

# CHICAGO **welding** ELECTRIC® **systems**

## AUTO-DARKENING WELDING HELMET with ANSI-Approved Lens

**Models** 91212/ 91214  
94336/ 94337

### ASSEMBLY AND OPERATING INSTRUCTIONS



**NOTE: YOUR Helmet may appear different from the Helmet pictured in this manual.** Aside from the slight differences noted in this manual, the warnings, operation instructions, and maintenance procedures will remain the same.



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**TO PREVENT SERIOUS INJURY OR BLINDNESS,  
READ AND UNDERSTAND ALL WARNINGS  
AND INSTRUCTIONS BEFORE USE.**

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**For technical questions and replacement parts, please call 1-800-444-3353**  
Manual revised 08/06

## Specifications

Model	91212	91214	94336	94337
Shell Designs	Blue	Flames	Eagle	Skull
Power Source	Solar Cells (rechargeable battery included, no additional battery required)		Solar Cells (rechargeable battery included, battery lifetime 4,000 hours)	
Viewing Area	3.86" x 1.73"		3.74" x 2.44"	
Operating Temperature	23 to 158° F		14 to 158° F	
Clear State	4 DIN		3.5 DIN	
Shade Range	9 to 13 DIN			
Ultraviolet / Infrared Protection	up to shade 14 all the time			
Welding Protection Types	For All Arc Welding Processes; Not for Laser Welding or Oxyacetylene Welding/Cutting			
Shell Material	High Impact-Resistant Plastic Polyamide Nylon			
Lens	Switching Speed (Clear to Dark): 1/25,000 second ANSI-Approved Lens			
Weight	1.5 lb.			
Power ON / OFF	Fully Automatic			
Storing Temperature	-4 to 158° F			

## Save This Manual

You will need the manual for the safety warnings and precautions, assembly instructions, operating and maintenance procedures, parts list and diagram. Keep your invoice with this manual. Write the invoice number on the inside of the front cover. Keep the manual and invoice in a safe and dry place for future reference.

## Unpacking

When unpacking, check to make sure that the item is intact and undamaged. If any parts are missing or broken, please call Harbor Freight Tools at the number on the cover of this manual as soon as possible.


## Safety Warnings and Precautions

**WARNING:** When using tool, basic safety precautions should always be followed to reduce the risk of personal injury and damage to equipment.

### Read all instructions before using this tool!

1. **Do not use the Welding Helmet if the lens is cracked, if the lens or sensors are dirty, or if the lens or front retaining frame is loose.**
2. **Keep work area clean.** Cluttered areas invite injuries.
3. **Observe work area conditions.** Do not use machines or power tools in damp or wet locations. Don't expose to rain. Keep work area well lit. Do not use electrically-powered tools in the presence of flammable gases or liquids.
4. **Keep children away.** Children must never be allowed in the work area. Do not let them

handle machines, tools, or extension cords.

5. **Store idle equipment.** When not in use, tools must be stored in a dry location to inhibit rust. Always lock up tools and keep out of reach of children.
6. **Use the right tool for the job.** Do not attempt to force a small tool or attachment to do the work of a larger industrial tool. There are certain applications for which this tool was designed. Do not modify this tool and do not use this tool for a purpose for which it was not intended.
7. **Dress properly.** Do not wear loose clothing or jewelry as they can be caught in moving parts. Protective gear is essential to protect against welding rays, some examples are: a leather welding apron, welding sleeves, jeans without cuffs, work boots. Wear restrictive hair covering to contain long hair.
8.  **Use eye and ear protection. When welding, wear ANSI-approved impact safety goggles under the Auto-Darkening Welding Helmet.** Wear a NIOSH-approved respirator and hearing protection when welding.
9. **Do not overreach.** Keep proper footing and balance at all times. Do not reach over or across running machines.
10. **Stay alert.** Watch what you are doing, use common sense. Do not operate any tool when you are tired.
11. **Check for damaged parts.** Before using any tool, any part that appears damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment and binding of moving parts; any broken parts or mounting fixtures; and any other condition that may affect proper operation. Any part that is damaged should be properly repaired or replaced by a qualified technician. Do not use the tool if any switch does not operate properly.
12. **Replacement parts and accessories.** When servicing, use only identical replacement parts. Use of any other parts can render helmet ineffective, possibly causing eye damage, and will void the warranty. Only use accessories intended for use with this tool. Approved accessories are available from Harbor Freight Tools.
13. **Do not operate tool if under the influence of alcohol or drugs.** Read warning labels on prescriptions to determine if your judgment or reflexes are impaired while taking drugs. If there is any doubt, do not operate the tool.
14. **Maintenance.** For your safety, service and maintenance should be performed regularly only by a qualified technician.
15. **People with pacemakers should consult their physician(s) before welding.** Electromagnetic fields (such as those caused by welding) in close proximity to a heart pacemaker could cause interference to or failure of the pacemaker.
16. **This helmet provides protection for intended purposes only.**
  - The Welding Helmet is not suitable for laser welding processes.
  - The Welding Helmet will not protect against severe impact hazards, including fragmenting grinding disks; never use Welding Helmet when grinding.
  - The Welding Helmet will not protect against explosive devices or corrosive liquids.

17. Use only at temperatures within the operating range for your model as stated on the specifications chart on page 2.

## Inhalation Hazard

### Welding Produces TOXIC FUMES and GASSES.



Exposure to welding gasses can increase the risk of developing certain cancers, such as cancer of the larynx and lung cancer. Also, some diseases that may be linked to exposure to welding gasses or fumes are:

- Early onset of Parkinson's Disease
- Heart Disease
- Damage to the reproductive organs
- Ulcers
- Inflammation of the small intestine or stomach
- Kidney damage
- Respiratory diseases such as emphysema, bronchitis or pneumonia



Safety precautions, such as using natural or forced air ventilation and wearing a NIOSH-approved respirator, are **ESSENTIAL** to reduce the risk of developing the above illnesses.

18. **Maintain the helmet and lens correctly to help ensure reliable protection.**
- **Clean filter's surfaces regularly.** Always keep sensors and solar cells clean using a clean lint-free tissue/cloth. Don't use any solvents on filter's screen or helmet components. Protect filter from liquid and dirt contact. Don't immerse the filter in water.
  - **Should the Auto-Darkening Welding Helmet not darken upon striking an arc, stop welding *immediately* and have the helmet checked by an authorized service technician.**
  - **Regularly replace the Front Lens Cover (1) if it becomes cracked, scratched, pitted, or otherwise damaged.**
  - **Don't make any modifications to either the Auto-Darkening Filter (2) or the rest of the helmet, other than those specified in this manual.** Don't use any replacement parts other than those specified in this manual. Unauthorized modifications and replacement parts will void the warranty and expose the user to the risk of personal injury. **Never open or tamper with the Auto-Darkening Filter (2).**
19. **The Welding Helmet's Auto-Darkening Filter (2) must never be placed on hot surfaces.**

**WARNING: SEVERE PERSONAL INJURY and/or BLINDNESS may occur if the user fails to follow the aforementioned warnings and/or fails to follow the operation instructions.**

**Warning:** The warnings, cautions, and instructions discussed in this instruction manual cannot cover all possible conditions and situations that may occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.

## Before First Use

1. **The Auto-Darkening Welding Helmet needs to be charged prior to use and after extended storage.** Leave the solar panel on the helmet facing the sun for at least 4 hours before first use.
2. Remove the protective film from both sides of the front lens (if not already done).
3. Follow the **Before Each Use** instructions below.

## Before Each Use

1. Check the Front Lens Cover to make sure that it is clean, and that no dirt is covering the two sensors on the front of the Filter Cartridge. Also, check the Front/Inside Lens Cover and the Front Lens Retaining Frame, and make sure that they are secure in place. Check for light tightness before each use.
2. Inspect all operating parts before each use for signs of wear or damage. Any scratched, cracked, or pitted parts should be replaced immediately before using again to avoid severe personal injury.
3. Select the shade number you need for your setting at the turn of a shade knob - see chart below. Finally, be sure that the shade number of the Welding Helmet is the correct shade number for your application. **Note:** If a selection of shades are recommended for your application, **try the darkest setting first.**

## Shade Guide Chart

Welding Process	Arc Current (Amperes)																			
	5	10	15	20	30	40	60	80	100	125	150	175	200	225	250	275	300	350	400	450
SMAW				9	10	11			12			13			14					
MIG (heavy)							10	11	12			13			14					
MIG (light)							10	11	12	13		14								
TIG, GTAW		9		10	11		12		13			14								
MAG/CO <sub>2</sub>						10	11	12	13			14								
SAW								10	11	12	13	14								
PAC							11		12		13									
PAW		8	9	10	11	12	13		14											

SMAW - Shielded Metal Arc Welding

MIG (heavy) - MIG on dense metals

PAC - Plasma Arc Cutting

TIG, GTAW - Gas Tungsten Arc Welding (GTAW)(TIG)

MIG (light) - MIG on light alloys

PAW - Plasma Arc Welding

SAW - Shielded Semi-automatic Arc Welding

4. Adjust headband so that the helmet is seated on the head as low as possible and close to your face. Adjust helmet's angle when in the lowered position by turning the adjustable limitation washer.

**IMPORTANT NOTE: Test the helmet auto-darkening filter lens before welding. While wearing the helmet, briefly strike an arc, keeping your face and eyes turned slightly away, and to one side. The lens should darken evenly when not directly facing the arc. If it does not darken properly, do not use the Welding Helmet.**

## Product Features/Operation

At the moment the welding operation is started, the filter screen automatically changes from clear to dark in only 1/25,000th of a second.

Dark to clear delay adjustment: Operator can vary the time for the filter to return to clear state. At the moment welding is stopped, the filter screen automatically changes from dark to clear state according to the time setting you select.

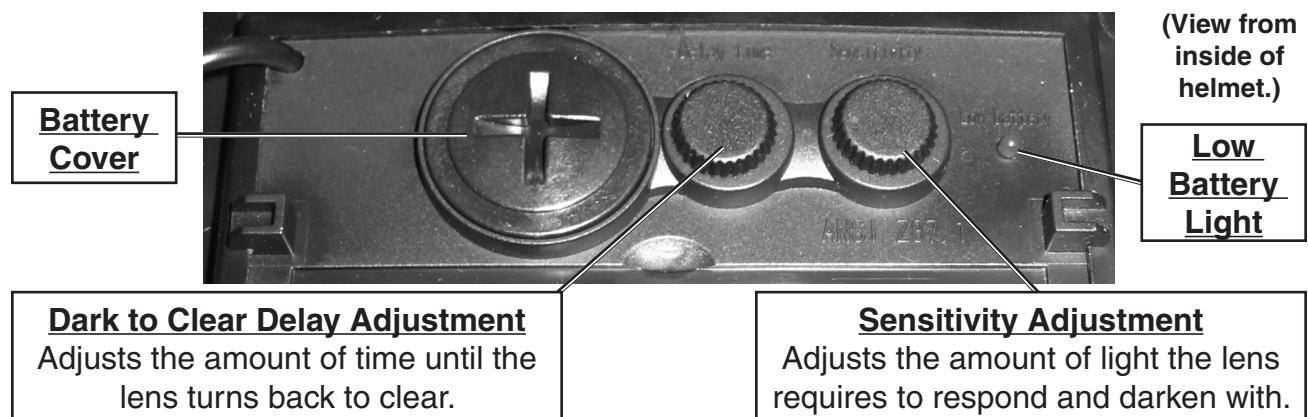
Switch Sensitivity Adjustment: The operator can adjust the amount of light needed to cause the Lens to darken.

This Welding Helmet utilizes high performance solar cells as power supply, and has built-in battery(ies) as power backup, see below. Under normal welding conditions, users can expect a battery lifetime of more than 6 years.

User-selectable (DIN) variable shades from 9 to 13 are adjusted at the turn of a shade knob (shade variable). This product is in full conformity with related DIN, ISO, EN379 safety standards and ANSI Z87.1-1989 standard.

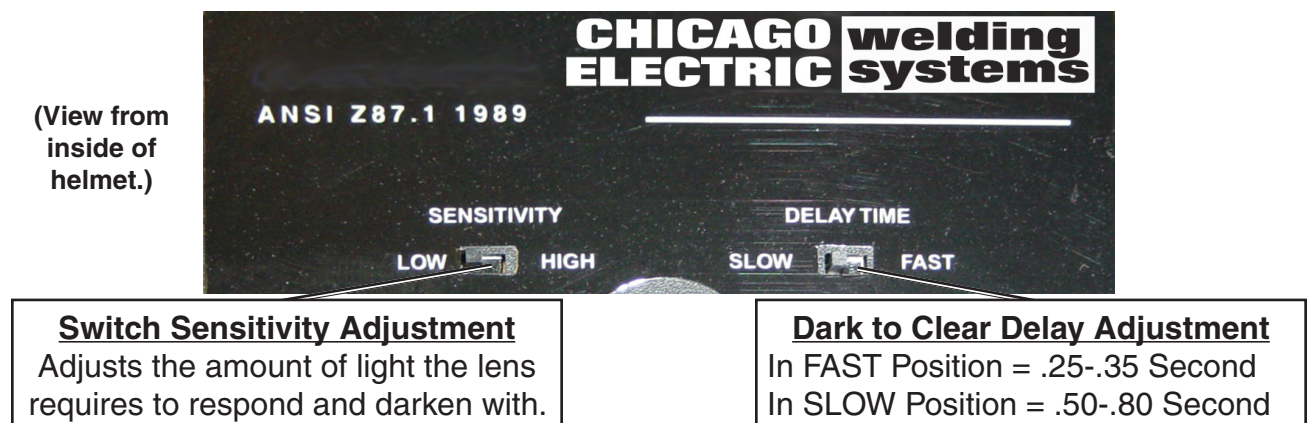
The ultra high performance of UV and IR Auto-Darkening filters provides to the user's eyes and face full protection against UV and IR radiation during the entire welding process, even in the clear state. The UV/IR protection level is up to Shade 16 (DIN) at all times.

### Models 94336 & 94337



These models include one built-in 3V CR2450 battery.  
Low Battery Light will illuminate when replacement is needed.

### Models 91212 & 91214



These models include built-in batteries. Battery removal/replacement is not possible.

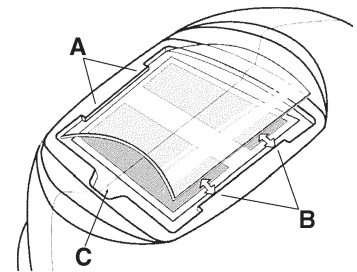
## TROUBLESHOOTING

1. **Irregular Darkening or Dimming**
  - a. Headband has been set unevenly on the two sides of the helmet (unequal distances from the eyes to the filter's lens).
  - b. Reset headband to reduce the difference in distances to filter, if necessary.
2. **Auto-Darkening Filter Does Not Darken Or Flickers**
  - a. Helmet was not properly charged before first use.
  - b. Front Lens Cover is soiled or damaged (change the Lens Cover).
  - c. Sensors are soiled (clean surface of the sensors).
  - d. Welding current is too low (increase the delay time, if necessary).
3. **Slow Response**
  - a. Operating temperature is too low (see specification chart, page 2).
4. **Poor Vision**
  - a. Front/Inside Lens Cover and/or filter soiled (change it).
  - b. Insufficient ambient light.
  - c. Shade number is incorrectly set (reset shade number).
5. **Welding Helmet Slips**
  - a. Headband is not adjusted properly (must be lowered).

**WARNING: You must stop using the Auto-Darkening Welding Helmet IMMEDIATELY if any of the above-mentioned problems can't be corrected.**

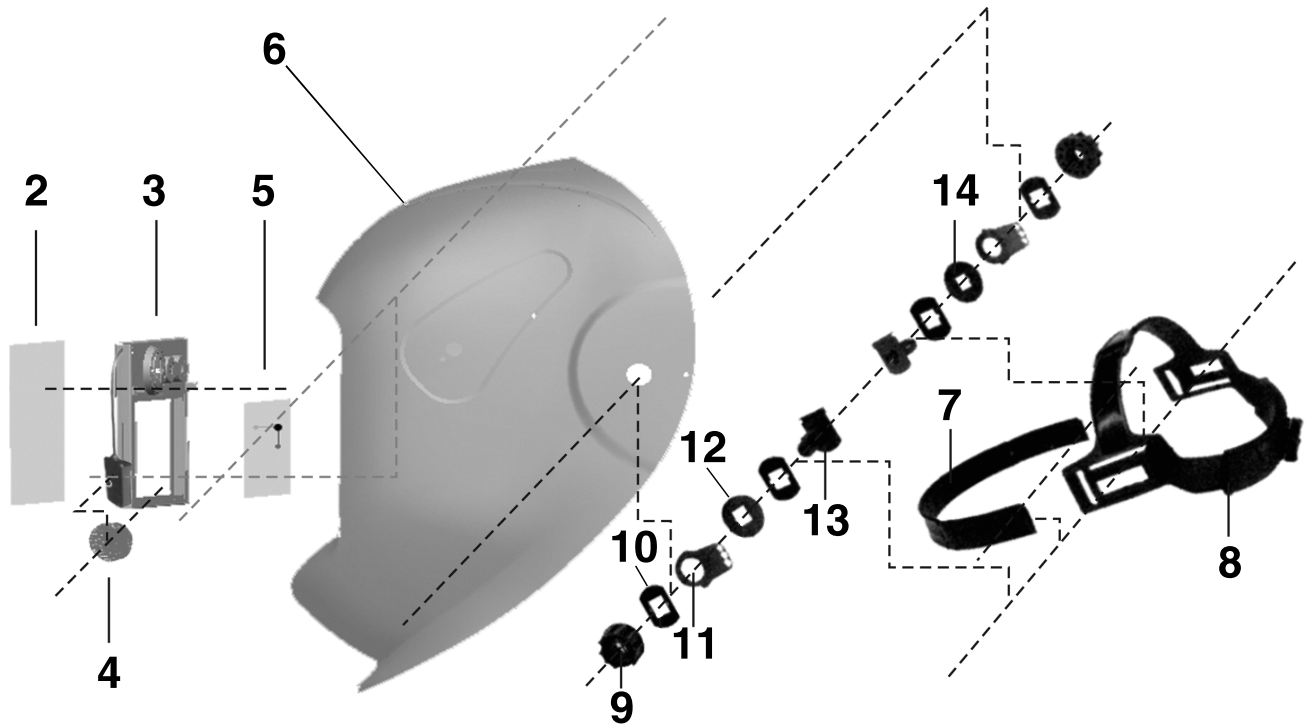
## MAINTENANCE

1. **Replace the Front Lens Cover (2) if it is damaged (cracked, scratched, soiled or pitted). Refer to the illustration to the right.**
  - a. Remove the Front Lens Cover (2) by gently pulling up the central part of the Lens.
  - b. Remove the protection film from both sides of the new Lens if it comes with the film on. Place the new Lens into the right position by bending it *slightly*, enough to fit in between the tabs at each side of the lens and putting the lens in place.
  - c. Check and make sure that the Lens is securely installed.
2. Clean the Filter Lens with a clean lint-free tissue or cotton cloth.
3. Don't immerse the lens in water or any other liquid. Never use abrasives, solvents or oil based cleaners.
4. To remove the Auto-Darkening Filter (3): Open the Spring (15) inside the helmet, remove the Shade Knob (4), loosen the nut holding the shade dial to the helmet, and remove the dial and filter. **Never try to open the Auto-darkening Filter (3).**
5. Storage temperature: -4 to 158° F.



## Parts List and Assembly Diagram

**IMPORTANT:** Parts are not necessarily interchangeable. When ordering parts, make certain to specify which model they are for.



Part	Description	Q'ty
2	Front Lens Cover	1
3	Auto-Darkening Filter Cartridge*	1
4	Shade Knob	1
5	Inside Lens Cover	1
6	Shell (Welding mask)	1
7	Front Headband	1
8	Adjustable Headband	1

Part	Description	Q'ty
9	Block Nut	2
10	Washer	4
11	Adjustable Limitation Washer	2
12	Left Limitation Washer	1
13	Screw	2
14	Right Limitation Washer	1
15	Lens Retaining Spring (not shown)	1

\*Includes Delay and Sensitivity Dials/Switches

**NOTE:** Some parts are listed and shown for illustration purposes only and are not available individually as replacement parts.

### PLEASE READ THE FOLLOWING CAREFULLY

THE MANUFACTURER AND/OR DISTRIBUTOR HAS PROVIDED THE PARTS LIST AND ASSEMBLY DIAGRAM IN THIS MANUAL AS A REFERENCE TOOL ONLY. NEITHER THE MANUFACTURER OR DISTRIBUTOR MAKES ANY REPRESENTATION OR WARRANTY OF ANY KIND TO THE BUYER THAT HE OR SHE IS QUALIFIED TO MAKE ANY REPAIRS TO THE PRODUCT, OR THAT HE OR SHE IS QUALIFIED TO REPLACE ANY PARTS OF THE PRODUCT. IN FACT, THE MANUFACTURER AND/OR DISTRIBUTOR EXPRESSLY STATES THAT ALL REPAIRS AND PARTS REPLACEMENTS SHOULD BE UNDERTAKEN BY CERTIFIED AND LICENSED TECHNICIANS, AND NOT BY THE BUYER. THE BUYER ASSUMES ALL RISK AND LIABILITY ARISING OUT OF HIS OR HER REPAIRS TO THE ORIGINAL PRODUCT OR REPLACEMENT PARTS THERETO, OR ARISING OUT OF HIS OR HER INSTALLATION OF REPLACEMENT PARTS THERETO.



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