Micro-Measurements

Model 700B
Portable Strain Gage Welding Unit

Instruction Manual

Version 2.00

PO Box 27777
Raleigh, NC 27611
USA

Telephone: 919-365-3800
micro-measurements.com
micro-measurements@vpgsensors.com

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1 WARNINGS & PRECAUTIONS

BEFORE USING THE BATTERY PACK AND CHARGER, READ THIS 700B USER'S MANUAL, MILWAUKEE® LITHIUM-ION BATTERY INSTRUCTIONS, AND ALL LABELS ON THE BATTERY PACK AND CHARGERS. Please see Milwaukee tools website for safe use, handling, and charging of batteries and chargers: https://www.milwaukeetool.com.

Warning – The 700B Portable Strain Gage Welding Unit generates a significant amount of electrical energy – up to 60 Joules (60 Watt-Seconds) of energy may be stored in the internal capacitors.

Shock Hazard – Use caution to avoid contacting the handle electrode during discharge or any time the trigger is pulled.

Shock Hazard – The 700B is not intended for use in a wet environment.

Arc Hazard - The 700B creates high energy sparks when in use. Do not use the 700B in a potentially explosive environment, or where flammable gases may be present. Do not use the 700B around combustible material.

No user serviceable parts are inside the 700B case. Do not open the case or attempt to service the unit. Return to the factory, or your distributor for all needed service.

Shock Hazard – Significant amounts of energy may be stored in the capacitor bank inside the case for up to 8 hours after the battery is removed.

Use appropriate Personal Protective Equipment (PPE) when using the 700B – safety glasses and gloves are recommended.

The discharge tip is sharp and may cause injury. Use caution when handling.

Do not hang the unit by its cables.

Store your battery pack and charger in a cool, dry place, do not charge battery in wet or damp locations. Do not store battery in direct sunlight, or any location that may cause the battery pack to reach temperatures greater than 120° F (49°C).

Cold batteries will have lower performance than those stored at room temperature. It is recommended that when used in cold climates, batteries be stored in a climate-controlled location when not in use to maximize their performance.

Micro-Measurements wants to ensure that our customers are aware that the external Lithium-ion battery (Li-ion) units utilized in Portable Strain Gage Welding Unit systems are considered Dangerous Goods/Hazardous Materials for shipping purposes. There are certain strict rules governing the transportation of Lithium-ion batteries and products powered by Lithium-ion batteries. These rules, imposed by federal and international regulatory agencies, can be very complex and will vary depending on transport mode and battery type.

700B has been designed and tested using the Milwaukee® M12™ line of battery packs. Do not use any other brands of batteries, chargers, or combinations thereof which may result in dangerous incompatibility within the various components and systems.

If you are uncertain on applicable Lithium-ion battery transport rules, Micro-Measurements recommends you visit the USDOT's website for further information: https://www.phmsa.dot.gov/lithiumbatteries

2 INTRODUCTION

2.1 About the 700B Portable Strain Gage Welding Unit

The 700B, Portable Strain Gage Welding Unit, has been designed and developed for the application of weldable sensors to a base material but can also be used for many other spot-welding applications. The welder mechanically attaches sensors to any ferrous base material.

The 700B functions through the use of pen-head, surface-level spot-welds. When used in large, tight groupings, this method of adhesion serves to rigidly fuse the elastic strain surface directly to the medium through which strain is being measured.

With less than a second of charge time between spot-welds, the 700B creates welds as fast as the user can place the tip and pull the trigger. The welder is powered by readily sourced and rechargeable Milwaukee® M12™ REDLITHIUM™[1] Li-ion 3.0 Ah battery packs and chargers used to power common power tools, making it lightweight, maneuverable, and greatly increasing its duty cycle.

2.2 About this Manual

This is a comprehensive document that explains the functions and features of the 700B. The following highlighted message blocks may periodically appear and contain important information that the user should be aware of:

STOP: This symbol and corresponding message represents information regarding the device that if not followed could lead to damaging the device! Pay close attention to this message.

WARNING: This symbol and corresponding message represents vital information and is critical for the device operation and/or the operational settings/configuration.

INFORMATION: This symbol and corresponding message represents general information and/or tips on successfully operating/configuring the device.

[1] Milwaukee, M12, and REDLITHIUM are registered trademarks to the Milwaukee Electric Tool Corporation and will be referenced throughout this manual.

3 SYSTEM CHARACTERISTICS

3.1 Technical Specifications

The 700B consists of a bank of high-performance capacitors to discharge weld energy to the work area. These capacitors are powered by a Lithium-ion battery attached to the bottom of the handle of the electrode assembly. Weld energy can be controlled through the soft buttons on the top of the case.

Figure 1. 700B Components

Table 1: 700B Component Dimensions and Weights

Item	Component	Dimensions (LxWxH)	Weight
1	700B Unit	8.25 x 3 x 7.5 in (210 x 76.2 x 191 mm)	4.6 lb (2.09 kg)
2	Handle	6.25 x 1.85 x 3.3 in (159 x 47 x 84 mm)	0.57 lb (0.26 kg)
3	Lithium-ion Battery	1.9 x 1.2 x 3.4 in (48 x 30 x 86 mm)	0.4 lb (0.182 kg)

4	Magnetic Ground Clamp	3.27 x 2.30 x 2.40 in (83 x 58 x 61 mm)	0.7 lb (0.32 kg)
5	Mechanical Ground Clamp	4.30 x 0.78 x 1.52 in (109 x 20 x 39 mm)	0.16 lb (0.07 kg)
6	Straight Welding Tip	1.25 x 0.13 x 0.13 in (32 x 3.1 x 3.1 mm)	0.004 lb (0.002 kg)
7	Curved Welding Tip	1.05 x 0.13 x 0.40 in (27 x 3.1 x 10 mm)	0.004 lb (0.002 kg)
8	Extension Rod	4.31 x 0.38 x 0.38 in (110 x 9.7 x 9.7 mm)	0.14 lb (0.06 kg)
9	Battery Charger	4.5 x 1.85 x 1.28 in (114 x 47 x 32 mm)	0.5 lb (.23 kg)
10	Cables	60 x 0.31 x 0.31 in (1524 x 7.9 x 7.9 mm)	0.63 lb (0.29 kg)

The battery and charger specifications are provided in Table 2 and Table 3. While the battery and charger specified in the tables below are the models that are supplied with the 700B, Milwaukee® manufactures several M12™ battery types ranging in capacity as well as several M12™ compatible chargers. Any of Milwaukee® M12™ batteries or compatible chargers can be used with the 700B.

Table 2: Lithium-ion Battery Specifications

Manufacturer	Milwaukee
Model	Milwaukee® M12™ REDLITHIUM™ Li-ion 3.0 Ah battery
Chemistry	Lithium-ion
Equivalent Lithium Content	2.5 g
Capacity/Energy	3 Ah
Voltage Range	7.6 – 12.6 Vdc, (10.8 Nominal)
Temperature Range	-4° to 175 °F (-20° to 80 °C)
Shelf Life @ Optimal Temperature	6 months
Dimensions	5.9 x 2.4 x 0.9 in (150 x 58.9 x 22.3 mm)
Weight	0.77 lb (349 g)

Table 3: Battery Charger Specifications

Max Output Power	36 W
Input	110VAC 60Hz or 220 VAC 50Hz , 1.5A
Output	+12 Vdc, 3A
Operating Temp.	40° to 105 °F (5° to 40 °C)
Dimensions	4.5 x 1.85 x 1.28 in (114 x 47 x 32 mm)
Weight	0.5 lb (230 g)

3.2 Shipping Requirements

Micro-Measurements wants to ensure that our customers are aware that the removable Lithium-ion batteries utilized in 700B's are considered Dangerous Goods/Hazardous Materials for shipping purposes. There are rules governing the transportation of Lithium-ion batteries and products powered by Lithium-ion batteries. These rules, imposed by federal and international regulatory agencies, can be very complex and will vary depending on transport mode and battery type.

If you are uncertain on applicable Lithium-ion transportation rules, Micro-Measurements recommends you visit the USDOT's website for further information: https://www.phmsa.dot.gov/lithiumbatteries

WARNING: Safety requirements for shipping Lithium-ion batteries by both ground and air are continuously updated. Anyone handling shipments that involve Lithium-ion batteries should receive the appropriate Dangerous Goods/Hazardous Materials shipping training which is offered by many vendors.

STOP: Significant criminal and civil penalties may be applied to individuals who improperly ship hazardous materials.

In addition to recommended training, three primary sources for shipping guidelines are:

- **Ground:** In the United States, ground shipment regulations for Lithium-ion batteries are provided by the U.S. Department of Transportation (USDOT). Refer to phmsa.dot.gov/lithiumbatteries for further information.
- **Air:** Air shipment requirements are provided by the International Air Transport Association (IATA) which the user should refer to at iata.org.
- **Manufacturer:** Another excellent source for shipping information is provided by the battery manufacturer, Milwaukee® Electric Tool at http://documents.milwaukeetool.com/eService/005d41776d4b410d8974e0eadc64021c.pdf.

Micro-Measurements complies with the latest hazmat delivery guidelines when shipping 700B with Lithium-ion batteries to and from our facilities. Users are responsible for complying with all current shipping regulations. Contact Micro-Measurements to request the latest copy of our shipping policy.

3.3 700B Assembly

INFORMATION: The 700B has two different sized terminals—a smaller one for the positive handle lead and the larger for the ground cable. Wing nuts are used for convenience in removing the leads. If the user prefers the cable to remain installed, we recommend using the supplied nylon-insert hex nuts.

Assembly of the unit is very fast and self-explanatory. Figure 4 illustrates the connection points for the integral cables.

1. Begin by connecting the grounding cable assembly; remove the wing nuts from the two studs located on the right side of the top of the 700B case.
2. First, connect the grounding cable (BLACK) to the larger stud (¼-20 imperial thread), stacking the cable lug and then replacing the ¼-20 imperial wing nut.
3. Hand tighten this stack so that nothing can rattle or shake loose.
4. Follow the same steps, 1 through 3, with the red cable and the smaller stud (#10-32 imperial thread), by placing the cable lug on the #10 imperial threaded stud and then tightening on the #10 imperial wing nut.

WARNING: Do not over tighten the wing nuts as that may result in loosening the stud on the 700B unit.

5. Next, connect the black, 3-pin connector leading from the yellow cable of the electrode handle assembly to the 3-pin receptacle on the connector panel. Be certain to lock the retaining ring on the connector.
6. Once all connections are properly engaged, place the battery in the bottom of the electrode handle assembly as shown in Figure 2 until it clicks in position.

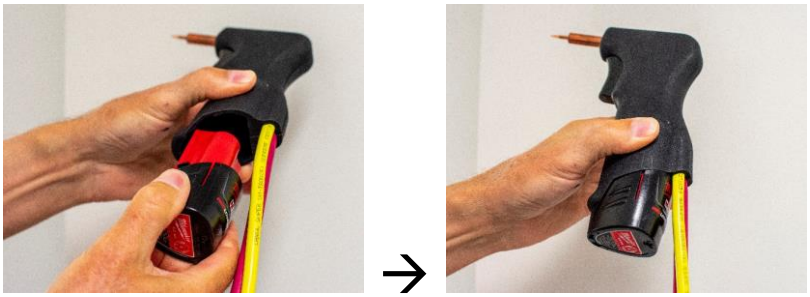


Figure 2: Lithium-ion Battery Installation

When the battery pack needs to be changed, press and hold the tabs on the sides of the pack then pull the pack out of the handle. This is shown in Figure 3 below.

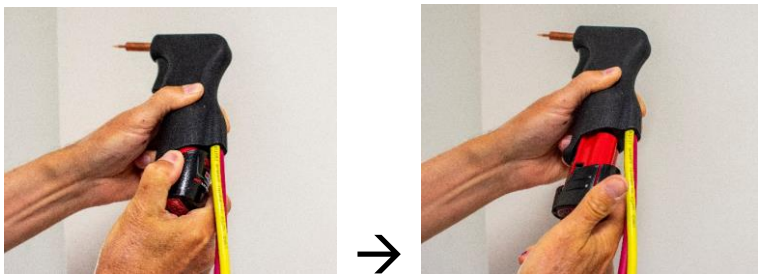


Figure 3: Lithium-ion Battery Removal

Figure 4: 700B Top View

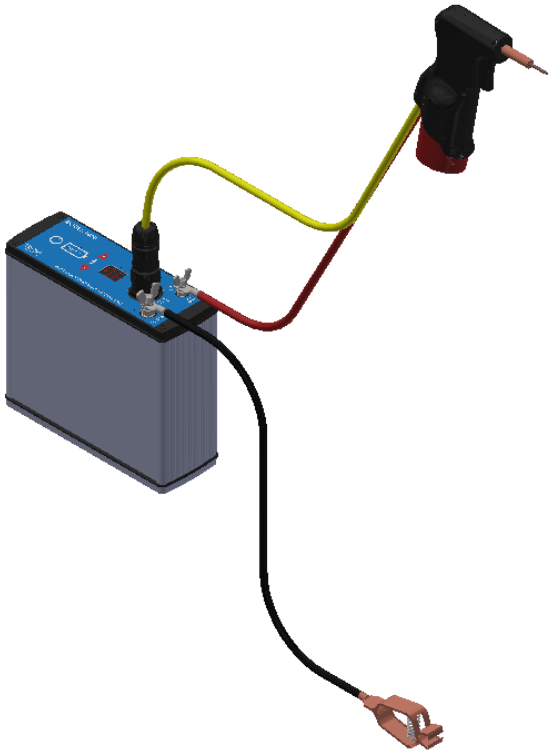


Figure 5: Fully Assembled 700B Handle and Clamp Cables

4 POWER

4.1 Powering On/Off & Battery Status

To turn the 700B on, make sure the battery is correctly connected within the electrode handle assembly, and then press the power button (left most) on the top panel, see Figure 8. Battery status can be checked, once the device is powered on, by pressing the

button. This will cause the display to display the current charge remaining percentage estimate of the battery. Display will show  followed by the battery percentage.

Table 1 outlines the estimated battery capacity based on the display.

INFORMATION: The battery charge percentage remaining estimate is updated once every 5 minutes during use.

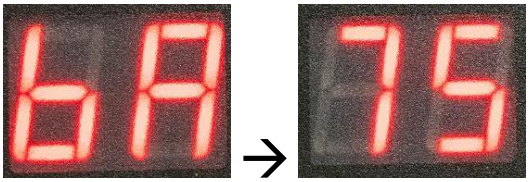


Figure 6: Display showing the current charge percentage of the battery

Table 4: Battery Display

Battery Display	Estimated Remaining Charge
	0%
	0-25%
	26-50%
	51-75%
	76-99%

The 700B will display when the battery is too low to continue welding. The display will sequence  then  as seen below. This is displayed when battery charge is below 10%.

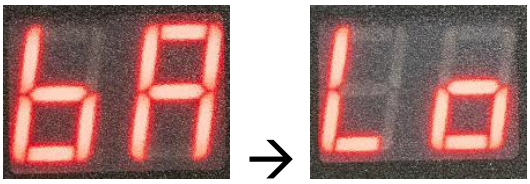


Figure 7: Display showing the low battery charge, too low to continue welding

Figure 8: Power Button on the left and Battery Indicator Button on the right

To power off the 700B press the On/Off button, the display will indicate the unit is powering down with the Pd symbol.

4.1.1.1 Battery Charger

The battery charger for the Lithium-ion batteries used in the 700B must be of the Milwaukee® M12™ line of compatible battery chargers.

STOP: The Milwaukee® M12 battery charger supplied with the 700B is either for 110 VAC power sources (M12-CH-110), or 220VAC power sources (M12-CH-220). If the charger is plugged into the incorrect power source, the charge could be permanently damaged.

Figure 9: Typical battery charger

5 USER INTERFACE FUNCTIONALLITY

5.1 Establishing Weld Energy

The 700B has a spot-welding energy range of 10-60 joules (10-60 Watt-Seconds). This number is displayed by default (unless actively displaying other information). Whenever the dot in the bottom right hand corner of the display is illuminated, this signifies that the capacitor bank is fully charged and ready to discharge energy for a spot-weld.

When increasing or decreasing the level of weld energy (respectively), use the + and − buttons located to the left of the display. Pressing either button once will increase/decrease the level of the weld energy by an increment of one joule. Pressing and holding either button will increase/decrease the level of weld energy by an increment of five joules until the button is released.

Figure 10: Weld energy level controls

Increase the welding energy level with the + button and decrease it with the − button. Pressing the + button once will increase the level of the weld energy by an increment of **one** joule and pressing and holding the same button will increase the level by an increment of **five** joules until the button is released.

Figure 11: How to use weld energy controls

5.2 Safety Features

The 700B has a built-in safety feature to prevent discharge of the capacitor bank when there is not an adequate ground path from the positive handle electrode through to the ground cable. The 700B estimates the resistance to ground through the positive handle electrode each time the trigger is pressed. If the resistance is greater than 1 ohm the 700B will not discharge the capacitor bank and instead will display the error message 

while the trigger is pressed. This feature ensures the correct electrical path for the welding energy.

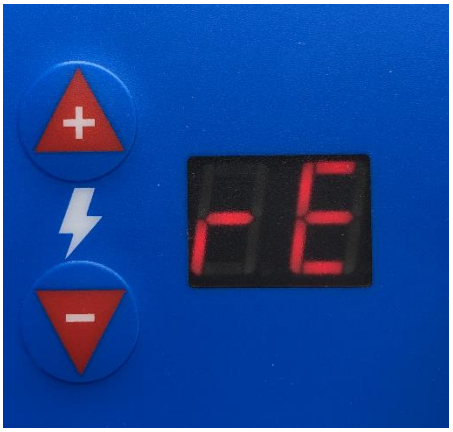


Figure 12: Resistance error on display

5.3 Firmware Version

The current operating firmware version can be obtained by simultaneously pressing and holding the 

button and the  button. This will cause the display to show the current firmware version. The display will show 

then the firmware version 1.0-99. The figure below shows an example of the display sequence for firmware version 

.

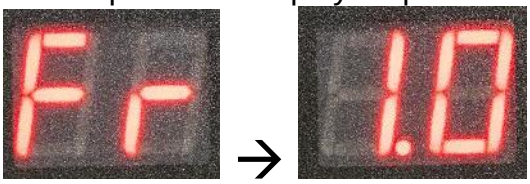


Figure 13: Firmware display example showing the current operating firmware is version 1.0

5.4 Sound Options

The 700B has an option for turning the sound on or off. This controls whether, or not, there is an audible tone as the system charges the capacitors for the next weld. This option is accessed by simultaneously pressing and holding the 

button and the  button to turn the sound on 

or off 

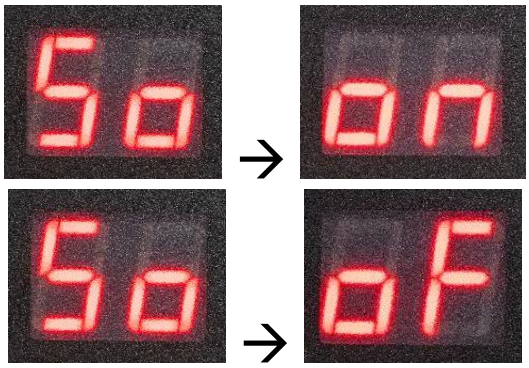


Figure 14: The sound on/off option shown on display

6 CREATING SPOT-WELDS

STOP: The rapid discharge of stored energy through a work specimen can produce sparks. Use proper Personal Protective Equipment when operating the 700B.

The stated purpose of this device is to create localized spot-welds between a base material and shim stock.
It is crucial to the integrity of the spot-welded connection that both surfaces be clean of paint, rust, dirt, dust, or any other contaminant that may reduce the adhesion of the surface to the shim. Please refer to the sensor instructions for proper surface preparation techniques and weld requirements.
Once the 700B has been assembled and the desired weld energy reached, the steps are as follow:

1. Attach the grounding lead to a bare spot of the medium near the area of work (usually a foot (~30 cm) or so, the grounding area must be electrically continuous with the work area). Depending on the purchased equipment, the grounding lead will terminate with either a clamp or a magnetic plug. To activate the magnetic plug, simply hold the plug against the ground area and turn the knob on the top of the plug — it should magnetically hold itself against the area of work.
2. Place the sensor in the appropriate position on the medium it is to be attached to.
3. Press the shim firmly against the medium with the copper welding tip of the handle.
4. Pull the trigger, the 700B will discharge weld energy through shim and create a localized spot-weld. Then it will automatically recharge its capacitor bank in preparation for the next spot-weld. During this recharging cycle, the unit will produce an audible beep until recharging is complete. Once the beep has stopped, the spot-welder is ready for its next discharge. Depending on the energy setting, the unit will recharge in 0.5-1 second; however, this process may take longer in colder temperatures and with older batteries.
5. Continue repeating steps 2 and 3 until the appropriate number of spot-welds has been created.

6.1 Verifying the Strength of a Spot-Weld

To determine if a spot-weld is an appropriate strength for welding, the weld energy must be sufficient to create localized joining of the materials (shim and medium). In most applications, 20-40 Joules of energy is required to ensure proper welding. This can be evaluated by ensuring a test strip remains on the medium when the body of a shim has been pulled from the medium and the welds remain. The following steps can be used to validate proper welding energy is being used:

6. Clean and prepare the medium surface per sensor manufacturer's instructions.
7. Create three or six spot-welds in a line on the shim, about 1/8" (~3 mm) apart from one another.
8. Using either pliers or gloves to avoid the sharp edges of the shim, completely separate the shim and the medium. Figure 15 illustrates the peel testing using pliers. If the shim has holes where the spot-welds were, then the weld energy is sufficient. If there are no visible holes on the shim where the spot-welds were, or if there is no residual shim material on the medium, then the weld energy is not sufficient.
9. Repeat steps 1 and 2, while gradually increasing the weld energy, until shim material is left behind on the medium when the shim is torn off.

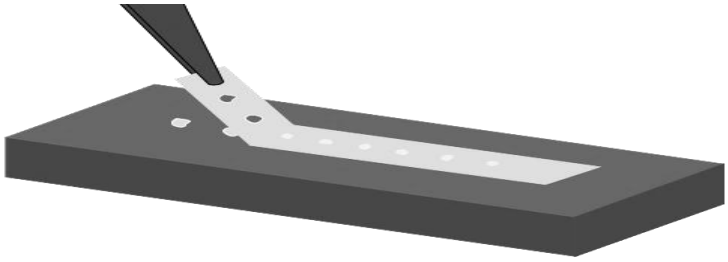


Figure 15: Peel test to ensure proper gage welding

7 CHANGING 700B TIPS

STOP: Use proper Personal Protective Equipment when discharging the 700B.

WARNING: The discharge tip is sharp and may cause injury. Use caution when handling.

WARNING: The 700B generates a significant amount of electrical energy – up to 60 Joules (60 Watt-Seconds) of energy may be stored in the internal capacitors.

7.1 General Recommendations:

The 700B tips are replaceable in the field. The user may want to change tips in the event they need a different tip or extension to allow the tip better access to the sensor being attached. In other cases, the user may want to replace a worn tip. In the welding process, material is lost from the 700B tip electrode. These tips are designed to be replaceable without hand tools.
The tip should be kept clean which can be performed with a 400-grit sandpaper. Sanding will clean debris and pits from the tip, and can help maintain a sharp point for accurate spot-welds.

Shock Hazard – Significant amounts of energy may be stored in the capacitor bank inside the case for up to 8 hours after the battery is removed.

Figure 16. Handle with Straight Welding Tip

Before attempting to change the welding tip, be sure the system is powered off and remove the battery from the Handle.

7.1.1 Straight Tip Replacement:

Figure 17. Straight Welding Tip

To replace the straight tip simply twist off the current tip then thread in a new tip.

Figure 18. Threaded Welding Tip Assembly

7.1.2 Curved Tip Replacement:

Figure 19. Curved WELding Tip

Remove the existing tip as above. The next step will require screwing on a #6-32 machine screw nut onto the curved tip's threaded end. This nut is used to help align the curved tip to the optimal tip angle while maintaining ergonomic hand position. With the hex nut installed on the tip screw the tip back into the handle electrode.

7.1.3 Tip Extension Rod Installation:

Figure 20. Welding Extension Rod

The Welding Tip Extension can be installed between the handle electrode and the tip. Note the handle electrode cannot be removed from the handle.

To install the Tip Extension, remove the existing tip, screw in the extension, and then thread in the desired tip as above.

8 MAITENANCE & TROUBLESHOOTING

8.1 Error Codes & Solutions

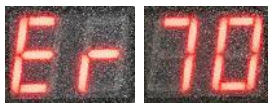
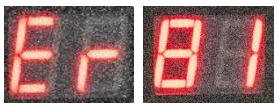
8.1.1 Resistance Error Code:

Cause: Device has determined too large of a resistance (greater than 1 ohm) between electrodes. Discharge will not occur if this sensed resistance in the discharge path is greater than 1 ohm. This error is shown when the trigger is pressed with more than 1 ohm in the discharge path, or when the tip is not in contact with the material to be welded, or when the ground clamp is not in direct contact with the base material to be welded.
Solution: Ensure all connections are properly made and tight; check all wingnuts and cables.

+ Ensure grounding lead is connected to the base material that is being spot-welded. Clean contact is required with the ground clamp, either mechanical jaw or magnetic.
+ Paint, excess surface rust, and any other contaminants must be removed from base material at ground lead location.
+ Ensure proper surface prep at gage location.
+ Ensure proper contact between the welder-to-gage and gage-to-specimen.
+ Place the discharge tip firmly in contact with the material to be welded before pressing the trigger.

Table 5: Display Error Codes

Error Code	Cause	Solution
	Very low battery Charge less than 10%	▪ Check battery charge level ▪ Change to battery with full charge ▪ If ambient temperature is cold, make sure the battery itself is warm
	Resistance error	▪ Welding resistance greater than 1 ohm ▪ Ensure all connections are properly made and tight ▪ Check all wingnuts and cables ▪ Ensure proper surface prep at gage location ▪ Ensure proper contact between the welder-to-gage and gage-to-specimen ▪ Place the discharge tip firmly in contact with the material to be welded before pressing the trigger
	Capacitor bank reading on power on was outside limits	▪ Cycle power and retry ▪ Remove battery from handle and replace it
	Current reading at power on was outside limits	▪ Cycle power and retry ▪ Remove battery from handle and replace it

	Battery reading at power on was outside limits	▪ Cycle power and retry ▪ Remove battery from handle and replace it
	ADC unit failed	▪ Cycle power and retry ▪ Remove battery from handle and replace it
	Display unit failed	▪ Cycle power and retry ▪ Remove battery from handle and replace it
	Capacitor bank charging timeout	▪ More than 5 seconds to recharging the capacitor bank ▪ Check battery charge level ▪ Cycle power and retry ▪ Check ambient temperature for a cold battery ▪ Charge battery ▪ If error persists, possible internal error of device; return for service
	Keypad button stuck	▪ Cycle power and retry ▪ If error persists, possible internal error of device; return for service
	Trigger on Handle stuck	▪ Be sure the trigger button is free to move ▪ Cycle power and retry ▪ If error persists, possible internal error of device; return for service
	Capacitor bank charge readback error	▪ Cycle power and retry ▪ If error persists, possible internal error of device; return for service

8.2 General Troubleshooting

User Interface buttons do not respond to presses, or display locks up — remove the battery from the handle temporarily and replace it. Press the Power button on the unit to power up the unit. If condition persists, return for service.

No user serviceable parts are inside the 700B. Do not open the case or attempt to service the unit. Return to the factory or your distributor for all needed service.

Shock Hazard - Significant amounts of energy may be stored in the capacitor bank inside the case for up to 8 hours after the battery is removed.

9 ORDERING INFORMATION

Part	Model	Description	Item detailed content
MM120-001649	700B	Welding Unit w/o Battery & Charger	700B Welding Unit, includes: - 700B Welder - Welding handle and cable assembly - Magnetic and mechanical ground cable assemblies - 1x Straight Probe Tip ***Battery and charger not included.***
MM120-001650	700B-110	Welding Unit w/ Battery & 110V Charger	700B Welding Unit with Battery and 110V Charger, includes: - 700B Welder - M12 Battery 3Ah - M12 Battery Charger 110VAC - Welding handle and cable assembly - Magnetic and mechanical ground cable assemblies - 1x Straight Probe Tip
MM120-001672	700B-STK	Solder Tip Kit	Replacement tips and extension rod, includes: - Two straight welding tips - Two curved welding tips - One extension rod
MM120-001673	700B-WNK	Wing Nut Kit	Replacement wing nuts, includes: - One stainless steel 10-32 wing nut - One stainless steel ¼-20 wing nut
MM13X500401	700B-HNDL	Welding Handle Assembly (replacement unit)	Replacement welding trigger handle and cable assembly. Includes: - One straight welding tip - Power cable, 5 ft (1.5 m) 6 AWG red cable - Trigger cable, 5 ft (1.5 m) 18/3 AWG yellow flexible cable
MM21X400001	700B-GND	Ground Clamp Assemblies (replacement units)	700B Ground Clamp Assemblies replacement grounding cable assemblies. Includes: - Magnetic black grounding clamp assembly (5 ft (1.5 m), 6 AWG) - Mechanical black grounding clamp assembly (5 ft (1.5 m), 6 AWG)
MM23X500007 (USA) Other countries: see details	700B-M12-3	M12 Battery 3.0 Ah	Milwaukee M12™ REDLITHIUM™ 3.0 Ah battery For countries out of North-America: Specific p/n for each country in Europe and China. Check with Micro-Measurements sales office or distributor for details.
MM26X100212	700B-CH-110	M12 Battery Charger, 110 VAC	110VAC Milwaukee M12™ battery charger, 110VAC input
See details	700B-CH-220	M12 Battery Charger, 220 VAC	220VAC Milwaukee M12™ battery charger, 220VAC input Specific p/n for each country in Europe and China. Check with Micro-Measurements sales office or distributor for details.
MM100-121073	700B-ST-STR	Straight Welding Tip	Single straight welding tip
MM100-121183	700B-ST-CUR	Curved Welding tip	Single curved welding tip

MM100-123344	700B-ER	Welding Extension Rod	700B Welding Extension Rod - Single welding extension rod
MM45X200001	700B-WU	Welding Main Unit (spare or replacement unit)	Welder main body only. **No welding handle or ground clamp assemblies. No battery or charger.**
MM42X200013	700B-WB	Ballistic Nylon Work Bag	Ballistic Nylon work bag, with shoulder strap and integral carabiner D-rings. Capable of carrying the 700B, two spare batteries, welding handle with cables, ground clamp assemblies, and spare welding tips. **Bag only**.
MM42X200014	700B-WC	Ruggedized Work Case	Rugged watertight transit case with custom antistatic foam cut out for 700B. Conforms to FedEx/UPS and IATA guidelines for shipping Lithium-Ion batteries. Capable of holding the 700B, four M12-30 batteries, Ballistic Nylon Work Case, M12 Charger, spare welding tip kit. Interior dimensions: 20 x 14 x 7.7 Inches (51 x 36 x 20 mm).

10 WARRANTY

Vishay Measurements Group, Inc. warrants all instruments it manufactures to be free from defect in materials and factory workmanship, and agrees to repair or replace any instrument that fails to perform as specified within three years after date of shipment. Coverage of computers, cameras, rechargeable batteries, battery charger and similar items, sold in conjunction with equipment manufactured by Vishay Measurements Group, Inc. and bearing the identifying name of another company, is limited to the original vendor warranty terms and period. The warranty on non-rechargeable batteries and similar consumable items is limited to the delivery of goods free from defects in materials and factory workmanship. This warranty shall not apply to any instrument that has been:

i. repaired, worked on or altered by persons unauthorized by Vishay Measurements Group, Inc. in such a manner as to injure, in our sole judgment, the performance, stability, or reliability of the instrument;
ii. subject to misuse, negligence, or accident; or
iii. connected, installed, adjusted, or used otherwise than in accordance with the instructions furnished by us.

At no charge, we will repair, at our plant, or an authorized repair station, or at our option, replace any of our products found to be defective under this warranty.

This warranty is in lieu of any other warranties, expressed or implied, including any implied warranties of merchantability or fitness for a particular purpose. There are no warranties which extend beyond the description on the face hereof. Purchaser acknowledges that all goods purchased from Vishay Measurements Group, Inc. are purchased as is, and buyer states that no salesman, agent, employee or other person has made any such representations or warranties or otherwise assumed for Vishay Measurements Group, Inc. any liability in connection with the sale of any goods to the purchaser. Buyer hereby waives all rights buyer may have arising out of any breach of contract or breach of warranty on the part of Vishay Measurements Group, Inc., to any incidental or consequential damages, including but not limited to damages to property, damages for injury to the person, damages for loss of use, loss of time, loss of profits or income, or loss resulting from personal injury.

Some states do not allow the exclusion or limitation of incidental or consequential damages for consumer products, so the above limitations or exclusions may not apply to you.

The Purchaser agrees that the Purchaser is responsible for notifying any subsequent buyer of goods manufactured by Vishay Measurements Group, Inc. of the warranty provisions, limitations, exclusions and disclaimers stated herein, prior to the time any such goods are purchased by such buyer, and the Purchaser hereby agrees to indemnify and hold Vishay Measurements Group, Inc. harmless from any claim asserted against or liability imposed on Vishay Measurements Group, Inc. occasioned by the failure of the Purchaser to so notify such buyer. This provision is not intended to afford subsequent purchasers any warranties or rights not expressly granted to such subsequent purchasers under the law.

Vishay Measurements Group, Inc. reserves the right to make any changes in the design or construction of its instruments at any time, without incurring any obligation to make any change whatever in units previously delivered. Vishay Measurements Group, Inc.'s' sole liabilities, and buyer's sole remedies, under this agreement shall be limited to the purchase price, or at our sole discretion, to the repair or replacement of any instrument that proves, upon examination, to be defective, when returned to our factory, transportation prepaid by the buyer, within the applicable period of time from the date of original shipment.

Return transportation charges of repaired or replacement instruments under warranty will be prepaid by Vishay Measurements Group, Inc.

Vishay Measurements Group, Inc. is solely a manufacturer and assumes no responsibility of any form for the accuracy or adequacy of any test results, data, or conclusions, which may result from the use of its equipment.

The manner in which the equipment is employed and the uses to which the data and test results may be put are completely in the hands of the Purchaser. Vishay Measurements Group, Inc. shall in no way be liable for damages consequential or incidental to defects in any of its products.

This warranty constitutes the full understanding between the manufacturer and buyer, and no terms, conditions, understanding, or agreement purporting to modify or vary the terms hereof shall be binding unless hereafter made in writing and signed by an authorized official of Vishay Measurements Group, Inc.

PO Box 27777
Raleigh, NC 27611
USA

Telephone: 919-365-3800
micro-measurements.com
micro-measurements@vpgsensors.com

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