

OM-230 915B

2007-03

Processes



TIG (GTAW) Welding

Description



Tungsten Grinder

MTG Plus Tungsten Grinder



OWNER'S MANUAL



Visit our website at www.MillerWelds.com

File: TIG (GTAW)



From Miller to You

Thank you and *congratulations* on choosing Miller. Now you can get the job done and get it done right. We know you don't have time to do it any other way.

That's why when Niels Miller first started building arc welders in 1929, he made sure his products offered long-lasting value and superior quality. Like you, his customers couldn't afford anything less. Miller products had to be more than the best they could be. They had to be the best you could buy.

Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite.



Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001:2000 Quality System Standard.

We've made installation and operation quick and easy. With Miller you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide the exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.



Miller Electric manufactures a full line of welders and welding related equipment. For information on other quality Miller

products, contact your local Miller distributor to receive the latest full line catalog or individual specification sheets. **To locate your nearest distributor or service agency call 1-800-4-A-Miller, or visit us at www.MillerWelds.com on the web.**



Working as hard as you do – every power source from Miller is backed by the most hassle-free warranty in the business.



TABLE OF CONTENTS

SECTIO	N 1 – SAFETY PRECAUTIONS - READ BEFORE USING	1
1-1.	Symbol Usage	1
1-2.	Tungsten Grinding Hazards	1
1-3.	California Proposition 65 Warnings	2
1-4.	Principal Safety Standards	2
SECTIO	N 2 – DEFINITIONS	3
2-1.	Manufacturer's Rating Label For CE Products	3
2-2.	Symbols And Definitions	3
SECTIO	N 3 – SPECIFICATIONS	4
3-1.	Description	4
3-2.	Included With Your Unit	4
3-3.	Specifications	5
SECTIO	N 4 – INSTALLATION	5
4-1.	Connecting Input Power	5
4-2.	Connecting Grinder To Exhaust (Vacuum) Hose	6
SECTIO	N 5 – OPERATION	7
5-1.	Grinder Components	7
5-2.	Grinding And Cutting Electrodes	8
5-3.	Replacing Grinding Wheels	9
5-4.	Installing Optional Double-Decker Kit	10
5-5.	Installing Grinder Mounting Bracket	11
SECTIO	N 6 – MAINTENANCE & TROUBLESHOOTING	12
6-1.	Routine Maintenance	12
6-2.	Troubleshooting	12
SECTIO	N 7 - PARTS LIST	13

SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

▲ Warning: Protect yourself and others from injury — read and follow these precautions.

Tung_Grind 9/06



1-1. Symbol Usage

Means Warning! Watch Out! There are possible hazards with this procedure! The possible hazards are shown in the adjoining symbols.

Marks a special safety message.

IF Means "Note"; not safety related.

1-2. Tungsten Grinding 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 Safety Standards listed in Section 1-4. Read and follow all Safety Standards.
- ▲ Only qualified persons should install, operate, maintain, and repair this unit.
- ▲ During operation, keep everybody, especially children, away.



ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The input power circuit and machine internal circuits are also live when power is on. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Disconnect input power before installing or servicing this equipment.
- Properly install this equipment according to its Owner's Manual and national, state, and local codes.
- Frequently inspect input power cord for damage or bare wiring replace cord immediately if damaged – bare wiring can kill.
- Turn off all equipment when not in use.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Keep all panels and covers securely in place.



GRINDING DUST can be hazardous.

Grinding produces dust. Breathing this dust can be hazardous to your health.

- Do not breathe the dust.
- Use local exhaust (forced ventilation) to remove dust or wear an approved respirator.
- Grinding dust from thoriated electrodes contains low-level radioactive material. Consider using tungsten containing ceria, lanthana, or yttria instead of thoria.
- Properly dispose of grinder dust in an environmentally safe way.
- Read and understand the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals and consumables.



This group of symbols means Warning! Watch Out! possible ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.



GRINDING can cause FIRE OR EXPLOSION.

- Do not grind where flying sparks can strike flammable material.
- Protect yourself and others from flying sparks and hot metal.
- Be alert that sparks and hot materials from grinding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.



FLYING SPARKS can cause injury.

- Wear a face shield to protect eyes and face.
- Shape tungsten electrode only on grinder with proper guards in a safe location wearing proper face, hand, and body protection.
- Sparks can cause fires keep flammables away.



HOT PARTS can cause severe burns.

- Do not touch hot parts bare handed.
- Allow cooling period before touching parts.
- To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.



OVERUSE can cause OVERHEATING

- Allow cooling period; follow rated duty cycle.
- Keep air holes free of dust; clean if necessary.



READ INSTRUCTIONS.

- Read Owner's Manual before using or servicing unit.
- Use only genuine Miller replacement parts.



MOVING PARTS can cause injury.

- Keep away from moving parts.
- Keep all doors, panels, covers, and guards closed and securely in place.
- Have only qualified persons remove doors, panels, covers, or guards for maintenance as necessary.
- Reinstall doors, panels, covers, or guards when maintenance is finished and before reconnecting input power.

1-3. California Proposition 65 Warnings

▲ Welding or cutting equipment produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)

1-4. Principal Safety Standards

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping, American Welding Society Standard AWS F4.1 from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, P.O. Box 9101, 1 Battery March Park, Quincy, MA 02269–9101 (phone: 617–770–3000, website: www.nfpa.org).

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1735 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202–4102 (phone: 703–412–0900, website: www.cganet.com).

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3 (phone: 800–463–6727 or in Toronto 416–747–4044, website: www.csa-international.org).

Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 11 West 42nd Street, New York, NY 10036–8002 (phone: 212–642–4900, website: www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B, from National Fire Protection Association, P.O. Box 9101, 1 Battery March Park, Quincy, MA 02269–9101 (phone: 617–770–3000,website: www.nfpa.org).

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), 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 (there are 10 Regional Offices--phone for Region 5, Chicago, is 312–353–2220,website: www.osha.gov).

About Pacemakers:

Pacemaker wearers consult your doctor before welding or going near welding operations. If cleared by your doctor, then following the above procedures is recommended.

SECTION 2 – DEFINITIONS

2-1. Manufacturer's Rating Label For CE Products



2-2. Symbols And Definitions

NOT	E	Some syr	mbols are found c	only on CE	products.		
Θ	Output	\sim	Alternating Current	Α	Amperes	V	Volts
$1 \sim$	Single Phase	Ð	Line Connection	Hz	Hertz		Read Instructions

Notes



SECTION 3 – SPECIFICATIONS

3-1. Description

The MTG Plus cuts, grinds, and planes tungsten electrodes used in the TIG (GTAW) welding process. Additional features and benefits of this unit are:

- Electrodes are sharpened to conform to recognized standards.
- The replaceable grinding wheel is diamond-coated on both sides.
- The grinding wheel has an offset edge for easy cutting an industry exclusive!
- The head assembly allows for different electrode angles and diameters.
- The unit can be hand operated, or wall or table-mounted using the supplied mounting bracket.
- ▲ Grinding the tungsten electrode produces dust and flying sparks which can cause injury and start fires. Use local exhaust (forced ventilation) at the grinder or wear an approved respirator.

Read MSDS for safety information. Consider using tungsten containing ceria, lanthana, or yttria instead of thoria. Grinding dust from thoriated electrodes contains low-level radioactive material. Properly dispose of grinder dust in an environmentally safe way. Wear proper face, hand, and body protection. Keep flammables away.

MTG Plus Tungsten Grinder 1 With Diamond Grinding Wheel Steel Carrying Case 2 Electrode Holder With 3 **Clamping Collet** 2 Torx Screwdriver 4 Mounting Bracket 5 5 804 716 / Ref 804 762

3-2. Included With Your Unit

3-3. Specifications

Dimensions	Weight	Input Power	Power-On Time	Cord Length	Rotary Speed
2.6 x 13.8 in (65 x 250 mm)	3 lb (1.4 kg) (w/Grinding Wheel)	120 V AC 50/60 Hz (500 watt Rating)	100%	9.8 ft (3 m)	30,000 RPM (U/min)

Noise Rating	Vibration Level	Electrode Material	Electrode Angles	Electrode Diameters
83 dBa (per EN23741)	2.5 m/s ² (per EN28662, Part 1)	Tungsten electrodes alloyed with zirconium, lanthanum, and cerium Consult country-spe- cific regulations for electrodes containing Thorium.	15° 18° 22.5° 30°	0.04 in (1 mm) 1/16 in (1.6 mm) 3/32 in (2.4 mm) 1/8 in (3.2 mm) 5/32 in (4 mm)

SECTION 4 – INSTALLATION

4-1. Connecting Input Power



4-2. **Connecting Grinder To Exhaust (Vacuum) Hose**



Notes



804 811

OM-230 915 Page 6

5-1. Grinder Components



5-2. Grinding And Cutting Electrodes



Grinding the tungsten electrode produces dust and flying sparks which can cause injury and start fires. Use local exhaust (forced ventilation) at the grinder or wear an approved respirator.

▲

Read MSDS for safety information. Consider using tungsten containing ceria, lanthana, or yttria instead of thoria. Grinding dust from thoriated electrodes contains low-level radioactive material. Properly dispose of grinder dust in an environmentally safe way. Wear proper face, hand, and body protection. Keep flammables away.

- □ Do not exert excessive pressure on the grinding wheel or the life of the wheel will be shortened.
- *□I* Use a rough grinding wheel to sharpen large electrodes.
- Solution Wait until grinding wheel stops before restarting grinder.
- 1 Tungsten Electrode

To Sharpen Electrode:

Determine diameter of electrode and desired sharpening angle.

Turn on grinder. Insert electrode in corresponding hole in grinder.

Slowly turn the electrode until tip is sharpened evenly. If the electrode is not turned the tip will be flat ground to the selected angle.

To Surface Grind Electrode:

Determine diameter of electrode.

Turn on grinder. Insert electrode in corresponding hole at front of grinding head. Grind the electrode tip until square.

To Cut Electrode To Length: (For Orbital Or Manual Welding):

2 Cutting Slot

Turn on grinder. Insert electrode in cutting slot and turn electrode slowly until cut.

IF An optional cutting device is available for larger electrodes. See Section 7.

Turn grinder off.



5-4. Installing Optional Double-Decker Kit



5-5. Installing Grinder Mounting Bracket



SECTION 6 – MAINTENANCE & TROUBLESHOOTING

6-1. Routine Maintenance



6-2. Troubleshooting

Trouble	Remedy				
Motor does not run.	Have Factory Authorized Service Agent check power cable, and replace if necessary.				
	Have Factory Authorized Service Agent check motor, and replace if necessary.				
Grinder head is loose.	Tighten head screw.				
Grinding wheel does not turn.	Tighten grinding wheel screw.				
	Have Factory Authorized Service Agent check motor, and replace if necessary.				
Grinding wheel wobbles.	Tighten grinding wheel screw.				
	Replace grinding wheel.				

SECTION 7 – PARTS LIST

IF Hardware is common and not available unless listed.



804 722

Figure 7-1. Complete Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 7-1. Complete Assembly	
1		. 232 143 .	. Motor, Electric 120 V, 50/60 Hz (Includes Flange)	1
		. 232 144 .	Brush, Carbon	2
3		. 232 145 .	. Wheel, Grinding (Standard)	1
4		. 232 146 . . 232 147 .	. Screw, Grinding wheel M4 x 6	1
6		. 232 148 .	. Screw. Head w/Collar M4 x 15 (Includes Head Nut)	2

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Accessories	
		. 232 149	Wheel, Grinding Rough	1
		. 232 150	Electrode Holder (Without Clamping Collets)	1
		. 232 151	Clamping Collet (For Clamping Electrode In Holder)	1
		. 232 152	Wall/Table/Vice Mounting Plate (Includes Two Head Screws)	1
		. 232 153	Protective Cover (Protects Grinder Head)	1
		. 232 154 . 232 147 . 232 149 . 232 155 . 232 156	 Double-Decker Kit (Consists Of) Head, Grinding Wheel, Grinding (Rough) Screw, Head w/Collar M4 x 34 Extension, Shaft 	1 1 1 1

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number drequired when ordering parts from your local distributor.



Effective January 1, 2007 (Equipment with a serial number preface of "LH" or newer)

This limited warranty supersedes all previous Miller warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY - Subject to the terms and conditions below, Miller Electric Mfg. Co., Appleton, Wisconsin, warrants to its original retail purchaser that new Miller equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Miller. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Miller will provide instructions on the warranty claim procedures to be followed.

Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the delivery date of the equipment to the original end-user purchaser, and not to exceed one year after the equipment is shipped to a North American distributor or eighteen months after the equipment is shipped to an International distributor.

- 5 Years Parts 3 Years Labor
 - * Original main power rectifiers
- 2 3 Years — Parts and Labor
 - Transformer/Rectifier Power Sources
 - Plasma Arc Cutting Power Sources
 - Process Controllers
 - Semi-Automatic and Automatic Wire Feeders
 - Inverter Power Sources (Unless Otherwise Stated)
 - Water Coolant Systems (Integrated)
 - Intellitia

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- **Engine Driven Welding Generators** (NOTE: Engines are warranted separately by the engine manufacturer.)
- 1 Year Parts and Labor Unless Specified
- Motor Driven Guns (w/exception of Spoolmate Spoolauns)
- Positioners and Controllers
- Automatic Motion Devices
- **BECS Foot Controls**
- Induction Heating Power Sources, Coolers, and Electronic

Controls/Recorders

- Water Coolant Systems (Non-Integrated)
- Flowgauge and Flowmeter Regulators (No Labor) *
- HF Units
- * Grids
- * Spot Welders
- Load Banks
- Arc Stud Power Sources & Arc Stud Guns
- Racks
- Running Gear/Trailers
- Plasma Cutting Torches (except APT & SAF Models)
- **Field Options** (NOTE: Field options are covered under True Blue® for the remaining warranty period of the product they are installed in, or for a minimum of one year whichever is greater.)
- Bernard-Branded Mig Guns (No Labor)
- Weldcraft-Branded TIG Torches (No Labor)
- Subarc Wire Drive Assemblies
- 4. 6 Months — Batteries
 - 90 Days Parts
 - MIG Guns/TIG Torches and Subarc (SAW) Guns

- Induction Heating Coils and Blankets, Cables, and Non-Electronic Controls
- * APT & SAF Model Plasma Cutting Torches
- **Remote Controls**
- Accessory (Kits)
- Replacement Parts (No labor)
- Spoolmate Spoolguns
- Canvas Covers

Miller's True Blue® Limited Warranty shall not apply to:

- Consumable components; such as contact tips, 1. cutting nozzles, contactors, brushes, slip rings, relays or parts that fail due to normal wear. (Exception: brushes, slip rings, and relays are covered on Bobcat, Trailblazer, and Legend models.)
- Items furnished by Miller, but manufactured by others, such 2. as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
- Equipment that has been modified by any party other than З. Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

MILLER PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at Miller's option: (1) repair; or (2) replacement; or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Miller's option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a Miller authorized service facility as determined by Miller. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY EXPRESS WARRANTY NOT PROVIDED RELEIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT TORT OR ANY OTHER LEGAL THEORY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDÍNG ANY IMPLIED WARRANTY MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER

Some states in the U.S.A. do not allow limitations of how long an implied warranty lasts, or the exclusion of incidental, indirect, special or consequential damages, so the above limitation or exclusion may not apply to you. This warranty provides specific legal rights, and other rights may be available, but may vary from state to state

In Canada, legislation in some provinces provides for certain additional warranties or remedies other than as stated herein, and to the extent that they may not be waived, the limitations and exclusions set out above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary from province to province.



Miller distributor.

Warranty Questions?

1-800-4-A-MILLER

for your local

Your distributor also gives you ...

Service

Call

You always get the fast, reliable response you need. Most replacement parts can be in your hands in 24 hours.

Support

Need fast answers to the tough welding questions? Contact your distributor. The expertise of the distributor and Miller is there to help you, every step of the way.



Please complete and retain with your personal records.

Model Name	Serial/Style Number
Purchase Date	(Date which equipment was delivered to original customer.)
Distributor	
Address	
City	
State	Zip



Contact a DISTRIBUTOR or SERVICE AGENCY near you.

Always provide Model Name and Serial/Style Number.

Contact your Distributor for:	Welding Supplies and Consumables	
	Options and Accessories	
	Personal Safety Equipment	
	Service and Repair	Miller Flectric Mfg. Co
	Replacement Parts	An Illinois Tool Works Company
	Training (Schools, Videos, Books)	Appleton, WI 54914 USA
	Technical Manuals (Servicing Information and Parts)	International Headquarters–USA USA Phone: 920-735-4505 Auto-Attended USA & Canada FAX: 920-735-4134
	Circuit Diagrams	International FAX: 920-735-4125
	Welding Process Handbooks	United Kingdom Phone: 44 (0) 1204-593493
	To locate a Distributor or Service Agency visit www.millerwelds.com or call 1-800-4-A-Miller	FAX: 44 (0) 1204-598066 www.MillerWelds.com
Contact the Delivering Carrier to:	File a claim for loss or damage during shipment.	
	For assistance in filing or settling claims, contact your distributor and/or equipment manufacturer's Transportation Department.	

