

AUTOMATIC GAS PURIFICATION SYSTEM

GP-500A-P-DUAL

USER MANUAL



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Revision Record

Rev	ECO	Date	Basis of Revision
A	46212	02/21	Initial Release (reference 107-00063-000)
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Table of Contents

REVISION HISTORY	2
TABLE OF CONTENTS	3
FOREWORD	4
LIMITED WARRANTY	5
INTRODUCTION.....	10
THEORY OF OPERATION	10
SERVICE REQUIREMENTS	11
INSTALLATION	12
GAS DRYER CONTROLS & OPERATION	13
INITIAL SET-UP	13
SYSTEM START-UP	13
CONFIGURE DATE AND TIME	13
SYSTEM OPERATION	14
PURGING	15
CIRCULATION	16
CHECKING THE LAST CYCLE TIME AND DATE	16
SYSTEM ERRORS	17
TECHNICIAN GUIDE: INITIAL SET-UP OF CONTROL SYSTEM	18
INSTALLING DEVELOPMENT SOFTWARE	18
PLC SETUP	18
TOUCHSCREEN SETUP	19
ALTERING SYSTEM BEHAVIOR	20

FOREWORD

The purpose of this manual is to supply operating, maintenance and service personnel with the information needed to operate the GP-500A Plus Automatic Gas Purification System.

Should questions arise, or if you have suggestions for improving this manual, please contact:

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Monrovia, CA 91016
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NOTICE

AMADA WELD TECH may be released from all warranty obligations if repairs or modifications are made by persons other than its own service personnel, or its authorized representatives, unless such repairs or modifications are specifically authorized in writing by AMADA WELD TECH INC.



Disposal

Properly handle and dispose of used materials.
For the disposal of electronic waste please contact AMADA WELD TECH.

This manual covers the following models:

Original Model Name	Original P/N		Current Model Name	Current P/N
BMI-500 DUAL AUTO DRYER	BMI-500-P-DUAL	→	GP-500A-P-DUAL	GP-500A-P-DUAL

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 Acknowledgment, 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 Acknowledgment, 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.

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.

(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.

(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 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).

Introduction

The **GP-500A-Plus Inert Gas Purification System** is a self-contained unit, designed to recirculate the atmosphere in a controlled atmosphere enclosure to remove moisture and oxygen. The system is designed to be used with AMADA WELD TECH Gloveboxes but may be sold as a stand-alone system and incorporated in the enclosures of different manufacturers.

This manual is intended to familiarize the operator with the principles of the operation of the **GP-500A-Plus Inert Gas Purification System**.



CAUTION!

There are no user serviceable parts inside this unit.



WARNING!

Columns contain suspect cancer hazard. Items are to be serviced by AMADA WELD TECH personnel only.


Theory of Operation

The **GP-500A-Plus Inert Gas Purification System** contains two (2) columns; 10" diameter x 19" height. Each column is packed with molecular sieve and Q-5 oxygen reducing material. The molecular sieve material removes moisture by absorption, while the Q-5 oxygen reducing material removes oxygen as a getter. A sealed rotary in-line blower (pump) is used to recirculate the gas. While one column is "on stream" (column CIRCULATION GAS EXHAUST and INLET valves open), the second column is on "standby", or undergoing "regeneration" (column CIRCULATION GAS EXHAUST and INLET valves closed). Automatic valves are used to divert gas through either column.

The **GP-500A-Plus Inert Gas Purification System** is designed to remove both oxygen and moisture from inert gases at a flow rate of 30 CFM and is capable of continuous operation at room temperatures less than 86°F (30°C).

The columns are automatically regenerated by heating of the columns and then purging with a forming gas containing no greater than 5% hydrogen and 95% inert gas by volume. Although the molecular sieve is a rugged material and Q-5 oxygen reducing material is suitable for use with many common contaminants, it is advisable to check with AMADA WELD TECH factory personnel prior to using this purifier for removal of moisture and oxygen from contaminated gas streams.

Service Requirements

Power	Single-Phase, 208 – 240 VAC, 20 A, 50/60 Hz
Regeneration Forming Gas	5% Hydrogen / 95% Nitrogen (at least 270 cu ft. / regeneration) 3/8" polyflow tube. CAUTION: A Hydrogen concentration > 5% will cause damage to the System.
Regeneration Purge Gas	100% Nitrogen or Argon (at least 15 cu ft / regeneration), 3/8" polyflow tube
Cooling Water	<p>12°C - 30°C at a minimum flow rate of 1/2 GPM (1.9 LPM) 3/8" polyflow tube. The installation area should be free of sudden temperature fluctuations and the humidity should be ≤ 85% (non-condensing).</p> <p>CAUTION:  Verify that the cooling water lines do not condense with moisture. If necessary, increase the external cooling water temperature to raise the dew point and prevent condensation.</p>

Installation

Please refer to the Pneumatic Schematic for the internal piping:

105-00299-000 – GP-500A-Plus Automatic Dual Column Gas Purifier Pneumatic Schematic

Please refer to the Electrical Schematic for the electrical connections:

105-00300-000 – GP-500A-Plus Automatic Dual Column Gas Purifier Electrical Schematic

The **GP-500A-Plus Inert Gas Purification System** circulation inlet and outlet are connected to the enclosure with fixed tubing.

The 30 CFM blower used in the **GP-500A-Plus Inert Gas Purification System** is a self-contained, regenerative type unit with a limited "head". The motor is internal to the blower and requires a minimum flow of 20 CFM in order to ensure adequate cooling of the blower motor.

The blower performance ranges from 20 CFM at 50" water to 30 CFM at 41" water. With this performance limitation, careful consideration must be given to pipe size, restrictions, unnecessary bends, filters, etc., that may reduce the flow rate and cause subsequent over-temperature operation of the blower which will lead to premature failure.

In order to remove any heat input to the system from the blower, a water cooled heat exchanger is included. The water inlet is a 3/8" tube connection with the water inlet located at the rear panel of the unit. The heat exchanger is capable of removing heat to within a few degrees of ambient temperature.

The ability of molecular sieve to remove water is directly related to temperature. At low PPM level, the water load capacity of the sieve is considerably affected by a rise in temperature above normal ambient conditions. Therefore, it is necessary to maintain a water temperature entering the heat exchanger within 53.6°F – 86.0°F (12°C – 30°C) at a minimum flow rate of 1/2 GPM (1.9 LPM).

The plumbing connections should be checked for possible leaks prior to use of the system. Checks should be performed using a pressure versus time check, or by pressurizing the system with helium and using a mass spectrometer to detect any leaks. There should be no evidence of leaks. **DO NOT** use Freon leak detectors. Freon reacts with the column packing and greatly reduces the oxygen gathering qualities.

Gas Dryer Controls & Operation

1. Initial Set-up:

Before the GP-500A-Plus can begin operation the enclosure must have a humidity level of $-25 \text{ dp}^\circ\text{C}$ or drier and following must be properly connected:

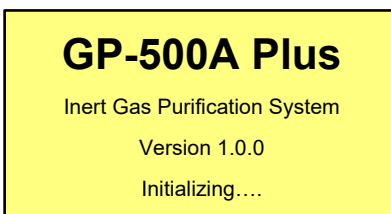
- Electrical Power
- Circulation Inlet and Exhaust
- Forming Gas
- Nitrogen Gas
- Purge Gas Exhaust
- Water Coolant

Note: Purging of columns can be executed without water coolant flowing. Circulation requires flowing water coolant.

Warning: Frequent exposure of the GP-500A-Plus to moisture saturated environment wetter than $-25\text{dp}^\circ\text{C}$ may cause permanent damage to the filter media

2. System Start-Up:

Once all external connections are made, switch the main power switch into the ON position to begin initialization of the system. The GP-500A-P's touchscreen interface will illuminate and display the Initialization Screen (Figure 1).

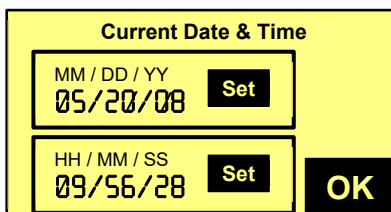


(Figure 1: Initialization Screen)

While the Initialization Screen is displayed, the GP-500A-P will ensure that all circulation valves are closed. If a circulation valve is detected in the open position, a Valve Error will occur (Please refer to System Errors for more details). The Initialization Screen will display for 10 seconds.

3. Configure Date and Time:

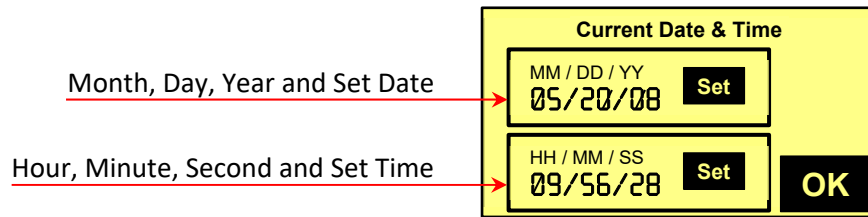
If no error is detected during initialization, the Date and Time Adjustment Screen (Figure 2) will display.



(Figure 2: Date and Time Adjustment Screen)

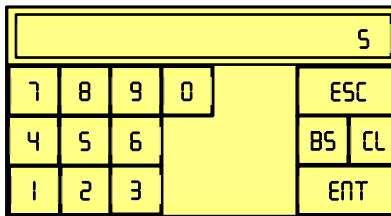
The GP-500A-P will automatically log the last time each column has been Purged and Circulated. To ensure the logged date and times are correct, the correct date and time must be entered at the Date and Time Adjustment Screen.

To adjust the date and time, press the onscreen button for each item that needs adjustment. Figure 3 shows the locations of the Date and Time Adjustment Screen onscreen buttons.



(Figure 3: Date and Time Adjustment Onscreen Buttons)

When the Month, Day, Year, Hour, Minute, or Second onscreen buttons are pressed, the Number Input Screen (Figure 4) will display.



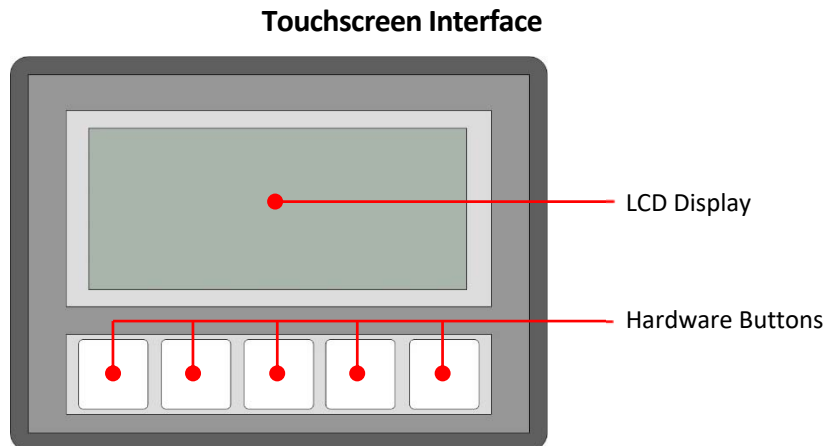
(Figure 4: Number Input Screen)

The Number Input Screen contains a number pad, ESC (escape) button, BS (backspace) button, CL (clear) button, ENT (enter) button, and input display. Pressing ESC will return you to the previous screen without making any changes. Pressing ENT will return you to the previous screen replacing the old value with the new value that was entered. CL clears the entire input display while BS removes one character at a time.

Once the correct time and date have been entered, the respective Set buttons must be pressed to apply the new date or time. Press OK to proceed.

4. System Operation:

After Initialization and Date and Time Adjustment, the system will be ready for operation. Column Purge and Circulation can be controlled using the hardware buttons below the LCD display on the touchscreen control unit (Figure 5). When depressing a hardware button, press and hold the button for 0.5 seconds or longer to successfully command the system.



(Figure 5: LCD Display and Hardware Button Locations)

The touchscreen display is graphically divided in half (Figure 6). The top section shows the temperature in Celsius and the status of Column 1. The bottom section shows the same for Column 2. Any errors will display in the status field of the affected column.

Column 1	22.3C
- Standby -	
Column 2	22.2C
- Standby -	

(Figure 6: System Status Screen after Startup)

Purging

Note: A full purge cycle should be performed on each column after extended periods of use. The duration of a purge cycle is approximately 6 hours.

Note: Purging can only be executed on one column at time. To purge both columns of the BMI-500 Plus, begin purging one column and, upon completion, begin purging the other column.

To begin a purge cycle, no other column must be currently purging. If the column that is to be purged is circulating, stop circulation (see CIRCULATION) prior to starting a purge cycle. The purge cycle is initiated by pressing the C1 Purge or C2 Purge buttons.

A purge cycle consists of three stages: warm-up (Duration: 3 hours), purge (Duration: 3 hours), and nitrogen flush (Duration: 5 minutes). If an error is generated when starting or executing the purge cycle, the user will be notified visually through the touchscreen interface (Please refer to System Errors for more details).

While a purge cycle is executing, the touchscreen display will resemble Figure 7 below. The status field of the purging column contains the status "Regen" in addition to the accumulated minutes throughout the purging cycle. When the minute counter reaches 365 minutes the purging cycle will complete.

Column 1	22.3C
005 Mins - Regen -	
Column 2	22.2C
- Standby -	

(Figure 7: Purging Column 1)

To abort purging prematurely, press the Purge button for the column that is currently purging. Be aware that if purging is aborted mid-cycle the purging cycle will begin at zero minutes on the minute counter when purging is resumed at a later point and will run for the entire 365 minutes.

Note: Circulation can be performed with one column while the other is purging.

Note: During the Purging stage of the Purge cycle, if gas ceases to flow, the touchscreen display will graphically alert the user with the "Gas is not Flowing" status message.

Circulation

Note: Only one column may circulate at any given time.

Note: A column cannot purge and circulate at the same time. An error will be displayed if the user attempts to do so.

Note: A column in standby can begin and end circulating while the other column is in standby or purging.

To begin circulation, press either the C1 Circ (Column 1 Circulation) or C2 Circ (Column 2 Circulation). Before circulation can commence, the GP-500A-P will perform a series of system checks (Duration: 15 seconds). If any of the checks fail, the user will be notified with an error message on the touchscreen LCD display. Water coolant must be flowing before a column can begin circulating. Figure 8 shows the touchscreen display while circulating.

Column 1	22.3C
- Circulating -	
Column 2	22.2C
- Standby -	

(Figure 8: Circulating Column 1)

To end circulation, press the circulation button of the column currently circulating. To switch circulating columns, press the circulation button of the other column.

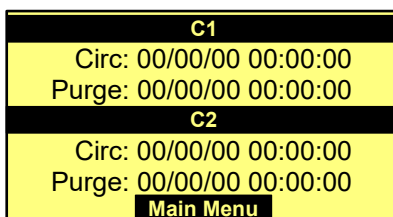
Note: A column must be cooled to begin circulation. A column is cooled when its temperature falls below 50 degrees Celsius (Figure 9).

Column 1	156.7C
- Cooldown -	
Column 2	22.2C
- Standby -	

(Figure 9: Column 1 is Cooling)

Checking the Last Cycle Time and Date

At any time while the system is in operation, the Last Cycle hardware button can be pressed on the touchscreen interface to view the dates and times of when both columns have been last circulated or purged (Figure 10). The circulation entry is updated when circulation begins on a column. The purge entry is updated upon successful completion of a purge cycle. Press the onscreen Main Menu button exit the Last Cycle screen.



(Figure 10: Last Cycle Screen)

5. System Errors:

The GP-500A-P will monitor sensors throughout operation to detect errors. When an error is detected, the user will be notified graphically through the touchscreen interface's LCD Display. Table 1 contains a list of possible system errors, their causes, and common actions to remedy them. Most errors will display temporarily: either for as long as the error condition exists or for a short time interval. Errors that require system service will be display indefinitely or until the system is power-cycled.

Table 1

Error	Common Causes	Remedy
C1 is Purging	Column 1 is purging and the user has attempted to begin circulating Column 1 or purging Column 2.	Abort or complete purging
C2 is Purging	Column 2 is purging and the user has attempted to begin Circulating Column 2 or Purging Column 1.	
C1 is Cooling	Column 1 temperature >50 degrees Celsius and the user has attempted to begin Circulating Column 1.	Allow column to cool before circulating
C2 is Cooling	Column 2 temperature >50 degrees Celsius and the user has attempted to begin Circulating Column 2.	
C1 Valve Error	Column 1 circulation valves are stuck, either open or closed.	Service system
C2 Valve Error	Column 2 circulation valves are stuck, either open or closed.	
Please Stop C1 Circulation	Column 1 is currently circulating and the user has attempted to begin Purging Column 1.	End circulation before purging
Please Stop C2 Circulation	Column 2 is currently circulating and the user has attempted to begin Purging Column 2.	
Water Not Flowing	Water coolant flow is not detected while Circulating or attempting to begin Circulation.	Check water supply
Gas is Not Flowing	Forming gas flow is not detected while Purging.	Check gas supply
C1 Heater Error	180 minutes into the Purging Cycle and Column 1 temperature has not reached 200°C.	Service system
C2 Heater Error	180 minutes into the Purging Cycle and Column 2 temperature has not reached 200°C.	

Technician Guide: Initial set-up of Control System

1. Installing Development Software

Software used to setup the Koyo DirectLOGIC06 (Automation Direct #D0-06DD2) PLC and C-More Touchscreen (Automation Direct #EA1-S3ML) are as follows:

- DirectSOFT V4.0 Build 25
- C-more micro Programming Software V1.20.7.40

When installing the development software on the PC Host, choose the default settings when possible. Choose to install the USB Driver for the USB-to-Serial Programming Adapter when prompted during the C-more micro Programming Software installation.

2. PLC Set-up

DirectLOGIC06 PLC setup requires the following:

- PLC connected to power supply and turned on (PWR led on PLC will illuminate when power is supplied to PLC indicating PLC is on)
- Thermocouple interface card (Automation Direct #F0-04THM) is installed in slot 1 of PLC
- Programming cable (Automation Direct #D2-DSCBL) is connected to Port 1 of PLC and serial COM Port on the PC Host
- PLC is switched to the TERM setting on the RUN/TERM/STOP switch
- DirectSOFT is properly installed on Host PC
- DirectSOFT Project file "plc.PRJ" of the latest available revision accessible from Host PC

To program a new or used PLC, perform the following:

1. Launch the DSLaunch4 Application
2. If the DirectLOGIC06 PLC comm link has not been previously created on the Host PC...
 - a. Right-Click on "Comm Links" and select "Add Link"
 - b. Select the COM port being used to program the PLC and click Next
 - c. Select "DL 0/1/2/4/350 Family" and click Next
 - d. Select "K Sequence" and Address 1 and click Next
 - e. Enter a unique Link Name such as "DL06" and click Finish
3. Right-Click on the newly created Comm Link and select "Run"
4. If the DirectLOGIC06 PLC already contains a ladder logic program which needs to be cleared from memory...
 - a. Select "PLC" from the menu bar and then "Clear PLC memory"
 - b. Check the "ALL" checkbox and click OK
 - c. If prompted to switch to program mode, do so
5. Select "File" from the menu bar and then "Open Project"

6. Locate the plc.PRJ project file and click Open
7. If prompted, select "Use Disk"
8. If "Set PID table address" window does not pop up, select "View" from the menu bar and then "PID View"
9. Input V2000 into Table Start Address and 1 into Number of Loops, click Update and Exit
10. On the "Setup PID" window that appears, click Close
11. Select "File" from the menu bar and then "Write Program" then "to PLC"

The PLC should now be ready for operation. Switch to the RUN setting on the RUN/TERM/STOP switch and disconnect the programming cable from Port 1. Once the touchscreen has been setup, the touchscreen data cable will be connected to Port 1.

3. Touchscreen Set-up

C-More Touchscreen setup requires the following:

- USB cable with A-type end connected to Host PC and B-type end connected to USB-to-Serial Programming Adapter.
- RS-232C cable with RJ12 connectors on both ends with one end connected to USB-to-Serial Programming Adapter and the other end connected to the C-More Touchscreen.
- C-More micro Programming Software is properly installed on Host PC.
- HMI Touchscreen file "Display(VerX.X.X.X).MGP" of the latest available revision accessible from Host PC.

To program a new or used Touchscreen, perform the following:

1. Launch the C-More micro Programming Software Application.
2. Close "Step 1" window then select "File" from the menu bar then "Open Project"
3. Locate the "Display.MGP" file and click Open
4. Select "No" when prompted to make copy of the original project
5. Select "File" from the menu bar then "Project Transfer"
6. If a compiler warning results, click Continue in the dialog box to proceed
7. In the "Step 3" dialog box select the COM port of the USB-to-Serial Programming Adapter. If this is unknown...
 - a. Click the Device Manager button
 - b. Expand the "Ports (COM & LPT)" subtree
 - c. Use the COM port listed for the "Koyo (or Prolific) USB-to-Serial Comm Port"
8. On the C-More touchscreen, press and hold the F1 and F5 hardware buttons at the same time for 3 seconds to activate the Setup Screen.
9. In the "Step 3" dialog box, click Transfer

The project should now transfer to the touchscreen. After the transfer is complete, the RS232C cable can be disconnected from the USB-to-Serial Programming Adapter and connected to Port 1 of the DirectLOGIC06 PLC.

4. Altering System Behavior

This section will describe how to make simple changes to the system behavior by manipulating values loaded into the DirectLOGIC06 PLC.

1. Connect the PLC to the Host PC as detailed in the PLC SETUP section of this manual and perform steps 1 & 2.
2. If the latest release of the D000248 project file is not listed in the 'Projects' listing in DSLaunch, right-click on 'Projects' and Browse for the project file.
3. With the project open in DirectSOFT32, select 'View' in the menu bar and click Ladder View. The screen should resemble Figure 1.

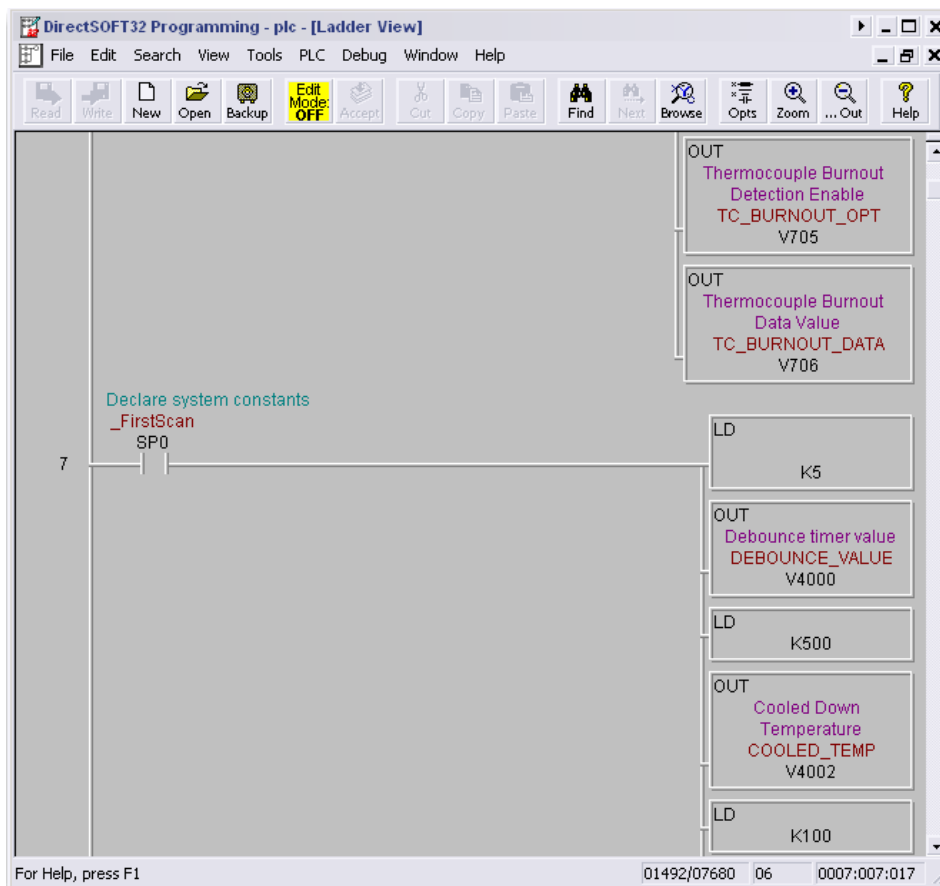


Figure 1: Ladder View

In Figure 1, the beginning rung 7 is shown. This rung contains system constants that are initialized upon system startup. To initialize a constant, a value is loaded into the PLC's accumulator with the 'LD' command and then it is written out to the variable's memory location using the 'OUT' command. Constant numerical values are preceded by a 'K'. The system constants are as follows:

- **Debounce Timer Value**

Length of time (in 10ths of a second) the user must depress a hardware button on the touchscreen before it registers in the control software as an intentional button press (Memory location: V4000, Default: 500 milliseconds).

- **Cooled Down Temperature**
Temperature (in 10ths of a degree Celsius) that controls the threshold between cooled and not cooled for both columns (Memory location: V4002, Default: 50°C).
- **Valve Delay Timer**
Length of time (in 10ths of a second) the system will delay after commanding the circulation valves to be closed or opened before checking the valves for doing so (Memory location: V4004, Default: 10 seconds).
- **Blower Delay**
Length of time (in 10ths of a second) the system will delay after commanding the blower to start or stop (Memory location: V4006, Default: 5 seconds).
- **Heater Setpoint**
Temperature (in 10ths of a degree Celsius) that the heater PID control will target during the Purge Cycle (Memory location: V4010, Default: 200°C)
- **Heater Low Temperature**
Lower temperature threshold (in 10ths of a degree Celsius) that the system will use to determine if there is a heater malfunction upon the completion of the Heater Timeout period of the Purge Cycle (Memory location: V4012, Default: 195°C)
- **Heater High Temperature**
Upper temperature threshold (in 10ths of a degree Celsius) that the system will use to determine if there is a heater malfunction upon the completion of the Heater Timeout period of the Purge Cycle (Memory location: V4014, Default: 205°C)
- **Heater Timeout**
Upper limit of minutes into the Purge Cycle that the system will wait until it checks for heater malfunctions (Memory location: V4016, Default: 180 minutes)
- **Warmup Time**
Upper limit of minutes into the Purge Cycle that the system will perform warmup functions (Memory location: V4020, Default: 180 minutes)
- **Forming Time**
Upper limit of minutes into the Purge Cycle that the system will perform forming functions (Memory location: V4022, Default: 360 minutes)
- **Nitrogen Time**
Upper limit of minutes into the Purge Cycle that the system will perform nitrogen functions (Memory location: V4024, Default: 365 minutes)

- **Deciseconds per Minute**
Length of time (in 10ths of a second) the system will wait before incrementing the minute counter (Memory location: V4040, Default: 59.9 seconds)
- **Error Display Time**
Length of time (in 10ths of a second) the system will display non-fatal errors (Memory location: V4050, Default: 10 seconds)
- **PID Turn on Temp**
Temperature threshold (in 10ths of a degree Celsius) which, when surpassed during the Warmup period in the Purge Cycle, will cause a transition between 100% duty cycle and the PID-controlled duty cycle (Memory location: V4052, Default: 175°C).
- **Warm Start Temperature**
Temperature threshold (in 10ths of a degree Celsius) which the system uses to determine if the system is performing a 'warm start' or a 'cold start' (Memory location: V4054, Default: 170°C).

To edit these values:

1. Click the 'Edit Mode' button in the DirectSOFT32 toolbar so that it reads 'Edit Mode: ON'.
2. Double click on the 'LD' command box of the constant to be edited
3. Enter the new value (remember: numerical values are preceded by a 'K')
4. Press enter
5. Repeat steps 2 through 4 for other values as desired
6. Once done editing values, click the 'Edit Mode' button
7. Click Yes to accept all edits
8. Make sure the RUN/TERM/STOP switch on the PLC is switched to TERM
9. Select 'File' from the menu bar, then 'Write', then 'to PLC'
10. Switch the RUN/TERM/STOP switch on the PLC to STOP, then RUN to restart the PLC control software
11. To save the new values as defaults, select 'File' from the menu bar, then 'Write', then 'to Disk'

End of Procedure

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