

SECTION 1 – SAFETY PRECAUTIONS – READ BEFORE USING

PAPR 2018-08

 **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. Arc Welding Hazards



The symbols shown below 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 listed in Section 1-5. 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.



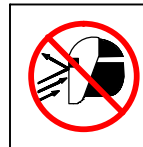
During operation, keep everybody, especially children, away.



ARC RAYS can burn eyes and skin.

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

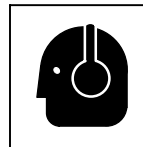
- Wear a welding helmet fitted with a proper shade of filter to protect your face and eyes when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards). Refer to Lens Shade Selection table in Section 1-3.
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash, glare, and sparks; warn others not to watch the arc.
- Wear body protection made from durable, flame-resistant material (leather, heavy cotton, wool). Body protection includes oil-free clothing such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Before welding, adjust the auto-darkening lens sensitivity setting to meet the application.
- Stop welding immediately if the auto-darkening lens does not darken when the arc is struck. See the Owner's Manual for more information.



WELDING HELMETS do not provide unlimited eye, ear and face protection.

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

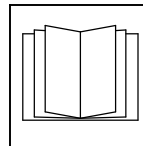
- Use helmet for welding/cutting applications only. Do not use the helmet for laser welding/cutting.
- Use impact resistant safety spectacles or goggles and ear protection at all times when using this welding helmet.
- Do not use this helmet while working with or around explosives or corrosive liquids.
- This helmet is not rated for overhead welding. Do not weld in the direct overhead position while using this helmet unless additional precautions are taken to protect yourself from arc rays, spatter, and other hazards.
- Inspect the auto-lens frequently. Immediately replace any scratched, cracked, or pitted cover lenses or auto-lenses.
- Lens and retention components must be installed as instructed in this manual to ensure compliance with ANSI Z87.1 protection standards.



NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.



READ INSTRUCTIONS.

- Read and follow all labels and the Owner's Manual carefully before installing, operating, or servicing unit. 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.



FUMES AND GASES can be hazardous.

Welding 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 arc to remove welding fumes and gases. 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, coolants, 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 watchperson nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld 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.



BREATHING UNFILTERED AIR can be hazardous.

Welding produces fumes and gases. Misuse of the powered air purifying respirator (PAPR) may expose you to fumes and gases hazardous to your health.

- Read and follow these instructions and the safety labels carefully. The powered air purifying respirator is intended only for welding applications. The powered air purifying respirator helps protect the user from specific airborne contaminants but must be used correctly to be fully effective. Have an industrial hygienist test the air in your facility to ensure the powered air purifying respirator provides adequate protection from contaminants in your environment. If you have questions about the powered air purifying respirator, see equipment NIOSH label and consult your Safety Director and a certified Industrial Hygienist. For occupational use applications, employers must implement a written respiratory protection program meeting the requirements of OSHA 29 CFR 1910.134 (USA) or CSA Z94.4 (Canada), and other substance specific requirements as applicable.
 - Do not use the powered air purifying respirator until you have been trained in its proper operation by a qualified person.
 - Do not use the powered air purifying respirator in applications immediately dangerous to life or health (IDLH).
 - Follow all applicable ANSI, OSHA, CSA, and other regulatory guidelines pertaining to the use of respirators.
 - Do not use the powered air purifying respirator where there is danger of fire or explosion.
- Do not use the powered air purifying respirator in windy conditions or negative pressure inside the hood can draw in contaminants from the outside air.
 - Do not use the powered air purifying respirator without a properly installed spark guard. Without the spark guard, welding sparks can ignite the filter or damage the filters and allow unfiltered air into the helmet.
 - The powered air purifying respirator does not supply oxygen. Use the respirator only in NIOSH-approved atmospheres. Do not use the respirator where oxygen levels are 19.5% or lower, where contaminant levels are unknown or are immediately dangerous to life or health, where contaminant levels exceed the powered air purifying respirator specifications, in areas that are poorly ventilated, or where escape is not possible without using the powered air purifying respirator.
 - Do not enter a hazardous area until you are sure the powered air purifying respirator is assembled correctly, working properly, and worn properly.
 - Before each use, inspect the respirator equipment for damage and verify it operates properly. Before using the respirator, test air flow to verify it is providing an adequate volume of air. Clean and maintain respirator equipment according to the manufacturer's instructions.
 - Do not use the powered air purifying respirator without all filter components or with the blower turned off because hazardous levels of oxygen and carbon dioxide can accumulate in the helmet.
 - Always wear the powered air purifying respirator when entering a contaminated area. Do not remove the respirator until outside the contaminated area.
 - Dangerous contaminants may not smell or be visible. Leave the area immediately if you notice any of the following:
 - ... Breathing becomes difficult.
 - ... You experience dizziness, impaired vision, or eye, nose, or mouth irritation.
 - ... The powered air purifying respirator alarm sounds.
 - ... The equipment is damaged.
 - ... Air flow decreases or stops.
 - ... If you think the equipment is not supplying adequate protection.
 - Do not remove the equipment until you are in a safe area.
 - Do not repair, modify, or disassemble the powered air purifying respirator or use with parts or accessories not supplied by the manufacturer. Use only those components that are part of the NIOSH-approved assembly.
 - Replace damaged or plugged filters. Do not wash or reuse filters. Do not clean filters by tapping or with compressed air or filter elements can be damaged. Dispose of used filter elements according to local, state, and federal requirements.
 - The powered air purifying respirator must be used with the helmet, hood, and filters recommended by the manufacturer to provide a NIOSH-approved respirator system. See the NIOSH label for information on the required equipment.
 - Do not use the powered air purifying respirator belt and shoulder straps as a safety harness.
 - Have a qualified person test the breathing air to ensure it meets Grade D requirements. Breathing air testing shall be done in accordance with a written respirator protection program (prepared by a qualified person) specific to the workplace.
 - The powered air purifying respirator contains electrical parts which have not been evaluated as an ignition source in flammable or explosive atmospheres by MSHA/NIOSH.

1-3. Lens Shade Selection Table

Process	Electrode Size in. (mm)	Arc Current in Amperes	Minimum Protective Shade No.	Suggested Shade No. (Comfort)*
Shielded Metal Arc Welding (SMAW)	Less than 3/32 (2.4)	Less than 60	7	--
	3/32–5/32 (2.4–4.0)	60–160	8	10
	5/32–1/4 (4.0–6.4)	160–250	10	12
	More than 1/4 (6.4)	250–550	11	14
Gas Metal Arc Welding (GMAW) Flux Cored Arc Welding (FCAW)		Less than 60	7	--
		60–160	10	11
		160–250	10	12
		250–500	10	14
Gas Tungsten Arc Welding (TIG)		Less than 50	8	10
		50–150	8	12
		150–500	10	14
Air Carbon Arc Cutting (CAC-A)	Light Heavy	Less than 500	10	12
		500–1000	11	14
Plasma Arc Cutting (PAC)		Less than 20	4	4
		20–40	5	5
		40–60	6	6
		60–80	8	8
		80–300	8	9
		300–400	9	12
		400–800	10	14
Plasma Arc Welding (PAW)		Less than 20	6	6–8
		20–100	8	10
		100–400	10	12
		400–800	11	14

Reference: ANSI Z49.1:2012

* Start with a shade that is too dark to see the weld zone. Then, go to a lighter shade which gives a sufficient view of the weld zone without going below the minimum.

1-4. Proposition 65 Warnings

 **WARNING: Cancer and Reproductive Harm – www.P65Warnings.ca.gov**

1-5. Principal Safety Standards

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, is available as a free download from the American Welding Society at <http://www.aws.org> or purchased from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihc.com).

Safe Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 25 West 43rd Street, New York, NY 10036 (phone: 212-642-4900, website: www.ansi.org).

NIOSH Approval of Respiratory Devices, CFR Title 42 – Public Health, Part 84, is available from the Centers for Disease Control, 1600 Clifton Rd. Atlanta, GA 30329–4027 (phone: 800–232–4636) or as a free download at www.cdc.gov/niosh.

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, from U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 (phone: 1-866-512-1800) (there are 10 OSHA Regional Offices—phone for Region 5, Chicago, is 312-353-2220, website: www.osha.gov).

American National Standard for Respiratory Protection, ANSI /ASSE Standard Z88.2–2015, from American National Standards Institute, 25 West 43rd Street, New York, NY 10036 (phone: 212-642-4900, website: www.ansi.org).

Selection, Use, and Care of Respirators, CAN/CSA Standard Z94.4, from Canadian Standards Association, Standards Sales, 5060 Spectrum Way, Suite 100, Mississauga, Ontario, Canada L4W 5N5 (phone: 800-463-6727, website: www.csagroup.org).

Commodity Specification for Air, CGA Pamphlet G-7.1, from Compressed Gas Association, 14501 George Carter Way, Suite 103, Chantilly, VA 20151 (phone: 703-788-2700, website: www.cganet.com).