

Model: \mathbf{Pro} - $\mathbf{X}\mathbf{M}^{\mathsf{TM}}$



Part Number: 605-0100/A Thermoplastic Extrusion Welder

Operator's Manual

Revision: C

Scope of Manual: This manual contains procedures for safety, general unpacking, installation, setup and operation of your DEMTECH Services, Inc. Pro-XM[™].

DEMTECH Services, Inc. Ship to address: 6414 Capitol Avenue Diamond Springs, CA 95619 U.S.A.



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Safety Precautions

Safety precautions for operating personnel and equipment:

WARNING 1: Operating personnel should perform only the procedures described and recommended in this manual. Only qualified service personnel familiar with electrical shock hazards and mechanical entanglement hazards present inside the equipment should perform disassembly or corrective maintenance of the equipment.

WARNING 2: To avoid shock hazards, the equipment must be grounded with an adequate earth ground in accordance with local and national electrical codes.

WARNING 3: The locations of potentially dangerous voltages and other hazards are identified and labeled on the equipment. Be careful to observe these warnings when installing, operating, maintaining or servicing the equipment. Observe all warnings in this manual.

WARNING 4: Make sure to turn off the equipment power and remove the \sim (AC) line cord from the power outlet before attempting to service the equipment. Do not perform service unless you are qualified and trained to do so.

WARNING 5: This product is intended for operator attended operation only. This product should never be left unattended at any time while it is plugged in and the power is turned on. Incorrect use of the product such as overheating of the material can present a fire and explosion hazard, especially near combustible materials and explosive gases.

WARNING 6: This product is intended for operation in dry environments only. Higher humidity environments should be kept non-condensing by avoiding large temperature swings.

WARNING 7: Do not touch the main housing, air nozzle and output molten material when they are hot as they can cause burns. After use allow ample time for the product to tool cool down before handling and stowing. Do not point the hot air flow and the output molten material in the direction of personnel.

CAUTION 1: Observe the precautions given on the equipment and within this manual to prevent damage to the equipment.

CAUTION 2: Before connecting the equipment to its electrical source, check that the \sim (AC) voltage, frequency and current to be supplied to the equipment are correct and match the serial plate affixed to the welder.

CAUTION 3: Use proper handling and packaging procedures for Electro-Static Discharge (ESD) sensitive circuit boards. Assume that all circuit boards are sensitive to potential damage from ESD.

CAUTION 4: Unauthorized personnel should not remove from the equipment those panels that are provided for protection and/or require a tool to remove.



1. General Safety & Maintenance Information

The DEMTECH Services, Inc. Pro-XM[™] Thermoplastic Extrusion Welder, <u>hereinafter referred to</u> <u>as the Pro-XM or welder</u>, is a high temperature and voltage piece of equipment. Always disconnect the power source before performing any service and/or maintenance procedures on the welder. Never pull or carry the welder by the power cord or electrical connection. Always maintain slack in any extension cords connected to the welder while in operation to avoid damage to the power connections. Keep hands, fingers and other body parts well clear of the heating element and related mounting components at all times. Always use the Pro-XM in a well ventilated area when welding materials such as PVC which can produce toxic fumes. Do not inhale toxic fumes when present. Do not operate near flammable materials of any kind. Do not apply flammable materials, including liquids, to seam area. Allow welder to cool completely, at least 15 minutes, before returning to the shipping/storage case. Protect welder from exposure to rain or standing water. Never attempt to weld in standing water.

1.1. Intended Use

The Pro-XM is intended as professional use equipment and not intended for sale to the general public. The total input power of the Pro-XM is specified as greater than 1 kW although in lightly loaded conditions the actual power may be less than 1 kW.

The Pro-XM has been manufactured utilizing the latest technology and current safety standards and regulations. However, improper use or abuse may lead to hazardous conditions for the user or other personnel or cause damage to the welder.

Always keep this manual with the welder at or near the location where the Pro-XM is being used for quick and easy reference.



The technician assigned to operate this welder must have read through and become familiar with this manual, particularly all safety information, before using the Pro-XM.

No changes and/or modifications should be made to the Pro-XM especially as it relates to safety.

1.2. Maintenance

Maintenance, inspection and adjustment of the Pro-XM may only be carried out by qualified personnel. Before removing or installing spare parts or performing any other repair operations to the welder consult DEMTECH Services, Inc. or your authorized DEMTECH service center for advice on proper procedures. This will help insure a safe and successful outcome. Always make sure all screw connections are tight before attempting to operate the welder after maintenance and/or repair procedures have been performed. Make sure all covers, guards and other safety devices have been fully reinstalled before use.



2. General Product Data

The DEMTECH Services, Inc. Pro-XM Thermoplastic Extrusion Welder, <u>hereinafter referred to</u> as the Pro-XM or welder, dramatically speeds the welding of plastic sheet materials utilizing molten plastic. This function combined with its simple construction and easy to use controls makes performing welding tasks very efficient. With minimal setup the welder speeds up processing time while providing a very rugged and reliable welder. You can be assured the Pro-XM has been built using the highest quality materials available which include billet aluminum and ground and hardened steel. DEMTECH Services, Inc. strives to make our welders easy to use and built to last. Just like all other DEMTECH Services, Inc. products, even a first time user will be productive in minutes.

3. Operating Environment

The Pro-XM is intended to be operated within the following environmental conditions. Operating the welder in environments which are less than or greater than nominal can adversely affect performance.

Temperature+65 to +90°F; 74°F Nominal (+18 to +32°C; 23°C Nom)

Humidity (non-condensing)......0 to 90%; 45% Nominal

Elevation0 to 7,000 Ft; 2,000 Ft Nom (0 to 2,134 meters; 610 meters Nom)



4. Site Preparation

Before proceeding with the unpacking and installation instructions in the following section(s) make sure the work site is prepared and ready to use the Pro-XM. You should have an adequate power source capable of providing clean Alternating Current (AC) power at 220-240 Volts at the rated current. Refer to the welder serial plate affixed to the side of the motor support housing for the voltage and current requirements of your welder. The install area should be clean, dry and free of debris and provide adequate working area to allow efficient and effective use of the welder.

Follow the detailed unpacking and installation instructions carefully.

5. Unpacking & Installation Instructions

This section contains instructions for the unpacking, placement and installation of the Pro-XM. Carefully review the following information, sub-sections and each procedure before beginning unpacking and installation of the welder.

The Pro-XM comes complete in a sturdy, reusable portable shipping/storage case. The custom foam inserts protect the welder from damage during shipping and storage and should always be left inside the case at all times. When the welder is out of the case make sure to keep the lid closed to avoid dirt, dust, debris and/or water from getting inside. The welder must be removed from the case and placed onto the work site for use. When not in use the Pro-XM should always be stored in the shipping/storage case to protect it from the elements and potential damage.

Note: The welder illustrated in this manual shows ALL available features for the Pro-XM, therefore, your welder may vary slightly in appearance from that depicted.



5.1. Unpacking and Preparation

- a. Before opening the shipping/storage case for the first time and unpacking the welder, inspect the outside of the case thoroughly for any signs of mishandling or damage during shipping. Report any damage to the shipping carrier immediately and <u>do not proceed with unpacking</u>. You should consult your administration concerning claims for shipping damage. Please notify DEMTECH Services, Inc. or your authorized DEMTECH distributor where the product was purchased in the event of any shipping damage.
- b. Unlatch and open the shipping/storage case lid and inspect inside the case and equipment thoroughly for any signs of mishandling or damage during shipping. Report any damage to the shipping carrier immediately and <u>do not proceed with unpacking</u>. You should consult your administration concerning claims for shipping damage. Please notify DEMTECH Services, Inc. or your authorized DEMTECH distributor where the product was purchased in the event of any shipping damage.
- c. Make note of the orientation of the equipment and packing foam inserts inside the shipping case to facilitate any repackaging requirements in the future.
- d. To avoid injury and/or damage to the welder, be sure to use adequate care when lifting, removing or replacing the welder into the shipping/storage case.
- e. The welder must be removed from the shipping/storage case and placed in an appropriate location suitable for the welding you intend to perform.



5.2. Electrical Plug Connection

- a. The Pro-XM is supplied with a separable power cord which connects to the bottom side of the drill motor D-handle. Depending on the intended country of use the plug at the other end of the power cord will vary but in all cases must be rated for the voltage and current requirements of the welder. It is highly recommended to use a twist-lock or twist-to-connect type plug with a permanent ground connection. Refer to the welder serial plate affixed to the side of the motor support housing for the voltage and current requirements of the welder. Connect the power cord to the drill motor and then the plug to an appropriate electrical outlet supplying the proper ~(AC) power. In all cases connection should only be made to a circuit with a maximum 20A breaker rating.
- b. Verify basic operation of the Pro-XM before proceeding with the remainder of the installation. The welder main power is always on when connected to power. The preheater utilizes a rocker power switch on the rear of the welder (see Figure 5.1). Toggle the switch to "I" to turn ON the pre-heater fan. Toggle the switch to "O" to turn OFF the preheater fan.



Figure 5.1



- c. The blower motor should start and air should begin exiting the pre-heat nozzle. Use caution as the exhaust air can be very hot. This procedure verifies the Pro-XM is receiving suitable power and welder is functioning properly. If the welder pre-heater powers-up as described you are now ready to operate the welder. If the welder does not power-up as described please contact DEMTECH Services, Inc. or your authorized DEMTECH service center.
- d. The operating voltage requirement for the Pro-XM is 220-240 Volts AC only. This operating voltage range refers to the actual voltage as measured at the welder power cord input plug after any extension cords while operating the welder under load. The following procedure should only be performed by a qualified electrician. To measure the voltage under load connect the welder to any extension cord(s) used and the generator supplying power. Start the generator and turn the welder pre-heat power switch to the ON position. Wait for the barrel preheat sensor to trip to allow operation of the drill motor. Once enabled power the drill motor utilizing the trigger switch. Now separate the plug at the end of the welder power cord just enough to expose the prongs but without disconnecting the power. Using a digital volt meter measure the voltage under load between the prongs. The measured value must be between 220 and 240 Volts AC.



5.3. Electrical Extension Cords

The Pro-XM is capable of welding very long seams. This ability may warrant the use of electrical extension cords. It is imperative to take into account the length and wire gauge of any extension cord used as these factors will ultimately determine the actual operating voltage of the welder. Extension cords should be a minimum of 12 gauge and regardless of overall length should have a minimum number of plug connections. Table 1 lists extension cord gauge and length recommendations.

Conductor Sizo	$\frac{3-\text{Wire}}{10\text{ AWG}}$	$\frac{3-\text{Wire}}{12\text{ AWG}}$
Conductor Size	(5.3 mm^2)	(3.3 mm^2)
Longth	500 feet	250
Length	(152 meters)	(76 meters)

Table 1 Maximum recommended extension cord length.

5.4. Generator Recommendations

When operating the Pro-XM using house power from a building circuit use the appropriate plug and power cord configuration. When in-field generators are used they must be rated for a minimum of 5000 watts, however a rating of 6500 watts or more is highly recommended in order to obtain the best welder performance and temperature control. As a rule higher wattage generators provide better performance of the welder. Keep in mind the length and wire gauge of any extension cord being used combined with the capacity of the generator ultimately determines the operating voltage and therefore performance of the welder.



6. Welder Set-Up and Operation

The initial set-up of the Pro-XM is by far the most critical aspect for proper operation of the welder. Proper set-up not only leads to quality welding results but also minimizes wear and tear on the welder itself. Improper adjusting of the welder can result in excessive wear on critical components.

6.1. Set-Up Preparation

The procedures described in the following sections cover the initial set-up required for welding. Initial operations must be made while the welder is at room temperature.

Install the desired welding shoe onto the end of the welder and orient the shoe and pre-heat shield as necessary for the welding to be performed (refer to Section 6.6).

Adjust the grip handle to the best position for the welding to be performed (see Figure 6.1). Loosen the handle by gripping it and twisting counter-clockwise. This will loosen the handle clamp. Position the handle within its 180° swing and tighten the handle clamp by twisting the handle clockwise.





Figure 6.1

The welder contains a temperature interlock device that prevents operation of the drill motor before the welder has reached proper operating temperature. To prepare the welder for operation turn on the pre-heat rocker power switch and adjust the hot air temperature potentiometer to the desired setting. This setting will vary depending on the material to be welded and the ambient environment. Operating experience will dictate the proper setting. The nominal setting on the potentiometer is 5.5 to 6.0 depending on the material to be welded. This provides a operating temperature range of between 450 °F to 525 °F. (these are only approximate).



6.2. Start a weld

Once the welder has stabilized at the operating temperature insert the end of the welding rod into the feed port while simultaneously powering the drill motor (see Figure 6.2). Once the welding rod has been started it will continue to self-feed as you weld. The welder drill motor should only be operated when welding rod is being continuously fed into the welder and should never be run dry. Direct the pre-heat nozzle toward the area to be welded. Pre-warm the welding zone with back-and-forth movements of the welder tip. Position the welder on the prepared welding zone and operate the drill motor trigger switch.



Figure 6.2





6.3. During a Weld

Keep the welding rod being fed into the welder clean and dry. Foreign material such as dust, dirt, sand and water droplets introduced into the feed port can cause premature wear on the welder.

For long welds the Pro-XM drill motor has a locking pin which allows you to lock the drill motor trigger switch in the ON position.

Further adjustment of the pre-heater potentiometer may be required.

6.4. Stop a weld

To stop welding simply pull and release the drill motor trigger.

If there is going to be a short pause before the next weld clear the excess molten plastic from the tip of the shoe to prevent it from cooling and inadvertently blocking the welder output. If there is going to be a long pause before the next weld it is recommended that the welding rod be cut at the feed port and the plastic within the barrel run out the nozzle. This procedure should also be followed before shutting down the welder in preparation for cooling and stowage.

6.5. Checking the Output Temperature

The temperatures of the extruded material and pre-heat air stream should be verified at regular intervals while performing welds over an extended period of time. An appropriate high-speed electronic temperature meter with matching temperature probes must be used when performing these measurements. To measure the extruded material temperature place the probe up into the nozzle opening at the center of the output stream. To measure the pre-heat air stream temperature place the probe up into the slot on the top of the shoe underneath the shield at the center of the output stream (see Figure 6.3).





Figure 6.3



6.6. Changing the Welding Shoe

Make sure to turn off the welder pre-heat toggle switch and remove the \sim (AC) line cord from the power outlet before attempting to service the equipment. Do not perform service unless you are qualified and trained to do so.

a. Using a 5mm hex wrench remove the two part number 605-018, Screws, from the Teflon Shoe Assembly. The Teflon Show Assembly may be one of the following: 605-TS-XG/B/A, 605-TS-XG/60/A or 605-TS-XG/ 1/2 /A (see Figure 6.4 and 6.5).



Figure 6.4



b. Remove the Mount from part number 605-017, Nozzle. Due to melted plastic material build-up, removal may require strong twisting from side-to-side and significant pulling force to remove (see Figure 6.5).



Figure 6.5

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- c. Clean any residual melted plastic material from the Teflon Shoe Assembly and Nozzle to facilitate and ease installation of the new Shoe.
- d. Install the new Teflon Shoe Assembly in the reverse order.
- 7. Factory Servicing

In the event your Pro-XM should require factory service, the entire welder needs to be returned to the factory. Refer to the following step for preparing the Pro-XM for return.

Carefully pack the Pro-XM in the reusable portable shipping/storage case provided with the welder for return to DEMTECH Services, Inc.'s factory for service. Unless previous arrangements are made shipping charges and insurance are the customer's responsibility. Ship the Pro-XM to DEMTECH Services, Inc. at:

DemTech Services, Inc Ship to address: 6414 Capitol Avenue Diamond Springs, CA 95619 U.S.A.

8. Welder Wiring Diagram

Refer to Diagram 8.1 for the Pro-XM Welder Wiring Interconnect Diagram.





Diagram 8.1

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9. Service/Spare Parts ID

Refer to the diagram and related parts lists on the following pages to identify service/spare parts for the Pro-XM. To locate a part find it visually on the exploded assembly diagram and note its item number. The item number is the upper digit in the item identification balloon. The lower digit in the balloon is the quantity used per assembly. Next refer to the parts list to identify the corresponding DemTech part number. The diagram and parts lists provided are as follows:

9.1. 605-0100/A, Assembly, Pro-XM Extrusion Welder19

9.2. 605-0100/A, Assembly, Pro-XM Extrusion Welder (Parts List).....20



9.1. 605-0100/A, Assembly, Pro-XM Extrusion Welder





44	STOCK	RIVET, 1/8" BLIND, DOME STYLE, STAINLESS STEEL	2
43	STOCK	HEATER, PRE-HEAT AIR, ERON	1
42	605-D46	HANDLE, DRILL MOTOR	1
41	605-TS-XG/ 1/2 /A	ASSEMBLY, TEFLON SHOE, CORNER	1
41	605-TS-XG/60/A	ASSEMBLY, TEFLON SHOE, BEAD	1
41	605-TS-XG/B/A	ASSEMBLY, TEFLON SHOE, BLANK	1
40	605-042	PIN, DOWEL, 1/8" OD X 1" LONG, HARDENED, 416 SS	2
39	605-041	SCREW, SET, M8 X 1.25 X 10mm LONG, EXTENDED DOG POINT, SS	2
38	605-040	CLAMP, SCREW, 47.5 - 50mm RANGE, STAINLESS STEEL	2
37	605-039	TRIM, EDGE, 7/16" X 1/8" GRIP, PEBBLE FINISH BLACK PVC	1
35	STOCK	SCREW, M4 X .7 X 12mm LONG, PAN HEAD PHILLIPS, 18-8 STAINLESS STEEL	4
34	605-035	PIN, COILED SPRING, 2.5mm OD X 12mm LONG, STD DUTY, STEEL	2
33	605-033	PIN, DOWEL, 3/16" OD X 1/4" LONG, 18-8 SS	1
32	605-032	PIN, DOWEL, 3/16" OD X 5/8" LONG, HARDENED, 416 SS	1
31	605-031	SCREW, M6 X 1 X 14mm LONG, SOCKET HEAD CAP, 18-8 STAINLESS STEEL	3
30	605-030	RING, RETAINING, INTERNAL, 1-3/4" HOUSING, ZINC CHROMATE STEEL	1
29	605-029	RING, OUTER, TAPERED ROLLER, 3/4" ID X 1-25/32" OD X 15/32" WIDE	1
28	605-028	BEARING, TAPERED ROLLER ASSY, 3/4" ID X 1-25/32" OD X 21/32" WIDE	1
27	605-027	THERMOSTAT, ENCAPSULATED, T0-220, 167° F, NO	1
26	605-026	SCREW, M3 X 0.5mm X 6mm LONG, PAN HEAD PHILLIPS, 18-8 SS	1
25	605-024	BOLT, 7/16-14 X 3/4" LONG, HEX HEAD CAP, 18-8 SS	2
24	605-023	BRACKET, HEATER REAR SUPPORT	1
23	605-022	GIB, GRIP HANDLE	1
22	605-021	CLAMP, GRIP HANDLE	1
21	605-020	BRACKET, GRIP HANDLE	1
20	605-019	TUBE, WIRE CONDUIT	1
19	605-018	SCREW, TEFLON SCREW MOUNT	2
18	605-017	NOZZLE, BARREL OUTPUT	1
17	605-016	SHIELD, NOZZLE AIR	1
16	605-015	HOUSING, HEATER / MOTOR WIRING	1
15	605-014	STUD, MOTOR OUTPUT	1
14	605-013	BRACKET, MOTOR / HEATER	1
13	605-012	MANIFOLD, AIR HEAT	1
12	605-011	SPACER, BRACKET SIDE	2
11	605-010/PR	INSERT, WELD ROD FEED	1
10	605-009	INSERT, WELD ROD CUT	1
9	605-008	INSERT, MIXING	1
8	605-007	HOUSING, BARREL	1
7	605-006	BARREL, EXTRUDER	1
6	605-005	SCREW, EXTRUSION	1
5	605-003	LABEL, PRO-XM WELDER, SET	1
4	605-002	MOTOR, DRILL, MODIFIED	1
3	110-245	SCREW, M4 X 0.7 X 10mm LONG, FLAT HEAD SOCKET CAP, SS	3
2	100-455	FUSE HOLDER, 3AG, SHOCK-SAFE, .250 QD	2
1	100-399	NAME PLATE / SERIAL # PLATE	1
ITEM	PART NUMBER	DESCRIPTION	QTY
		Parts List	1

9.2. 605-0100/A, Assembly, Pro-XM Extrusion Welder (Parts List)



10. Product Warranty

Warranty

DEMTECH Services, Inc. warrants all equipment of its manufacture to be free from defects in materials and workmanship for a period of one year from the date of shipment to the original buyer. The liability under this warranty is limited to replacement parts and labor on equipment when the equipment is returned prepaid to the factory or its authorized service center with prior authorization from DEMTECH Services, Inc., and upon examination by DEMTECH Services, Inc., is determined to be defective. At DEMTECH Services, Inc.'s option, a service representative may be dispatched to the equipment location.

As an additional protection, DEMTECH Services, Inc. warrants that for a period of 90 days from the date of shipment to the original buyer, pending prior authorization from DEMTECH Services, Inc., there will be no charge for service related shipping of parts and/or equipment or for authorized travel of a service representative to the equipment location. After 90 days, all costs incurred for shipping the equipment or parts thereof or for travel are the responsibility of the buyer. Our warranty for this equipment is rendered void if the welder has been repaired, taken apart or modified, or attempted to be, unless such actions have been taken in accordance with written instructions received from DEMTECH Services, Inc. The warranty is also void if the equipment has been subjected to abuse, accident or other abnormal conditions.

IF ANY FAULT DEVELOPS, THE FOLLOWING STEPS SHOULD BE TAKEN:

- 1. Notify DEMTECH Services, Inc. by calling 1-888-324-9353. Overseas customers should contact the local DEMTECH authorized service center. Please be prepared with the model number, serial number and full details of the difficulty. Upon receipt of this information, service data or shipping instructions will be provided by DEMTECH Services, Inc. Do not return the welder for repair without first contacting the factory or its representative for instructions.
- 2. After the initial 90 day period, on receipt of shipping instructions, forward the equipment prepaid to the factory or its authorized service center as instructed. If requested, an estimate of the charges will be made before work begins, especially with those cases where the DEMTECH Services, Inc. product is not covered by the warranty.
- 3. If the original carton and packing are not available, the product should be packed in a container with a strong exterior and surrounded by a protective layer of shock-absorbing material. DEMTECH Services, Inc. advises returning the equipment at full value to the carrier.

DEMTECH Services, Inc. reserves the right to make changes in design at any time without incurring any obligation to install the same changes on welders previously purchased.

This warranty states the essence of the obligations or liabilities on the part of DEMTECH Services, Inc. THE FORMAL, COMPLETE AND EXCLUSIVE STATEMENT OF DEMTECH SERVICES, INC.'S WARRANTY IS CONTAINED IN ITS QUOTATIONS, ACKNOWLEDGEMENTS AND INVOICES. DEMTECH Services, Inc. neither assumes, nor authorizes any person to assume for it, any liability in connection with the sale of its equipment other than those set forth herein.

END OF MANUAL