



**CORNWELL®**  
**QUALITY TOOLS**

**MMW820DVG**



***Auto Darkening  
Welding Helmet***



**SAFETY WARNINGS - READ BEFORE USING****WARNING**

Read &amp; Understand All Instructions Before Using



Auto-Darkening welding helmets are designed to protect the eye and face from sparks, spatter and harmful radiation under normal welding conditions. Always turn on the Auto-Darkening Welding helmet by pressing the "MODE" button. Make sure to set shade number, delay & sensitivity properly according to your welding process before welding. Auto-darkening filter automatically changes from a light state to a dark state when an arc is struck, and it returns to the light state when welding stops.

**The Auto-Darkening welding helmet comes assembled. But before it can be used, it must be adjusted to fit the user properly. Check battery surfaces and contacts and clean it if necessary. Verify if the battery is in good condition and installed properly. Set up for delay time, sensitivity and shade number for your application.**

**The helmet should be stored in dry, cool and dark area and remove the battery, when not using it for a long time.**

**WARNING**

- This Auto-Darkening welding helmet is not suitable for laser welding.
- Never place this helmet and Auto-Darkening filter on a hot surface.
- Never open or tamper with the Auto-Darkening filter.
- This Auto-Darkening welding helmet will not protect against severe impact hazards.
- This helmet will not protect against explosive devices or corrosive liquids.
- Don't make any modifications to either the filter or helmet, unless specified in this manual. Don't use replacement parts any other than those specified in this manual. Unauthorized modifications and replacement parts will void the warranty and expose the operator to the risk of personal injury.
- Should this helmet not darken upon striking an arc, stop welding immediately and contact your supervisor or your dealer.
- Don't immerse the filter in water.
- Don't use any solvents on the filter screen or helmet components.
- Use only at temperatures: -10 °C ~ +55 °C (14 °F ~ 131 °F). The helmet should be stored in dry cool and dark area and remove the battery, when not using it for a long time.
- Storing temperature: -20 °C ~ +70 °C (-4 °F ~ 158 °F).
- Protect filter from contacting with liquid and dirt.
- Clean the filter surface regularly; don't use strong cleaning solutions. Always keep the sensors and solar cells clean using a clean lint-free tissue.
- Regularly replace the cracked / scratched / pitted front cover lens.
- The materials which may come into contact with the wearer's skin, can cause allergic reactions in some circumstances.



## WARNING



Severe personal injury could occur if the user fails to follow the above mentioned warnings and/or fails to follow the operating instructions.

## COMMON PROBLEMS AND REMEDIES

### • Irregular Darkening Dimming

Headgear has been set unevenly and there is an uneven distance from the eyes to the filter lens (Reset the headgear to reduce the difference to the filter).

### • Auto-Darkening filter does not darken or flickers

- ① Front cover lens is soiled or damaged (Change the cover lens).
- ② Sensors are soiled (Clean the sensors surface).
- ③ Welding current is too low (Adjust the sensitivity level to higher).
- ④ Check battery and verify they are in good condition and installed properly. Also, check battery surfaces and contacts and clean if necessary. Please refer to the “POWER” on page 2.

### • Slow response

Operating temperature is too low (Do not use at temperatures below -10 °C or 14 °F).

### • Poor vision

- ① Front / inside cover lens and / or the filter is soiled (Change lens).
- ② There is insufficient ambient light.
- ③ Shade number is incorrectly set (Reset the shade number).
- ④ Check if removing the film on the front cover lens.

### • Welding helmet slips

Headgear is not properly adjusted (Readjust the headgear).



## WARNING





The user must stop using the auto-darkening welding helmet immediately if the above-mentioned problems cannot be corrected. Contact the dealer.

## INSTRUCTIONS FOR USE

**WARNING!** Before using the helmet for welding, ensure that you have read and understood the safety instructions.

### • POWER

The symbol “” shows current state of the battery (See fig.1). The volume of battery has four levels to appear(See fig.2). The symbol “” appears on the display screen before 1–2 days of battery life remains, CR2450 lithium battery should be replaced in time. The symbol of the battery Indicator is not real-time, will be updated after pressing “MODE” button shortly.

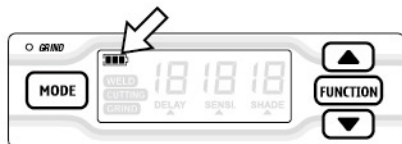


fig.1



fig.2

- Slide the battery holder out of the auto darkening filter, (remove the used battery when replacing battery), put new CR2450 battery inside the battery holder, and put the battery holder back into the auto darkening filter. Please make sure the anode and cathode of the battery are installed correctly. (See fig.3)

## DIGITAL OPERATION GUIDE

### • ON-OFF

Short press any button to check if the lens is working properly and begin to set up lens shade number, sensitivity, and delay adjustments. ADF will turn off automatically after being put still for 30 minutes.

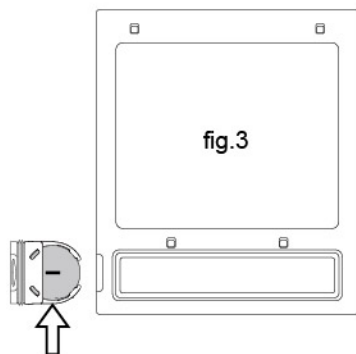
### • MODE CONTROL

Short press “MODE” button to select the mode appropriate for the work activity (See fig.4):

**Weld Mode** – used for most welding applications. Push “FUNCTION” button to adjust shade number, sensitivity, and delay settings properly before welding. In this mode the lens turns to dark immediately when you start welding.

**Cutting Mode** – used for cutting applications. Push “FUNCTION” button to adjust shade number, sensitivity, and delay settings properly before cutting. In this mode the lens turns to dark immediately when you start cutting.

**Grind Mode** – used for grinding applications. In this mode the lens shade is fixed shade No. 3. Can not adjust shade number, sensitivity, and delay settings.



Be sure Negative (-) side of battery faces up.



fig.4

### • VARIABLE SHADE CONTROL

After turning on the lens, short press “FUNCTION” button to choose “SHADE”, and adjust lens shade number (See fig.5). Use the shade control “▲” and “▼” buttons to select the lens shade in the dark state. The shade range for each mode are as follows:

**Weld Mode** – No. 9 ~ No. 13 / **Cutting Mode** – No. 5 ~ No. 8 / **Grind Mode** - No. 3 only

Select the proper shade number for your welding/cutting process, by referring to the “Shade Guide Table” below.



fig.5

### • SENSITIVITY CONTROL

Short press “FUNCTION” button to choose “SENSI”. (See fig.6).

Use Sensitivity Control “▲” and “▼” buttons to make the lens more or less sensitive to arc light of different welding processes. Sensitivity setting 5-10 is the normal setting for everyday use. The sensitivity ranges for each mode are as follows:

**Weld/Cutting Mode** – No.0 ~ No. 10 / **Grind Mode** – No sensitivity adjustment

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.).

It may be necessary to adjust helmet sensitivity to accommodate different lighting conditions or if lens is flashing on and off. Adjust helmet sensitivity as follows: adjust helmet sensitivity in lighting conditions helmet will be used in.

- Press “▼” button to lower setting to 0.
- Face the helmet in the direction of use, exposing it to the surrounding light conditions.
- Press “▲” button repeatedly until the lens darkens, then press “▼” button until lens clears. Helmet is ready for use. Slight readjustment may be necessary for certain applications or if lens is flashing on and off.



fig.6

## • DELAY CONTROL

Press "FUNCTION" button to choose "DELAY", begin lens delay adjustments (See fig.7). Use the Lens Delay Control "▲" and "▼" buttons to adjust the time for the lens to switch to the clear state after welding or cutting.

**Weld/Cutting Mode** – No.0 ~ No. 10 / **Grind Mode** – No sensitivity adjustment

The delay is particularly useful in eliminating bright after-rays present in higher amperage applications where the molten puddle remains bright momentarily after welding. Use the Lens Delay Control buttons to adjust delay from 0 to 10 (0.1 to 1.0 second). When welding stopped, the viewing window automatically changes from dark back to light but with a pre-set delay to compensate for any bright afterglow on the workpiece. The delay time /response can be set from level 0 to level 10. It is recommended to use a shorter delay with spot welding applications and a long delay with applications using higher currents. Longer delays can also be used for lower current TIG welding, and TIG / MIG / MAG pulse.



fig.7

## • ADJUSTING THE FIT OF THE HELMET

The overall circumference of the headband can be made larger or smaller by rotating the knob on the back of the headband (See adjustment "Y" in fig.8). This can be done while wearing the helmet and allows just the right tension to be set to keep the helmet firmly on the head without it being too tight.

• If the headband is riding too high or too low on your head, adjust the strap which passes over the top of your head. To do this release the end of the band by pushing the locking pin out of the hole in the band. Slide the two portions of the band to a greater or lesser width as required and push the locking pin through the nearest hole (See adjustment "W" in fig.8).

• Test the fit of the headband by lifting up and closing down the helmet a few times while wearing it. If the headband moves while tilting, re-adjust it until it is stable.

## • ADJUSTING THE DISTANCE BETWEEN THE HELMET AND THE FACE

Step 1: Undo the block nut (See "T" in fig.8) to adjust the distance between the helmet and your face in the down position.

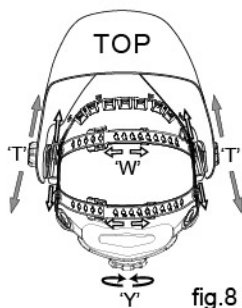


fig.8

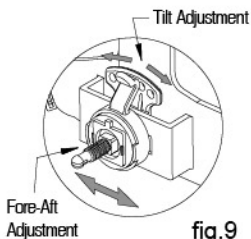


fig.9

Step 2: Re-tighten the block nut when adjustment is complete.

#### • ADJUSTING VIEW ANGLE POSITION

**TILT:** Tilt adjustment is located on right side of helmet. Loosen the right side headgear tension knob and push the top end of the adjustment lever outward until the lever's Stop Tab clears the notches. Then rotate the lever forward or back to the desired tilt position. The Stop will automatically engage again when released locking the helmet into position (See fig.9).

• You are now ready to use the helmet. The shading may be adjusted during use by re-setting the potentiometer control.

## MAINTENANCE

#### REPLACING FRONT COVER LENS :

Remove lens cassette by moving locks toward center (fig.10) and lift up the lens cassette to remove/replace the front cover lens.

#### REPLACING INSIDE COVER LENS :

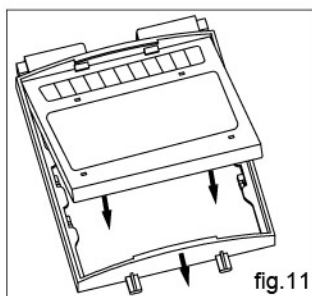
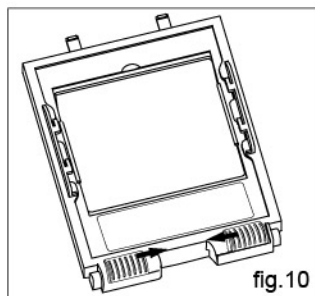
Replace the inside clear lens if it is damaged. Place your fingernail in recess below cartridge view window and flex lens upwards until it releases from edges of cartridge view window.

#### CHANGE THE SHADE CARTRIDGE :

Remove ADF holder assembly from helmet shell. See fig.11 for removal. Flex top end of the ADF holder to allow for ADF cartridge to be removed from frame. Install new ADF cartridge into frame per fig.10 below. Make sure that the ADF cartridge is inserted in ADF holder correctly as shown. Install ADF holder assembly into helmet shell.

#### CLEANING:

Clean helmet by wiping with a soft cloth. Use mild disinfection solution to disinfect the protector. Clean cartridge surfaces regularly. Do not use strong cleaning solutions. Clean sensors and solar cells with methylated spirit and a clean cloth and wipe dry with a lint-free cloth.





## TECHNICAL SPECIFICATIONS

Optical Class	1 / 1 / 1 / 2
Viewing Area	97 x 81 mm (3.82" x 3.19")
Cartridge Size	133 x 114 x 9 mm (5.25" x 4.50" x 0.35")
Arc Sensor	4
Light State	DIN 3
Dark State	DIN 5 ~ 8 / 9 ~ 13
Shade Control	Internal, Variable Shade, Digital Display Control
Power On/Off	Automatic On / Off
Sensitivity Control	Low — High, Digital Display Control
UV/IR Protection	Up to Shade DIN16 at all times
Power Supply	Solar cell. Battery replaceable 1 × CR2450 lithium battery
Switching Time	1/25,000 s. from Light to Dark
Oxyfuel Gas Welding	Yes
Oxygen Cutting	Yes
Delay (Dark to Light)	0.1 ~ 1.0 s Digital Display Control
Low Amperage TIG Rated	≥ 2 amps (DC); ≥ 2 amps (AC)
Grinding	Yes
Operating Temp.	-10°C ~ +55°C (14°F ~ 131°F)
Storing Temp.	-20°C ~ +70°C (- 4°F ~ 158°F)
Helmet Material	High Impact Resistance Nylon
Total Weight	1.45 Lbs
Application Range	Stick Welding (SMAW); TIG DC&AC; TIG Pulse DC; TIG Pulse AC; MIG/MAG/CO2; MIG/MAG Pulse; Plasma Arc Cutting (PAC); Plasma Arc Welding (PAW); Air Carbon Arc Cutting (CAC-A); Oxyfuel Gas Welding (OFW); Oxygen Cutting (OC); Grinding
Approved	ANSI Z87.1, CSA Z94.3

## SHADE GUIDE TABLE

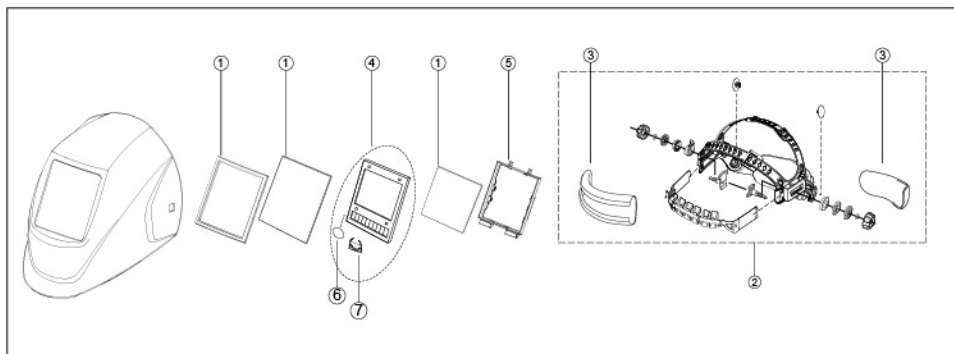
### GUIDE FOR SHADE NUMBERS

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

<sup>(1)</sup> 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

<sup>(2)</sup> 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.

## PARTS LIST & ASSEMBLY



Reference Number	Description	Part No.
1	Cover Lens Kit (4 outer/2 inner)+Gasket	MMWLK82
2	Headgear	MMWHG16
3	Sweatband Bundle	MMWSB16
4	Replacement Lens	MMWRL82
5	Lens Retainer	MMWLH66
6	Battery (1pc)	MMWCR2450R
7	Battery Holder	MMWBHL2450-3



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