

MMW900PVG

CORNWELL[®] ***TOOLS***

AUTO DARKENING WELDING HELMET

User manual

- TRUE COLOR
- Digital Product
- 180° SIDE VIEW



CORNWELL[®]
QUALITY TOOLS





- **TRUE COLOR** vision on the work piece both prior and during welding, which means improved quality and higher efficiency.
- Overall-process protection against ultraviolet (UV) and infrared (IR) radiation. The MMW900PVG is equipped with a lithium battery and solar cells that extends the life of the battery.
- The product is in full conformity with related ANSI, CE. CSA, AS/NZS safety standards.

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SHADE NUMBER

Recommended Shade Number According to EN169

Welding Process	Arc Current(Amperes)																										
	0.5	1	2.5	5	10	15	20	30	40	60	80	100	125	150	175	200	225	250	275	300	350	400	450	500			
SMAW	9									10	11					12					13					14	
MIG(heavy)	10											11				12					13					14	
MIG(Light)	10											11				12			13			14			15		
TIG,GTAW	9							10	11				12				13			14							
MAG/CO ₂	10											11	12		13					14			15				
SAW	10															11	12		13	12		13	14		15		
PAC	11														12				13								
PAW	2.5	3	4	5	6	7	8	9	10	11	12		13				14					15					

Adjust shade pursuant to the field condition.



READ CAREFULLY AND UNDERSTAND THESE INSTRUCTIONS BEFORE USING THE HELMET

WARNING

The MMW900PVG welding helmet is designed to protect the eyes and face from sparks, spatter and harmful radiation under normal welding conditions. The welding helmets may only be used for welding and not for other purposes. They are suitable for use with virtually all welding process, except oxy-acetylene, laser and gas welding procedures. They will not protect against severe impact hazards, including fragments from grinding disks, explosive devices or corrosive liquids. Machine guards and appropriate protection must be used. Avoid work positions that could expose unprotected areas of the body to sparks spatter, direct and/or reflected radiation. Use adequate protection if exposure can not be avoided.

If the auto-darkening filter is cracked, stop using the helmet: UV/IR protection may be compromised, resulting in burns to the eyes and skin.

During the welding process, heat and radiation are released.

- **FUMES AND GASES** can be dangerous to your health.
 - Keep your head out of fumes.
 - Use enough ventilation, exhaust at the arc, or both, to keep fumes and gases away from your breathing zone and general area.
- **ARC RAYS** can injure eyes and burn skin.
 - Before welding, always inspect helmet and filter lens to be sure they are fitted properly, in good condition and not damaged.
 - Check to see that the clear lens is clean and securely attached to the helmet.
 - Always wear safety glasses or goggles under the welding helmet and protective clothing, to protect your skin from radiation, burns and spatter.
 - Ensure that optical radiation from other welder's arcs in the immediate area does not enter in from behind the helmet and auto-darkening filter.

Welding produces sparks and drops of molten metal that fly in all directions.

- The protective helmet must be worn to avoid potentially serious physical damages.
- Appropriate additional safety clothing must be worn to protect the rest of the body.



CORRECT USE OF THE WELDING HELMET

- Before using the helmet, make sure that:
 - The front cover lens, and the filter are in the correct position and correctly fixed in place
 - All the sensors and the cells are not obstructed
 - The protection films on both screens are removed
 - The red light is off, otherwise change the batteries
- Keep the filter viewing area as close as possible to the eyes during welding.
- When welding for extended periods, occasionally check the helmet and make sure there are no signs of deformation or deterioration.
- Do not use the helmet without the transparent filter protections (internal and external): non-observance may cause a safety hazard or irreparable damage to the filter.
- Subjects with particularly sensitive skin must take extra care: materials that may come into contact with the skin can cause allergic reactions.
- Check that the protection level matches your welding process. If the helmet presents operation problems, refer to the “troubleshooting” chapter; if the problem persists, immediately stop using the helmet and contact the person in charge or a distributor.

MAINTENANCE

- Regularly check the condition of the helmet and change any damaged parts.
- Replace the external/internal transparent filter protection if it is damaged.
- Do not immerse the filter in water or other liquids; do not use solvents to clean the filter.
- Do not put any heavy tools/objects in or on the helmet in order not to damage the filter or the protective screens.
- Keep the helmet away from flames
- Do not drop the helmet.
- Do not place the helmet too close to the welding area.
- Respect the temperature:
 - Use: +23°F (-5°C) ÷ +131°F (+55°C)
 - Storage: -4°F (-20°C) ÷ +158°F (+70°C)
- Remove batteries when the helmet is not in use for long periods of time.



- Place the helmet in a way that does not allow its dimension to deform, or the viewing filter to break.
- Do not allow the filter to come into contact with liquid and dirt.
- Do not open the filter container. Do not use any tools or other sharp objects to remove any components of filter or helmet.
- Do not use replacement parts other than those original ones: unauthorized modifications and replacement parts will void the warranty and expose the operator to the risk of personal injury.

CLEANING

Keep the filter, the sensor and the solar cell clean. After using the helmet and before putting it away, it must be checked to verify integrity and to eliminate any drops of molten metal.

The cartridge and the front cover lens must be cleaned at regular intervals with clean cotton, a soft cloth or a special rag for lens. Do not use strong cleaning agents or solvents: clean the inside and the outside of the helmet with a neutral disinfectant product.

Non-observance of this regulation can expose the operator to health risks and void warranty.

We will not accept any liability if the welding helmet is used for other purposes or if these instructions are disregarded.



OPERATING INSTRUCTIONS

Check the front cover lens to make sure that they are clean, and that no dirt is covering the sensors on the front of filter cartridge. Also check the front / rear cover lens and the front lens retaining snap joint to make sure that they are secure.

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.

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

Do not make any modifications to either the welding lens or helmet, other than those specified in this manual.

Failure to follow these warnings and/or failure to follow all of the operating instructions could result in severe personal injury.

ADJUSTMENT INSTRUCTIONS

Basic Functional Parameters

The MMW900PVG has one main window and two side windows.

- The main window and two side windows have independent working modes to choose from.
- The main window has three operating modes: GRIND, WELD and CUT.
- The specific function of the three operation modes parameters are shown in table 1.
- The side window has two operating modes: GRIND and WELD.
- The specific function of the two operation modes parameters are shown in table 2.

Table 1 MMW900PVG Main window function parameters of three operation modes

Parameter Mode	SHADE	SENS	DELAY
GRIND	3	0	No Display
WELD	8~13	1~8	0~9
CUT	4~8	1~8	0~9

Note: 1) 0 to 9 of the delay time corresponds to 0.06s to 1.0s, 0 is suitable for TAC welding.

- 2) In the function of Welding and Cutting modes, sensitivity and delay time can be set differently.

Table 2 MMW900PVG Side window function parameters of two operation modes

Parameter Mode	SHADE	SENS	DELAY
GRIND	3	0	No Display
WELD	10	1~4	No Display

Note: 1) The two side windows have separate modes and parameter settings.

- 2) In welding mode when sensitivity set to 1, the side window will be darkening follow the main window. When sensitivity set to 2, the side window darkening follows the main window with low sensitivity. When sensitivity set to 3, the side window darkening follows the main window with high sensitivity. When sensitivity set to 4, the side window will stay dark.

Main window Advanced Function

In order to improve the convenience and comfort for users, MMW900PVG added 4 optional features and one-button grinding outside: Automatic Shade Number Adjust, Automatic Sensitivity Adjust, Automatic Delay Time Adjust and Gradual Return. The optional features of three operation modes of the main window are shown in table 3. The outside grinding button is a self-recovery button, which can quickly switch the working mode of the main window to grinding and press it again to return back the previous working mode. When grinding button switches the working mode of the main window to grinding, the main window will flash twice, and when the working modes switches to the previous working mode, the main window will flash once.

Table 3 MMW900PVG Main window Optional features of three operation modes

Optional Features \ Mode	Automatic Shade Number Adjust	Automatic Sensitivity Adjust	Automatic Delay Time Adjust	Gradual Return
GRIND	No	No	No	No
WELD	Yes	Yes	Yes	Yes
CUT	No	Yes	No	No

Function Definition Of The Display Area

Figure 1 is the display area, it has 10 function buttons, LCD display and LED lights, which is explained next.

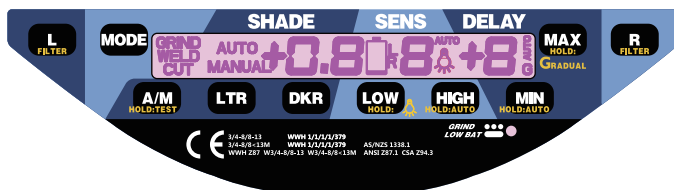


Figure 1 Display Area

(1) Main window Function Buttons

Buttons	Function	The usage the Buttons
MODE	1. Short Press-Switching Mode: GRIND—WELD—CUT—GRIND.	1. Short Press-Press 0.1s to switch the mode. Release the button and press again to switch mode again.
A/M HOLD: TEST	1. Short Press-In the welding mode switch automatic or manual setting the shade number. 2. Long Press-Test Function: Screen Flashes—Grind—Cut—Weld.	1. Short Press-Short press to switch automatic or manual setting the shade number. 2. Long Press-Press over 1.5s to start the TEST for one time.
LTR	1. Short Press-Decrease the shade number. 2. Long Press-In the welding and automatic shade number mode, main window quickly decreases the shade number.	1. Short Press-Short press to decrease the shade number. Release the button and press again to decrease the shade number again. 2. Long Press-Press over 1.5s to decrease the shade number quickly.
DKR	1. Short Press-Increase the shade number. 2. Long Press-In the welding and automatic shade number mode, main window quickly increases the shade number.	1. Short Press-Short press to increase the shade number. Release the button and press again to increase the shade number again. 2. Long Press-Press over 1.5s to increase the shade number quickly.
LOW	1. Short Press-Decrease the sensitivity. 2. Long Press-Anti-light interference mode on/off. When Anti-light interference is on, the sensitivity area displays a bulb icon.	1. Short Press-Press 0.1s to decrease the sensitivity. Release the button and press again to decrease the sensitivity again. 2. Long Press-Press over 1.5s to turn on/off the Anti-light interference mode.
HIGH HOLD: AUTO	1. Short Press-Increase the sensitivity. 2. Long Press-In the cut or weld mode, set sensitivity automatically. (In the process of automatic set sensitivity, SENS area will be shown "AUTO", sensitivity numbers increase from 0 to 8 in turn)	1. Short Press-Press 0.1s to increase the sensitivity. Release the button and press again to increase the sensitivity again. 2. Long Press-Press over 1.5s to set sensitivity automatically for one time.
MIN HOLD: AUTO	1. Short Press-Decrease the delay time. 2. Long Press-Enter or exit automatic delay time function (When automatic delay time function is enabled, the screen of DELAY area will show "AUTO")	1. Short Press-Press 0.1s to decrease the delay time. Release the button and press again to decrease the delay time again. 2. Long Press-Press over 1.5s to enter automatic delay time function and press over 1.5s again to exit automatic delay time function.
MAX HOLD: Gradual	1. Short Press-Increase the delay time. 2. Long Press-In the weld mode, enter or exit automatic shade number gradual return. (When gradual return function is enabled, the screen of DELAY area will show "G")	1. Short Press-Press 0.1s to increase the delay time. Release the button and press again to increase the delay time again. 2. Long Press-Press over 1.5s to enter automatic shade number gradual return and press over 1.5s again to exit gradual return.

(2) Side window Function Buttons

Buttons	Function	The usage the Buttons
L FILTER	<p>1. Short Press-Setting the left window and press the button once to increase the sensitivity. When enter the setting f left window, the sensitivity area of screen will display "L" and left window will flash. After setting the parameters, if there is no keystroke, the LCD screen will be automatically return to the parameter interface of the main window after 8 seconds.</p> <p>2. Long Press-Quickly back to the main window parameter display screen.</p>	<p>1. Short Press-Press 0.1s to increase the sensitivity. Release the button and press again to increase the sensitivity again.</p> <p>2. Long Press- Press over 1.5s to main window parameter display screen.</p>
R FILTER	<p>1. Short Press-Setting the left window and press the button once to increase the sensitivity. When enter the setting of right window, the sensitivity area of screen will display" R" and right window will flash. After setting the parameters, if there is no keystroke, the LCD screen will be automatically return to the parameter interface of the main window after 8 seconds.</p> <p>2. Long Press-Quickly back to the main window parameter display screen.</p>	<p>1. Short Press-Press 0.1s to increase the sensitivity. Release the button and press again to increase the sensitivity again.</p> <p>2. Long Press-Press over 1.5s to main window parameter display screen.</p>

(2) LCD Display

LCD Display have four parts: Mode, Shade, Sensitivity and Delay time.

- 1) GRIND, WELD, CUT indicates the current work mode.
- 2) Sensitivity: In the WELD or CUT mode, SENS area will be shown the number. 0 for the grinding. For main window, 1 is the minimum sensitivity, and 8 for the maximum sensitivity. For side window, 1 is the minimum sensitivity, and 4 for the maximum sensitivity. The main window has Anti-light interference mode. When working in a strong light environment turn the Anti-light interference mode on, the bulb icon will be displayed in the SENS area on the screen. When automatic sensitivity function is enabled, SENS area will be shown "AUTO". The sensitivity numbers will increase from 1 to 8 in turn, and stop at the gear number which is automatically set. Then the system will quit the automatic sensitivity setting mode.

3) Delay time: DELAY area will be shown current number. When automatic delay time function is enabled, DELAY area will be shown "AUTO". The numbers on the screen can adjust from -9 to +9 . In the weld mode, When gradual return function is enabled, the screen of DELAY area will show "G".

4) Low battery: When the battery is low, the screen will display low battery, indicating that the batteries need to be charged.

(4) LCD Display

There are two kinds of LED Light mode: Flash and always light. Different LED light indicators are shown in table 4.

Table 4 Different LED light indicators

Operation Condition	LED Indicator
Grind	Red light for 2s and flash for 0.3s
Lack of battery (empty)	Red light always on and the display flashes a low-power icon every 5s

Note: The main window in the grind mode when the battery is not enough, the LED will indicate lack of battery.

Sleep and wake up

In order to extend the service life of the battery, auto darkening welding filter under the condition of environmental light intensity is less than 1lx and without arc for a long time, need to enter a dormant state and work in low power mode. In a dormant mode, when the environmental light intensity is more than 1lx, auto darkening welding filter will be working normally in 10s.

Basic function of the headlamp

For different welding environments, the lens is integrated with a built-in headlamp. Headlamps have two levels of brightness, high (100lm) and low (50lm).

1) Function

Headlamp has two working modes: manual and automatic. The headlamp manual mode is continuously lit at a fixed brightness. In the automatic mode, the headlamp will be automatically extinguished after the welding arc, and the headlamp will be lit immediately after the welding arc is extinguished. The main advantage of automatic mode is to extend the use time of the headlamp.

- ① Short press to switch the brightness in the manual mode:
Highlight → low light → Off → high light
- ② Long press to enter the automatic mode, the light will blink twice quickly. Short press at any time to return to the manual mode. The brightness of the automatic mode is determined by the brightness of the current manual mode, as shown in the following table:

In Manual Mode	Highlight	Low light	Off
Brightness after long press to enter the automatic mode	Highlight	Low light	Highlight

2) Charging

When the Low BAT indicator is steady red and the display displays the low charge, the battery needs to be charged. You can use the standard TYPE-C charging interface to plug into the TYPE-C interface on the upper part of the lens. When the lens is charging, the charging indicator will light up. The red light indicates that the lens is charging and the green light indicates that the charging is completed.

3) Low battery protection

When the battery is low, the headlamp will be forced to automatically turn off to save power, so as to ensure that the auto darkening welding lens can still work normally for more than 7 days.

Headgear

Headgear adjustment:

The helmet should be adjusted to cover the eyes and face effectively while welding. The position of the forehead band and rear headband can be manually adjusted to fit securely. Rotate the gear to adjust the tightness until it feels comfortable. The front and rear headbands should be adjusted to tightly cover the forehead and the backside of head. See figure 2a.

Headgear depth:

The depth of the headgear can be adjusted to the position that the headgear sits above your brow. Tighten/loosen the two slotted straps to fit the top of your head. See figure 2b.

Distance between lens and face:

The distance from the lens can be adjusted by pressing side pins and move sliders simultaneously. There are 5 distance positions available for adjustment. See figure 2c.

Angle limitation position:

The ideal helmet position is where your eyes are at 90° angle behind the lens. There are 7 angle limitation positions available for adjustment. Press side buttons and move the sliders simultaneously to make the helmet obtain the required angle limitation position. See figure 2d.

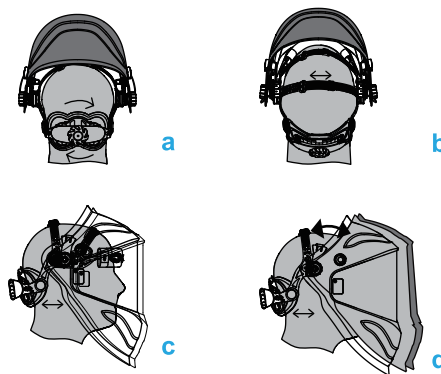


FIGURE 2

As a result of above mechanism action, the welder surely feels more comfortable than before and are in working with more high proficiency at any time.



TECHNICAL SPECIFICATIONS

Main Window:

Light state: DIN3

Dark state: DIN 4-8/8-13

Main window viewing area: 4.50" x 3.36" (114.5 x 85.5 mm)

Side Window:

Light state: DIN3

Dark state: DIN 10

Side window viewing area: 2 pcs x 1.42 (Top)" / 3.22 (Bottom) x 2.70 (Height)"
(2 pcs x 36.2 (Top) / 81.8 (Bottom) x 68.6 (Height) mm)

Sensors: 7

Optical class: 1/1/1/1

True color: YES

Tig capability: >2A

Control: Digital

Shade control: Auto / Manual

Shade deviation of auto shade: -2.0 - +2.0

Sensitivity: 1-8, Automatic

Delay: 0.06 - 1.0S

Manual: YES

Auto mode: YES (-/+9 steps adjustment)

Gradual: YES

TAC welding: YES

Gradual shade return to clear state: YES

Switch time: 1/10000S

Mode: CUT/WELD/GRIND

Power supply:

Auto ON / OFF: YES

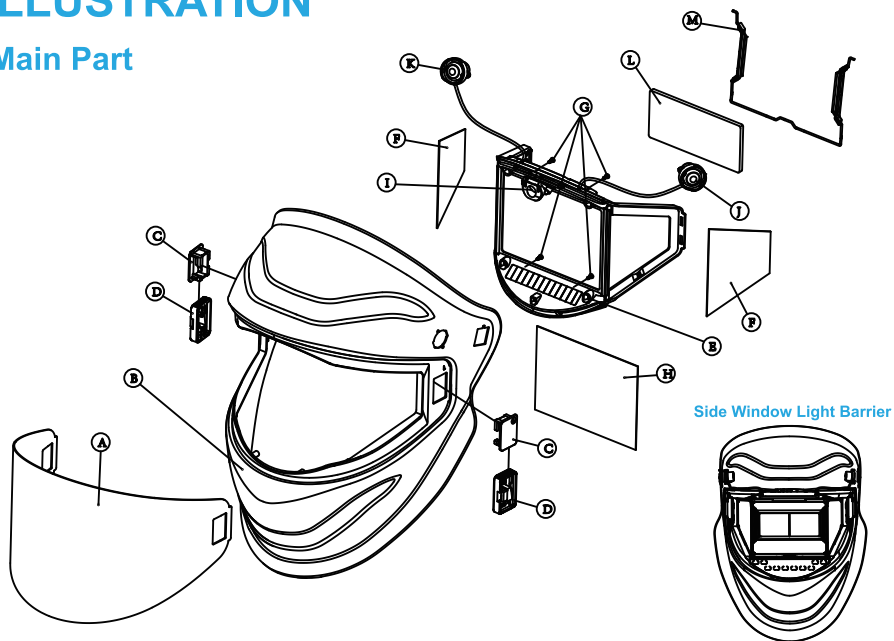
Power backup: Solar panel & battery 1*CR14650

Test: YES

UV & IR protection: Up to shade 16

ILLUSTRATION

Main Part



A Front protection plate

B Helmet shell

C Snap joint for protection plate

D Lock for snap joint of protection plate

E Auto darkening lens

F Rear protection plate 01

G Screw

H Rear protection plate 02

I Light

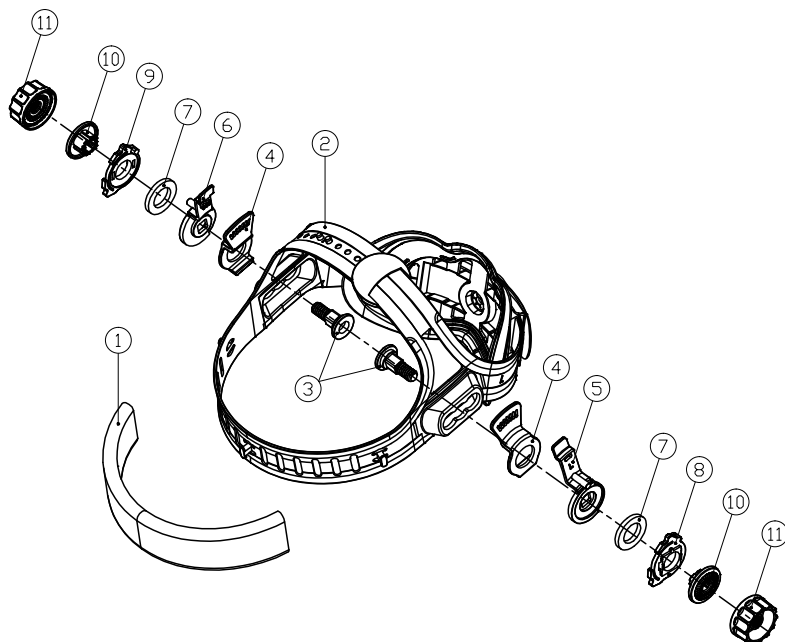
J Grinding button

K Light switch button

L Magnifying glass

M Press spring

Headgear



AGHEADGEAR2.0 PARTS LIST

ITEM	DESCRIPTION	QTY
1	Sweatband	1
2	Headband	1
3	Screw	2
4	Limitation Washer	2
5	Left Adjustable Washer	1
6	Right Adjustable Washer	1
7	Rubber Spacer Ring	2
8	Left Angle Adjustable Washer	1
9	Right Angle Adjustable Washer	1
10	Washer	2
11	Headband Adjustable Nut	2

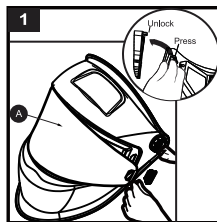


DISASSEMBLY AND ASSEMBLY INSTRUCTIONS

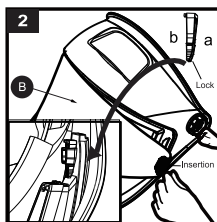
Protection Plate

1. Unlock the snap joint of protection plate if it is locked (A).

Press the snap joint for protection plate and then take out the plate (A).

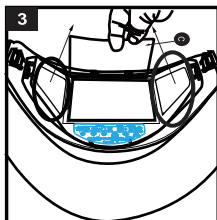


2. Change another protection plate and insert the snap joint (make sure "a" side close to the helmet) and then lock it (B).



3. Insert a finger into the semicircular hole and pull out the inner protection lens (C). Remove protection film from lens.

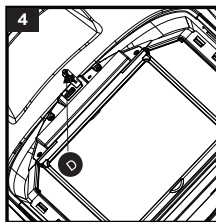
Place inside protection lens (C) back into the front of the helmet by inserting one side of the lens into either side slot and then bend the lens just enough that it will slip into the other side slot.



DISASSEMBLY AND ASSEMBLY INSTRUCTIONS

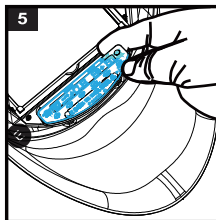
Battery

4. Charge using the TYPE C (D).

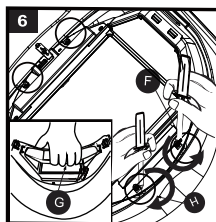


Filter

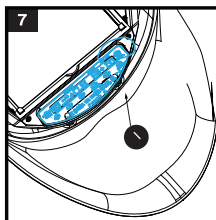
5. Peel off the control panel (E).



6. Loosen the screw (F) and take out the filter (G) assembly from the shell.
Tighten the screws (H).



7. Paste the control panel (I).



TROUBLESHOOTING

Some common problems listed below, together with their possible solutions, can arise when using the helmet:

PROBLEM	POSSIBLE CAUSE	SOLUTION
The filter does not darken or is unstable when switching from light to dark and viceversa	The external transparent protection of the filter is dirty or damaged	Change the external transparent protection
	The sensors are dirty	Clean the sensor surface
	The level of the welding current level (sensitivity) is too low	Increase sensitivity
	The batteries are not in good condition or not properly inserted	Replace the batteries or remove them and re-insert them properly
	Battery terminals and the contact surfaces of the filter are dirty or oxidized	Clean both
	The switch "WELD-GRIND" on the filter is in position "GRIND"	Place the switch in the "WELD"
Slow switching	The operating temperature is too low	Do not use at temperatures under +23°F (-5°C).
Poor visibility	The external or/and internal protection of the filter is/are dirty or damaged	Clean the dirty components and replace the damaged ones
	Not enough light in the surrounding area	
	The scale number is not set correctly, or the fixed scale number is not suitable	Where possible, select the correct number
Filter darkening without arc being struck	Sensitivity is too high	Adjust sensitivity to the right level
Filter remains dark after completing a weld	Delay set too high Ambient light is too bright	Adjust delay. Reduce light level
Weld spatter is damaging the filter	Missed, damaged, broken, distorted front cover	Replace front cover lens

ATTENTION! If the described malfunctions cannot be solved, stop using the helmet immediately and contact Cornwell Quality Tools.



RELATED PARTS LIST

AGHEADGEAR2.0

Head gear replacement

BDWH-TRUEVIEW-PANOV2-EL

Exterior cover plate replacement, CLEAR

BDWH-TRUEVIEW-PANOV2-EL-Y

Exterior cover plate replacement, YELLOW

BDWH-TRUEVIEW-PANOV2-IL

Interior cover plate replacement

HELMET WARRANTY

Cornwell Quality Tools will replace any warranted parts or components that fail due to such defects in material and manufacturing defects. **Cornwell Quality Tools must be notified in writing within thirty (30) days of such defect or failure**, at which time Cornwell Quality Tools will provide instructions on the warranty claim procedures to be followed for replacement parts and components.

Notifications submitted as online warranty claims must provide detailed descriptions of the fault and troubleshooting steps taken to diagnose which parts need a replacement. Warranty claims on safety products that lack the required information may be denied by Cornwell Quality Tools.

All registered safety products are covered under our 2 year warranty replacement policy. The warranty policy for replacement parts begins on the purchase date of the equipment for the end-user purchaser. Proof of purchase is required for any warranty claim.

If your product is out of warranty, please contact Cornwell Quality Tools for our "Out Of Warranty" policy. Call 800-321-8356 or email sales@cornwelltools.com



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CORNWELL®
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