as hose and CGA cylinder connections. Use PTFE-based sealant (PTFE-tape) on pipe threads.

Use only compressed gas cylinders that are approved by the Department of Transportation (DOT) with this equipment. The torch will operate on cylinders that are available from Smith or from your local welding supply dealer.

9-1. Industrial-Type Cylinder Information

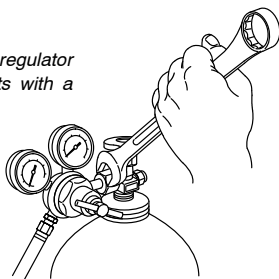
- Industrial oxygen cylinders are pressurized to approximately 2,250 psig (15,513 kPa)
- Industrial hydrogen cylinders are pressurized to approximately 2,250 psig (15,513 kPa).
- Industrial acetylene cylinders are pressurized to approximately 250 psig (1724 kPa)

9-2. Installing Regulators

Oxygen regulator is identified by green label and has right-hand threads for cylinder connection. Fuel gas regulator is identified by red label and has left-hand threads for cylinder connection.

1. Attach the oxygen regulator to the oxygen cylinder and tighten firmly with a wrench clockwise (right-hand threads). See Figure 2.

 *Always tighten regulator connection nuts with a wrench.*



161-015

Figure 2. Installing Regulator

2. Attach the fuel gas regulator to the fuel gas cylinder and tighten firmly with a wrench counterclockwise (left-hand threads). Fuel gas regulators may have left or right hand threads. A regulator connection with machined grooves in the nut indicates the regulator has left-hand threads. If there are no machined grooves in the nut the regulator has right-hand threads (for use with MC or B acetylene cylinders).

9-3. Installing Hoses

 **Replace hoses at the first sign of any defects, flaws, or damage. The hoses should otherwise be replaced every four years. Inspect hoses for damage or leaks before each operation. Do not allow hoses to come in contact with hot metal, molten solder, or corrosive chemicals. Do not expose hoses to fluxing agents as these agents will deteriorate the hose materials and cause them to leak.**

 **Do not splice or use damaged oxy-fuel hoses.**

1. Use only the hoses that are supplied by Smith. These hoses transport low-pressure gases from the regulator to the torch tips. The hoses are color coded (green) for oxygen and (red) for fuel gas.
2. Attach the green hose to the oxygen regulator (right-hand thread) and tighten firmly with a wrench.
3. Attach the red hose to the fuel gas regulator (left-hand thread) and tighten firmly with a wrench.

4. Close both the oxygen and fuel gas valves on torch body.

9-4. Activating The Regulators

 **Do not stand in front of or behind the regulator when opening the cylinder valve. Never open a cylinder valve suddenly as this can damage a regulator or cause an oxygen regulator fire.**

 **Do not activate the system with the regulator pressure adjusting handle turned in. This condition can allow high pressure gas to damage the internal parts of the regulator which can result in a fire or explosion.**

1. Turn the oxygen regulator pressure adjusting handle counterclockwise until no spring pressure is felt on the pressure adjusting handle.
2. Turn the fuel-gas regulator pressure adjusting handle counterclockwise until no spring pressure is felt on the pressure adjusting handle.
3. With the oxygen cylinder between you and the regulator, slowly open the cylinder valve until the maximum cylinder pressure is indicated on the high-pressure regulator gauge. Then, open the oxygen cylinder valve all the way.
4. Open cylinder valve. When using acetylene as the fuel gas, open cylinder valve no more than 3/4 turn. When using a fuel gas other than acetylene, open the cylinder valve completely.

9-5. Adjusting Regulator Pressures And Purging The Hoses

1. Verify the oxygen and fuel-gas valves on the torch body are in the closed (off) position.
2. Turn oxygen regulator pressure-adjusting handle clockwise until the low pressure gauge indicates 5 psig (34 kPa).

 **Always purge gas from the system before lighting torch to prevent a possible mixed-gas explosion. Purge gas in a well ventilated area and away from flame or sparks.**

3. With no tip installed, open the torch body oxygen valve and allow oxygen to flow for three to four seconds. This will purge the oxygen side of the system.
4. Repeat steps 2 and 3 for the fuel gas. This will purge the fuel gas side of the system.

9-6. Testing The Equipment For Leaks

 **Use an approved oil-free leak detection fluid to locate possible leaks.**

 **Do not stand in front of or behind the regulator when opening the cylinder valve. Never open a cylinder valve suddenly as this can damage a regulator or cause an oxygen regulator fire.**

With the system pressurized and the torch body valves closed, check every connection and joint from the cylinder valve to the torch tip with an approved leak detection solution (Figure 3). If leaks are detected, eliminate them before proceeding. If leaks cannot be eliminated, do not put the equipment into service until it has been repaired or replaced.

 *If the torch is not going to be in use for more than one half hour, it is recommended that the system be completely shut down (see Section 9-11).*



161-013

Figure 3. Testing Equipment For Leaks

9-7. Selecting And Installing A Tip

1. Select the desired tip. Tip sizes are represented by a number (2–7) stamped on the copper section. Size 7 produces the largest flame.

 *It is recommended that the size 2 tip not be used for gas other than acetylene or hydrogen.*

2. Install tip and tighten with a wrench. (Do not overtighten.)

9-8. Lighting And Adjusting Torch When Using Acetylene Or Hydrogen Fuel Gas

The following instructions are adjustment procedures for the torch when using acetylene or hydrogen fuel gases. This equipment is designed to operate at a set volume of gas for each tip.

Follow the set-up instructions explained in Sections 9-2 thru 9-7 before lighting the torch.

 **Using less than the required volume of gas may result in overheating of the tip or equipment and can lead to an internal fire or flashback.**

 **Do not use acetylene above 15 psi (103 kPa) flowing.**

 **When lighting torch, keep the tip pointed away from people and combustibles.**

 *When using hydrogen, the flame from the size 2 tip will be difficult to see. Lighting and flame adjustment should be made in a dark area or in front of a dark background. Use of a cobalt goggle lens may increase flame visibility.*

1. Adjust the regulator outlet pressure to the torch by turning the regulator adjusting handle clockwise until the outlet pressure gauge indicates the recommended pressures for the tip being used (see Section 12-1).
2. Open the torch fuel gas valve approximately 1/8 to 1/4 turn and ignite the gas using an approved friction spark lighter or bunsen burner.

 **Do not use matches or a cigarette lighter to ignite the gas.**

3. Continue opening the fuel gas valve until the flame is about to leave the end of the tip or the soot being discharged disappears.
4. Slowly open the torch oxygen valve. Continue to open torch valve until the flame is in its neutral condition or the desired flame is achieved.

9-9. Lighting And Adjusting Torch When Using Alternate Fuel Gases (Propane, Propylene, Natural Gas)

The following instructions are adjustment procedures for the torch when using alternate fuel gases. This equipment is designed to operate at a set volume of gas for each tip.

Follow the set-up instructions explained in Sections 9-2 thru 9-7 before lighting the torch.

-  **Using less than the required volume of gas may result in overheating of the tip or equipment and can lead to an internal fire or flashback.**
-  **When lighting torch, keep the tip pointed away from people and combustibles.**

 *Do not use the size 2 tip for alternate fuel gases. The size 3 tip may be difficult to light when using natural gas as the fuel.*

1. Adjust the regulator outlet pressure to the torch by turning the regulator adjusting handle clockwise until the outlet pressure gauge indicates the recommended pressures for the tip being used (see Section 12-1).
2. Open the torch fuel gas valve approximately 1/8 to 1/4 turn and ignite the gas using an approved friction spark lighter or bunsen burner.

 **Do not use matches or a cigarette lighter to ignite the gas.**

3. Adjust until the flame is about to leave the end of tip.
4. Slowly open the torch oxygen valve until a neutral flame is obtained.
5. Further open the torch fuel valve 1/8–1/4 turn.
6. Again open the torch oxygen valve until the flame is neutral.
7. If needed, continue this procedure until the maximum volume of fuel and oxygen are being used and desired flame is achieved.

9-10. Extinguishing The Torch Flame And Securing Equipment

1. Turn the torch oxygen valve to the closed position (clockwise).
2. Turn the torch fuel gas valve to the closed position (clockwise).

9-11. Shutting Down The System

1. Extinguish torch flame (see Section 9-10).
2. Turn the oxygen cylinder valve to the closed position (clockwise).
3. Turn the fuel gas cylinder valve to the closed position (clockwise).

9-12. Bleeding The System

1. Remove tip from torch body.
2. Open torch oxygen valve 1/2 turn.
3. Observe oxygen regulator. When low pressure gauge indicates zero (0), close the torch oxygen valve.
4. Turn the oxygen regulator pressure adjusting handle to the left (counterclockwise) until no spring pressure is felt on the adjusting handle.
5. Repeat steps 2, 3, and 4 for the fuel gas.
6. Secure equipment and store in safe area.

SECTION 10 – HOSE REPLACEMENT



- ⚠** Replace hoses at the first sign of any defects, flaws, or damage. The hoses should otherwise be replaced every four years. Inspect hoses for damage or leaks before each operation. Do not allow hoses to come in contact with hot metal, molten solder, or corrosive chemicals. Do not expose hoses to fluxing agents as these agents will deteriorate the hose materials and cause them to leak.

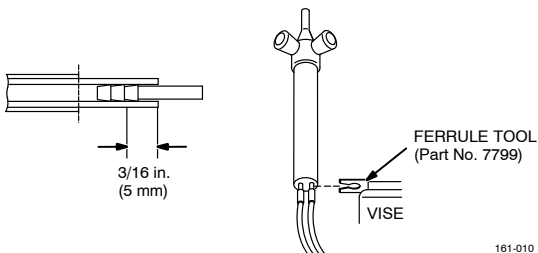
 The following instructions apply only to the torch bodies in torch models 11-1101C, 11-1104C, 11-1107, and 11-1110. Check instructions per your specific torch body number as stamped on the black handle tube.

10-1. Removing Old Hose

1. Lock ferrule tool in vise. Insert tool between torch body and ferrule. See Figure 4.
2. Grasp torch firmly and pull forward. The ferrule will slide back on the hose. Repeat operation on second hose. Slide ferrule away from torch.
3. Remove hose from torch body.

10-2. Installing New Hose

1. Check that regulator right-hand thread nut is on green hose and left-hand thread (grooved) nut is on red hose. Place new ferrule on each hose and slide ferrule down each hose 1–2 in. (25–51 mm).
2. Slide the green hose over the barbed nipple. Slip hose into ferrule tool below ferrule and slide tool against end of ferrule.



161-010

Figure 4. Hose Replacement

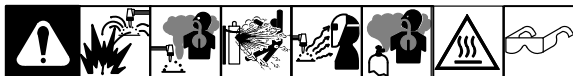
3. Push metal ferrule onto barbed nipple. Slip hose into ferrule tool below ferrule and slide tool against end of ferrule.
4. Hold torch so that ferrule tool is resting on top of vise. Open vice jaws to approximate width of hose. Using a plastic hammer, wood block, or equivalent, tap lightly on end of tubing or socket until the metal ferrule just covers the barbs of the nipples. Remove tool.

5. Repeat instructions for red hose.

⚠ Use an approved oil-free leak detection fluid to locate possible leaks.

6. Close torch valves and pressurize torch (both hoses) to 10–12 psig (69–83 kPa). Immerse torch in water and check connections and torch for leaks (bubbles). If a leak is not observed, the torch is now ready to use. If leaks are detected, eliminate them before proceeding. If leaks cannot be eliminated, do not put the equipment into service until it has been repaired or replaced.

SECTION 11 – REGULATORS



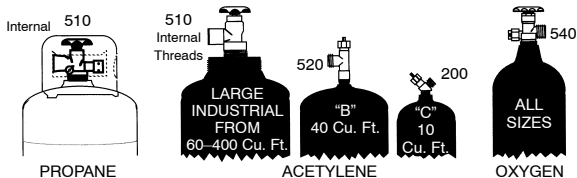
The following regulators are recommended for use with the torch because they provide the low regulated pressures and flows necessary for fine flame adjustment and stability.

Stock No.	Gas	Inlet Connection
30-20-540	Oxygen	CGA 540
30-15-520	Acetylene	CGA 520
30-15-300	Acetylene	CGA 300
30-15-510	Acetylene	CGA 510
30-15-200	Acetylene	CGA 200
30-15-510	LP*	CGA 510
30-100-350	Hydrogen	CGA 350

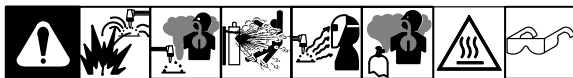
* Propane or propylene-based fuels.

11-1. Cylinder Valve Identification For Regulator Selection

 *Compressed Gas Association connection numbers are also shown.*



SECTION 12 – TECHNICAL DATA



12-1. Tip Specifications

A. Straight, Curved, And Twin-Flame Torch Tips

Tip Size	Orifice Diameter in. (mm)	Gas Pressure psig (kPa)		Consumption Each Gas* ft ³ /hr (L/hr)	Recom'd Fuel Gas w/Oxygen
		Oxygen	Fuel		
2	0.006 (0.15)	2 (13.8)	2 (13.8)	0.1 (3.1)	Acetylene, Hydrogen
3	0.011 0.28)	4 (27.6)	4 (27.6)	0.9 (26.6)	Acetylene, Hydrogen, Propane, Propylene, Natural Gas, City Gas
4	0.020 (0.5)	5 (34.5)	5 (34.5)	1.9 (53.2)	
5	0.029 (0.73)	6 (41.4)	6 (41.4)	3.1 (87.8)	
6	0.037 (0.94)	6 (41.4)	6 (41.4)	5.4 (152)	
7	0.047 (1.19)	8 (55.2)	8 (55.2)	7.5 (213)	

* Acetylene and oxygen only.

 Pressures above apply to all fuel gases.

B. Multi-Orifice Heating Tip Specifications

Stock No.	Fuel Gas	Gas Pressure psig (kPa)		Gas Consumption ft ³ /hr (L/hr)		Flame Average (BTU/hr)
		Oxygen	Fuel	Oxygen	Fuel	
13-662	Acetylene	15 (103.4)	10 (69)	6 (169.9)	5.5 (155.7)	8000
	Hydrogen			5.5 (155.7)	11 (311.5)	3500
	Propylene			2.3 (65.1)	0.5 (14.2)	1200
13717	Propane	15 (103.4)	10 (69)	5 (141.6)	2.4 (68)	6000
	Natural Gas	7 (48.3)	5 (34.5)	3 (85)	3 (85)	3000

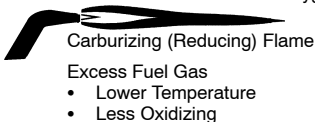
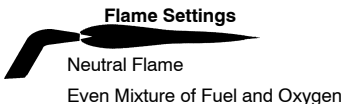
 **Do not use heating tips with disposable cylinders.**

12-2. Fuel Gas And Flame Characteristics

Settings: Neutral Flame

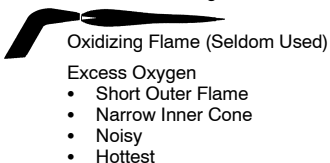
Acetylene – Oxygen

After igniting, open acetylene valve until soot disappears from end of flame. Add oxygen until the feather shown on the right just disappears in the bright inner cone.



Propane – Oxygen

After igniting, add oxygen until bright inner core reaches its shortest point and then stop. Repeat process to force as much fuel through the tip as possible.

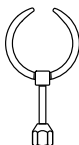


SECTION 13 – ACCESSORIES



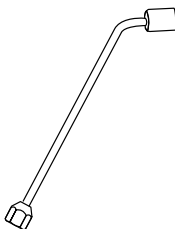
Twin Flame Tip

Sizes 4–6



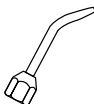
Propane/Natural Gas Heating Tip

Stock No. 13717



Acetylene/Hydrogen Heating Tip

Stock No. 13-662



Curved Tips

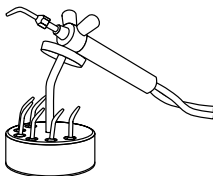
Sizes 2–7

Size 2–3 Tips Have Jeweled Orifice

Magnetic Stand

Stock No. 14014

Torch And Tips Sold Separately
Solid metal stand comes with holes for tips 2–7. Magnetic clip mounts easily on Little Torch body.



161-012 / 161-014

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Effective April 1, 2025

**(For Oxy-Fuel and Pressure Regulation Equipment
with a date code of CFD or newer)**

This limited warranty supersedes all previous Smith warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY - Subject to the terms and conditions below, Smith, a brand of Miller Electric Mfg., LLC, warrants to authorized distributors that new Smith equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Smith. **THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.** Within the warranty periods listed below, Smith will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Smith shall honor warranty claims on warranted equipment listed below in the event of a defect within the warranty coverage time periods listed below. Warranty time periods start on the delivery date of the equipment to the end-user purchaser.

1. 25 Years – Parts and Labor
 - * Torch Handles, Cutting Attachments, Straight Cutting Torches and Machine Torches. The use of tips other than genuine Smith tips voids the warranty.
2. 3 Years – Parts and Labor
 - * Series 22, 30, 32, 35, 36, 40, 46 Regulators, all Flowmeters, Flow Gauges, and Flowmeter Regulators
3. 2 Years – Parts and Labor
 - * Series 250, 820, and Branded Specialty Gas Regulators
4. 1 Year – Parts and Labor
 - * Gas Axe Cutting Torches, HVAC/Purge Regulators, 3-Stage Nitrogen Low-Pressure Blanketing Regulators, Gas Savers, and all other Oxy-Fuel Products
 - * The Little Torch, Quickbraze Torch, Handi-Heat/Silver Smith Torch
5. 90 Days – Parts and Labor
 - * Corrosive Service Regulators

Smith's Limited Warranty shall not apply to:

1. Consumable components; oxy-fuel cutting, welding, and heating tips, or parts that fail due to normal wear.
2. Items furnished by Smith, but manufactured by others. These items are covered by the manufacturer's warranty, if any.
3. Equipment that has been modified by any party other than Smith, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.
4. Defects caused by accident, unauthorized repair, or improper testing.

SMITH PRODUCTS ARE INTENDED FOR COMMERCIAL AND INDUSTRIAL USERS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF OXY FUEL AND GAS CONTROL EQUIPMENT.

The exclusive remedies for warranty claims are, at Smith's option, either: (1) repair; or (2) replacement; or, if approved in writing by Smith, (3) the pre-approved cost of repair or replacement at an authorized Smith service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon use). Products may not be returned without Smith's written approval. Return shipment shall be at customer's risk and expense.

The above remedies are F.O.B. Watertown, SD, or Smith's authorized service facility. Transportation and freight are the customer's responsibility. TO THE EXTENT PERMITTED BY LAW, THE REMEDIES HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES REGARDLESS OF THE LEGAL THEORY. IN NO EVENT SHALL SMITH BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT) REGARDLESS OF THE LEGAL THEORY. ANY WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY, OR REPRESENTATION, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, ARE EXCLUDED AND DISCLAIMED BY SMITH.

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