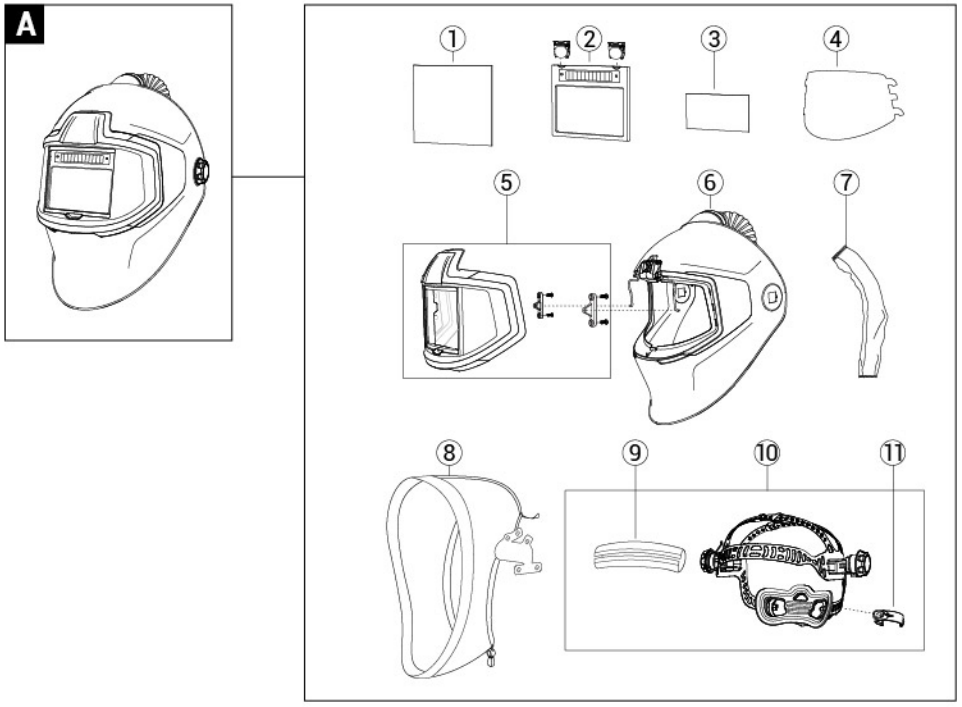
UNIVERSAL

DEFENDER

Defender Helmet with 110L

Auto Darkening Welding Helmet User Instructions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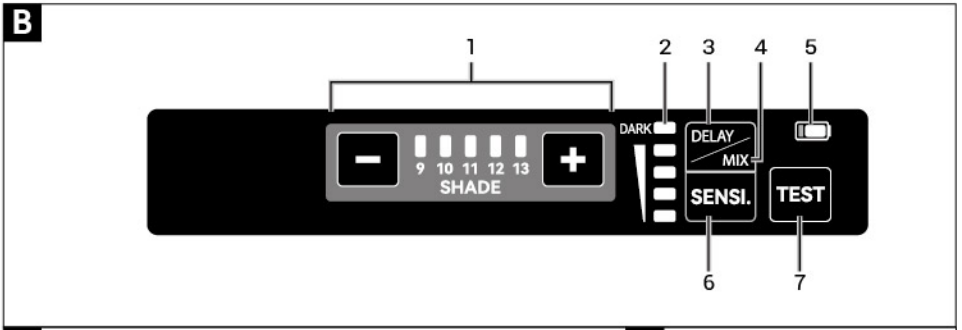
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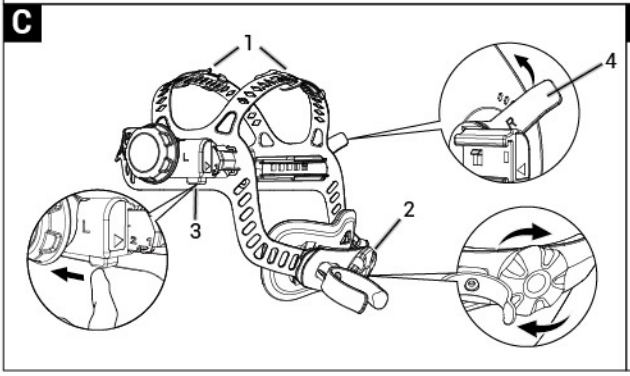
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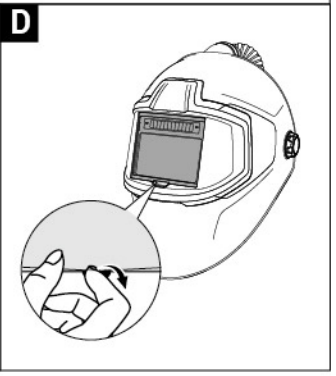
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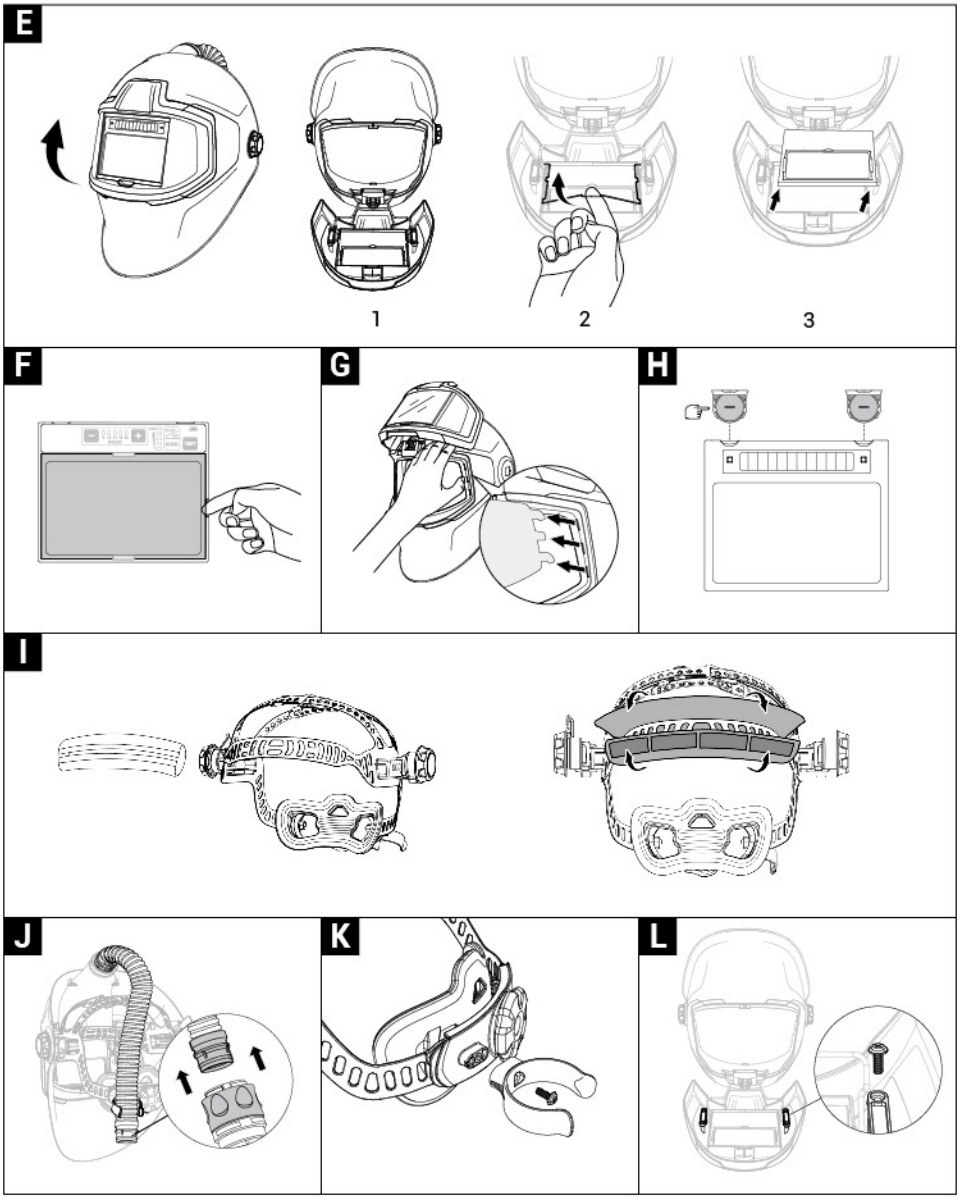
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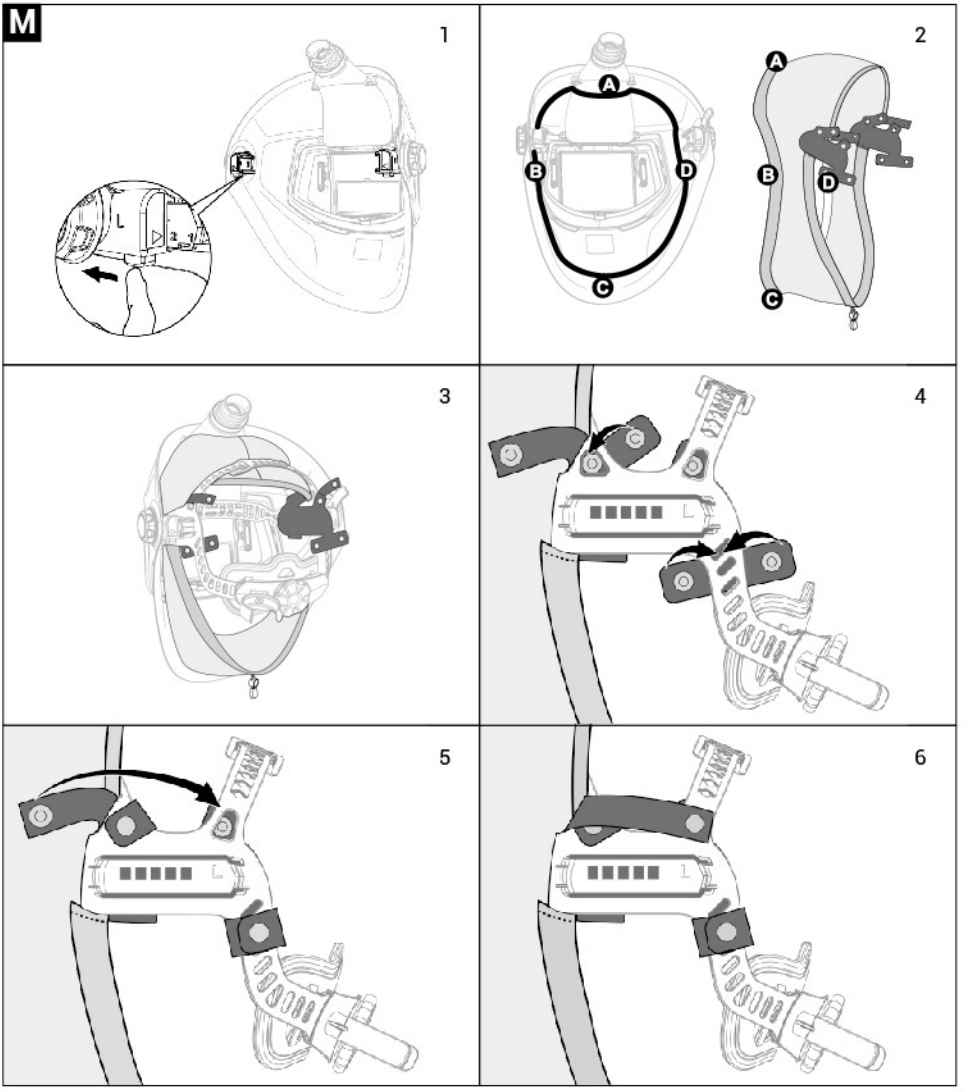
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1. WARNING

- Always read and follow the User Instructions provided with each individual component of any welding helmet assembly. User Instructions include important warnings and use limitations. Failure to follow all User Instructions may result in injury or death.
- Continued use of an auto-darkening filter that fails to switch to the dark state may result in permanent eye injury and vision loss. If the problem cannot be identified and corrected, do not use the auto-darkening filter.
- The Defender Helmet with 110L is suitable for all common welding processes, except gas and laser welding. Use of this product for the applications may result in permanent eye injury and vision loss.
- Carefully inspect the complete Defender Helmet with 110L before each use. Cracked, pitted or scratched filter galss or protection plates reduce vision and can seriously impair protection. All damaged components should be replaced immediately.
- Remove any protective film from the helmet.
- Only operate the auto-darkening filter at temperatures between -10°C (14°F) and 55°C (131°F). If used outside of this range, the filter may not perform as designed and may result in permanent eye injury and vision loss.
- Check battery surfaces and contacts and clean it if necessary. Verify if the battery is in good condition and installed properly.
- The protection marked in accordance with this standard is only provided when all lens and retention components are installed according to the list or other manufacturer's instructions.
- Eye and face protectors that have been subject to an impact shall not be used and shall be discarded and replaced.
- The auto-darkening filter shall only be used in conjunction with the inner cover lens.
- The eye-protectors against high speed particles worn over standard ophthalmic spectacles may transmit impacts, thus creating a hazard to the wearer.
- Toughened mineral filter oculars shall only be used in conjunction with a suitable backing ocular.
- If the symbols are not common to both the ocular and the frame then it is the lower level which shall be assigned to the complete eye-protector.
- If the impact letter followed by letter "T", you can use it for protection against high speed particles at extremes of temperature. If the impact letter does not followed by letter "T", you should only use the eye protector for protection against high speed particles at room temperature.
- We recommend a use for a period of 5 years. The duration of use depends on various factors such as use, cleaning storage and maintenance. Frequently inspections and replacement if it is damaged are recommended.
- The product is in conformity with Directive 2001/95/EC, Regulation (EU) 2016/425 necessary as brought into UK law and amended, Annex II.
- The user shall contact the health and safety representative to ensure he is given the proper protection by the personal eyewear during working conditions.
- This protector is appropriate for the headform 1-M.

2. DESCRIPTION

2.1 Product Overview (Fig.A)

Part List

ITEM	PART NO.	DESCRIPTION
A-1	EP401-0000-005	Defender Helmet Front Cover Lens (110x92x1.0 mm) (5pcs/set)
A-2	EP396-0000-005	Defender Helmet Replacement ADF (110L)
A-3	EP403-0000-005	Defender Helmet Inside Cover Lens (106x65.5x1.0 mm) (110L) (5pcs/set)
A-4	EP404-0000-005	Defender Helmet Inner Grind Lens (247.9x114.4x1.5 mm) (5pcs/set)
A-5	RP256-0000-005	Defender Helmet Flip-up (assembly parts included)
A-6	RP257-0000-005	Defender Helmet Shell (w/o flip-up) (air-fed)
A-7	AC640-0000-005	Defender Helmet Hose Cover Short (300mm)
A-8	AC641-0000-005	Defender Helmet Face Seal
A-9	AC642-0000-005	Defender Helmet Front Sweatband
A-10	AC644-0000-005	Defender Helmet Headgear (air-fed) (including sweatband & hose ring)
A-11	AC645-0000-005	Defender Helmet Headgear Hose Ring

2.2 Intended Use

The Defender Helmet with 110L is designed to help protect the wearer's eyes from harmful radiation including visible light, ultra-violet radiation (UV) and infrared radiation (IR) resulting from certain arc, plasma and gas welding/cutting processes when used in accordance with these User Instructions.

2 sensors on the front of the auto-darkening filters react independently at the moment the welding arc is struck and cause the filter to darken. The auto-darkening filter switches back to the light state after the welding arc has stopped. Protection from ultra-violet radiation (UV) and infrared radiation (IR) is continuous, whether the auto-darkening filter is in the light or the dark state. In the event of battery or electronic failure, the welder remains protected against UV and IR radiation equivalent to the darkest shade setting (shade 16).

Intended Use

- Stick electrode welding
- TIG
- MIG
- MAG
- Plasma cutting
- Plasma arc welding
- Autogenous welding
- Flame cutting
- Grinding

The Defender Helmet with 110L allows the welder to view their work clearly and safely during set-up, during the weld and after without interruption and without the burden or delay of manually lifting the shield or filter.

3. INSTRUCTIONS FOR USE

3.1 Preparations Before Use

1. Low Battery Indicator
The batteries should be installed/replaced when the low battery indicator (Fig.B-5) flashes or LEDs do not flash when the buttons are pressed.

2. Test
Press and hold "TEST" to preview shade selection before working (Fig.B-7). When released then viewing window will automatically return to the light state (Shade 3).

⚠ If the auto-darkening filter does not function as described above, do not use and immediately contact your supervisor.

⚠ The auto-darkening filter may not turn dark if the sensors are blocked or the welding arc is totally shielded. Flashing light sources (e.g. safety strobe lights) can trigger the auto-darkening filter making it flash when no welding is occurring. This interference can occur from long distances and/or from reflected light. Welding areas must be shielded from such interference.

⚠ The auto-darkening filter will automatically turn off after a period of inactivity.

3.2 Auto-darkening Filter Function

1. Shade (Fig.B-1)
The following areas are preset:
– Weld mode: Darkening states 9 to 13

2. Sensitivity (Fig.B-6)
The sensitivity of the sensor can be adjusted to accommodate a variety of welding methods and workplace conditions. The sensitivity time can be set to 4 positions as you require.
As a simple rule, for optimum performance, it is recommended to set sensitivity to the maximum at the beginning and then gradually reduce it, until the filter reacts only to the welding light flash and without annoying spurious triggering due to ambient light conditions (direct sun, intensive artificial light, neighbouring welder's arcs etc.).

3. Delay (Fig.B-3)
When welding/cutting ceases, the delay function should be used to set the recovery delay time of the filter from the dark to light state according to the welding application and current. The delay time can be set to 4 positions as you require . It is recommended to use a shorter delay with spot welding applications and a longer delay with applications using higher currents. Longer delays can also be used for low current TIG welding, and TIG / MIG / MAG pulse.

4. Dark (Fig.B-2)
When the auto-darkening filter is set to DARK mode, it functions solely as a dark glass and does not provide auto-darkening. The shade number in DARK mode can be selected based on your specific configuration.

5. Mix Mode (Fig.B-4)
This mode is applicable for tack welding and high-current welding. It helps reduce eye fatigue caused by abrupt changes in shade.

The MIX mode consists of 3 periods:
1. The delay from the dark state to intermediate shade number;
2. Shade gradient phase;
3. The delay from the intermediate shade number to light state.

A lower delay is recommended for quick tack welding, while a higher delay works better for high-current welding.

3.3 Auto-darkening Filter Adjustments

1. Selecting Shade Level
Check with the Shade Guide Table on the last page to determine the proper dark shade setting for your application. In order to see which shade the filter is currently set to, momentarily press the shade button and observe the flashing LED. To select another shade, keep pressing the " - " or " + " while the LED is flashing until the LED indicates the desired setting.

2. Setting Sensitivity
Press the SENSI button repeatedly until the LED shows the desired setting.

3. Selecting Delay Time
Press the DELAY button repeatedly until the LED shows the desired setting.

4. Switching Mode

GRIND	Fold the movable visor up for grinding.
DARK	Press the SENSI. button until the DARK LED (Fig.B-2) flashes.
MIX	Long-press the DELAY/MIX button until the LED flashes slower.

3.4 Helmet Adjustments

1. Adjusting the Headgear Tightness

- To adjust the headgear's top for a proper fit, push the small button through the current slot, slide it to the desired slot, and snap the small button into place (Fig.C-1).
- Adjust the headgear by turning the adjusting wheel (Fig.C-2) to match your head circumference.
- Once you've put on the helmet, move your head to ensure it sits securely and stably.

2. Adjusting the Distance Between the Filter and the Face

- Press down and hold the buttons on both sides (Fig.C-3) so the headgear can be slide back and forth.
- Release the buttons to snap the pins into slots. Make sure the distance between the lens to both eyes are the same.

3. Adjusting the Viewing Angle

- Loosen the right block nut.
- Adjust the viewing angle with the pins on the angle limitation washer.
- Snap the pin into the desired slot on the right boot screw (Fig.C-4).
- Re-tighten the right block nut.

4. Connect Hose to Helmet

- Pull the head of hose to connect it to protruding connector of Defender Helmet, and then release the head of hose to complete the fixing (Fig.J).

4. MAINTENANCE

4.1 Replacing Front Cover Lens (Fig.D)

Replace the outside cover lens if it is damaged. Place your fingernail in recess below filter view window and flex lens upwards until it releases from edges of filter view window.

4.2 Replacing Inside Cover Lens (Fig.F)

Replace the inside cover lens if it is damaged. Place your fingernail in recess on the right side of the filter view window and flex lens upwards until it releases from edges of filter view window.

4.3 Replacing Batteries (Fig.H)

Slide the battery holder out of the auto darkening filter (remove the used battery when replacing battery), put new 2xCR2032 batteries inside the battery holder, and put the battery holder back into the auto darkening filter (Fig.H) . Please make sure the anode and cathode of the battery are installed correctly.

4.4 Replacing the Grinding Visor (Fig.G)

- Flip the lid to the top.
- Press the grinding visor from both sides to release it.
- Insert a new grinding visor shield.
- Close the flip lid.

4.5 Replacing the Auto-darkening Filter (Fig.E)

- Open the flip lid containing the auto-darkening filter.
- Place the helmet with the inner side facing you (Fig.E-1).
- Use your forefinger to push up the retaining clip in the middle to release it from the groove (Fig.E-2).
- Remove the filter cartridge (Fig.E-3). To replace, follow the reverse steps.

4.6 Changing the Sweatband (Fig.I)

- Remove sweatband and padding from the hook-and-loop strap.
- Place a new sweatband around the front headgear, then close the hook-and-loop fastener.
- Attach new padding to the hook-and-loop strap on the back of the headgear.

4.7 Replacing the Clamp (Fig.K)

- Unscrew the middle screw at the back of the headgear to remove the clamp.
- Replace it with a new clamp and tighten the screw.

4.8 Replacing the Flip Lid (Fig.L)

- Open the flip lid.
- Remove the flip lid by unscrewing the 4 screws on both inner sides.
- Replace it with a new flip lid and tighten the screws.

4.9 Replacing the Face Seal (Fig.M)

- The face seal can be used to facilitate cleaning after disassembling from the shell, but it must be replaced if it is damaged.
- Press the small button on cantilevered components and push the headgear in the direction of arrow to separate headgear from the helmet (Fig.M-1).
- In accordance with the order of A-D in the figure, aligh the face seal with the velcro inside the helmet shell and make sure the face seal is closely attached to helmet shell (Fig.M-2).
- Then press the small button on cantilevered components to install the headgear to the helmet (Fig.M-3).
- Fasten the side snaps in the specified order and positions (Fig.M-4/5).
- The correct final configuration is depicted (Fig.M-6).

5. CLEANING AND STORAGE

5.1 Cleaning

- Clean the welding helmet with mild soap and lukewarm water.
- Use mild disinfection solution to disinfect the protector. Do not use solvents.
- Clean the auto-darkening filter with a clean, lint-free tissue or cloth.
- Do not immerse auto-darkening filters in water or spray directly with liquids.

5.2 Storage

Store the welding visor fully assembled in a place that is dry and free of dirt. Protect from direct sunlight and thermal radiation. Take out the batteries if storing for extended periods.

6. SPECIFICATIONS

Model	Defender Helmet with 110L
Viewing Area	100 x 60 mm (3.94" x 2.36")
Cartridge Size	110 x 90 x 9 mm (4.33" x 3.54" x 0.35")
Optical Class	1 / 1 / 1 / 2
Number of Sensors	2
Power On / Off	Automatic On / Off
Battery Type	Solar cell. Battery replaceable, 2 x CR2032 lithium battery
Dark Shades	9-13
Light State	Shade 3.0
Switching Speed	1/25, 000 s (55°C)
Special Modes	GRIND / MIX / DARK
Sensitivity Control	Low - High, LED and button control
Delay	0.05/0.2/0.6/1.0s, 4-level
UV / IR Protection	Up to Shade DIN16 at all times
Operating Temp.	-10°C to 55°C (14°F to 131°F)
Storing Temp.	-20°C to 70°C (- 4°F to 158°F)
Helmet Material	High Impact Resistance Nylon
Approvals	CE, ANSI, CSA, AS/NZS, EAC

7. TROUBLE SHOOTING

Fault	Cause	Remedy
The auto-darkening filter flickers or does not auto-darken.	Low battery level.	Replace the batteries.
	The outside cover lens is dirty.	Replace the outside cover lens.
	Dirty arc sensors.	Clean the arc sensors.
	Low welding current.	Use a higher sensitivity setting.
Darkening is uneven.	The distance between eyes and auto-darkening filter is different for each eye.	Check the headgear settings.
The response time is too long.	The ambient temperature is too low.	Use only within the specified temperature range (above -10 °C or 14 °F).
Poor vision quality.	The outside cover lens is dirty or scratched.	Clean or replace the outside cover lens.
	The wrong shade number was selected.	Select the right shade number.
	The protective film has not been removed.	Remove the protective film.
Welding helmet slips.	Incorrect headgear settings.	Adjust the headgear.

SHADE GUIDE TABLE

GUIDE FOR SHADE NUMBERS

OPERATION	ELECTRODE SIZE 1/32 in. (mm)	ARC CURRENT(A)	MINIMUM PROTECTIVE SHADE	SUGGRSTED[1] SHADE NO. (COMFORT)
Shielded metal arc welding	Less than 3 (2.5) 3-5 (2.5–4) 5-8 (4–6.4) More than 8 (6.4)	Less than 60 60-160 160-250 250-550	7 8 10 11	— 10 12 14
Gas metal arc welding and flux cored arc welding		Less than 60 60-160 160-250 250-500	7 10 10 10	— 11 12 14
Gas tungsten arc welding		Less than 50 50-150 150-500	8 8 10	10 12 14
Air carbon Arc cutting	(Light) (Heavy)	Less than 500 500-1000	10 11	12 14
Plasma arc welding		Less than 20 20-100 100-400 400-800	6 8 10 11	6 to 8 10 12 14
Plasma arc cutting	(Light)[2] (Medium)[2] (Heavy)[2]	Less than 300 300-400 400-800	8 9 10	8 12 14
Torch brazing		–	–	3 to 4
Torch soldering		–	–	2
Carbon arc welding		–	–	14
	PLATE THICKNESS			
	in.	**mm**		
Gas welding Light Medium Heavy	 Under 1/8 1/8 to 1/2 Over 1/2	 Under 3.2 3.2 to 12.7 Over 12.7		 4 or 5 5 or 6 6 or 8
Oxygen cutting Light Medium Heavy	 Under 1 1 to 6 Over 6	 Under 25 25 to 150 Over 150		 3 or 4 4 or 5 5 or 6

[1] As a rule of thumb, start with a shade that is too dark, then go to a lighter shade which gives sufficient view of the weld zone without going below the minimum. In oxyfuel gas welding or cutting where the torch produces a high yellow light, it is desirable to use a filter lens that absorbs the yellow or sodium line the visible light of the (spectrum) operation.

[2] These values apply where the actual arc is clearly seen. Experience has shown that lighter filters may be used when the arc is hidden by the workpiece.

Data from ANSI Z49.1-2005

WARRANTY

Universal's only obligation shall be repair, replace or refund the purchase price of such parts or products material and fabrication defects free of charge within the warranty period. This warranty does not cover to cause by improper handling abuse or application other than recommended in the user instruction.
If you come across any problem during warranty period, contact your distributor, send the defective parts together with the completed defect problem if necessary.

For future reference, please complete the owner's record below:

Serial Number:

Purchase Date:

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