

THERMOCOUPLE WELDER
TC-W100A

USER MANUAL



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Revision Record

Revision	EO	Date	Basis of Revision
---	---	05/90	Original Manual Release
A	19161	02/02	Add Unitek Peco™ name + Update manual
B	21443	06/07	Correct error in ToC and update to Miyachi Unitek corporate logo.
C	41646	12/11	Updated to Miyachi Unitek labeling.
D	42840	10/13	Updated to Miyachi America name and logo.
E	43479	12/14	Updated to Amada Miyachi America name and logo.
F	43808	07/15	Updated to Amada format.
G	45833	04/20	Updated Company Name (Amada Weld Tech) + Model Name.
H	46292	04/21	See ECO for description.
J	47206	01/24	Change Manual Title

FOREWORD

Thank you for purchasing an AMADA WELD TECH Thermocouple Welder.

Upon receipt of your equipment, please thoroughly inspect it for shipping damage prior to its installation. Should there be any damage, please immediately contact the shipping company to file a claim, and notify us at:

AMADA WELD TECH INC.
1820 South Myrtle Avenue
Monrovia, CA 91016
Telephone: (626) 303-5676
FAX: (626) 358-8048
e-mail: info@amadaweldtech.com

The purpose of this manual is to supply operating and maintenance personnel with the information needed to properly and safely operate and maintain the Thermocouple Welder.

We have made every effort to ensure that the information in this manual is accurate and adequate.

Should questions arise, or if you have suggestions for improvement of this manual, please contact us at the above location/numbers.

AMADA WELD TECH is not responsible for any loss due to improper use of this product.

SAFETY NOTES

This instruction manual describes how to operate, maintain and service the Thermocouple Welder, and provides instructions relating to its SAFE use. Procedures described in this manual **MUST** be performed, as detailed, by **QUALIFIED** and **TRAINED** personnel.

For **SAFETY**, and to effectively take advantage of the full capabilities of the tester, please read these instruction manuals before attempting to use the workstation.

Procedures other than those described in this manual or not performed as prescribed in it, may expose personnel to electrical hazards.

After reading this manual, retain it for future reference when any questions arise regarding the proper and **SAFE** operation of the tester.

Please note the following conventions used in this manual:

WARNING: Comments marked this way warn the reader of actions which, if not followed, might result in immediate death or serious injury.

CAUTION: Comments marked this way warn the reader of actions which, if not followed, might result in either damage to the equipment, or injury to the individual if subject to long-term exposure to the indicated hazard.

**Disposal**

Properly handle and dispose of used materials.

For the disposal of electronic waste please contact AMADA WELD TECH.

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LIMITED WARRANTY

GENERAL TERMS AND CONDITIONS FOR THE SALE OF GOODS

1. Applicability.

(a) These terms and conditions of sale (these “**Terms**”) are the only terms which govern the sale of the goods (“**Goods**”) by Amada Weld Tech Inc. (“**Seller**”) to the buyer identified in the Sales Quotation and/or Acknowledgment (as each defined below) to which these Terms are attached or incorporated by reference (“**Buyer**”). Notwithstanding anything herein to the contrary, if a written contract signed by authorized representatives of both parties is in existence covering the sale of the Goods covered hereby, the terms and conditions of said contract shall prevail to the extent they are inconsistent with these Terms.

(b) The accompanying quotation of sale (the “**Sales Quotation**”) provided to Buyer, and/or sales order acknowledgement (“**Acknowledgement**”) and these Terms (collectively, this “**Agreement**”) comprise the entire agreement between the parties, and supersede all prior or contemporaneous understandings, agreements, negotiations, representations and warranties, and communications, both written and oral. For clarification, after the Acknowledgement is received by Buyer, the order for Goods is binding and cannot be cancelled by Buyer for any reason and the full purchase price amount set forth in the Acknowledgement shall be due and payable by Buyer to Seller pursuant to the payment schedule set forth in the Acknowledgement unless otherwise agreed to in writing by Seller. All terms and conditions contained in any prior or contemporaneous oral or written communication which are different from, or in addition to, the terms and conditions in this Agreement are hereby rejected and shall not be binding on Seller, whether or not they would materially alter this Agreement. These Terms prevail over any of Buyer’s terms and conditions of purchase regardless whether or when Buyer has submitted its purchase order or such terms. Fulfillment of Buyer’s order does not constitute acceptance of any of Buyer’s terms and conditions and does not serve to modify or amend these Terms. Notwithstanding anything herein to the contrary, all orders for Goods must be for a minimum purchase price of \$100 or such orders will be rejected by Seller.

2. Delivery.

(a) The Goods will be delivered within a reasonable time after Seller provides Buyer the Acknowledgment, subject to availability of finished Goods. Seller will endeavor to meet delivery schedules requested by Buyer, but in no event shall Seller incur any liability, consequential or otherwise, for any delays or failure to deliver as a result of ceasing to manufacture any product or any Force Majeure Event. Delivery schedules set forth in the Acknowledgment are Seller’s good faith estimate on the basis of current schedules. In no event shall Seller be liable for special or consequential damages resulting from failure to meet requested delivery schedules.

(b) Unless otherwise agreed in writing by the parties in the Acknowledgement, Seller shall deliver the Goods to Seller’s plant in Monrovia, CA, USA (the “**Shipping Point**”) using Seller’s standard methods for packaging and shipping such Goods. Buyer shall take delivery of the Goods within three (3) days of Seller’s written notice that the Goods have been delivered to the Shipping Point. Buyer shall be responsible for all loading costs (including freight and insurance costs) and provide equipment and labor reasonably suited for receipt of the Goods at the Shipping Point. Seller shall not be liable for any delays, loss or damage in transit.

(c) Seller may, in its sole discretion, without liability or penalty, make partial shipments of Goods to Buyer, if applicable. Each shipment will constitute a separate sale, and Buyer shall pay for the units shipped whether such shipment is in whole or partial fulfillment of Buyer’s purchase order.

(d) If for any reason Buyer fails to accept delivery of any of the Goods on the date fixed pursuant to Seller’s notice that the Goods have been delivered at the Shipping Point, or if Seller is unable to deliver the Goods at the Shipping Point on such date because Buyer has not provided appropriate instructions, documents, licenses or authorizations: (i) risk of loss to the Goods shall pass to Buyer; (ii) the Goods shall be deemed to have been delivered; and (iii) Seller, at its option, may store the Goods until Buyer picks them up, whereupon Buyer shall be liable for all related costs and expenses (including, without limitation, storage and insurance).

3. Non-delivery.

(a) The quantity of any installment of Goods as recorded by Seller on dispatch from Seller’s place of business is conclusive evidence of the quantity received by Buyer on delivery unless Buyer can provide conclusive evidence proving the contrary.

(b) Seller shall not be liable for any non-delivery of Goods (even if caused by Seller’s negligence) unless Buyer gives written notice to Seller of the non-delivery within three (3) days of the date when the Goods would in the ordinary course of events have been received.

(c) Any liability of Seller for non-delivery of the Goods shall be limited to (in Seller’s sole discretion) replacing the Goods within a reasonable time or adjusting the invoice respecting such Goods to reflect the actual quantity delivered.

4. Shipping Terms. Unless indicated otherwise in the Acknowledgment, Delivery shall be made EXW (Incoterms 2010), Shipping Point, including without limitation, freight and insurance costs. If no delivery terms are specified on the Acknowledgement, the method of shipping will be in the sole discretion of Seller. Unless directed in writing otherwise by Buyer, full invoice value will be declared for all shipments.

5. Title and Risk of Loss. Title and risk of loss passes to Buyer upon delivery of the Goods at the Shipping Point. As collateral security for the payment of the purchase price of the Goods, Buyer hereby grants to Seller a lien on and security interest in and to all of the right, title and interest of Buyer in, to and under the Goods, wherever located, and whether now existing or hereafter arising or acquired from time to time, and in all accessions thereto and replacements or modifications thereof, as well as all proceeds (including insurance proceeds) of the foregoing. The security interest granted under this provision constitutes a purchase money security interest under the California Commercial Code.

6. Amendment and Modification. These Terms may only be amended or modified in a writing which specifically states that it amends these Terms and is signed by an authorized representative of each party.

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7. Inspection and Rejection of Nonconforming Goods.

(a) Buyer shall inspect the Goods within two (2) days of receipt (“**Inspection Period**”). Buyer will be deemed to have accepted the Goods unless it notifies Seller in writing of any Nonconforming Goods during the Inspection Period and furnishes such written evidence or other documentation as required by Seller. “**Nonconforming Goods**” means only the following: (i) product shipped is different than identified in Buyer’s Acknowledgement; or (ii) product’s label or packaging incorrectly identifies its contents. Notwithstanding the foregoing, for shipped Goods that require field installation, the “re-verification” terms in the Acknowledgement shall apply and for custom installations, the inspection and verification shall take place at Buyer’s site immediately after the installation is completed.

(b) Seller will only accept Nonconforming Goods that are returned under Seller’s Return Material Authorization procedures then in effect (“**RMA**”). Buyer shall obtain a RMA number from Seller prior to returning any Nonconforming Goods and return the Nonconforming Goods prepaid and insured to Seller at 1820 South Myrtle Avenue, Monrovia, CA 91016 or to such other location as designated in writing by Seller for the examination to take place there. If Seller reasonably verifies Buyer’s claim that the Goods are Nonconforming Goods and that the nonconformance did not developed by use from Buyer, Seller shall, in its sole discretion, (i) replace such Nonconforming Goods with conforming Goods, or (ii) credit or refund the Price for such Nonconforming Goods pursuant to the terms set forth herein. Notwithstanding the foregoing, the only remedy for Nonconforming Goods that are custom systems is repair (not refund or replacement). No returns for Nonconforming Goods are allowed after thirty (30) days from the original shipping date.

(c) Buyer acknowledges and agrees that the remedies set forth in Section 7(a) are Buyer’s exclusive remedies for the delivery of Nonconforming Goods. Except as provided under Section 7(a) and Section 14, all sales of Goods to Buyer are made on a one-way basis and Buyer has no right to return Goods purchased under this Agreement to Seller.

8. Price.

(a) Buyer shall purchase the Goods from Seller at the prices (the “**Prices**”) set forth in Seller’s published catalogue literature in force as of the date of the Sales Quotation. However, the Prices shown in such catalogue literature or any other publication are subject to change without notice. Unless specifically stated to the contrary in the Sales Quotation, quoted Prices and discounts are firm for thirty (30) days from the date of the Sales Quotation. Unless otherwise stated, prices are quoted EXW (Incoterms 2010), Shipping Point. Unless otherwise stated in the Acknowledgement, if the Prices should be increased by Seller before delivery of the Goods to a carrier for shipment to Buyer, then these Terms shall be construed as if the increased prices were originally inserted herein, and Buyer shall be billed by Seller on the basis of such increased prices.

(b) All Prices are exclusive of all sales, use and excise taxes, and any other similar taxes, duties and charges of any kind imposed by any governmental authority on any amounts payable by Buyer. Buyer shall be responsible for all such charges, costs and taxes (present or future); provided, that, Buyer shall not be responsible for any taxes imposed on, or with respect to, Seller’s income, revenues, gross receipts, personnel or real or personal property or other assets.

9. Payment Terms.

(a) Unless otherwise provided in the Acknowledgement, if Buyer has approved credit with Seller, Buyer shall pay all invoiced amounts due to Seller within thirty (30) days from the date of Seller’s invoice. If Seller does not have Buyer’s financial information and has not provided pre-approved credit terms for Buyer, the payment must be made in cash with order or C.O.D. in US dollars. If Buyer has approved credit terms, the payment may be made by cash with order, wire transfer of immediately available funds, or check in US dollars. Certain products require a down payment. Any payment terms other than set forth above will be identified in the Acknowledgement. Notwithstanding anything herein to the contrary, all prepaid deposits and down payments are non-refundable. If a deposit is not received when due, Seller reserves the right to postpone manufacturing of Goods until payment is received. Seller will not be responsible for shipment delays due to deposit payment delays.

(b) In Seller’s sole discretion, Seller may access Buyer interest on all late payments at the lesser of the rate of 1.5% per month or the highest rate permissible under applicable law, calculated daily and compounded monthly. Buyer shall reimburse Seller for all costs incurred in collecting any late payments, including, without limitation, attorneys’ fees. In addition to all other remedies available under these Terms or at law (which Seller does not waive by the exercise of any rights hereunder), Seller shall be entitled to suspend the delivery of any Goods if Buyer fails to pay any amounts when due hereunder and such failure continues for ten (10) days following written notice thereof.

(c) Buyer shall not withhold payment of any amounts due and payable by reason of any set-off of any claim or dispute with Seller, whether relating to Seller’s breach, bankruptcy or otherwise.

10. Intellectual Property; Software License.

(a) To the extent that any Goods provided under this Agreement contains software, whether pre-installed, embedded, in read only memory, or found on any other media or other form (“**Software**”), such Software and accompanying documentation are licensed to Buyer, not sold and shall remain the sole and exclusive property of Seller or third party licensors of Seller. Seller grants Buyer a non-exclusive license to use the Software solely as provided in and in connection with the use of the Goods in which such Software is contained and in accordance with any applicable user documentation provided with such Goods and subject to the provisions of this Agreement. Certain of Seller’s Goods may include third party software such as computer operating systems. Licenses to such third party software are subject to the terms and conditions of any applicable third party software license agreements. Unless identified in the Acknowledgement, no license is granted by Seller with respect to such third party software products that may be provided with the Goods (if any). Seller makes no warranties regarding any third party software that may accompany the Goods or otherwise and such software is explicitly included in the definition of Third Party Products below.

(b) Buyer shall not copy, modify, or disassemble, or permit others to copy, modify, or disassemble, the Software, nor may Buyer modify, adapt, translate, reverse assemble, decompile, or otherwise attempt to derive source code from the Software. Buyer shall not transfer possession of the Software except as part of, or with, the Goods, and each such transfer shall be subject to the restrictions contained herein. Buyer may not sublicense, rent, loan, assign or otherwise transfer the Software or documentation, and Buyer shall retain on all copies of the Software and documentation all copyright and other proprietary notices or legends appearing therein or thereon. Seller may terminate this license upon written notice for any violation of any of the terms of this license or any material breach of any provision of this Agreement. Buyer shall immediately discontinue use of the Software upon any termination of this license or Agreement. This license shall terminate upon any termination of the Agreement.

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(c) All patents, trademarks, copyrights or other intellectual property rights embodied in the Goods, including without limitation the Software, are owned by Seller and its licensors. Seller and its licensors retain all right, title and interest in such intellectual property rights. Except as expressly set forth herein, no license rights or ownership in or to any of the foregoing is granted or transferred hereunder, either directly or by implication. ALL RIGHTS RESERVED.

(d) If Buyer is the United States Government or any agency thereof, each of the components of the Software and user documentation are a "commercial item," and "computer software" as those terms are defined at 48 C.F.R. 2.101, consisting of "commercial computer software" and "commercial computer software documentation," as such terms are used in 48 C.F.R. 12.212. Consistent with 48 C.F.R. 12.212 and 48 C.F.R. 227.7202-1 through 227.7202-4, all United States government Buyers acquire only those rights in the Software and user documentation that are specified in this Agreement.

11. Installation and Other Services. Seller shall provide installation services ("**Installation Services**") to Buyer if set forth in the Acknowledgment. If Installation Services are provided for in the Acknowledgment, Buyer will prepare the location for the installation consistent with Buyer's written specifications and Buyer will install necessary system cable and assemble any necessary equipment or hardware not provided by Seller, unless agreed otherwise in writing by the parties. For Goods that will be operated on or in connection with Buyer supplied hardware or software, Buyer is responsible for ensuring that its hardware and software conform with Seller minimum hardware and software requirements as made available to Buyer. Seller shall provide other field services, such as maintenance visits and field repairs (the "**Other Services**" and together with the Installation Services, the "**Services**") if set forth in the Acknowledgment.

12. Limited Warranty.

(a) Subject to the exceptions and upon the conditions set forth herein, Seller warrants to Buyer that for a period of one (1) year from the date of shipment ("**Warranty Period**"), that such Goods will be free from material defects in material and workmanship.

(b) Notwithstanding the foregoing and anything herein to the contrary, the warranty set forth in this Section 12 shall be superseded and replaced in its entirety with the warranty set forth on **Exhibit A** hereto if the Goods being purchased are specialty products, which include, without limitation, laser products, fiber markers, custom systems, workstations, Seller-installed products, non-catalogue products and other custom-made items (each a "**Specialty Product**").

(c) **EXCEPT FOR THE WARRANTY SET FORTH IN SECTION 12(A), SELLER MAKES NO WARRANTY WHATSOEVER WITH RESPECT TO THE GOODS (INCLUDING ANY SOFTWARE) OR SERVICES, INCLUDING ANY (a) WARRANTY OF MERCHANTABILITY; (b) WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE; (c) WARRANTY OF TITLE; OR (d) WARRANTY AGAINST INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS OF A THIRD PARTY; WHETHER EXPRESS OR IMPLIED BY LAW, COURSE OF DEALING, COURSE OF PERFORMANCE, USAGE OF TRADE OR OTHERWISE.**

(d) Products manufactured by a third party and third party software ("**Third Party Product**") may constitute, contain, be contained in, incorporated into, attached to or packaged together with, the Goods. Third Party Products are not covered by the warranty in Section 12(a). For the avoidance of doubt, **SELLER MAKES NO REPRESENTATIONS OR WARRANTIES WITH RESPECT TO ANY THIRD PARTY PRODUCT, INCLUDING ANY (a) WARRANTY OF MERCHANTABILITY; (b) WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE; (c) WARRANTY OF TITLE; OR (d) WARRANTY AGAINST INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS OF A THIRD PARTY; WHETHER EXPRESS OR IMPLIED BY LAW, COURSE OF DEALING, COURSE OF PERFORMANCE, USAGE OF TRADE OR OTHERWISE.** Notwithstanding the foregoing, in the event of the failure of any Third Party Product, Seller will assist (within reason) Buyer (at Buyer's sole expense) in obtaining, from the respective third party, any (if any) adjustment that is available under such third party's warranty.

(e) Seller shall not be liable for a breach of the warranty set forth in Section 12(a) unless: (i) Buyer gives written notice of the defect, reasonably described, to Seller within five (5) days of the time when Buyer discovers or ought to have discovered the defect and such notice is received by Seller during the Warranty Period; (ii) Seller is given a reasonable opportunity after receiving the notice to examine such Goods; (iii) Buyer (if requested to do so by Seller) returns such Goods (prepaid and insured to Seller at 1820 South Myrtle Avenue, Monrovia, CA 91016 or to such other location as designated in writing by Seller) to Seller pursuant to Seller's RMA procedures and Buyer obtains a RMA number from Seller prior to returning such Goods for the examination to take place; and (iii) Seller reasonably verifies Buyer's claim that the Goods are defective and that the defect developed under normal and proper use.

(f) Seller shall not be liable for a breach of the warranty set forth in Section 12(a) if: (i) Buyer makes any further use of such Goods after giving such notice; (ii) the defect arises because Buyer failed to follow Seller's oral or written instructions as to the storage, installation, commissioning, use or maintenance of the Goods; (iii) Buyer alters or repairs such Goods without the prior written consent of Seller; or (iv) repairs or modifications are made by persons other than Seller's own service personnel, or an authorized representative's personnel, unless such repairs are made with the written consent of Seller in accordance with procedures outlined by Seller.

(g) All expendables such as electrodes are warranted only for defect in material and workmanship which are apparent upon receipt by Buyer. The foregoing warranty is negated after the initial use.

(h) Subject to Section 12(e) and Section 12(f) above, with respect to any such Goods during the Warranty Period, Seller shall, in its sole discretion, either: (i) repair or replace such Goods (or the defective part) or (ii) credit or refund the price of such Goods at the pro rata contract rate, provided that, if Seller so requests, Buyer shall, at Buyer's expense, return such Goods to Seller.

(i) **THE REMEDIES SET FORTH IN SECTION 12(H) SHALL BE BUYER'S SOLE AND EXCLUSIVE REMEDY AND SELLER'S ENTIRE LIABILITY FOR ANY BREACH OF THE LIMITED WARRANTY SET FORTH IN SECTION 12(A).** Representations and warranties made by any person, including representatives of Seller, which are inconsistent or in conflict with the terms of this warranty, as set forth above, shall not be binding upon Seller.

13. Limitation of Liability.

(a) **IN NO EVENT SHALL SELLER BE LIABLE FOR ANY CONSEQUENTIAL, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR PUNITIVE DAMAGES, LOST PROFITS OR REVENUES OR DIMINUTION IN VALUE, LOSS OF INFORMATION OR DATA, OR PERSONAL INJURY OR DEATH ARISING IN ANY WAY OUT OF THE MANUFACTURE, SALE, USE, OR INABILITY TO USE ANY GOODS, SOFTWARE OR SERVICE, OR ARISING OUT OF OR RELATING TO ANY BREACH OF THESE TERMS, WHETHER OR NOT THE POSSIBILITY OF SUCH DAMAGES HAS BEEN DISCLOSED IN ADVANCE BY BUYER OR COULD HAVE BEEN REASONABLY FORESEEN BY BUYER, REGARDLESS OF THE LEGAL OR EQUITABLE THEORY (CONTRACT, TORT OR OTHERWISE) UPON WHICH THE CLAIM IS BASED, AND NOTWITHSTANDING THE FAILURE OF ANY AGREED OR OTHER REMEDY OF ITS ESSENTIAL PURPOSE.**

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(b) IN NO EVENT SHALL SELLER'S AGGREGATE LIABILITY ARISING OUT OF OR RELATED TO THIS AGREEMENT, WHETHER ARISING OUT OF OR RELATED TO BREACH OF CONTRACT, TORT (INCLUDING NEGLIGENCE) OR OTHERWISE, EXCEED THE TOTAL OF THE AMOUNTS PAID TO SELLER FOR THE GOODS SOLD HEREUNDER.

(c) ALL WARRANTIES SET FORTH HEREIN, DIRECT OR IMPLIED, ARE VOIDED IF THE INITIAL INSTALLATION AND START-UP OF THE SUBJECT GOOD IS NOT SUPERVISED BY AN AUTHORIZED REPRESENTATIVE OF SELLER. AFTER INSTALLATION, ANY RE-ALIGNMENT, RE-CLEANING, OR RE-CALIBRATION, PROVIDED THEY ARE NOT RELATED TO A PROVEN DEFECT IN MATERIALS OR WORKMANSHIP, SHALL BE PERFORMED BY AN AUTHORIZED REPRESENTATIVE OF SELLER AT THE CURRENT SERVICE RATES.

(d) WHERE GOODS ARE SUBJECT TO A MOVE TO ANOTHER LOCATION AFTER THE ORIGINAL INSTALLATION HAS BEEN MADE, THE WARRANTY MAY BE MAINTAINED ONLY IF SUPERVISED BY AN AUTHORIZED REPRESENTATIVE OF SELLER. SELLER, FOR A SERVICE CHARGE, WILL ARRANGE FOR AND SUPERVISE THE DISCONNECTION, TRANSPORTATION, REINSTALLATION AND START-UP OF THE EQUIPMENT. CLAIMS FOR DAMAGE IN SHIPMENT ARE THE RESPONSIBILITY OF BUYER AND SHALL BE FILED PROMPTLY WITH THE TRANSPORTATION COMPANY.

14. Return Goods Policy. Seller's products may be returned to Seller for credit within sixty (60) days of shipment subject to the following conditions.

(a) In order to return products for credit, Buyer must obtain a RMA number from Seller. Upon receipt, it must be executed by an authorized person and then returned with the Goods. Goods returned to Seller without a RMA will be returned at Buyer's expense.

(b) Goods are to be returned to Seller at 1820 South Myrtle Avenue, Monrovia, CA 91016 with Freight Prepaid. Seller will not accept collect shipments.

(c) Restocking fees will be assessed in accordance with the following schedules: (i) Goods returned within the first thirty (30) days from shipment date will be restocked less twenty percent (20%) of the amount billed on the original invoice. (ii) Goods returned over thirty (30) days of shipment but less than sixty (60) days will be restocked less thirty percent (30%) of the amount billed on the original invoice. (iii) No returns are allowed after sixty (60) days from the original shipping date.

(d) The restocking fees set forth above are the minimum fees. If a returned Good requires rework to restore it to a saleable condition, further charges will be assessed. Seller's quality assurance department will document the condition of the Goods when received by Seller and report their findings to Buyer.

(e) **Notwithstanding the foregoing provisions of this Section 14, the following Goods cannot be returned, are not eligible for any credit and cannot be restocked: (i) custom or modified products and (ii) any expendable product(s) that have been used.**

15. Compliance with Law and Indemnification. Buyer shall comply with all applicable laws, regulations and ordinances. Buyer shall maintain in effect all the licenses, permissions, authorizations, consents and permits that it needs to carry out its obligations under this Agreement. Buyer shall comply with all export and import laws of all countries involved in the sale of the Goods under this Agreement or any resale of the Goods by Buyer. Goods, Services and technical data delivered by Seller shall be subject to U.S. export controls. Buyer shall, and shall cause its customers to, obtain all licenses, permits and approvals required by any government and shall comply with all applicable laws, rules, policies and procedures of the applicable government and other competent authorities. Buyer will indemnify and hold Seller harmless for any violation or alleged violation by Buyer of such laws, rules, policies or procedures. Buyer shall not transmit, export or re-export, directly or indirectly, separately or as part of any system, the Goods or any technical data (including processes and Services) received from Seller, without first obtaining any license required by the applicable government, including without limitation, the U.S. government. Buyer also certifies that none of the Goods or technical data supplied by Seller under this Agreement will be sold or otherwise transferred to, or made available for use by or for, any entity that is engaged in the design, development, production or use of nuclear, biological or chemical weapons or missile technology. No Buyer information will be deemed "technical data" unless Buyer specifically identifies it to Seller as such. Buyer assumes all responsibility for shipments of Goods requiring any government import clearance. Seller may terminate this Agreement if any governmental authority imposes antidumping or countervailing duties or any other penalties on Goods. For all international shipments, Seller requires that all required Export Control documentations, including Form BIS-711 Statement by Ultimate Consignee and Purchases, are submitted by Buyer along with the purchase order. Seller reserves the right to postpone shipment until all documentations are completed and submitted to Seller. Seller will not be responsible for shipment delays due to non-compliance by Buyer of the foregoing two sentences.

16. Termination. In addition to any remedies that may be provided under these Terms, Seller may terminate this Agreement with immediate effect upon written notice to Buyer, if Buyer: (i) fails to pay any amount when due under this Agreement and such failure continues for ten (10) days after Buyer's receipt of written notice of nonpayment; (ii) has not otherwise performed or complied with any of these Terms, in whole or in part; or (iii) becomes insolvent, files a petition for bankruptcy or commences or has commenced against it proceedings relating to bankruptcy, receivership, reorganization or assignment for the benefit of creditors.

17. Waiver. No waiver by Seller of any of the provisions of this Agreement is effective unless explicitly set forth in writing and signed by Seller. No failure to exercise, or delay in exercising, any rights, remedy, power or privilege arising from this Agreement operates or may be construed as a waiver thereof. No single or partial exercise of any right, remedy, power or privilege hereunder precludes any other or further exercise thereof or the exercise of any other right, remedy, power or privilege.

18. Confidential Information. All non-public, confidential or proprietary information of Seller, including, but not limited to, specifications, samples, patterns, designs, plans, drawings, documents, data, business operations, customer lists, pricing, discounts or rebates, disclosed by Seller to Buyer, whether disclosed orally or disclosed or accessed in written, electronic or other form or media, and whether or not marked, designated or otherwise identified as "confidential," in connection with this Agreement is confidential, solely for the use of performing this Agreement and may not be disclosed or copied unless authorized in advance by Seller in writing. Upon Seller's request, Buyer shall promptly return all documents and other materials received from Seller. Seller shall be entitled to injunctive relief for any violation of this Section 18. This Section 18 does not apply to information that is: (a) in the public domain through no fault of Buyer; (b) known to Buyer at the time of disclosure without restriction as evidenced by its records; or (c) rightfully obtained by Buyer on a non-confidential basis from a third party.

19. Force Majeure. Seller shall not be liable or responsible to Buyer, nor be deemed to have defaulted or breached this Agreement, for any failure or delay in fulfilling or performing any term of this Agreement when and to the extent such failure or delay is caused by or results from acts or circumstances

TC-W100A - THERMOCOUPLE WELDER

beyond the reasonable control of Seller including, without limitation, acts of God, flood, fire, earthquake, explosion, governmental actions, war, invasion or hostilities (whether war is declared or not), terrorist threats or acts, riot, or other civil unrest, national emergency, revolution, insurrection, epidemic, lock-outs, strikes or other labor disputes (whether or not relating to either party's workforce), or restraints or delays affecting carriers or inability or delay in obtaining supplies of adequate or suitable materials, materials or telecommunication breakdown or power outage (each a "Force Majeure Event"), provided that, if the event in question continues for a continuous period in excess of thirty (30) days, Buyer shall be entitled to give notice in writing to Seller to terminate this Agreement.

20. Assignment. Buyer shall not assign any of its rights or delegate any of its obligations under this Agreement without the prior written consent of Seller. Any purported assignment or delegation in violation of this Section 20 is null and void. No assignment or delegation relieves Buyer of any of its obligations under this Agreement.

21. Relationship of the Parties. The relationship between the parties is that of independent contractors. Nothing contained in this Agreement shall be construed as creating any agency, partnership, joint venture or other form of joint enterprise, employment or fiduciary relationship between the parties, and neither party shall have authority to contract for or bind the other party in any manner whatsoever.

22. No Third-Party Beneficiaries. This Agreement is for the sole benefit of the parties hereto and their respective successors and permitted assigns and nothing herein, express or implied, is intended to or shall confer upon any other person or entity any legal or equitable right, benefit or remedy of any nature whatsoever under or by reason of these Terms.

23. Governing Law. All matters arising out of or relating to this Agreement is governed by and construed in accordance with the internal laws of the State of California without giving effect to any choice or conflict of law provision or rule (whether of the State of California or any other jurisdiction) that would cause the application of the laws of any jurisdiction other than those of the State of California.

24. Dispute Resolution.

(a) If Buyer is an entity formed under the laws of the United States of America, or any of its states, districts or territories ("U.S. Law"), then any dispute, legal suit, action or proceeding arising out of or relating to this Agreement shall be adjudicated and decided in the federal courts of the United States of America or the courts of the State of California in each case located in the City of Los Angeles and County of Los Angeles, California and each party irrevocably submits to the exclusive and personal jurisdiction of such courts in any such dispute, suit, action or proceeding.

(b) If Buyer is an entity formed under the laws of any country, state, district or territory other than U.S. Law, then the parties irrevocably agree that any dispute, legal suit, action or proceeding arising out of or relating to this Agreement shall be submitted to the International Court of Arbitration of the International Chamber of Commerce ("ICC") and shall be finally settled under the Rules of Arbitration of the ICC. The place and location of the arbitration shall be in Los Angeles, California, pursuant to the ICC's Rules of Arbitration and shall be finally settled in accordance with said rules. The arbitration shall be conducted before a panel of three arbitrators. Each party shall select one arbitrator and the two arbitrators so selected shall select the third arbitrator, who shall act as presiding arbitrator. Notwithstanding the foregoing, if the matter under dispute is \$500,000 or less, there shall only be one arbitrator who shall be mutually selected by both parties. If the party-selected arbitrators are unable to agree upon the third arbitrator, if either party fails to select an arbitrator, or in the case that only one arbitrator is required and the parties are unable to agree, then the International Court of Arbitration shall choose the arbitrator. The language to be used in the arbitral proceeding shall be English. The arbitrator(s) shall have no authority to issue an award that is contrary to the express terms of this Agreement or the laws of the State of California or applicable US Federal Law, and the award may be vacated or corrected on appeal to a court of competent jurisdiction for any such error. The arbitrator(s) shall be specifically empowered to allocate between the parties the costs of arbitration, as well as reasonable attorneys' fees and costs, in such equitable manner as the arbitrator(s) may determine. The arbitrator(s) shall have the authority to determine issues of arbitrability and to award compensatory damages, but they shall not have authority to award punitive or exemplary damages. Judgment upon the award so rendered may be entered in any court having jurisdiction or application may be made to such court for judicial acceptance of any award and an order of enforcement, as the case may be. In no event shall a demand for arbitration be made after the date when institution of a legal or equitable proceeding based upon such claim, dispute or other matter in question would be barred by the applicable statute of limitations. Notwithstanding the foregoing, either party shall have the right, without waiving any right or remedy available to such party under this Agreement or otherwise, to seek and obtain from any court of competent jurisdiction any interim or provisional relief that is necessary or desirable to protect the rights or property of such party, pending the selection of the arbitrator(s) hereunder or pending the arbitrator(s)' determination of any dispute, controversy or claim hereunder.

25. Notices. All notices, request, consents, claims, demands, waivers and other communications hereunder (each, a "Notice") shall be in writing and addressed to the parties at the addresses set forth on the face of the Acknowledgement or to such other address that may be designated by the receiving party in writing. All Notices shall be delivered by personal delivery, nationally recognized overnight courier (with all fees pre-paid), facsimile (with confirmation of transmission) or certified or registered mail (in each case, return receipt requested, postage prepaid). Except as otherwise provided in this Agreement, a Notice is effective only (a) upon receipt of the receiving party, upon confirmation of delivery by nationally recognized overnight courier or upon forty-eight (48) hours after being sent by certified or registered mail (as applicable), and (b) if the party giving the Notice has complied with the requirements of this Section 25.

26. Severability. If any term or provision of this Agreement is invalid, illegal or unenforceable in any jurisdiction, such invalidity, illegality or unenforceability shall not affect any other term or provision of this Agreement or invalidate or render unenforceable such term or provision in any other jurisdiction.

27. Survival. Provisions of these Terms which by their nature should apply beyond their terms will remain in force after any termination or expiration of this Order including, but not limited to, the following provisions: Compliance with Laws, Confidentiality, Governing Law, Dispute Resolution, Survival, and the restrictions on Software in Sections 10(b), (c) and (d).

CHAPTER 1

SYSTEM DESCRIPTION

Introduction

The AMADA WELD TECH TC-W100A Thermocouple Welder, Part Number 1-196-0x, is a manual feed thermocouple welder designed to weld thermocouple wires together to form a thermocouple junction, uniform in size, and without detrimental oxide layers when used with argon cover gas. Four different size Wire Clamp Jaws, which are inserted into the TC-W100A Handpiece, permit joining of most thermocouple wire materials that ranges in diameter from 38 AWG (0.0040 inch) to 20 AWG (0.0320 inch). The circuitry is solid state, with components conservatively rated when used within the maximum specified repetition rates. The unique charging circuit uses thyristors to provide high reliability and precise charging intervals. Operator safety is ensured through the use of multiple earth ground connections.

Power Supply

Description

The Model TC-W100A combines capacitor discharge power supply and Tungsten Inert Gas (TIG) welding technology to make a thermocouple junction.

Line Voltage

Line voltage is 115, 230, or 100 Volts, 60/50 Hz. The Thermocouple Welder (TC-W100A) is a multi-voltage unit is normally connected for 115V, 60/50 Hz operation unless otherwise specified on the nameplate and the label attached to the line cord. The actual line voltage should be within $\pm 13\%$ of the nominal voltage for which the TC-W100A is connected.

Line Current Ratings

Part Number	Nominal Line Voltage (VRMS)	Line Voltage Range (VRMS)	Line Frequency (Hz)	Circuit Breaker Size (Amps)	No. of Breakers Required
1-196-04	115	100 – 130	50/60	0.5	1
1-196-04-01	230	200 – 260	50/60	0.3	2
1-196-04-02	100	87 – 113	50/60	0.5	1

50/60 Hz Operation

The TC-W100A is a dual-frequency machine that does not require calibration for operation at 50 or 60 Hz.

CHAPTER 1: SYSTEM DESCRIPTION

Standby Power

Standby power is approximately 15 watts.

Stored Energy Rating

1.5 to 190 watt-seconds (joules).

Welding Speed

The actual weld time is less than 0.1 seconds and the time for the circuitry to recharge is a maximum of 3 seconds. The maximum number of welds per minute is limited to how fast the Handpiece can be loaded and inserted into the Weld Chamber.

Capacitor Bank

The Capacitor Bank is $18,300\mu\text{F} \pm 5\%$ at $20\text{ }^{\circ}\text{C}$. At full rating, the Capacitor Bank is operated at 144 volts.

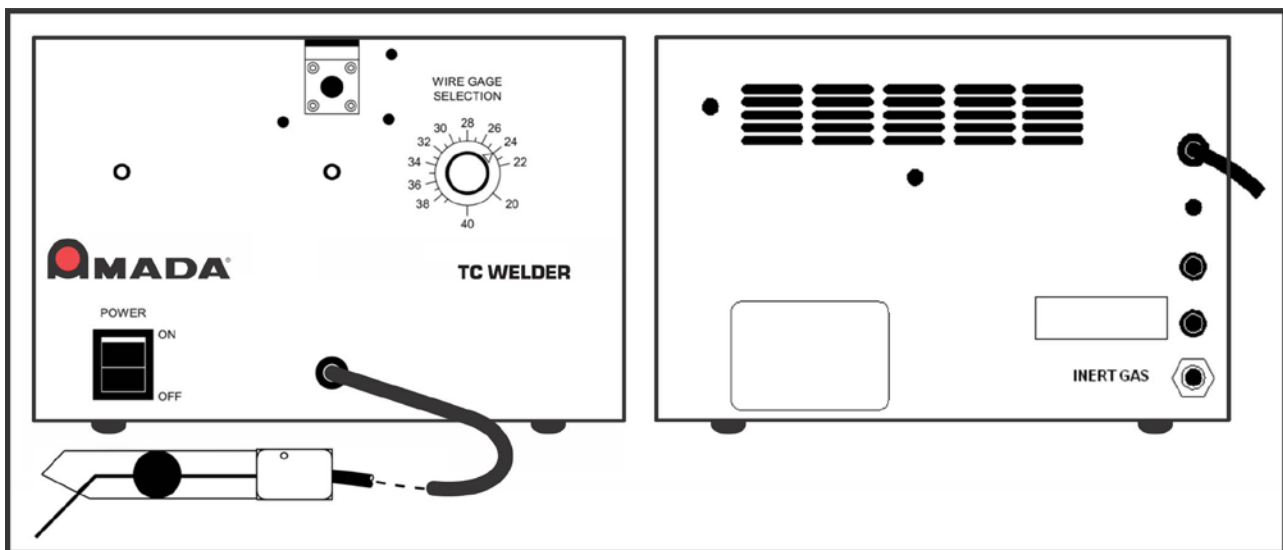


Figure 1-1. Front and Back Views of Thermocouple Welder.

Line Voltage Regulator

The Line Voltage regulator ensures that the welds are independent of changes in line voltage by maintaining the voltage on the capacitor bank within $\pm 0.25\%$ of setting for a $\pm 13\%$ change in line voltage.

Turndown Circuit

The Turndown Circuit allows the user to reduce the energy setting by using the Wire Gauge Selection Control. The excess energy stored in the capacitor bank is dissipated internally. The Turndown Circuit dead-band is approximately 0.6% of the full scale voltage.

Line Failure Turndown

The Line Failure Turndown is a safety feature which ensures that the capacitor bank is automatically discharged whenever the input power is interrupted.

Weld Fire Lockout

This feature helps prevent poor welds by inhibiting firing of the TC-W100A until the energy stored in the capacitor bank is within 1% of the pre-selected value.

Power Switch

A rocker switch disconnects both sides of the input power line when switched to the “OFF” position.

Weld Ready

A yellow lamp indicates that the capacitor bank has been charged or discharged to the proper voltage level and is ready to make a weld.

Wire Gauge Selector

The Wire Gauge Selector controls the level of stored energy necessary to make a thermocouple weld. Energy levels are indicated for each American Wire Gauge (AWG) from 38 AWG to 20 AWG. Because of variations in the thermocouple wire diameters and in the melting characteristics of the various thermocouple alloys, it may be necessary to increase or decrease the WIRE GAUGE SELECTOR setting to produce a good thermocouple weld. This control may also be used to increase or decrease the size of the weld bead to meet specific customer requirements.

Physical Dimensions

HEIGHT	6-7/8	inch	(17.5 cm)	
WIDTH	10-1/4	inch	(26.0 cm)	
DEPTH	10	inch	(25.4 cm)	
WEIGHT	16.2	lb	(7.4 kg)	Includes Handpiece

CHAPTER 1: SYSTEM DESCRIPTION

Handpiece Specifications

The Model TC-W100A Handpiece is not supplied with any Wire Clamp Jaw Assemblies. A single Wire Clamp Jaw Assembly of the proper gauge is required to operate the TC-W100A. Four Wire Clamp Jaw Assemblies are available for use with different gauge wires. The table below defines which Wire Clamp Jaw Assembly should be used with each wire diameter size.

Wire Size AWG	Stock No.	Model No.	ID No.
38-32	10-293-01	TC-W100ACS38	1
31-27	10-294-01	TC-W100ACS31	2
26-23	10-295-01	TC-W100ACS26	3
22-20	10-296-01	TC-W100ACS22	4

Wire Gauge Diameter Specifications

The table below defines the maximum outer jacket insulation size for each wire gauge. It does not refer to the insulation covering each wire.

Nominal AWG	Wire Size Diameter		Max Insulation Diameter		Nominal AWG	Wire Size Diameter		Max Insulation Diameter	
	inch	mm	inch	mm		inch	mm	inch	mm
38	0.0040	0.1016	0.038	0.97	28	0.0126	0.3200	0.055	1.40
37	0.0045	0.1143	0.038	0.97	27	0.0142	0.3607	0.055	1.40
36	0.0050	0.1270	0.038	0.97	26	0.0159	0.4039	0.124	3.15
35	0.0056	0.1422	0.038	0.97	25	0.0179	0.4547	0.124	3.15
34	0.0063	0.1600	0.038	0.97	24	0.0201	0.5105	0.124	3.15
33	0.0071	0.1803	0.038	0.97	23	0.0226	0.5740	0.124	3.15
32	0.0080	0.2032	0.038	0.97	22	0.0253	0.6426	0.159	4.04
31	0.0089	0.2261	0.055	1.40	21	0.0285	0.7239	0.159	4.04
30	0.0100	0.2540	0.055	1.40	20	0.0320	0.8128	0.159	4.04
29	0.0113	0.2870	0.055	1.40					

Initiation

The Handpiece must be correctly inserted into the Weld Chamber to initiate firing. The two thermocouple wires loaded in the Handpiece must touch the Arc Button located inside the Weld Chamber in order to initiate a weld. The firing sequence ensures that the Handpiece is double earth grounded for maximum operator safety. Internal power supply filtering prevents premature firing due to radio frequency interference.

Safety Features

Double earth grounded techniques eliminate the possibility of electrical shock to the operator. The Handpiece used to hold the thermocouple wires is earth grounded to the TC-W100A chassis using a non-removable cable. The length of the cable prevents injury to the Handpiece should it fall off a table or bench that is a minimum of 30 inches high. When the Handpiece is placed in the Weld Chamber, a solenoid mechanically clamps the Handpiece, creating a second earth ground path.

Physical Dimensions

BODY LENGTH	4	inch	(10.16 cm)
BODY DIAMETER	3/4	inch	(1.91 cm)
WIRE CLAMP LENGTH	3/4	inch	(1.91 cm)
WIRE CLAMP DIAMETER	1/4	inch	(0.64 cm)
WEIGHT	0.2	lb	(91 gram)

Argon Purge Gas

Thermocouple welding is performed in an argon filled Weld Chamber which is located on the center, upper face of the TC-W100A. Argon purge gas is necessary to prevent thermocouple joint oxidation during the welding process.

NOTE: Nitrogen is not effective as a purge gas.

Gas Flow

3 cubic feet per hour, nominal.

Argon Purge Gas Shutoff

An internal solenoid valve blocks the flow of argon purge gas to the Weld chamber when input power to the TC-W100A is turned off.

NOTE: For this system to be economical, the user must eliminate all leaks in the gas system feeding the TC-W100A. When the input power is on, gas flow is continuous. An internal gas reservoir, located between the purge gas input connector and the shutoff solenoid, stores a sufficient amount of argon purge gas to immediately clear out the Weld Chamber when the TC-W100A is turned back on.

CHAPTER 2 INSTALLATION

Section I. Power Supply Installation

Power Supply

CAUTION: Do not connect the Thermocouple Welder to the power line at this time. Check the voltage label on the line cord. At the time of shipment, the voltage for which the Thermocouple Welder was connected was marked on the line cord. Do not connect the Thermocouple Welder to any voltage without properly changing the internal connections.

The TC-W100A was assembled at the factory for operation at a specific line voltage. If the TC-W100A is used on a line voltage other than the one for which it is connected, serious damage can result. Most Thermocouple Welders are shipped from the factory wired for 115 volt, 50/60 Hz operation.

To check whether the TC-W100A is connected for 115 or 230 volts, follow steps below:

- Turn the WIRE GAUGE SELECTOR fully counter-clockwise to 40. Verify that the POWER switch is in the “OFF” position and that the line cord is disconnected.
- If power was previously applied, wait one minute to ensure that the Capacitor bank is fully discharged.
- Loosen the four screws which secure the cover and lift the cover straight up to remove it. The different transformer connections and circuit breakers for each specific line voltage are illustrated in figure 2-1.
- Replace the cover and tighten the screws. Change the line cord plug, if necessary. If necessary, change or replace the voltage label on the line cord to show the correct operating voltage.

AMADA WELD TECH recommends that the Thermocouple Welder (TC-W100A) be installed in a well ventilated area, free of dirt and moisture. The Thermocouple Welder is a self-contained unit designed to minimize installation and setup time.

Connect the Purge Gas Inlet Port, located on the rear panel of the TC-W100A, to a PROPERLY FILTERED ARGON GAS SUPPLY using 0.25” O.D. x 0.17” I.D., 120 PSI, plastic tubing. Turn ON the purge gas supply. Set the Pressure Regulator to 50 PSIG. Set the Flow Regulator for 3 cubic feet per hour. Repair leaks, if necessary.

CHAPTER 2: INSTALLATION

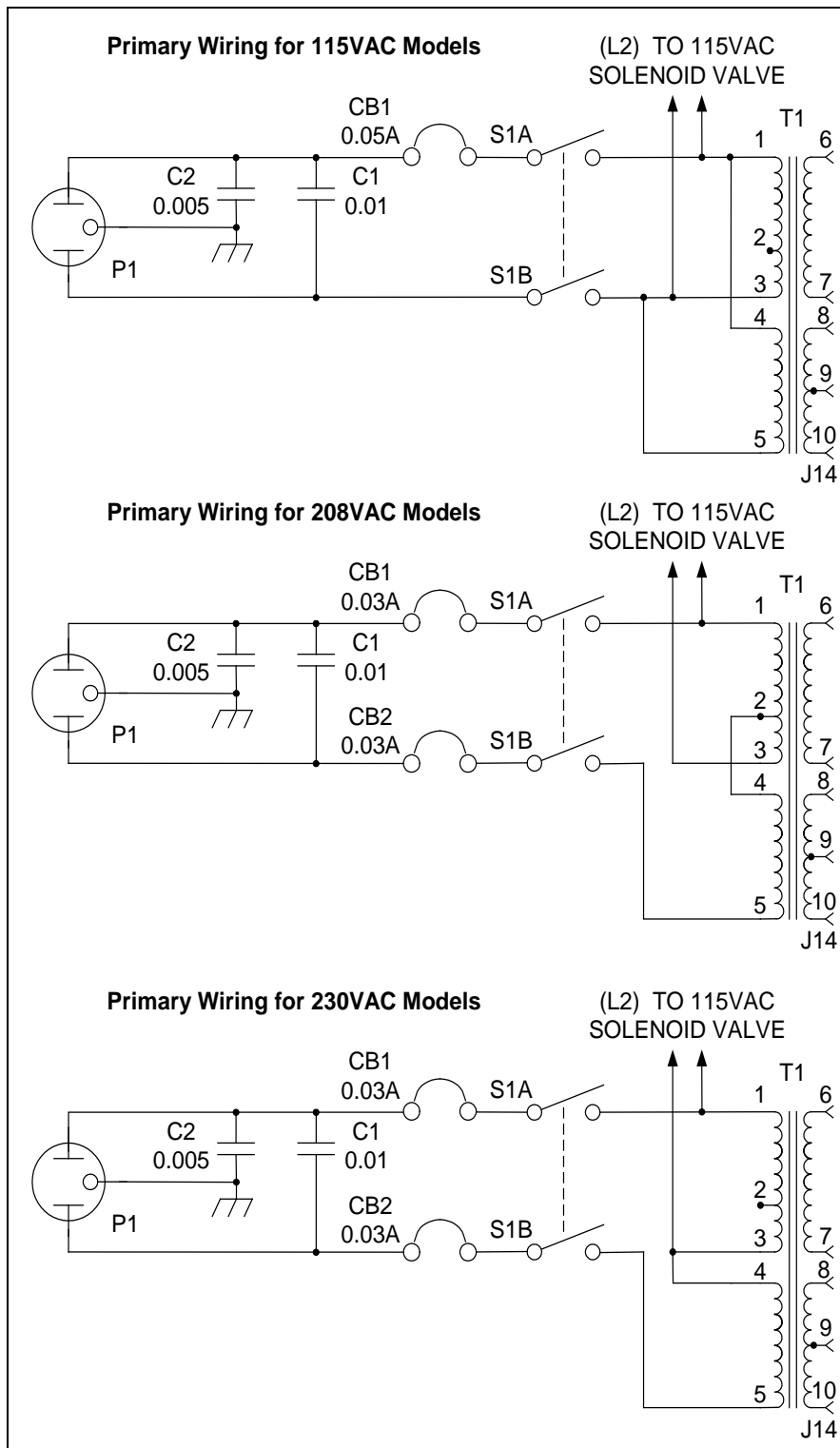


Figure 2-1. Power Supply Connections

Section II. Thermocouple Wire Preparation

Insulation Stripping

The jacket insulation and the insulation covering both thermocouple wires must be stripped back a MINIMUM distance from the end of the wire where the weld is to take place. Proper removal of the insulation allows the bare thermocouple wires to protrude a minimum distance from the end of the Handpiece Wire Clamping Jaws. Mechanical strippers with oval shaped cutters work best. Do not use Thermal Strippers with Teflon Coated Wires. Thermal stripping Teflon leaves a thin Teflon coating on the wires, preventing weld current from flowing. When properly stripped, the bare thermocouple wires will be of equal length, parallel, and free of insulation residue. The table below gives the minimum wire stripping length for each wire size.

Wire Size AWG	Stock No.	Model No.	ID No.	Strip Length Inches	Strip Length MM
38 – 32	10-293-01	TC-W100ACS38	1	0.200	5.08
31 – 27	10-294-01	TC-W100ACS31	2	0.200	5.08
26 – 23	10-295-01	TC-W100ACS26	3	0.200 - 0.220	5.08 – 5.59
22 – 20	10-296-01	TC-W100ACS22	4	0.200 - 0.220	5.08 – 5.59

The recommended tolerance on Strip Length is $-0/+0.010$ inches ($-0/+0.25$ mm). Any strip length greater than those shown above is acceptable.

The TC-W100A Handpiece can be used with non-insulated thermocouple wire. Non-insulated wire must protrude a MINIMUM of 0.135 inches (3.43 mm) from the closed Wire Clamp Jaws.

Handpiece – Wire Clamping Jaws Installation

Wire Clamp Jaw Removal and Insertion

Loosen the set screws that hold each Wire Clamp Jaw in place. Pull each jaw straight out of the Handpiece. See figure 2-2.

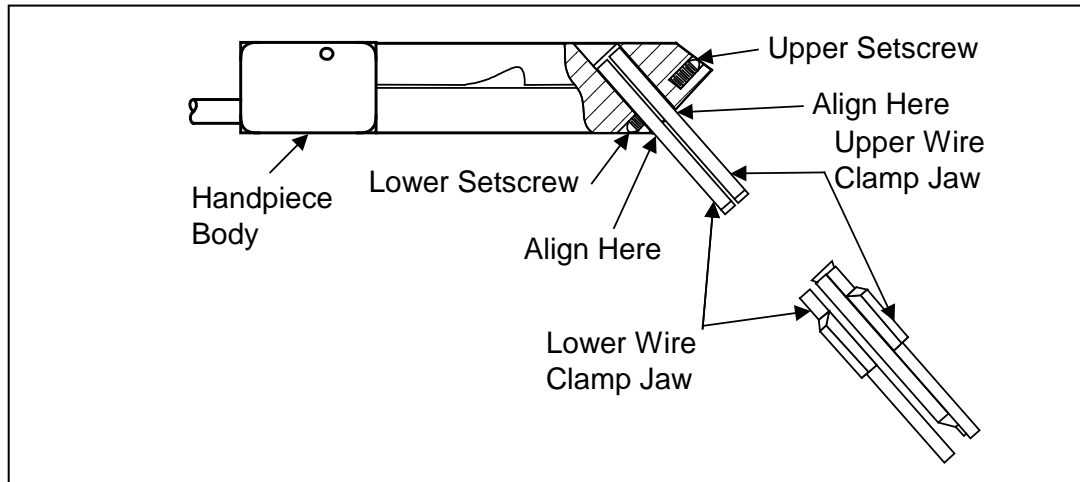


Figure 2-2. Wire Clamp Jaw Assembly

To replace the Upper Wire Clamp Assembly, open the Handpiece by sliding the black Loading Button back toward the square part of the Handpiece. Insert the Wire Clamp Jaw, CONTAINING THE GUIDE TUBE, into the upper half of the Handpiece. Line up the flat wedge shaped face on the Wire Clamp Jaw with the flat surface on the upper Handpiece face. Tighten the set screw.

To replace the Lower Wire Clamp Assembly, insert the remaining Wire Clamp Jaw into the lower half of the Handpiece. Line up the flat wedge shaped face on the Wire Clamp Jaw with the flat surface on the upper Handpiece face. Tighten the set screw. Close the Handpiece by sliding the black Loading Button forward. Both halves should be flush at the tip when the tip is closed.

Do not mix Wire Clamp sets. The identification code on the upper Wire Clamp Jaw must match the identification code on the lower Wire Clamp Jaw.

CHAPTER 3

OPERATING INSTRUCTIONS

Section I. Operation

- Turn ON the purge gas supply. Set the Pressure Regulator to 50 PSIG. Set the Flow Regulator for 3 cubic feet per hour.
- Switch the POWER SWITCH to “ON”. Purge gas from the reservoir will immediately fill the Weld Chamber, making the TC-W100A ready to use. When replacing the purge gas tank or if the purge gas line has been opened, wait 5 minutes for the purge gas to replace the air in the purge gas line, reservoir, and Weld Chamber. See Chapter 2.
- Set the WIRE GAUGE SELECTOR to the desired wire gauge size. The WELD READY lamp may flicker and go OFF instead of staying ON when the WIRE GAUGE SELECTOR is turned COUNTERCLOCKWISE. The first weld may be safely made and the READY LAMP will turn ON for subsequent welds.
- Grasp the Handpiece in either hand. Slide the black Loading Button back toward the square part of the Handpiece. Using the opposite hand, insert the stripped end of the thermocouple wire into the large open end on the back of the Upper Wire Clamp Jaw. Feed the wire into the large open end on the back of the Upper Wire Clamp Jaw. Feed the wire into the tube until it stops. If the insulated wire slides through the tube without stopping, clamp the BARE wire so that it protrudes a minimum of 0.135 inches (3.43 mm) from the end of the Wire Clamp Jaw. See figure 3-1.

Clamp the thermocouple wires together by closing the Handpiece.

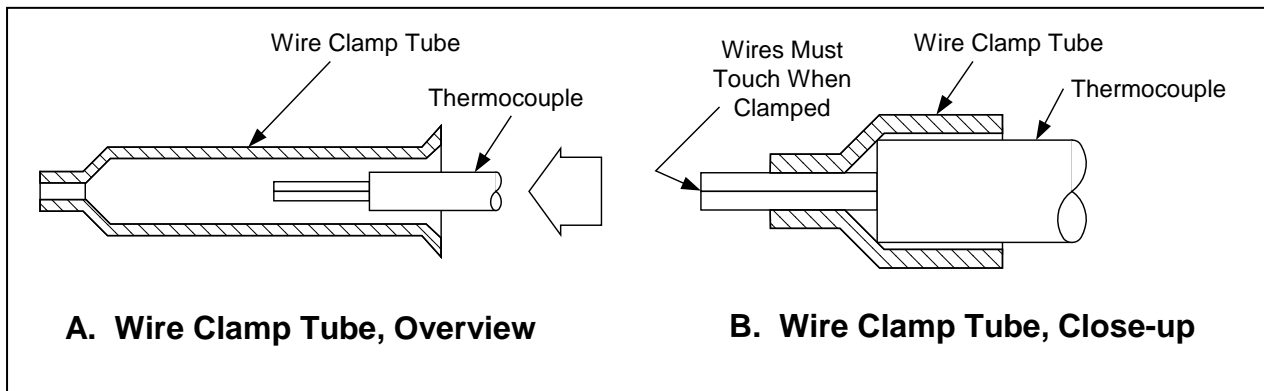


Figure 3-1. Thermocouple wire insertion procedure.

CHAPTER 3: OPERATING INSTRUCTIONS

NOTE: It may be more comfortable to feed the thermocouple wire into the Handpiece with your dominant hand, while using the other hand to hold and operate the Handpiece. The black Loading Button can be placed on either side of the Handpiece to accommodate left or right hand operation. See Chapter 4.

- Verify that the WELD READY lamp is on and then gently slide the closed Wire Clamp Jaws into the Weld Chamber. When the ends of the thermocouple wires touch the Arc Button, located inside the Weld Chamber, a solenoid lightly clamps the Wire Clamp Jaws and then automatically fires the power supply. Remove the Handpiece after the “thump” sound has occurred, which indicates that the TC-W100A has fired.
- Open the Wire Clamp Jaws and remove the welded thermocouple wire. The weld bead should appear round and without oxidation. It should not be necessary to change the wire gauge setting more than 2 or 3 wire sizes. Adjust the WIRE GAUGE SELECTOR to produce the desired weld bead. Turning the Control CLOCKWISE will INCREASE the size of the weld bead.

NOTE: If the weld bead is too large, it cannot be pulled back through the Wire Clamp guide tube. See Chapter 5, Section II, Troubleshooting.

CHAPTER 4

USER MAINTENANCE

Section I. Handpiece Maintenance

Wire Clamp Jaws

With use, the Upper Wire Clamp Jaw will accumulate wire insulation and metal particles inside the Guide Tube. The buildup rate depends on the number of thermocouple welds made, the thermocouple insulation material, and the thermocouple wire material. The larger size wires will accumulate particles at a faster rate. To clean both Wire Clamps, remove them from the Handpiece and place them in an ultrasonic cleaner. Add a cleaning solvent such as the Cole-Parmer Micro-90 Cleaning Solution.

WARNING: Do not use a wire to clean the upper Wire Clamp guide tube. Doing so may cause internal damage to the guide tube.

Handpiece Cable Replacement

The Handpiece Cable is very flexible and should last many years with careful use. Should the insulation become cracked at either the Handpiece or Power Supply front attachments, return the unit to AMADA WELD TECH. See *Chapter 5, Section III, Repair Service*.

Section II. Weld Chamber Maintenance

Over time, the thermocouple weld bead will become dirty in appearance, signaling an undesirable buildup of thermocouple weld material on the Arc Button located inside of the Weld Chamber. If the Arc Button is not periodically resurfaced, the weld quality will deteriorate to where a weld cannot be made.

The buildup rate depends on the number of thermocouple welds made, the thermocouple wire material, and the thermocouple wire diameter. Buildup occurs faster with large gauge wires such as 20-22 AWG and usually appears as a bright metallic deposit on the face of the Arc Button.

Should this occur, return the unit to AMADA WELD TECH. See *Chapter 5, Section III, Repair Service*.

CHAPTER 5 SERVICE

Section I: Calibration

The Model TC-W100A does not require calibration. Component tolerances and stability are such that the Capacitor Bank Voltage will not vary from Power Supply to Power Supply by more than 4% for the same WIRE GAUGE SELECTOR setting.

Section II. Troubleshooting

Thermocouple Weld is Dirty or Inconsistent

Return the unit to AMADA WELD TECH. See *Section III, Repair Service*.

Poor Welds or Failure to Weld

- a Improper wire gauge selection.
- b Wrong Wire Clamp Jaws for the thermocouple wire size.
- c Poor electrical contact to thermocouple wires.
- d Heavy oxide or corrosion on the thermocouple wires. Check gas flow. Keep thermocouple in Weld Chamber for one second before removing.

NOTE: A dark residue is normal with type J thermocouples.

- e Thermocouple wires are different lengths.
- f Thermocouple wires are not touching each other at the tip.
- g Handpiece is forced past the clamping position during welding.

No Output

Bad Control Board Assembly, Weld Capacitor, or Arc Button or Wire Clamp Solenoid malfunction. AMADA WELD TECH strongly recommends that the Power Supply be returned to the factory for service. See Section III, Repair Service.

Thermocouple Stuck in Wire Clamp Tube

If the weld bead is larger than the inside of the Wire Clamp Tube, the thermocouple wire cannot be removed without first cutting off the weld bead using a flush cutting wire cutter or a sharp knife. Avoid cutting or nicking the Wire Clamp Tube.

Section III. Repair Service

Technical Assistance

If you need further technical assistance, please contact either your authorized service agent or AMADA WELD TECH at the postal or e-mail address or telephone or FAX number shown in the Foreword of this manual. Before calling please obtain the model number, stock number, and the serial number from the nameplate on the product.

Telephone Service

Call the AMADA WELD TECH Repair Department at the telephone number shown in the Foreword of this manual. Before calling, please obtain the model number and serial number from the identification plate on the rear panel.

Factory Service Repair

We provide a repair service for both warranty and non-warranty repairs. Call our Customer Service Department at the telephone number shown in the Foreword of this manual for a Return Material Authorization number. All equipment to be returned to us for repair must be shipped prepaid.

Please include information concerning the type of problem you are experiencing. Include with the shipping information the name and telephone number of the person whom we should call with the estimated cost of repairs.

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