

ProBlue® Adhesive Melters Model P4, P7, and P10

Customer Product Manual

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www.nordson.com



Nordson Corporation welcomes requests for information, comments, and inquiries about its products. General information about Nordson can be found on the Internet using the following address: <http://www.nordson.com>.

Address all correspondence to:

Nordson Corporation
Attn: Customer Service
11475 Lakefield Drive
Duluth, GA 30097

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Section 1

Safety

Read this section before using the equipment. This section contains recommendations and practices applicable to the safe installation, operation, and maintenance (hereafter referred to as “use”) of the product described in this document (hereafter referred to as “equipment”). Additional safety information, in the form of task-specific safety alert messages, appears as appropriate throughout this document.



WARNING: Failure to follow the safety messages, recommendations, and hazard avoidance procedures provided in this document can result in personal injury, including death, or damage to equipment or property.

Safety Alert Symbols

The following safety alert symbol and signal words are used throughout this document to alert the reader to personal safety hazards or to identify conditions that may result in damage to equipment or property. Comply with all safety information that follows the signal word.



WARNING: Indicates a potentially hazardous situation that, if not avoided, can result in serious personal injury, including death.



CAUTION: Indicates a potentially hazardous situation that, if not avoided, can result in minor or moderate personal injury.

CAUTION: (Used without the safety alert symbol) Indicates a potentially hazardous situation that, if not avoided, can result in damage to equipment or property.

Responsibilities of the Equipment Owner

Equipment owners are responsible for managing safety information, ensuring that all instructions and regulatory requirements for use of the equipment are met, and for qualifying all potential users.

Safety Information

- Research and evaluate safety information from all applicable sources, including the owner-specific safety policy, best industry practices, governing regulations, material manufacturer's product information, and this document.
- Make safety information available to equipment users in accordance with governing regulations. Contact the authority having jurisdiction for information.
- Maintain safety information, including the safety labels affixed to the equipment, in readable condition.

Instructions, Requirements, and Standards

- Ensure that the equipment is used in accordance with the information provided in this document, governing codes and regulations, and best industry practices.
- If applicable, receive approval from your facility's engineering or safety department, or other similar function within your organization, before installing or operating the equipment for the first time.
- Provide appropriate emergency and first aid equipment.
- Conduct safety inspections to ensure required practices are being followed.
- Re-evaluate safety practices and procedures whenever changes are made to the process or equipment.

User Qualifications

Equipment owners are responsible for ensuring that users:

- Receive safety training appropriate to their job function as directed by governing regulations and best industry practices
- Are familiar with the equipment owner's safety and accident prevention policies and procedures
- Receive, equipment- and task-specific training from another qualified individual

NOTE: Nordson can provide equipment-specific installation, operation, and maintenance training. Contact your Nordson representative for information

- Possess industry- and trade-specific skills and a level of experience appropriate to their job function
- Are physically capable of performing their job function and are not under the influence of any substance that degrades their mental capacity or physical capabilities

Applicable Industry Safety Practices

The following safety practices apply to the use of the equipment in the manner described in this document. The information provided here is not meant to include all possible safety practices, but represents the best safety practices for equipment of similar hazard potential used in similar industries.

Intended Use of the Equipment

- Use the equipment only for the purposes described and within the limits specified in this document.
- Do not modify the equipment.
- Do not use incompatible materials or unapproved auxiliary devices. Contact your Nordson representative if you have any questions on material compatibility or the use of non-standard auxiliary devices.

Instructions and Safety Messages

- Read and follow the instructions provided in this document and other referenced documents.
- Familiarize yourself with the location and meaning of the safety warning labels and tags affixed to the equipment. Refer to *Safety Labels and Tags* at the end of this section.
- If you are unsure of how to use the equipment, contact your Nordson representative for assistance.

Installation Practices

- Install the equipment in accordance with the instructions provided in this document and in the documentation provided with auxiliary devices.
- Ensure that the equipment is rated for the environment in which it will be used and that the processing characteristics of the material will not create a hazardous environment. Refer to the Material Safety Data Sheet (MSDS) for the material.
- If the required installation configuration does not match the installation instructions, contact your Nordson representative for assistance.
- Position the equipment for safe operation. Observe the requirements for clearance between the equipment and other objects.
- Install lockable power disconnects to isolate the equipment and all independently powered auxiliary devices from their power sources.
- Properly ground all equipment. Contact your local building code enforcement agency for specific requirements.
- Ensure that fuses of the correct type and rating are installed in fused equipment.
- Contact the authority having jurisdiction to determine the requirement for installation permits or inspections.

Operating Practices

- Familiarize yourself with the location and operation of all safety devices and indicators.
- Confirm that the equipment, including all safety devices (guards, interlocks, etc.), is in good working order and that the required environmental conditions exist.
- Use the personal protective equipment (PPE) specified for each task. Refer to *Equipment Safety Information* or the material manufacturer's instructions and MSDS for PPE requirements.
- Do not use equipment that is malfunctioning or shows signs of a potential malfunction.

Maintenance and Repair Practices

- Perform scheduled maintenance activities at the intervals described in this document.
- Relieve system hydraulic and pneumatic pressure before servicing the equipment.
- De-energize the equipment and all auxiliary devices before servicing the equipment.
- Use only new or factory-authorized refurbished replacement parts.
- Read and comply with the manufacturer's instructions and the MSDS supplied with equipment cleaning compounds.

NOTE: MSDSs for cleaning compounds that are sold by Nordson are available at www.nordson.com or by calling your Nordson representative.

- Confirm the correct operation of all safety devices before placing the equipment back into operation.
- Dispose of waste cleaning compounds and residual process materials according to governing regulations. Refer to the applicable MSDS or contact the authority having jurisdiction for information.
- Keep equipment safety warning labels clean. Replace worn or damaged labels.

Equipment Safety Information

This equipment safety information is applicable to the following types of Nordson equipment.

- Hot melt and cold adhesive application equipment and all related accessories
- Pattern controllers, timers, detection and verification systems, and all other optional process control devices

Equipment Shutdown

To safely complete many of the procedures described in this document, the equipment must first be shut down. The level of shut down required varies by the type of equipment in use and the procedure being completed. If required, shut down instructions are specified at the start of the procedure. The levels of shut down are:

Relieving System Hydraulic Pressure

Completely relieve system hydraulic pressure before breaking any hydraulic connection or seal. Refer to the melter-specific product manual for instructions on relieving system hydraulic pressure.

De-energizing the System

Isolate the system (melter, hoses, guns, and optional devices) from all power sources before accessing any unprotected high-voltage wiring or connection point.

1. Turn off the equipment and all auxiliary devices connected to the equipment (system).
2. To prevent the equipment from being accidentally energized, lock and tag the disconnect switch(es) or circuit breaker(s) that provide input electrical power to the equipment and optional devices.

NOTE: Government regulations and industry standards dictate specific requirements for the isolation of hazardous energy sources. Refer to the appropriate regulation or standard.

Disabling the Guns

All electrical or mechanical devices that provide an activation signal to the guns, gun solenoid valve(s), or the melter pump must be disabled before work can be performed on or around a gun that is connected to a pressurized system.

1. Turn off or disconnect the gun triggering device (pattern controller, timer, PLC, etc.).
2. Disconnect the input signal wiring to the gun solenoid valve(s).
3. Reduce the air pressure to the gun solenoid valve(s) to zero; then relieve the residual air pressure between the regulator and the gun.

General Safety Warnings and Cautions

Table 1-1 contains the general safety warnings and cautions that apply to Nordson hot melt and cold adhesive equipment. Review the table and carefully read all of the warnings or cautions that apply to the type of equipment described in this manual.









Equipment types are designated in Table 1-1 as follows:


HM = Hot melt (melters, hoses, guns, etc.)

PC = Process control

CA = Cold adhesive (dispensing pumps, pressurized container, and guns)

Table 1-1 General Safety Warnings and Cautions

Equipment Type	Warning or Caution	
HM		WARNING: Hazardous vapors! Before processing any polyurethane reactive (PUR) hot melt or solvent-based material through a compatible Nordson melter, read and comply with the material's MSDS. Ensure that the material's processing temperature and flashpoints will not be exceeded and that all requirements for safe handling, ventilation, first aid, and personal protective equipment are met. Failure to comply with MSDS requirements can cause personal injury, including death.
HM		WARNING: Reactive material! Never clean any aluminum component or flush Nordson equipment with halogenated hydrocarbon fluids. Nordson melters and guns contain aluminum components that may react violently with halogenated hydrocarbons. The use of halogenated hydrocarbon compounds in Nordson equipment can cause personal injury, including death.
HM, CA		WARNING: System pressurized! Relieve system hydraulic pressure before breaking any hydraulic connection or seal. Failure to relieve the system hydraulic pressure can result in the uncontrolled release of hot melt or cold adhesive, causing personal injury.
HM		WARNING: Molten material! Wear eye or face protection, clothing that protects exposed skin, and heat-protective gloves when servicing equipment that contains molten hot melt. Even when solidified, hot melt can still cause burns. Failure to wear appropriate personal protective equipment can result in personal injury.
HM, PC		WARNING: Equipment starts automatically! Remote triggering devices are used to control automatic hot melt guns. Before working on or near an operating gun, disable the gun's triggering device and remove the air supply to the gun's solenoid valve(s). Failure to disable the gun's triggering device and remove the supply of air to the solenoid valve(s) can result in personal injury.
HM, CA, PC		WARNING: Risk of electrocution! Even when switched off and electrically isolated at the disconnect switch or circuit breaker, the equipment may still be connected to energized auxiliary devices. De-energize and electrically isolate all auxiliary devices before servicing the equipment. Failure to properly isolate electrical power to auxiliary equipment before servicing the equipment can result in personal injury, including death.
HM, CA, PC		WARNING: Risk of fire or explosion! Nordson adhesive equipment is not rated for use in explosive environments and should not be used with solvent-based adhesives that can create an explosive atmosphere when processed. Refer to the MSDS for the adhesive to determine its processing characteristics and limitations. The use of incompatible solvent-based adhesives or the improper processing of solvent-based adhesives can result in personal injury, including death.
HM, CA, PC		WARNING: Allow only personnel with appropriate training and experience to operate or service the equipment. The use of untrained or inexperienced personnel to operate or service the equipment can result in injury, including death, to themselves and others and can damage to the equipment.

Equipment Type	Warning or Caution
HM	 <p>CAUTION: Hot surfaces! Avoid contact with the hot metal surfaces of guns, hoses, and certain components of the melter. If contact can not be avoided, wear heat-protective gloves and clothing when working around heated equipment. Failure to avoid contact with hot metal surfaces can result in personal injury.</p>
HM	<p>CAUTION: Some Nordson melters are specifically designed to process polyurethane reactive (PUR) hot melt. Attempting to process PUR in equipment not specifically designed for this purpose can damage the equipment and cause premature reaction of the hot melt. If you are unsure of the equipment's ability to process PUR, contact your Nordson representative for assistance.</p>
HM, CA	<p>CAUTION: Before using any cleaning or flushing compound on or in the equipment, read and comply with the manufacturer's instructions and the MSDS supplied with the compound. Some cleaning compounds can react unpredictably with hot melt or cold adhesive, resulting in damage to the equipment.</p>
HM	<p>CAUTION: Nordson hot melt equipment is factory tested with Nordson Type R fluid that contains polyester adipate plasticizer. Certain hot melt materials can react with Type R fluid and form a solid gum that can clog the equipment. Before using the equipment, confirm that the hot melt is compatible with Type R fluid.</p>

Other Safety Precautions

- Do not use an open flame to heat hot melt system components.
- Check high pressure hoses daily for signs of excessive wear, damage, or leaks.
- Never point a dispensing handgun at yourself or others.
- Suspend dispensing handguns by their proper suspension point.

First Aid

Do the following if molten hot melt comes in contact with your skin.

1. Do NOT attempt to remove the molten hot melt from your skin.
2. Immediately soak the affected area in clean, cold water until the hot melt has cooled.
3. Do NOT attempt to remove the solidified hot melt from your skin.
4. In case of severe burns, treat for shock.
5. Seek expert medical attention immediately. Give the MSDS for the hot melt to the medical personnel providing treatment.

Safety Labels and Tags

Figure 1-1 illustrates the location of the product safety labels or tags that are affixed to the equipment. Table 1-2 provides the text of any safety message that appears on each tag or the meaning of symbols that appear without any safety message.

The installation kit provided with the melter may contain label overlays that are printed in a variety of languages. If required by governing safety regulations, apply the appropriate overlay to the text portion of the labels shown in Figure 1-1.

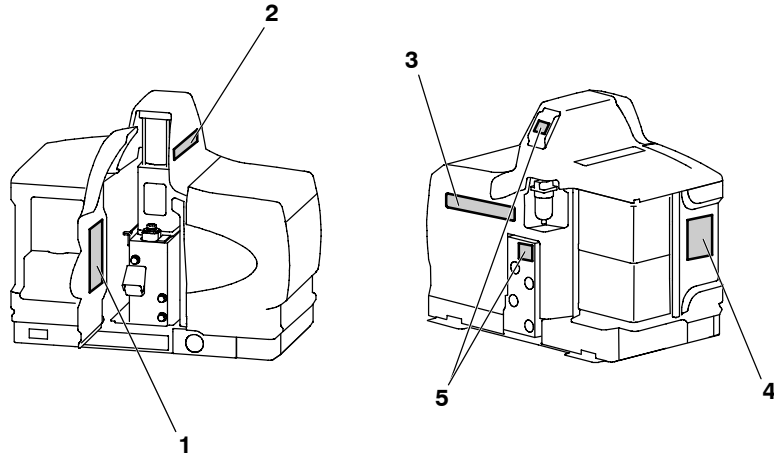


Figure 1-1 Location of safety labels and tags

Table 1-2 General Safety Warnings and Cautions

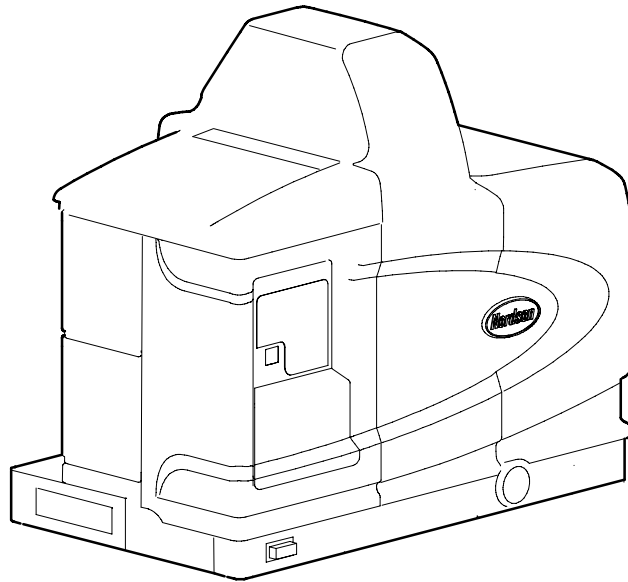
Item	Description
1	WARNING Burn hazard. Hot adhesive. Release pressure before servicing.
2	CAUTION Burn Hazard. Hot Surfaces.
3	WARNING Burn hazard. Hot adhesive. Release pressure before servicing.
4	WARNING Hazardous voltage. Disconnect all power supply connections before servicing.
5	Symbol means: Hot Surface! Do not touch.

Section 2

Introduction

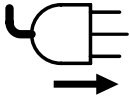
This manual describes the installation and use of the ProBlue™ 4 (P4), ProBlue 7 (P7), and ProBlue 10 (P10) adhesive melter. When necessary, the reader is referred to the documentation supplied with other Nordson products or products supplied by third parties.

With the exception of tank capacity, hose/gun capacity, and exterior appearance, all ProBlue melters are functionally identical. To simplify the presentation of information in this manual, depictions of the model P4 are used generically throughout this manual to represent all ProBlue melters.



Other Sources of Information

Refer to the following additional resources for quick-reference information, technical support, and information about getting the most out of your ProBlue melter.



Installation Guide

The installation guide shipped with the melter provides a visual quick-reference for installing the melter.



User's Guide

The user's guide shipped with the melter provides a visual quick-reference to the most common operator-level tasks. The guide is appropriately sized and laminated so that it can be kept with the melter on the production floor.



Online Support

Visit www.enordson/support to download melter firmware updates and software utilities.

Visit www.emanuals.nordson.com to download product manuals and instruction sheets.



Product Resource CD

The resource CD, which is stored in the back of this manual, contains an electronic version of this manual, parts information, and other useful resources that are designed to assist you with using and servicing your melter.

Product Description

See Figure 2-1. Nordson ProBlue adhesive melters are used in conjunction with Nordson hot melt hoses and guns to create a hot melt application system.

The melter liquifies solid-form hot melt and maintains the hot melt at the desired temperature. When the guns are activated, the melter pumps the liquified hot melt through the hoses and out the gun nozzles, where it is commonly applied to the surface of a product or package.

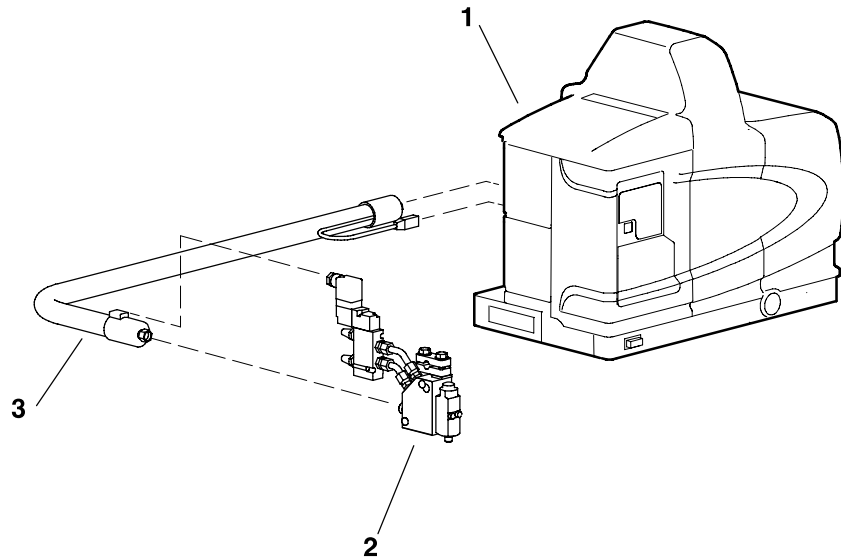


Figure 2-1 System components

1. ProBlue melter
2. Hot melt gun
3. Hot melt hose

Intended Use

ProBlue melters are specifically designed to:

- Melt and pump solid-form hot melt materials that are engineered to be liquified and extruded at temperatures below 230 °C (450 °F)
- Be used with compatible hot melt hoses and guns that are manufactured by Nordson Corporation
- Be used in non-explosive environments

Limitations of Use

Use ProBlue melters only for the purpose for which they are designed. ProBlue melters should not be used

- to melt or pump polyurethane reactive or polyamid hot melt materials or any other material that creates a health or safety hazard when heated
- in environments that will require the melter to be cleaned using a water wash or spray

Modes of Operation

ProBlue melters operate in the following modes:

Automatic scan—The melter automatically checks and displays the current temperature of the tank, hoses, and guns to confirm that they are within their pre-defined temperature range. By default, the melter is always in the automatic scan mode unless it is placed into another operating mode.

Standby—The temperatures of the tank, hoses, and guns are reduced down from their operating temperature (hereafter referred to as set-point temperature) by a pre-set number of degrees.

Setup—The setup mode is used to configure melter control options and features and to review stored operating data. To prevent unauthorized changes to the melter's configuration, the melter can be password-protected

Fault—The melter alerts the operator when an abnormal event occurs.

Melter Identification

See Figure 2-2. You will need the model and part number of your melter when requesting service or ordering spare parts and optional equipment. The model and part number are indicated on the equipment identification plate that is located on the front of the melter.

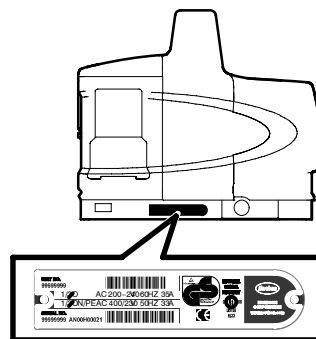


Figure 2-2 Equipment identification plate

Key Components

Figure 2-3 provides the name and the location of key melter components.

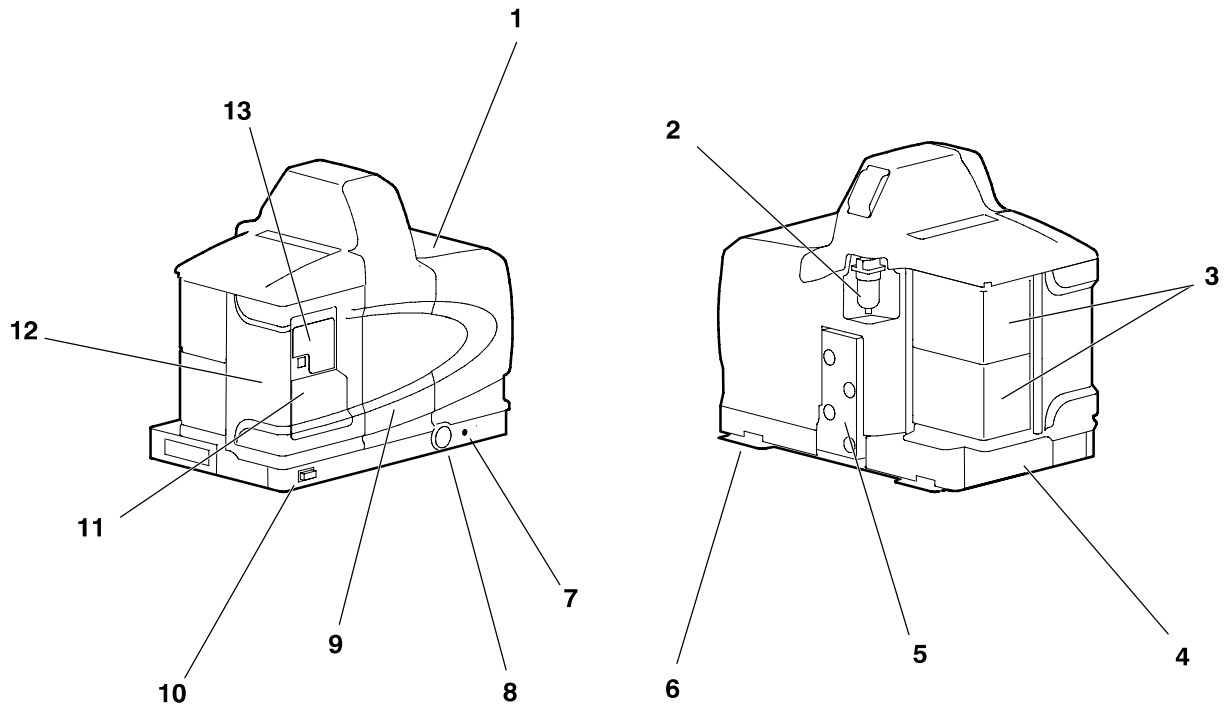


Figure 2-3 Key components

- | | | |
|---------------------|------------------------------|------------------------------------|
| 1. Tank | 6. Sub-base | 11. Keypad door |
| 2. Air filter | 7. Pressure adjustment screw | 12. Electrical enclosure door |
| 3. Hose/gun modules | 8. Pressure gauge | 13. Control panel (see Figure 2-4) |
| 4. Chassis | 9. Pump enclosure door | |
| 5. Manifold | 10. Control switch | |

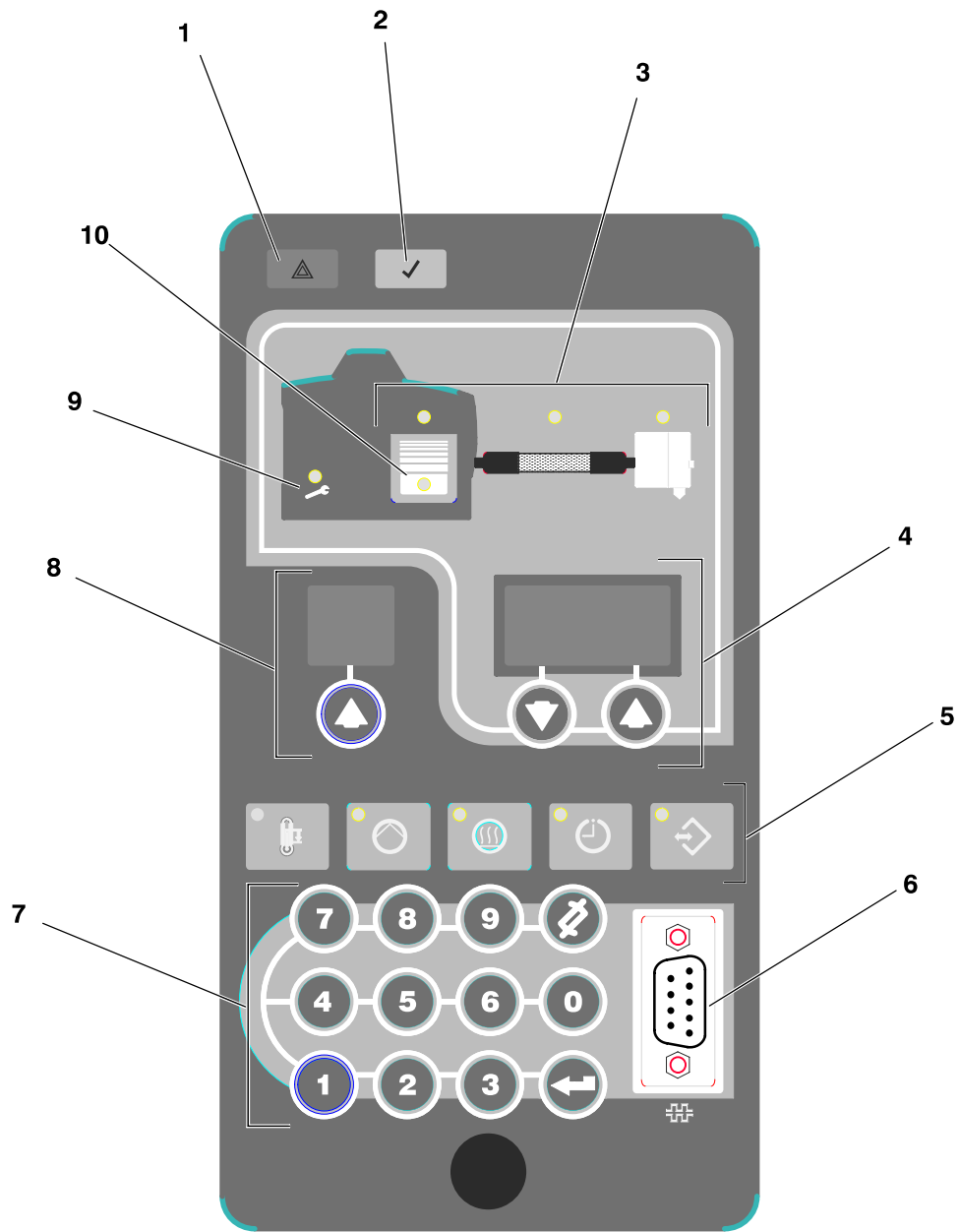


Figure 2-4 Control panel

- | | |
|----------------------------------|--------------------------------|
| 1. Fault LED | 6. Serial port |
| 2. Ready LED | 7. Keypad |
| 3. Component keys/LEDs | 8. Left display and scroll key |
| 4. Right display and scroll keys | 9. Service LED |
| 5. Function keys | 10. Tank low-level LED |

Optional Equipment

The following equipment may be ordered to expand the functionality and capacity of ProBlue adhesive melters.

- **Input/output (I/O) expansion cards** that allow you to expand the number of available control inputs.
- **Communications cards** that allow the melter to communicate with other process equipment or a controller that uses standard network protocols.
- **Hose/Gun modules** that allow you to increase the number of hoses/guns that can be connected to the melter.
- **Automatic Fill Systems** that provide automated transfer of dry adhesive materials to your melter. Choose either the FillEasy[®] or FillMaster[®] product.
- **8-Hose/Gun Expansion Base** that expands the capacity of a P10 adhesive melter from 6-hoses/guns to 8-hoses/guns.

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Section 3

Installation



WARNING: Allow only personnel with appropriate training and experience to operate or service the equipment. The use of untrained or inexperienced personnel to operate or service the equipment can result in injury, including death, to themselves and others, and damage to the equipment.

Quick-Start

If you have already installed the melter using the installation guide (P/N 1024498) that is provided inside the shipping container, and you have no questions concerning the installation, go to *Setting Up the Melter* later in this section for information about how to prepare the melter to operate with your manufacturing process.

Installing 400/480 Volt Melters

Refer to Appendix E for information about installing 400/480 volt ProBlue adhesive melters. After completing the procedures described in Appendix E, you will be referred back to this section to set up the melter.

Overview

ProBlue melters are factory-configured for each order and require only the assembly and set up tasks described in this section. If your melter was ordered as a complete system, the shipping container will also contain one or more hot melt hoses and guns. ProBlue 400/480 volt melters include a transformer assembly that is shipped separately from the melter.

The melter is shipped from the factory with an installation kit that contains components that must be assembled onto the melter by the customer. Some additional materials must also be supplied by the customer to complete the installation.

If optional equipment was ordered with the melter, refer to the documentation provided with the optional equipment for installation and operating instructions.

Overview *(contd)*

The illustrations accompanying the procedures in this section depict the P4 melter. Unless otherwise noted, the instructions also apply to the P7 and P10 melter.

Additional Information



This section presents installation procedures in their most commonly used form. Procedural variations or special considerations are explained in the additional information table that follows most procedures. Where applicable, some table entries also contain cross-reference information. Additional information tables are indicated by the symbol shown to the left.

Installation Tasks

The installation sequence is as follows:

1. Verify that the required environmental conditions and utilities exist.
2. Unpack and inspect the melter.
3. Mount the transformer/melter onto the parent machine or support structure.
4. Configure the electrical service.
5. Connect a compressed air supply.
6. Connect hot melt hoses and guns.
7. Set up the melter to work with the manufacturing process.
8. (Optional) Install inputs and outputs.
9. Install optional equipment.
10. Connect a gun driver, pattern controller, or timer.
11. Flush the melter.
12. (Optional) Set up communications between the melter and a PC.

Experience of Installation Personnel

The instructions provided in this section are intended to be used by personnel who have experience in the following subjects:

- Hot melt application processes
- Industrial power and control wiring
- Industrial mechanical installation practices
- Basic process control and instrumentation

Installation Requirements

Before installing the melter, ensure that the desired installation location provides the required clearances, environmental conditions, and utilities.

Clearances

Figure 3-1 illustrates the *minimum* clearances that are required between the melter and surrounding objects. Table 3-1 describes each clearance.

NOTE: 400/480 volt melter clearances are provided in Appendix E.

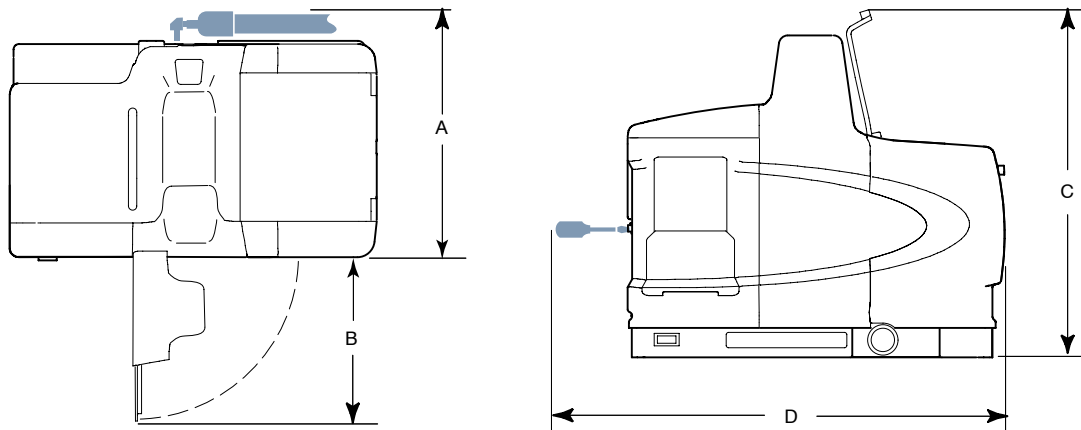


Figure 3-1 Minimum installation clearances (Top and side views shown)

Table 3-1 Installation Clearances

Item	Description	Required Clearance
A	The distance from the outside edge of a $\frac{5}{16}$ -inch Nordson hose to the front face of the melter when a short 90-degree hose fitting is used to connect the hose to the melter	P4 = 370 mm (14.5 in.) P7 = 370 mm (14.5 in.) P10 = 391 mm (15.4 in.)
B	The clearance required to open the pump enclosure door	P4 = 243 mm (9.6 in.) P7 = 243 mm (9.6 in.) P10 = 268 mm (10.55 in.)
C	The distance from the melter sub-base to the front edge of the tank lid when the lid is at its highest point.	P4 = 502 mm (20.0 in.) P7 = 564 mm (22.2 in.) P10 = 656 mm (26.0 in.)
D	The clearance required on the left side of the melter to open the electrical enclosure door or remove a hose/gun module.	P4 = 648 mm (25.5 in.) P7 = 711 mm (28.0 in.) P10 = 714 mm (28.1 in.)

Ventilation

See Figure 3-2. ProBlue melters are cooled by convection. Air is drawn in through openings in the chassis of the melter and is exhausted out of the ventilation slots at the top of the melter.

CAUTION: Do not block the air intake openings and ventilation slots.

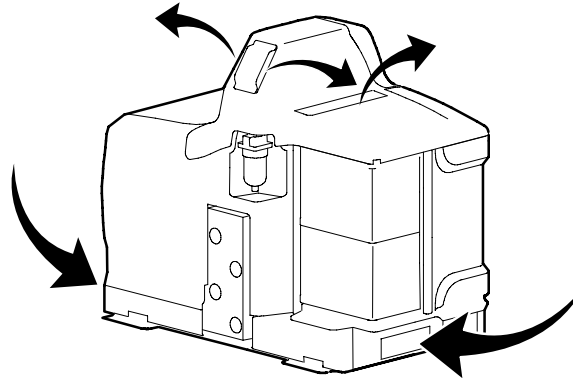


Figure 3-2 Melter cooling

Electrical Power

Before installing the melter, ensure that the melter will not be overloaded and that the plant's electrical service is rated to handle the power required by the melter and the hoses and guns that you plan to use.

Refer to Appendix A, *Calculating Melter Power Requirements*, for information about how to calculate the maximum allowable hose lengths and gun wattages that can be used in your manufacturing application.



WARNING: Risk of electrocution! Install a lockable power disconnect switch between the electrical service and the melter. Failure to install or properly use the disconnect switch when servicing the melter can result in personal injury, including death.

Compressed Air

To achieve maximum hot melt output, the melter must be connected to an air supply that is capable of providing a maximum of 6.2 Bar (90 psi) of dry, nonlubricated air. The actual pressure required for the melter to support your manufacturing process will depend on such factors as the type of hot melt and gun you are using and the required dimensions of the hot melt bead.

NOTE: The minimum operating air pressure is 0.7 bar (10 psi). Operating the melter with the air pressure set to less than 0.7 bar (10 psi) may cause the pump to function erratically.

Nordson recommends that an isolation valve be installed in the plant air supply line just before the melter.

Other Considerations

Consider the following additional factors when evaluating where to install the melter.

- The maximum distance between the melter and each gun is dictated by the power requirement of each hose. Refer to Appendix A, *Calculating Melter Power Requirements* for information about how to determine the maximum allowable length.
- The operator must be able to safely reach the control panel and accurately monitor the control panel indicators.
- The operator must be able to safely observe the level of hot melt inside the tank.
- The melter must be installed so that it can be safely removed from its sub-base.
- The melter must be installed away from areas with strong drafts or where sudden temperature changes occur.
- The melter must be installed where it will be in conformance with the ventilation requirements specified in the Material Safety Data Sheet for the hot melt being used.
- The melter should not be exposed to excessive vibration.
- P4 and P7 melters provide an auxiliary hose port at the bottom of the manifold. If the auxiliary hose port will be used, the parent machine or other support structure must provide clearance under the melter to connect the hose to the auxiliary hose port.

Unpacking the Melter

Before starting the installation, remove the melter from the pallet, locate the installation kit, and inspect the melter for damaged and missing parts. Report any problems to your Nordson representative.

Contents of the Installation Kit

The installation kit provided with the melter contains the components shown in Figure 3-3. The quantity and type of hose fittings provided in the kit depends upon the melter's model number and configuration.

NOTE: 400/480 volt transformers are shipped with a separate installation kit. Refer to Appendix E for information about the contents of the transformer installation kit.

The installation kit also contains a package of safety label overlays that are printed in a variety of languages. If required by local regulations, the appropriate language overlay should be applied over the English version of the same label. Refer to Section 1, *Safety Labels and Tags*, for the location of each safety label.

NOTE: P10 melters also include a manifold guard kit P/N 1031871.

Customer-Supplied Materials

The following additional materials are also required to install the melter.

- A power cable. If the cable clamp that is provided in the installation kit is not used, rigid or flexible electrical conduit will be required.
- Four 8 mm ($\frac{5}{16}$ in.) machine bolts with locking hardware
- A plant air supply with an in-line isolation valve

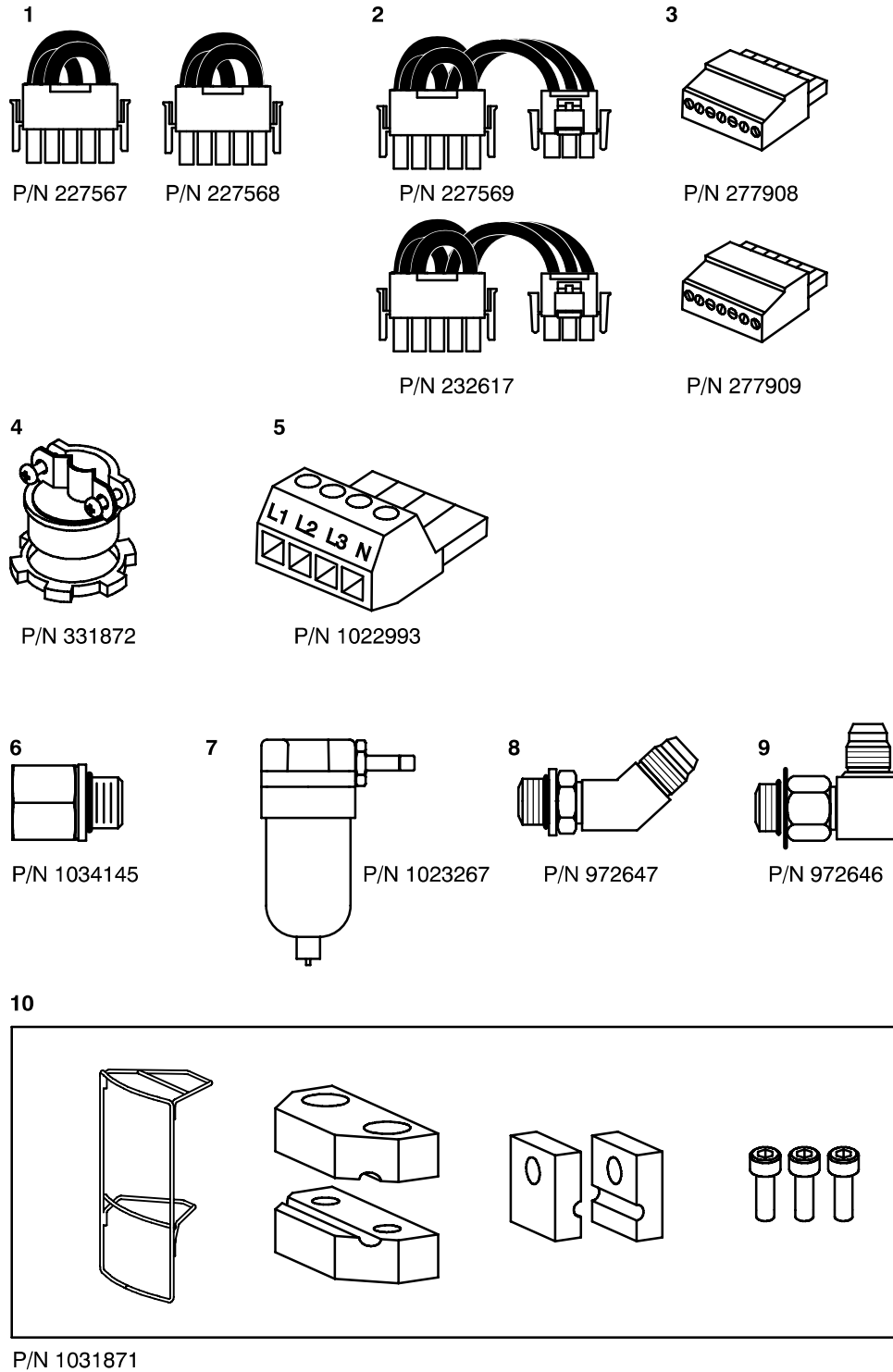
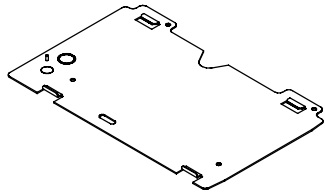


Figure 3-3 Installation kit components

- | | |
|-----------------------------------|--------------------------------------|
| 1. Voltage plug (2) | 6. NPTF-to-BSP adapter |
| 2. Voltage plug with neutral (2) | 7. Air filter |
| 3. Input and Output connector (2) | 8. 45-degree hose fitting |
| 4. Cable clamp | 9. 90-degree hose fitting |
| 5. Electrical connector | 10. 6-hose manifold guard (P10 only) |

Mounting the Melter



Melter sub-base

ProBlue melters use a unique mounting sub-base that allows the melter to be easily mounted onto and removed from the parent machine or support structure, without the need to unbolt the melter.

Before mounting the melter, ensure that the parent machine or support structure is level with respect to the floor, provides an even mounting surface, is free of excessive vibration, and that it is capable of supporting the combined weight of the melter, a full tank of hot melt, and the hoses and guns.

Refer to Section 8, *Technical Data*, for the dimensions of the sub-base and the weight of the melter. Refer to the technical data provided by the hot melt manufacturer for information about the volumetric weight of the hot melt.

To mount the melter

See Figure 3-4.

1. Remove the PG-21 conduit knockout from the sub-base. See Figure 8-4 for the location of the conduit knockout.
2. Lay out the sub-base bolt pattern on the parent machine or support structure and then drill/tap holes for four 8 mm ($\frac{5}{16}$ in.) mounting bolts (customer-supplied).

NOTE: The mounting sub-base has the same bolt-mounting pattern as Nordson's 3100V and 3400V melters.

3. Bolt the sub-base to the parent machine using four 8-mm ($\frac{5}{16}$ in.) machine bolts with locking hardware.



WARNING: Risk of electrical shock or short circuit. Use the cable clamp that is provided or use electrical conduit to protect the power cable from the sharp edge of the conduit knockout.

4. Install the cable clamp in the PG-21 conduit knockout.
5. Route the power cable between the power disconnect switch and the melter and through the cable clamp. Tighten the cable clamp.

CAUTION: Before setting the melter down onto the sub-base, ensure that both locking screws on the front chassis of the melter are turned fully counterclockwise until they stop.

6. Carefully lower the melter onto the sub-base so that the back of the melter is approximately $\frac{1}{2}$ inch in front of the rear locking tabs.
7. Slide the melter to the rear of the sub-base until the rear locking tabs enter the slots in the back of the melter.
8. Lock the melter to the sub-base by turning each of the locking screws, which are located in the front of the melter, clockwise until they stop.

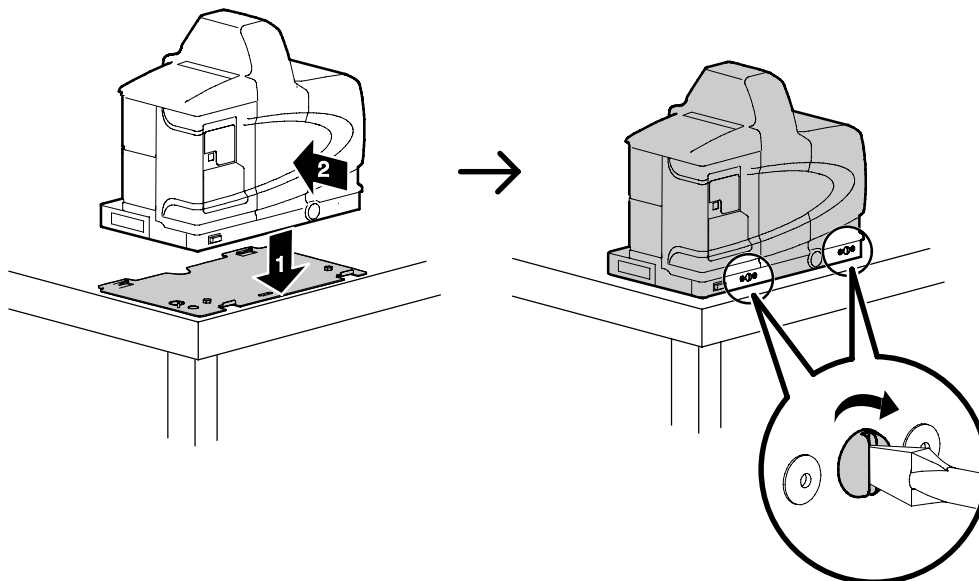
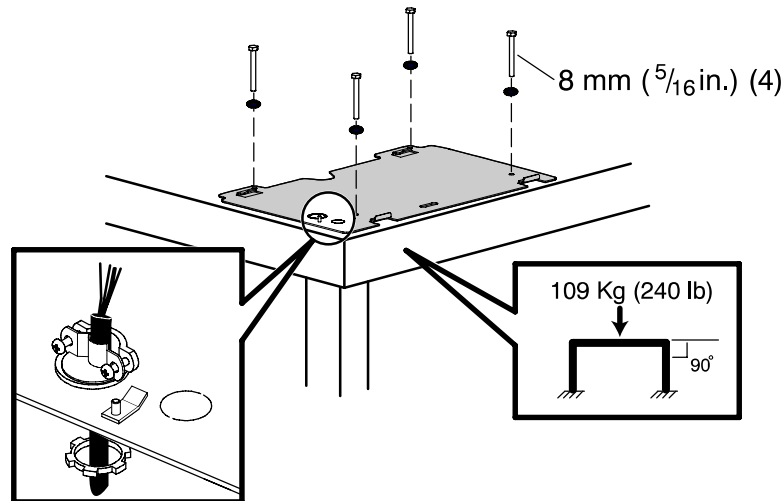


Figure 3-4 Mounting the sub-base and the melter

Configuring the Electrical Service

ProBlue melters are shipped from the factory without an attached power cable and without an electrical service type specified. To configure the melter to function in your facility, you must connect a power cable and a Nordson-supplied voltage plug to the melter.

To connect a power cable to the melter

1. Select a power cable rated for the maximum amperage required by the melter. Ensure that the power cable meets applicable electrical codes and standards.

The maximum power draw for each ProBlue shipping configuration, operating at 230 volt, in both 1-phase and 3-phase are listed in Table 3-2. The values presented in Table 3-2 assume that each hose gun module is being used at its maximum capacity of 2000 watts.

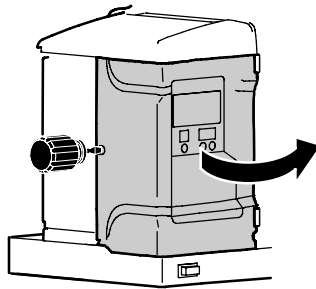
NOTE: Contact your Nordson representative for assistance in calculating the melter's power draw for operating voltages other than 230 volts or for assistance in calculating the exact power draw for specific hoses and guns that are manufactured by Nordson Corporation.

Table 3-2 Melter Power Requirement

Melter	Number of Hose/Guns	1-Phase Power Draw (Amps)	3-Phase Power	
			Without Neutral	With Neutral
P4	2	17	15	9
	4	26	23	17
P7	2	18	16	10
	4	27	24	17
P10	2	18	16	10
	4	27	24	17
	6	36	31	18



WARNING: Risk of electrocution! Install a lockable power disconnect switch between the electrical service and the melter. Failure to install or properly use the disconnect switch when servicing the melter can result in personal injury, including death.

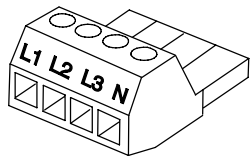


Opening the electrical enclosure door

2. Open the electrical enclosure door.
3. Route the power cable into the wire tray in the base of the electrical enclosure.

NOTE: If the power cable cannot be routed through the conduit knockout provided in the sub-base (Refer to *Mounting the Melter* earlier in this section), route the cable through the optional knockout provided on the left side of the chassis.

See Figure 3-5.



Electrical connector
(P/N 1022993)

4. Connect each power cable lead to the appropriate terminal on the electrical connector (P/N 1022993). Table 3-3 describes the terminal connections for each type of electrical service.
5. Plug the electrical connector into receptacle TB1 on the main board.
6. Connect the ground lead from the power cable to the ground lug that is located on the chassis. The lug is marked PE/G.
7. Connect the ground jumper that is connected to the ground lug, to the ground post that is located on the sub-base.

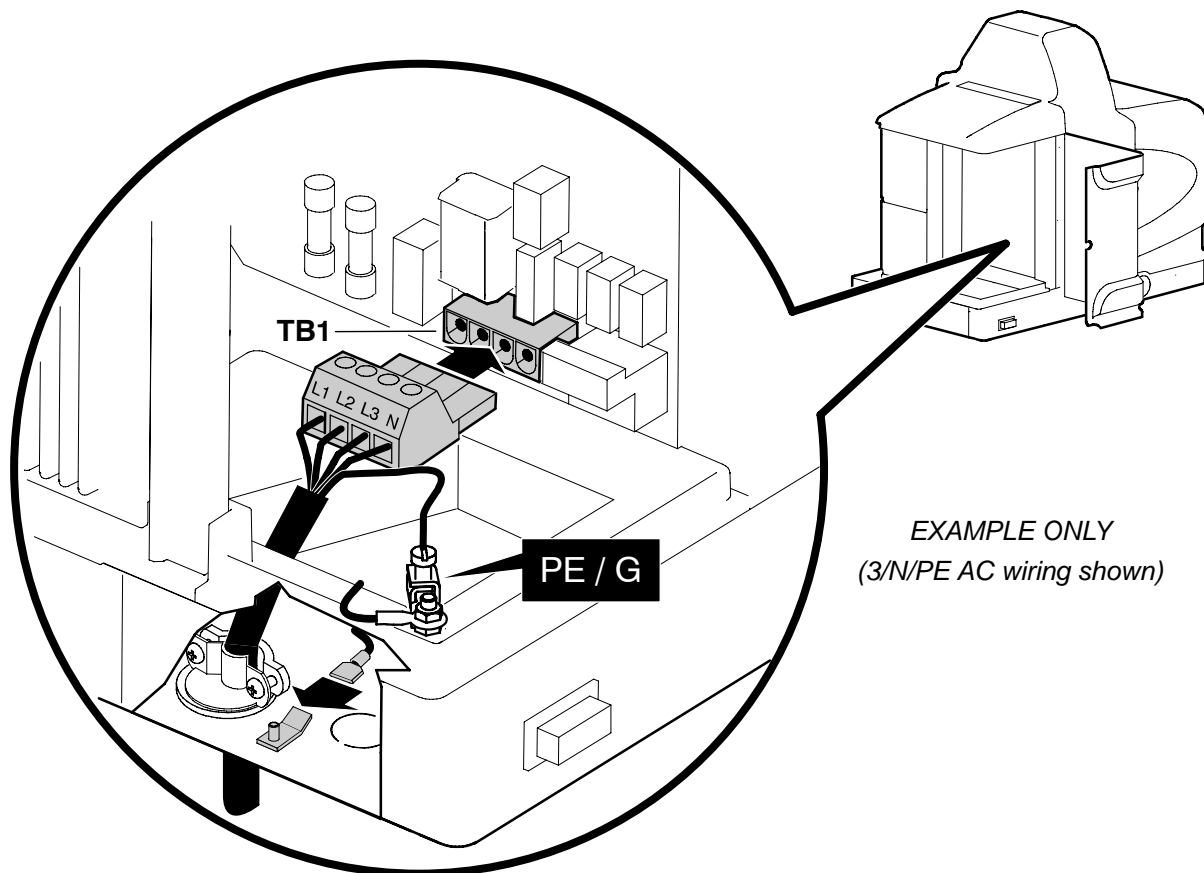


Figure 3-5 Connecting the power cable, ground lead, and ground jumper

To connect a power cable to the melter (contd)

Table 3-3 Electrical Service Information

If the Electrical Service Type is..		Use Electrical Connector Terminals..				Use Voltage Plug..
		L1	L2	L3	N	
400/230 VAC 3-phase (4-wire service, including a neutral) See note.	3/N/PE AC 400/230V	●	●	●	●	227569 Red/Yellow
230 VAC 1-phase (2-wire service, including a neutral) See note.	1/N/PE AC 200–240V	●			●	232617 Blue/Yellow
200 to 240 VAC 3-phase (3-wire service without a neutral)	3/PE AC 200–240V	●	●	●		227568 Red/Green
200 to 240 VAC 1-phase (2-wire service without a neutral)	1/PE AC 200–240V	●	●			227567 Blue/Green

NOTE: The 400/230 VAC 3-phase service (4-wire service including neutral) includes the 415/240 VAC 3-phase (4-wire service, including neutral) voltage. The 230 VAC 1-phase service (2-wire service, including a neutral) includes the 240 VAC 1-phase (2-wire service, including a neutral) voltage.

To connect a voltage plug to the melter

1. Refer to Table 3-3 to determine the part number of the voltage plug that matches the required electrical service.

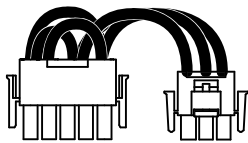
NOTE: Each voltage plug is color-coded and is labeled with its part number and service type.

See Figure 3-6.

2. Insert the correct voltage plug into receptacle J1 on the main board. Ensure that the plug snaps into place. If the plug contains a neutral lead, connect the neutral lead to receptacle J2 on the main board.

3. When the electrical service is completely installed and inspected in accordance with local electrical codes and standards, close the electrical enclosure door and switch the local power disconnect switch on.

If the electrical service was configured correctly, the melter control panel will display dashes.



Voltage plugs with and without the neutral lead

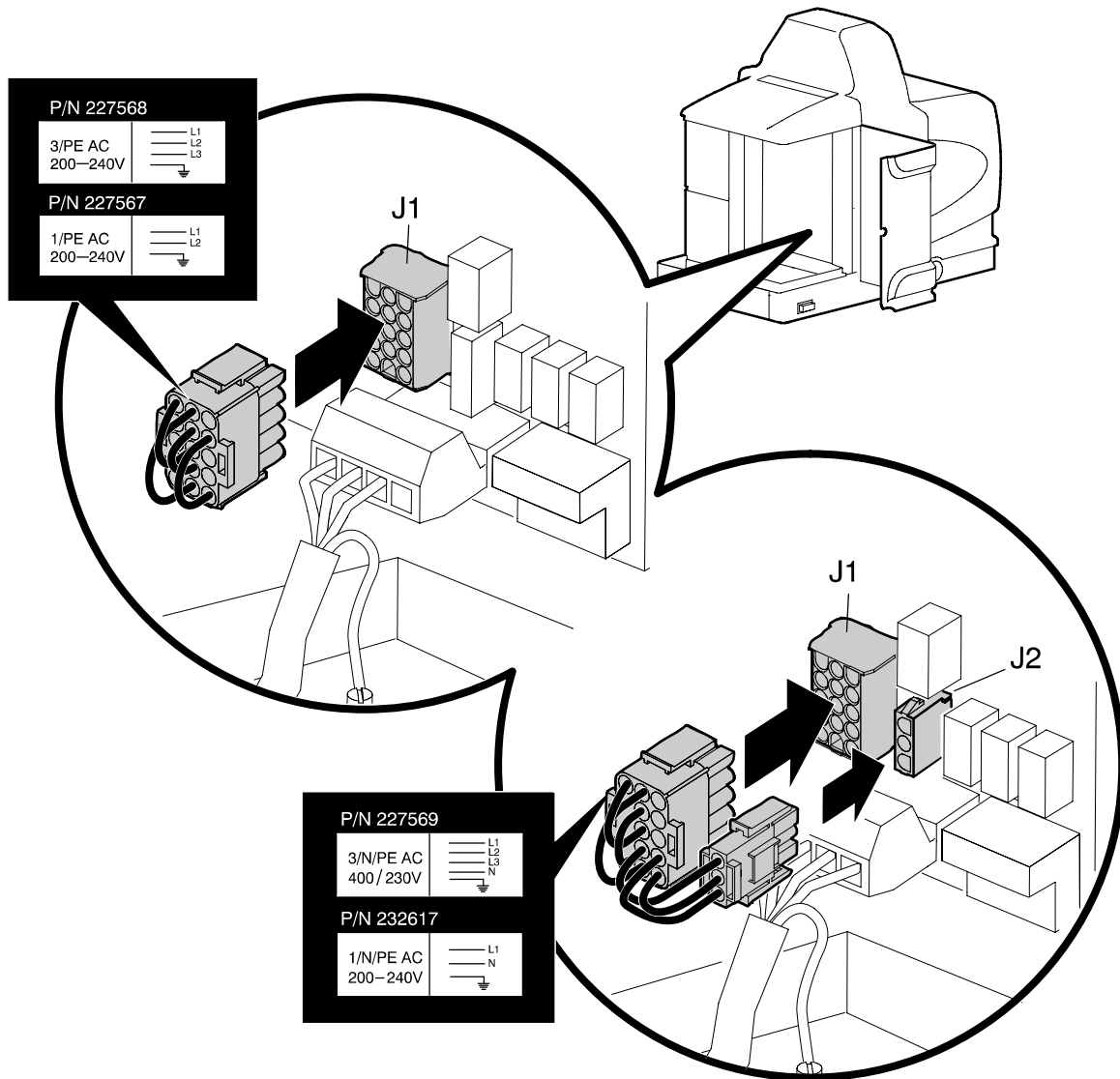


Figure 3-6 Connecting a voltage plug

Connecting a Compressed Air Supply

CAUTION: Do not force the air pressure adjustment screw beyond its normal range of adjustment. Forcing the adjustment screw beyond its normal range of adjustment will damage the pneumatic assembly.

To connect an air supply

1. Use a 5 mm hex wrench to turn the pressure adjustment screw counterclockwise until it stops (off).

See Figure 3-7.

2. Insert the male fitting located on the outlet side of the air filter (P/N 1023267) into the air inlet port on the back of the melter.

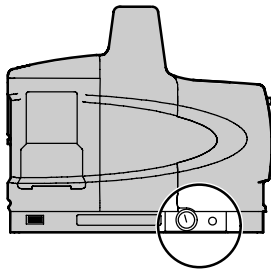
CAUTION: Rigidly support the plant air supply before connecting it to the air filter.

3. Connect a regulated plant air supply to the inlet of the air filter. If required, use the $\frac{1}{4}$ NPTF-to-G $\frac{1}{4}$ BSPP male adapter fitting (P/N 1034145) that is provided in the installation kit.

NOTE: The air filter inlet is threaded to receive a male G1/4 BSPP fitting.

4. Open the plant air supply to the melter.
5. Turn the pressure regulator adjustment clockwise to set the melter's operating air pressure (pressure supplied to the pump) to 1.4 Bar (20 psi). The operating air pressure should be adjusted later to meet the requirements of the manufacturing process.

NOTE: The minimum operating air pressure is 0.7 bar (10 psi). Operating the melter with the air pressure set to less than 0.7 bar (10 psi) may cause the pump to function erratically.



Pressure regulator and adjustment screw

P/N 1034145

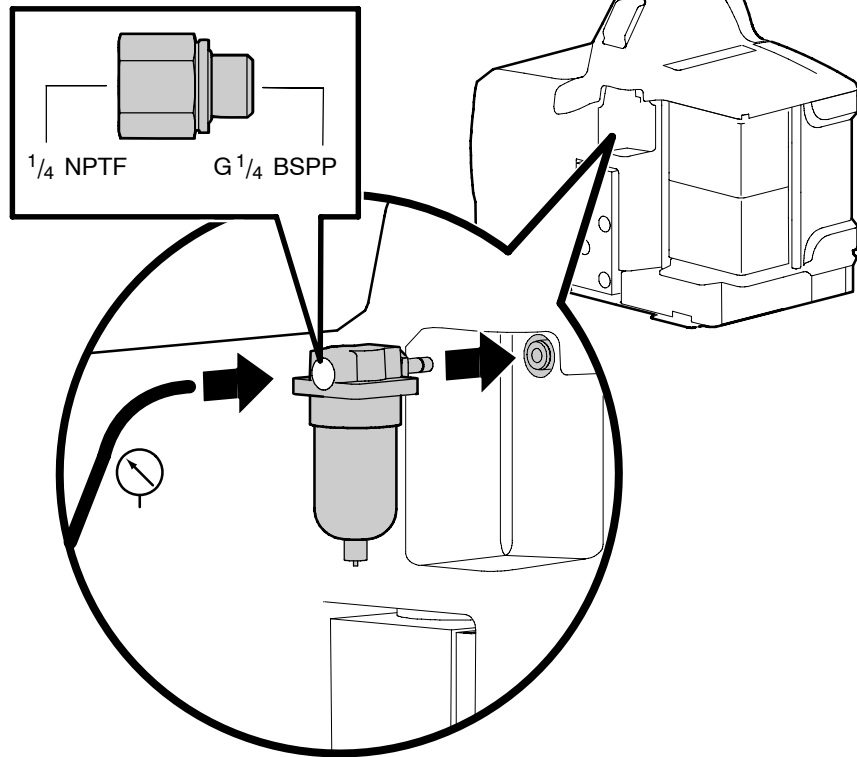
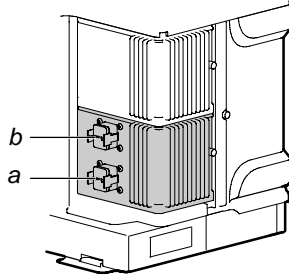


Figure 3-7 Connecting the air filter and the plant air supply line

Connecting Hoses and Guns

ProBlue melters use standard Nordson hoses and guns. The P4 and P7 melters support the connection of up to four hose/gun pairs. The P10 melter supports the connection of up to six hose/gun pairs.

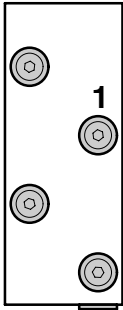


Hose/gun module 1
a) Receptacle 1 b) Receptacle 2

The hose/gun capacity of each melter is determined by the number of hose/gun modules installed on the melter. Each hose/gun module supports the connection of two hose/gun pairs. The hose/gun capacity of melters that were ordered with less than their full hose/gun capacity can be increased by adding additional hose/gun modules. Unused hose/gun module positions are covered by blank modules.



WARNING: Risk of fire or equipment damage. Before connecting hoses and guns to the melter, confirm that the power required by each hose/gun pair and each hose/gun module, does not exceed the maximum wattages specified in Appendix A, Table A-2, *Maximum Allowable Wattages*.



Hose port 1
(P4/P7 melter manifold shown)

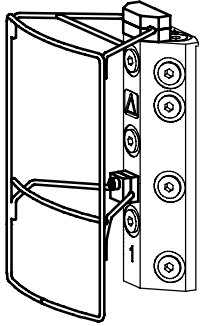
To connect hoses

See Figure 3-8.

Observe the following guidelines:

- For information about choosing the correct Nordson hot melt hose for your manufacturing process, refer to the latest edition of Nordson's hot melt dispensing equipment *Replacement Parts Catalog* or contact your Nordson representative.
- Refer to the user's guide provided with each Nordson hose. The guide contains important information about routing and installing the hose.
- Always use hose port 1 first. The position of port 1 is stamped on the face of the manifold. The P4 and P7 melters provide four hose ports on the face of the manifold and a fifth hose port at the bottom of the manifold. The P10 melter provides nine ports, six of which can be used at any one time.
- If you install an additional hose/gun module, you must restart the melter and enter a set-point temperature for each hose/gun that you connect to the new module in order for the new hoses/guns to be recognized.

CAUTION: Failure to connect a hose to port 1 may create spaces within the manifold where hot melt will not circulate. The presence of these spaces can result in the build-up of hot melt char, which can lead to an increase in the frequency of melter maintenance.



P10 6-hose manifold guard

- Use the 6-hose manifold guard that is shipped with all P10 melters. Instructions for installing the guard are provided with the guard.
- Coordinate the connection of each hose with the receptacles on each hose/gun module. For example, connect the cordset from the hose that is connected to port 1 (marked) to receptacle 1.
- Save all of the port plugs removed from the manifold. A port plug will need to be reinstalled into the manifold if a hose is later removed.
- Use the 45- or 90-degree hose fittings provided in the installation kit.

NOTE: Only 90-degree fittings are shipped with the P4 and P7 melters.

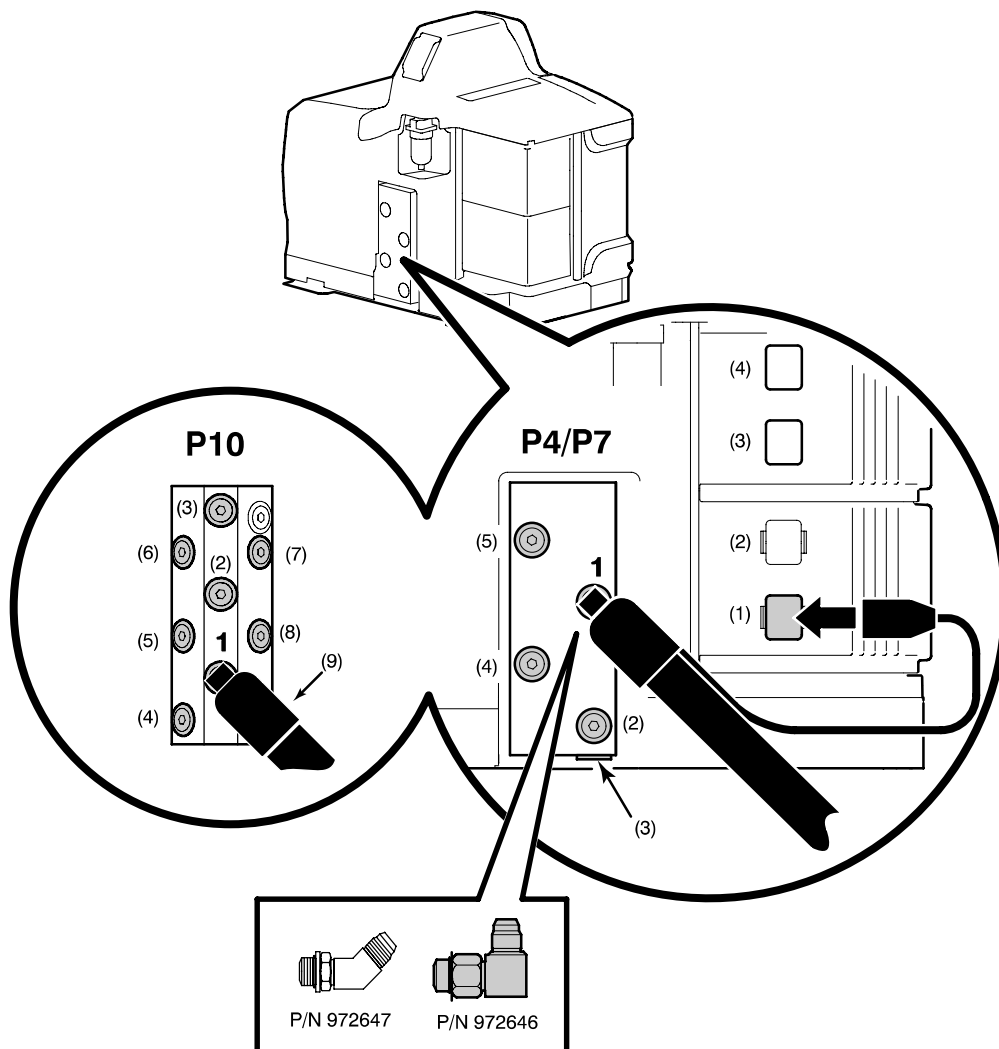
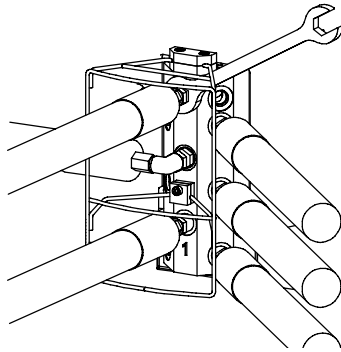


Figure 3-8 Connecting a hose

Connecting Hoses and Guns *(contd)*



P10 hose routing options

P10 Hose Routing Options

The unique angled design of the manifold on the P10 melter allows each hose (six hoses maximum) to be routed in the same or different directions without interfering with each other. Use the 45- or 90-degree hose fitting supplied with the melter. Additional 45-degree, 90-degree, and straight fittings may be ordered to customize your hose configuration.

To connect guns

Observe the following guidelines:

- ProBlue melters support all T-style handguns.
- For information about choosing the most appropriate Nordson hot melt gun for your manufacturing process, refer to the latest edition of Nordson's hot melt dispensing equipment *Replacement Parts Catalog* or contact your Nordson representative. Refer to Appendix A, *Calculating Melter Power Requirements*, for information about how to calculate the power required by Nordson hot melt guns.
- Refer to the user's guide that is shipped with each gun for information about installing the gun and connecting a hose to the gun.

NOTE: ProBlue melters are shipped with a 100-mesh (.15 mm) hot melt filter installed in the pump. Order the appropriate gun nozzle based on this filter mesh size.

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Setting Up the Melter

After physically installing the melter, it must be set up to support your manufacturing process. Melter setup consists of enabling or making changes to factory-set operating parameters that affect the use and function of the melter. The operating temperature (set-point) of the tank and each hose and gun is also established during melter setup.

The melter is shipped from the factory with the most commonly used operating parameters already set up. The factory setup can be modified at any time to suit your manufacturing process.

Quick Setup

Table 3-4 describes the most commonly used operating parameters and their factory settings. Review the table to determine if the factory settings for each parameter will support your manufacturing process. If the default values for each of these operating parameters are appropriate for your manufacturing process, then no melter setup is required. Go directly to *Set-point Temperature of the Tank, Hoses, and Guns* later in this section to complete the installation process.

If you need to make changes to the factory setup or if you want to learn about other operating parameters, go to the next part in this section, *Operating Parameters*.

Table 3-4 Common Operating Parameters

Parameter	Parameter Name	Purpose	Default Value
4	Ready Delay Time	A timer that delays the activation of the ready LED for a pre-defined time period after the tank, hoses, and guns are at the desired set-point temperature. The ready delay timer will only activate if the temperature of the tank, at the time the melter is turned on, is below its assigned set-point temperature by 27 °C (50 °F) or more.	0 minutes
5	Service Interval Time	A timer that turns on a service LED when the value set for the timer equals the number of hours that the heaters have been on. The service LED is used to signal the need for maintenance.	500 hours
8	Automatic Pump On	Determines whether the pump will turn on automatically when the all components are at their desired set-point temperature (enabled) or whether the pump must be turned on manually (disabled).	Enabled
11	Create Password	Sets a password that must be entered before any melter operating parameter or set-point temperature can be changed.	5000
20	Temperature Units	Sets the units of the temperature display to degrees Celsius (C) or to degrees Fahrenheit (F).	C
21	Over Temperature Delta	Sets the number of degrees that any heated component can exceed its assigned set-point temperature before an over temperature fault occurs.	15 °C (25 °F)
22	Under Temperature Delta	Sets the number of degrees that any heated component can drop below its assigned set-point temperature before an under temperature fault occurs.	25 °C (50 °F)
23	Standby Delta	Sets the number of degrees that the temperature of all heated components will be decreased when the melter is placed into the standby mode.	50 °C (100°F)
26	Manual Standby Time	Sets the amount of time the melter will remain in the standby mode after the standby key is pressed.	Disabled
50 to 77	Seven-day Clock	A group of parameters that control the melter's clock. The clock is used to automatically turn the heaters on and off and to place the melter into the standby mode.	Disabled

Operating Parameters

The melter uses operating parameters to store noneditable and editable values. Noneditable values are those that provide information about the historical performance of the melter. Editable values are either a numeric set-point or a control option setting. Control options settings affect the display of information or the function of the melter.

Operating parameters are stored in the melter's firmware in the form of a sequentially numbered list. The list is organized into the logical groups described in Table 3-5.

Table 3-5 Parameter Groups

Group	Parameter Numbers	Group Description
Standard	0 to 11 and 14	Noneditable and other frequently used parameters
Temperature Control	20 to 26	Control heaters
Input Setup	30 to 39	Configure the standard and optional inputs
Output Setup	40 to 46	Configure the standard and optional outputs
Seven-day Clock	50 to 77	Configure the clock feature

In addition to the ability to read and edit parameter values, you can also save and restore the current value of every operating parameter and review a log of the last ten changes that were made to editable parameters.

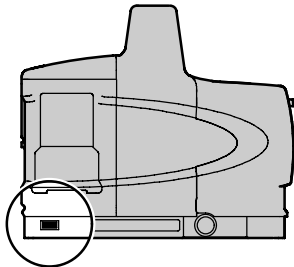
Selecting Operating Parameters

Table 3-6 provides a complete list of the operating parameters. Review the list to determine which operating parameters would best support your manufacturing process. Refer to Appendix B, *Operating Parameters*, for detailed information about each parameter. Appendix B contains a complete description of each parameter, including its affect on the melter, default value, and format.

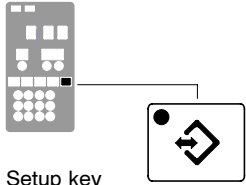
NOTE: Parameters that are used to configure optional equipment or that are otherwise reserved in the firmware are excluded from Table 3-6 and Appendix B.

Reading or Editing Operating Parameters

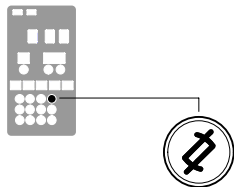
Regardless of whether a parameter's value is editable or not, the procedure for accessing each parameter in order to read or edit its current value is the same.



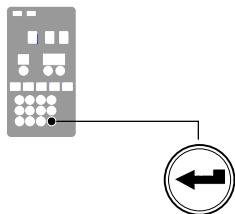
Melter control switch (On/Off)



Setup key



Clear/Reset key



Enter key

To read or edit a parameter

1. Switch the melter on.
The melter performs a start-up check.
2. Press the **Setup** key.
The left display flashes parameter 1.
3. Use the numeric keypad to enter the number of the desired parameter.
Refer to Table 3-6 for a complete list of parameters.

NOTE: If you incorrectly enter the parameter number, press the **Clear/Reset** key to return to parameter 1 and then re-enter the correct parameter number.

When you have finished entering the one- or two-digit parameter number, the right display indicates the parameter's current value.

4. Do *one* of the following:
 - If the value is noneditable, refer to Section 4, *Monitoring the Melter*.
 - If the value is editable go to step 5.
5. Press the **Enter** key.
The right display flashes.
6. Use the keypad to enter the desired numeric set-point or control option into the right display. Refer to Appendix B for information about the numeric value or control option choices for each parameter.
NOTE: If the keypad has no effect on the right display, the melter is password protected. You must enter a valid password before you can edit parameters. Refer to Section 4, *Enter the Melter Password*.
7. Press the **Enter** key.
The melter checks that the new value or control option is acceptable.
 - If the numeric set-point or control option is accepted, the left and right displays index to the next sequential parameter number and value.
 - If the numeric set-point or control option is not accepted, the right display will indicate dashes (---) for three seconds and then it will change back to the original value.
8. Repeat step 5 through step 7 to read or change the next sequential parameter number or press the **Setup** key to exit the setup mode.

Table 3-6 Operating Parameters

Parameter	Name	Range of Values	Default Value
<i>Standard</i>			
0	Enter Password	0 to 9999	4000
1	Total Hours with Heaters On (noneditable)	0–999,999	0
2	Fault Log (noneditable)	—	_F0 (empty)
3	Change History Log (noneditable)	—	P_ (empty)
4	Ready Delay Time	0 to 60 minutes	0 minutes
5	Service Interval Time	0 to 8736 hours	500 hours
6	Service LED Heater Hours	0 to 9999 hours	0
8	Automatic Pump On	0 (disabled) or 1 (enabled)	1 (enabled)
9	Automatic Pump On Temperature	0 (disabled) or (1 to 230 C)	0 (disabled)
10	Enable or Disable Password	0 (disabled) or 1 (enabled)	0 (disabled)
11	Create Password	0 to 9999	5000
14	External Communications Lock-out	0 or 1	0 (disabled)
<i>Temperature Control</i>			
20	Temperature Units (degrees °C or °F)	C (degrees Celsius) or F (degrees Fahrenheit)	C (degrees Celsius)
21	Over Temperature Delta	5 °C (10 °F) to 60 °C (110 °F)	15 °C (25 °F)
22	Under Temperature Delta	5 °C (10 °F) to 60 °C (110 °F)	25 °C (50 °F)
23	Standby Delta	25 °C (50 °F) to 190 °C (350 °F)	50 °C (100 °F)
24	Automatic Standby Timeout	0 to 1440 minutes	0 (disabled)
25	Automatic Heaters Off Time	0 to 1440 minutes	0 (disabled)
26	Manual Standby Time	0 to 180 minutes	0 (disabled)
<i>Input Setup</i>			
30	Standard Input 1	0–10, 15–16	10 (Automatic Standby)
31	Standard Input 2	0–9, 15–16	1 (Standby on/off)
32	Standard Input 3	0–9, 15–16	2 (Heaters on/off)
33	Standard Input 4	0–9, 15–16	4 (Hose/gun 1 enable/disable)
34	Optional Input 5	0–9, 15–16	0 (disabled)
35	Optional Input 6	0–9, 15–16	0 (disabled)
36	Optional Input 7	0–9, 15–16	0 (disabled)
37	Optional Input 8	0–9, 15–16	0 (disabled)
38	Optional Input 9	0–9, 15–16	0 (disabled)
39	Optional Input 10	0–9, 15–16	0 (disabled)
<i>Output Setup</i>			
40	Standard Output 1	0–6	1 (Ready)
41	Standard Output 2	0–6	3 (Fault)
42	Standard Output 3	0–6	4
43	Optional Output 4	0–6	0 (disabled)
44	Optional Output 5	0–6	0 (disabled)

45	Optional Output 6	0–6	0 (disabled)
46	Optional Output 7	0–6	0 (disabled)
<i>Seven-day Clock</i>			
50	Current Day	1 to 7 (1 = Monday)	—
51	Current hour	0000 to 2359	—
55	Schedule 1 Heaters On	0000 to 2359	06:00
56	Schedule 1 Heaters Off	0000 to 2359	17:00
57	Schedule 1 Enter Standby	0000 to 2359	—:—
58	Schedule 1 Exit Standby	0000 to 2359	—:—
60	Schedule 2 Heaters On	0000 to 2359	—:—
61	Schedule 2 Heaters Off	0000 to 2359	—:—
62	Schedule 2 Enter Standby	0000 to 2359	—:—
63	Schedule 2 Exit Standby	0000 to 2359	—:—
65	Schedule 3 Heaters On	0000 to 2359	—:—
66	Schedule 3 Heaters Off	0000 to 2359	—:—
67	Schedule 3 Enter Standby	0000 to 2359	—:—
68	Schedule 3 Exit Standby	0000 to 2359	—:—
71	Schedule for Monday	0–7	0
72	Schedule for Tuesday	0–7	0
73	Schedule for Wednesday	0–7	0
74	Schedule for Thursday	0–7	0
75	Schedule for Friday	0–7	0
76	Schedule for Saturday	0–7	0
77	Schedule for Sunday	0–7	0



You can exit the setup mode at any time by pressing the **Setup** key.

Parameter numbers that are not applicable are skipped when you scroll through the operating parameter list in the left display.

When the right display is flashing, you can quickly set the value of the current parameter to its lowest possible value by simultaneously pressing both of the right-display scroll keys.

While in the setup mode, if no key is pressed for two minutes, the melter will return to the automatic scan mode.

You can also use the right-display scroll keys to enter or change a parameter's value or control option. After entering the parameter's number in the left display, press either of the right-display scroll keys to change the value or control option.

If password protection is enabled, the melter will return to the password protected mode whenever you exit the setup mode.

Appendix B, *Parameter 10*

Set-point Temperature of the Tank, Hoses, and Guns

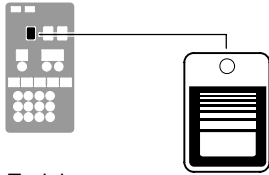
The melter is shipped from the factory with the tank set-point temperature at 175 °C (350 °F) and the hose and gun set-point temperatures at 0 degrees (turned off).

Before the melter can be used, a set-point temperature must be assigned to the tank, hoses, and guns. Assign set-point temperatures using any of the following methods:

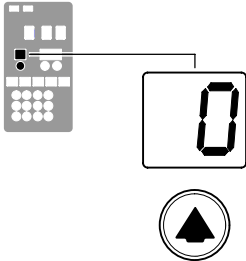
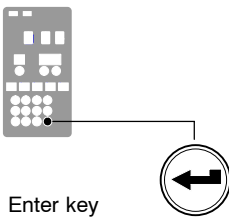
- **Global**—The tank and all hoses and guns are set to the same set-point temperature.
- **Global-by-component group**—All of the hoses or all of the guns are set to the same set-point temperature.
- **Individual Component**—The set-point temperature of the tank and each hose and gun is set individually.

Since most manufacturing processes will require the tank, hoses, and guns to be set to the same temperature, only the global method of assigning set-point temperatures is described in this section. For information about the other two methods of assigning set-point temperatures, refer to Section 4, *Adjusting Component Temperatures*.

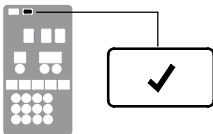
As with operating parameters, you can also save and restore set-point temperatures and review past changes that were made to set-point temperatures.



Tank key

Left display and
scroll key

Enter key



Ready LED

To assign a global set-point temperature

1. Press and hold the **Tank** key for three seconds.

The left display flashes 1.

2. Scroll the left display to 0.

The right display indicates all dashes (---) and the LEDs on the tank, hose, and gun keys turn green.

3. Press the **Enter** key.

The right display flashes.

4. Use the numeric keypad to enter the set-point temperature recommended by the manufacturer of the hot melt.

Refer to the technical data sheet provided by the manufacturer of the hot melt to determine the optimal set-point temperature.

5. Press the **Tank** key.

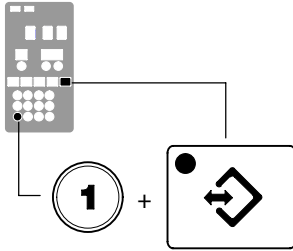
Each component begins to heat or cool to the new global set-point temperature and the melter returns to the automatic scan mode.

When all of the components reach the global set-point temperature, the ready LED turns on (green).

Save and Restore Melter Settings

The current value of all editable operating parameters and the set-point temperature of each component can be saved and, if necessary, restored at a later time. When saved settings are restored, they overwrite the settings that are presently in use.

This save-restore feature is useful in instances where the settings that are in use are deliberately or accidentally changed and you need to return the melter to its pre-change setup.

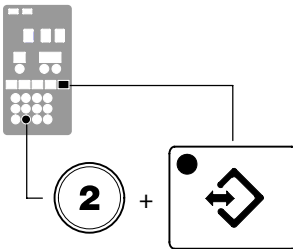


Saving current settings

To save current settings

With the melter in the automatic scan mode, simultaneously press the number **1** key and the **Setup** key.

S-1 appears momentarily in the right display.



Restoring saved settings

To restore saved settings

CAUTION: All melter settings will be deleted! Before restoring saved settings, ensure that use of the restored settings will not disrupt the current process or create an unsafe operating condition.

With the melter in the automatic scan mode, simultaneously press the number **2** key and the **Setup** key.

S-2 appears momentarily in the right display.



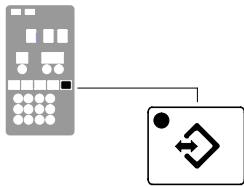
If you use the restore feature before the save feature is used for the very first time, the factory default set-point temperatures will be restored. This will cause the hoses and guns to stop heating.

You can transfer melter settings from one melter to another using the Nordson Configuration Manager software utility.

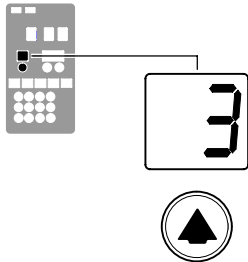
Refer to Appendix C, *Melter Communications*

Review Parameter and Set-point Temperature Changes

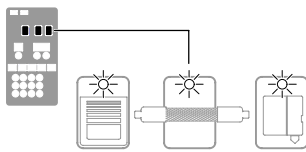
The melter stores in a change history log, a record of the last ten changes that were made to either operating parameters or set-point temperatures. Since the log only stores ten changes, old log entries are overwritten beginning with the first log entry, by the eleventh and following log entries.



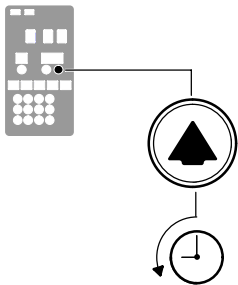
Setup key



Left display and scroll key



Component key LEDs



Scrolling through the log

To review the change history log

1. Press the **Setup** key.

Operating parameter 1 flashes in the left display.

2. Press the left display scroll key to change the display to parameter 3 (the change history log).

The following occurs:

- If the last change was to an editable parameter, all of the component key LEDs remain off.
or
- If the last change was to a set-point temperature, the LED on the associated component key(s) turns on.
and
- The right display indicates the four-digit log entry associated with the *last* change that was made.

Table 3-7 provides the meaning, from left to right, of each digit in the log entry. Following the table are two example log entries.

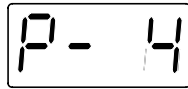
3. Press the right-display scroll key to review each of the remaining nine log entries. Each press of the scroll key displays a progressively older log entry.
4. Press the **Setup** key to return to the automatic scan mode.

Table 3-7 Change History Log

First Digit	Second Digit	Third and Fourth Digits			
P (Parameter)		<i>Indicates the number of the parameter that was changed</i>			
		<i>Are used in conjunction with the LEDs on the component keys to indicate the location and method of a set-point temperature change.</i>			
S (Set-point)	—	When this LED is on..	And the Fourth Digit Indicates..	The change was to..	And the Method of Change was..
		Tank Key	1	The tank	Individual
		Hose Key	1– 6	A single hose	Individual
		Gun Key	1– 6	A single gun	Individual
		All Keys	0	All components	Global
		Hose Key	0	All hoses	Global-by-component
		Gun Key	0	All guns	Global-by-component

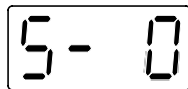
Change History Log Examples

Example 1:



Parameter 4 (ready delay) was changed.

Example 2:



If the LED on the gun key is on, then this display would indicate that the global-by-component method was used to change the temperature of the guns.



Unused log entries in the change history log are indicated by "P-_" in the right display.

To view how many heater hours have elapsed since a specific change (displayed) was made, simultaneously press both of the right-display scroll keys.

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Installing Melter Inputs

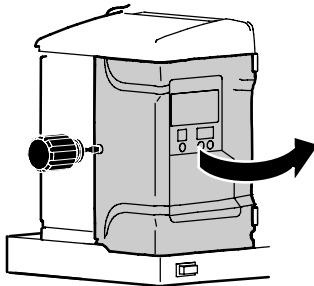
ProBlue melters are equipped with four standard inputs. Each input is customer-wired to the melter and then set up to provide one of the following control options:

- Place the melter into the standby mode
- Turn the heaters on and off
- Enable or disable a specific hose or gun
- Turn the pump on and off

Inputs are activated using a constant 10 to 30 VDC signal voltage, which is supplied by the customer's control equipment. The inputs are not polarity sensitive.



WARNING: The operator can override the melter inputs by using the control panel function keys. Ensure that the control logic for any external device that sends an input signal to the melter is programmed to prevent the creation of an unsafe condition in the event that the operator overrides an external input to the melter.



Opening the electrical enclosure door

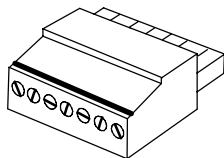
To wire inputs to the melter

1. Route a 2-, 4, 6, or 8-conductor signal cable from the control equipment to the melter, and through the PG-16 penetration in the sub-base. Use rigid or flexible conduit or a suitable strain relief to protect the cable from the sharp edge of the conduit penetration.

NOTE: Use a signal cable suitable for NEC class1 remote control and signaling circuits. To reduce the possibility of electrical shorting, route the cable so that it does not touch nearby circuit boards.

See Figure 3-9.

2. Connect each pair of input wires to the appropriate terminals (8 through 14) on connector P/N 277909. If input number four is used, terminal 7 on connector P/N 277908 must also be used. Both connectors are provided in the installation kit. Table 3-8 lists the terminal numbers that correspond to each input.



Connector P/N 277909

NOTE: Connector P/N 277909 is physically keyed to prevent it from being used in place of connector P/N 277908, which has terminals numbered 1 through 7.

3. Plug the connector (P/N 277909) into the bottom receptacle of terminal TB2, which is located on the right side of the main board. If input number four is used, plug connector P/N 277908 into the top receptacle on terminal TB2.

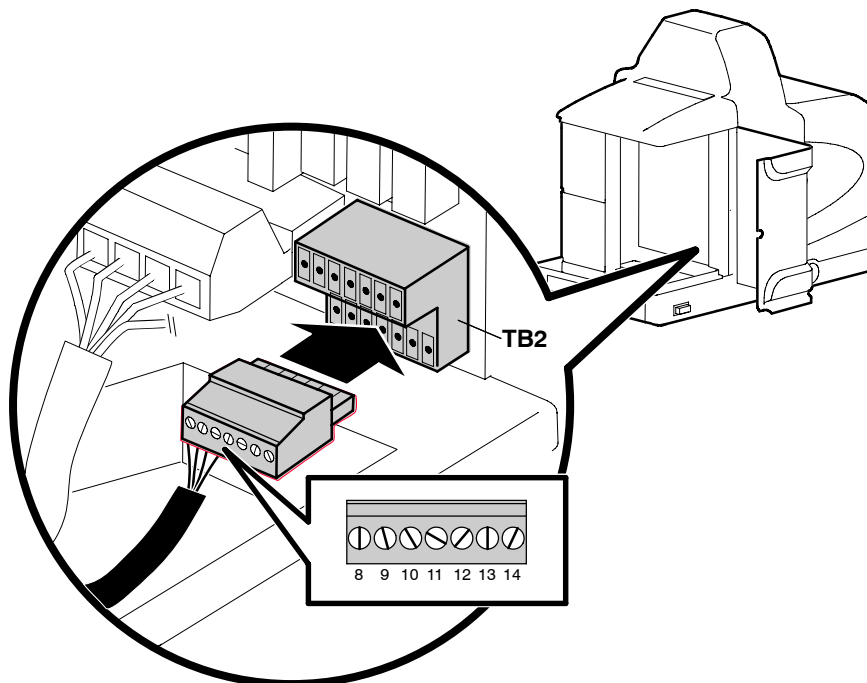


Figure 3-9 Wiring inputs

To set up an input

Set up the parameter control option for each input that you connected to the melter. Table 3-8 list the available control options. Refer to *Setting Up the Melter*, earlier in this section for information about how to select operating parameters and edit parameter control options.



With the exception of the pump enable/disable control option (Table 3-8), All inputs are transition-based.

Appendix B, *Input Setup*

The input capacity of the melter may be increased from four inputs to a total of ten inputs by adding an optional I/O card that is available from Nordson Corporation.

Section 7, *Parts*

Table 3-8 Input Data

Input	Terminals	Operating Parameter	Control Option	Note
<i>Standard Inputs</i>				
1	8 and 9	30	0 - Input Disabled 1 - Standby On/Off 2 - Heaters On/Off 3 - Pump Enable/Disable 4 - Hose/Gun 1 Enable/Disable 5 - Hose/Gun 2 Enable/Disable 6 - Hose/Gun 3 Enable/Disable 7 - Hose/Gun 4 Enable/Disable 8 - Hose/Gun 5 Enable/Disable 9 - Hose/Gun 6 Enable/Disable 10 – Automatic standby (Default)	A, B C F D
2	10 and 11	31	0 - Input Disabled 1 - Standby On/Off (Default) 2 - Heaters On/Off 3 - Pump Enable/Disable 4 - Hose/Gun 1 Enable/Disable 5 - Hose/Gun 2 Enable/Disable 6 - Hose/Gun 3 Enable/Disable 7 - Hose/Gun 4 Enable/Disable 8 - Hose/Gun 5 Enable/Disable 9 - Hose/Gun 6 Enable/Disable	F
3	12 and 13	32	Same as parameter 31 (Default=2)	
4	7 and 14	33	Same as parameter 31 (Default=4)	
<i>Optional Inputs</i>				
5	11 and 12	34	0 (Disabled)	E
6	13 and 14	35	0 (Disabled)	E
7	15 and 16	36	0 (Disabled)	E
8	17 and 18	37	0 (Disabled)	E
9	19 and 20	38	0 (Disabled)	E
10	9 and 10	39	0 (Disabled)	E
<p>NOTE</p> <p>A: Parameter 30 has 10 control options. parameters 31, 32, and 33 each have only 9 control options.</p> <p>B: Parameters 34 through 39 are reserved for the six inputs created when the optional I/O expansion card is installed. The six optional inputs have the same control options as parameter 31.</p> <p>C: If control option 3 is selected, the pump will not turn on—even if you press the pump key—if voltage is not present on the input's contacts.</p> <p>D: If control option 10 is selected for input 1, a time must be set in parameter 24.</p> <p>E: Refer to the instruction sheet provided with the optional I/O expansion card for wiring information.</p> <p>F: When the 8-Hose/Gun Expansion option is installed, the option for Hose/Gun 7 or 8 Enable/Disable appear as options 15 and 16 respectively.</p>				

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Installing Melter Outputs

The melter is equipped with three user-configurable outputs. Outputs are used to communicate with user-supplied production equipment or control hardware, such as a programmable logic controller.

Each output is customer-wired and then set up in the melter's firmware to provide one of the following outputs:

- The melter is ready
- The melter is ready *and* the pump is on
- A fault has occurred
- The hot melt level is low
- The service LED is on
- A potential fault is detected

All outputs contacts are rated at 240 VAC 2 A or 30 VDC 2 A. All contacts are normally open when the melter is turned off.

To connect an output to the melter

See Figure 3-10.

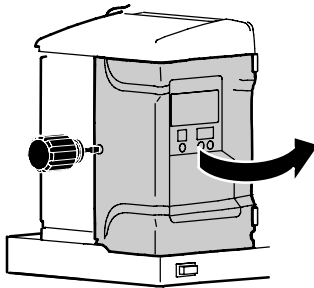
1. Route a 2-, 4, or 6-conductor signal cable from the control equipment to the melter, through the PG-16 penetration on the floor of the electrical compartment. Use rigid or flexible conduit or a suitable strain relief to protect the cable from the sharp edge of the conduit penetration.

NOTE: Use a signal cable suitable for NEC class1 remote control and signaling circuits. To reduce the possibility of electrical shorting, route the cable so that it does not touch nearby circuit boards.

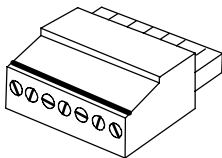
2. Connect each pair of output wires to the appropriate terminals (1 through 7) on connector P/N 277908. The connector is provided in the installation kit. Table 3-9 lists the terminal numbers that correspond to each output.

NOTE: Terminal number 7 on connector P/N 277908 is reserved for input number four. Connector P/N 277908 is physically keyed to prevent it from being used as connector P/N 277909, which has terminals numbered 8 through 14.

3. Plug connector P/N 277908 into the top receptacle on terminal TB2, which is located on the main board.



Opening the electrical enclosure door



Connector P/N 277908

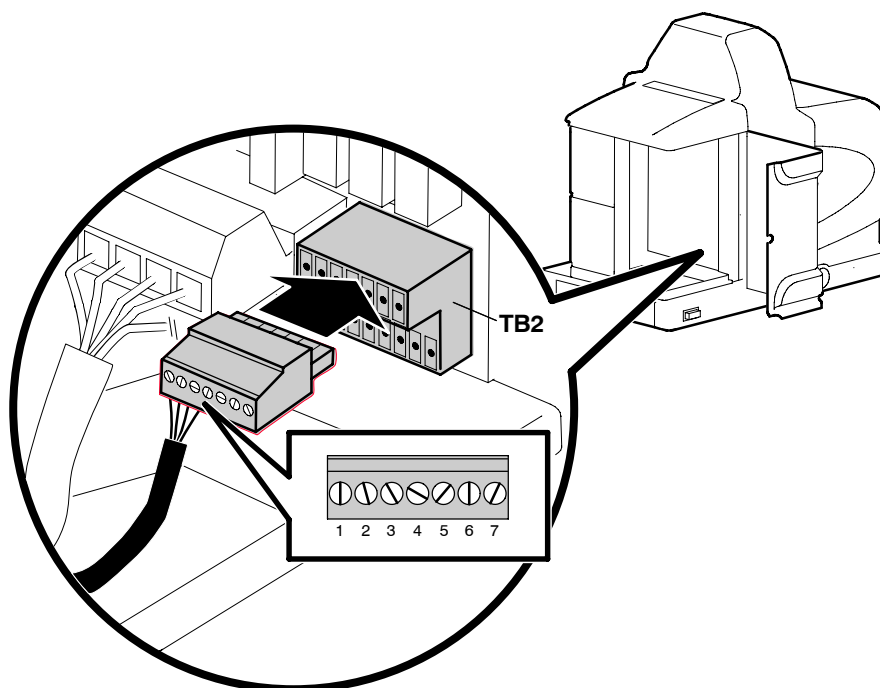


Figure 3-10 Wiring outputs

To set up an output

Set up the parameter control option for each output that you connected to the melter. Table 3-9 lists the available control options. Refer to *Setting Up the Melter*, earlier in this section, for information about how to select operating parameters and edit parameter control options.



The output capacity of the melter may be increased from three outputs to seven outputs by adding an optional I/O expansion card that is available from Nordson Corporation.

Section 7, *Parts*

Table 3-9 Output Data

Output	Terminals	Operating Parameter	Control Options	Note
<i>Standard Outputs</i>				
1	1 and 2	40	0 - Output Disabled 1 - Ready (Default) 2 - Ready <i>and</i> the pump is on 3 - Fault 4 - Tank Low Level 5 - Service LED is On 6 - Alert	A A A B A C
2	3 and 4	41	Same as parameter 40 (Default=3)	
3	5 and 6	42	Same as parameter 40 (Default=4)	
<i>Optional Outputs</i>				
4	1 and 2	43	0 (Disabled)	D
5	3 and 4	44	0 (Disabled)	
6	5 and 6	45	0 (Disabled)	
7	7 and 8	46	0 (Disabled)	
NOTE	<p>A: When control option condition occurs, contacts close. Contacts are normally open when power is off.</p> <p>B: When control option condition occurs, contacts open. Contacts are normally open when power is off.</p> <p>C: Control option 6 provides an output signal when a potential fault is detected. If control option 3 and 6 are both used, then both a fault output and an alert output signal will be present when the fault LED turns on.</p> <p>D: For wiring information, refer to the instruction sheet that is provided with the optional I/O expansion card</p>			

Installing Optional Equipment

Each item of optional equipment is shipped with instructions for installing and operating the equipment. Refer to Section 7, *Parts*, for equipment part numbers.

Connecting a Gun Driver, Pattern Controller, or Timer

If applicable, complete the melter installation by connecting the guns to the desired gun driver, pattern control, or timer. Refer to the product manual provided with the device for information about installing and operating the equipment.

Flushing the Melter

Before using the melter for production, it should be flushed to remove any residue left over from factory-testing. Flushing the melter is accomplished by processing a minimum of one tank volume of hot melt through the melter, hoses, and guns.

Refer to Section 4, *Operation*, for information about filling the tank and operating the melter.

Setting Up Melter Communications

You can transfer melter settings between melters, and upgrade or downgrade the melters operating firmware by using a personal computer that is connected to your melter's serial port.

Refer to Appendix C, *Melter Communications*, for information about downloading, installing, and using the software that is required to connect a personal computer to your melter.

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Section 4

Operation



WARNING: Allow only personnel with appropriate training and experience to operate or service the equipment. The use of untrained or inexperienced personnel to operate or service the equipment can result in injury, including death, to themselves and others, and damage to the equipment.

This section provides information about the following operator-level tasks:

- Filling the melter tank
- Starting the melter
- Monitoring melter operation
- Adjusting the operating temperature of heated components
- Using the melter function keys
- Shutting the melter down

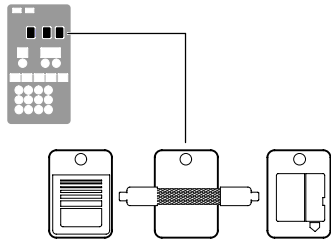
Most of the controls described in this section are located on the control panel behind the keypad door. Refer to Section 2, *Key Components*, for the location of the control panel.

Additional Information



This section presents operating procedures in their most commonly used form. Procedural variations or special considerations are explained in the additional information table that follows most procedures. Where applicable, some table entries also contain cross-reference information. Additional information tables are indicated by the symbol shown to the left.

More about Heated Components



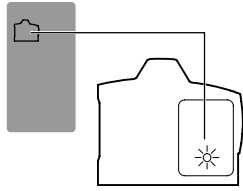
Component keys
(tank, hose, and gun)

The melter contains three groups of heated components. These are the tank group, which contains the tank and the manifold, the hose group, and the gun group. Component groups are represented on the control panel by the component keys shown to the left.

Heated components within each group are identified by their position number. The position of the tank and pump is fixed at 1. Hose and gun position numbers are automatically assigned based on the hose/gun receptacle they are connected to. For example, the position numbers of a hose/gun pair that is connected to the second receptacle would be hose position 2 and gun position 2.

The number of hose/gun receptacles available on each melter depends on the configuration in which the melter was ordered. ProBlue adhesive melters may have either two, four, or six hose/gun receptacles. An optional expansion base may be ordered that adds receptacles for two additional hoses/guns.

Filling the Tank



Low-level LED (yellow)

Before filling the tank, confirm that the hot melt material is compatible with the melter. Refer to Section 2, *Intended Use*, for information about hot melt materials that should not be used in ProBlue melters.

The tank is equipped with a low-level float switch. When the volume of adhesive in the tank reaches approximately one-half of the tank’s rated capacity, the float switch turns on the low-level LED located on the control panel.

To fill the tank



WARNING: Hot! Risk of burns! Use a scoop to fill the tank with hot melt. Never use your bare hands. Using your bare hands to fill the tank may result in personal injury.

1. Open the tank lid.

See Figure 4-1

2. Use a scoop to fill the tank with hot melt up to the tank fill line. The line is marked on the screen that protects the tank float switch. Table 4-1 lists the tank capacity of each ProBlue melter.
3. Close the tank lid when you are finished filling the tank.

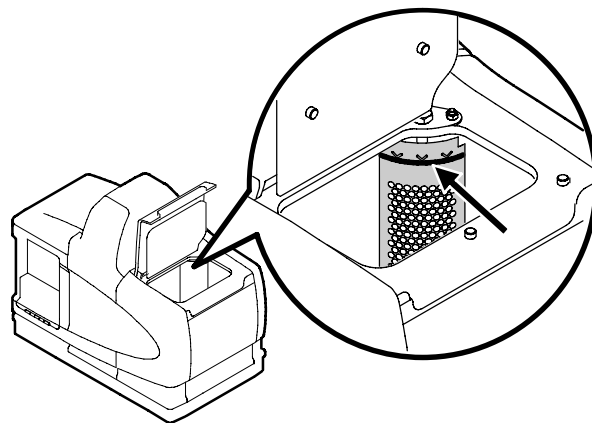


Figure 4-1 Tank fill line

Table 4-1 Tank Capacity

Model	Capacity		
	Liters	Kilograms	Pounds
P4	4	4	9
P7	7	7	15
P10	10	10	22

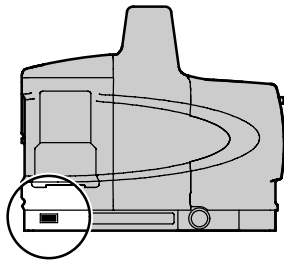
*Assumes a hot melt with a specific gravity of 1

Starting the Melter

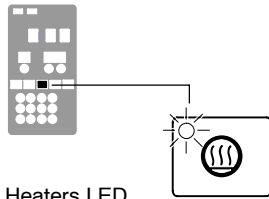
Before starting the melter for the first time, confirm that the

- melter is fully installed including any required inputs and outputs, gun drivers, pattern controllers, and timers
- melter's operating parameters are set up to support the current manufacturing process

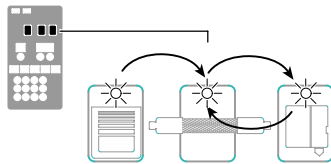
Refer to Section 3, *Installation*, if any of the items listed above are not complete.



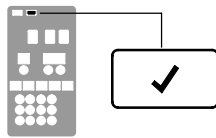
Melter control switch (on/off)



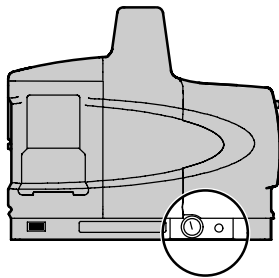
Heaters LED



Automatic scan sequence



Ready LED



Air pressure gauge

To start the melter

1. Switch the melter on.

The melter:

- Tests the control panel LEDs
- Turns on the heaters (the heaters LED turns green)
- Begins to automatically scan through and display the actual temperature of the tank and each hose and gun that has a set-point temperature that is greater than zero degrees. The sequence of the automatic scan is: tank, each hose and gun pair, and then back to the tank.
- Turns on the ready LED (green) when the tank and all of the hoses and guns are within 3 °C (5 °F) of their assigned set-point temperature.

NOTE: Appendix D contains a functional description of the pump.

2. Check the air pressure gauge on the front of the melter to confirm that the operating air pressure is set correctly.

NOTE: The minimum operating air pressure is 0.7 bar (10 psi). Operating the melter with the air pressure set to less than 0.7 bar (10 psi) may cause the pump to function erratically.



If the melter is switched on when the temperature of the tank is 27 °C (50 °F) or greater below its assigned set-point temperature (cold start condition), the ready LED will not turn on until the ready delay (defined when the melter was set up) has elapsed.

Appendix B, *Parameter 4*

The time remaining on the ready delay (in minutes) appears in right display at the end of every scan cycle. When only one minute remains in the ready delay time, the right display counts down in seconds.

Appendix B, *Parameter 4*

You can by-pass the ready delay time by pressing the **Heaters** key twice.

The appearance of F4 in the right display immediately after the melter is switched on indicates a problem with the melter's processor or main board.

Section 4, *Monitor Melter Faults*

The appearance of F1 in the right display immediately after starting the melter indicates that a hose or gun cordset may be loose or disconnected.

Section 6, *Troubleshooting*

If the melter is set up for manual pump activation, the pump LED will not turn on when the melter is ready.

Appendix B, *Parameter 8*

The condition of one or more inputs, may prevent the heaters from turning on.

Section 3, *Installing Inputs*

If the seven-day clock feature was set up and turned on when the melter was last switched off, the clock will automatically turn on the next time the melter is switched on.

Section 4, *Using Melter Function Keys*

It is normal for the pump to slowly cycle when no hot melt is being dispensed from the guns.

If a power failure occurs, the melter will restart in its normal heat-up cycle, even if the heaters were off or the melter was in standby prior to the power failure. If the seven-day clock was on prior to the power failure, the melter will restart in the mode dictated by the clock schedule at the time the melter restarts.

Monitoring the Melter

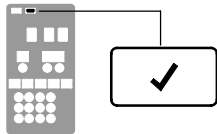
The melter provides indicators that allow you to:

- Quickly confirm that the melter is operating correctly
- Monitor the actual temperature of the manifold and each hose and gun
- Identify melter faults
- Identify when the level of hot melt in the tank is low
- Check the operating air pressure
- Determine when service is required

The melter automatically determines the number and location of all hoses and guns that are connected to it. Refer to *More About Heated Components*, earlier in this section, for information about hose/gun capacity and the identification of heated components.

You can also use a personal computer to monitor the melter. Refer to Appendix C, *Melter Communications*, for information about connecting a personal computer to the melter and installing the required software.

Confirm that the Melter is Operating Correctly



Ready LED

The ready LED turns on (green) when all of the heated components are within 3 °C (5 °F) of their set-point temperature.

The ready LED will not turn on, or will turn off, if any of the following events occur:

- The ready delay is still counting down.
- The operator or a remote input places the melter in the standby mode.
- The seven-day clock places the melter in the standby mode.
- There is a fault (the fault LED will turn on).

Refer to *Monitoring Melter Faults*, and *Using Melter Function Keys*, later in this section for information about melter faults and using the seven-day clock and standby functions. Refer to Appendix B, *Parameter 4*, for information about the ready delay.



Heated components with a set-point temperature of zero degrees are skipped during the automatic scan cycle.

The set-point temperature of the tank and the manifold cannot be set independently.

The time remaining on the ready delay appears in the right display at the end of each scan cycle.

Appendix B, *Parameter 4*

You can override the seven-day clock at any time. If the clock has turned the heaters off, pressing the heaters key will turn the heaters back on. If the clock has placed the melter into the standby mode, pressing the standby key will return the heated components to their assigned set-point temperature.

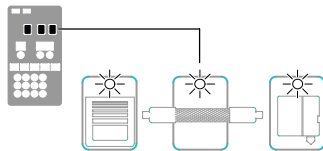
Section 4, *Using Melter Function Keys*

Monitor Component Temperatures

You can check the actual temperature of each heated component—the tank and each hose and gun—using the automatic scan mode or by manually selecting and checking each component.

By default, the melter remains in the automatic scan mode except when:

- The melter is placed into the setup mode
- The set-point temperature of all hoses and guns is set to zero degrees
- A fault occurs

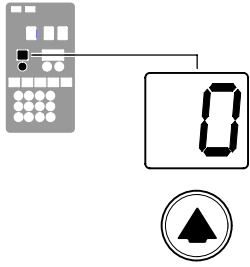


LEDs on component keys

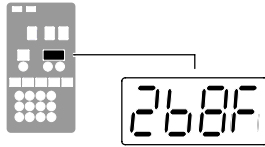
To check component temperatures using the automatic scan mode

1. When the ready LED is on, observe the LEDs on the component keys.
2. When the LED on the key that represents the desired component group (tank, hose, or gun) turns on, observe the left display until it indicates the position number of the specific component you want to check.
3. When the position number of the desired component appears in the left display, observe the right display to determine the component's actual temperature.

Monitor Component Temperatures (contd)



Left display and scroll key



Component temperature display

To manually check a component's temperature

1. Press the key (tank, hose, or gun) that represents the component group you want to check.

The automatic scan stops and the left display indicates the number of the first sequential component in the selected component group. The right display indicates the component's actual temperature.

NOTE: When the tank key is pressed, the left display does not indicate a component number (blank display).

2. If the first sequential component is not the component you want to check, use the left-display scroll key to change to the correct component number.

The right display indicates the actual temperature of the selected component.

3. Press the **Setup** key twice to return to the automatic scan mode.



When you scroll the left display past the number of the last sequential component in a component group, the number of the first sequential component in the next component group appears in the left display.

The melter will return to the automatic scan mode two minutes after the last key is pressed.

When you press the **Tank** key, it is the manifold temperature that is actually indicated in the right display. To check the actual temperature of the tank, simultaneously press the **Tank** key and the left-display scroll key.

The default unit for temperature display is degrees Celsius (C). This may be changed to degrees Fahrenheit using operating parameter 20.

Appendix B, Parameter 20

The LEDs on each component key will change from green to yellow if any component in the component group drops more than 3 °C (5 °F) below its assigned set-point temperature.

You can check the set-point temperature of a component at any time, by pressing the right-display UP scroll key. Holding down the scroll key while the melter is in the automatic scan mode reveals the set-point of each component that is scanned.

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Monitor Melter Faults

The melter alerts the operator to the faults listed in Table 4-2. Faults affect the melter in one of three ways: the heaters turn off; the heaters remain on, but the fault condition persists; or the melter stops functioning.

When a fault occurs, you must diagnose and correct the fault condition and then place the melter back into operation. You can use the fault log to determine the type, order, and relative time of the last ten faults.

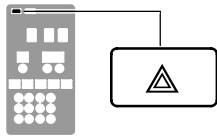
Table 4-2 Melter Faults

Display Code/Sub-code	Name	Affect on Melter	Cause
F1/None	RTD	Heaters turn off	The RTD for the component indicated has failed or the component was disconnected from the melter.
F2/None	Under temperature	Heaters turn off	The actual temperature of the component indicated has dropped below the under temperature delta, which was set using parameter 22.
F3/None	Over temperature	Heaters turn off	The actual temperature of the component indicated has increased beyond the over temperature delta, which was set using parameter 21.
F4/1	RAM test	Melter stops functioning	Internal RAM failure
F4/2	Internal Clock time	Heaters remain on, but fault condition persists	Internal clock failure
F4/4	Internal clock battery backed RAM	Heaters remain on, but fault condition persists	Battery-backed RAM failure
F4/5	Internal clock battery	Heaters remain on, but fault condition persists	Battery-backed RAM battery dead
F4/6	Analog-to-digital	Melter stops functioning	RTD analog-to-digital converter failed
F4/7	Analog-to-digital calibration	Melter stops functioning	RTD analog-to-digital converter could not be calibrated Faulty hose or gun.
F4/8	Main board feedback	Melter stops functioning	Communication failure between main board and CPU
F4/A	Thermostat	Melter stops functioning	Tank or manifold thermostat is open
F4/d	Communications with optional I/O card	Heaters remain on, but fault condition persists	Communication failure between CPU and the optional I/O card
F4/E	Fieldbus communications failure	Alert output (if output option 6 is selected) Melter continues to operate normally.	Fieldbus card failure.

How F1, F2, and F3 Faults are Handled

When the melter detects an F1, F2, or an F3 fault:

1. The automatic scan stops and the melter begins to monitor the potential fault for up to two minutes. The ready and heater LEDs remain on during the two-minute time period. If, at any time during the two-minute period, the melter detects that the fault condition no longer exists, the melter will return to the automatic scan mode.
2. The LED on the affected component key (tank, hose, or gun) turns on to indicate the type of component that has, or is, failing.
3. The right display indicates the type of fault (F1, F2, or F3).
4. The left display indicates, as follows, the component that has, or is, failing.
 - If the LED on the tank key is on, the left display will indicate either 1 for the tank or 2 for the manifold.
 - If the LED on the hose or gun key is on, the left display will indicate the number of the affected hose or gun.
5. If the fault condition still exists at the end of the two-minute monitoring period, the ready LED will turn off, the red fault LED will turn on, the heaters turn off, and the melter records the fault in the fault log. Refer to *To review the fault log* later in this part.



Fault LED (red)

Monitor Melter Faults (contd)

How F4 Faults are Handled

When the melter detects an F4 fault:

1. The ready LED turns off and the red fault LED turns on.
2. All of the component key LEDs (tank, hose, and gun) turn off.
3. The right display indicates F4.
4. The left display indicates a sub-code. Sub-codes classify the fault as being fatal or nonfatal. The affect on the melter of each of these two classes of F4 faults is:

Fatal—The fault LED turns on and stays on and the melter stops functioning completely.

Nonfatal—The fault LED turns on for five seconds, but the heaters and pump continue to operate normally. Nonfatal faults affect the internal clock and the optional I/Os.

Refer to Section 6, *Troubleshooting*, for information about diagnosing F4 faults.

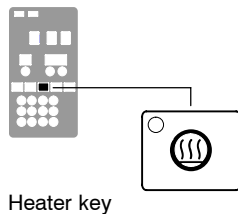
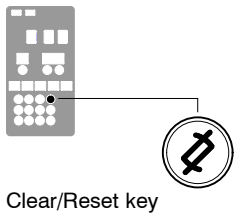
5. The melter records the fault in the fault log. Refer to *To review the fault log*, later in this part.

To put the melter back into operation

1. Diagnose and correct the fault condition. Refer to Section 6, *Troubleshooting*, for information about diagnosing and correcting fault conditions.

NOTE: When a fatal F4 fault exists, the control switch will not function. Remove power to the melter at the local disconnect switch.

2. Return the melter to the automatic scan mode by pressing the **Setup** key twice.
3. Press the **Clear/Reset** key.
4. Press the **Heater** key to turn on the heaters.





To view the temperature of a heated component when an F2 or F3 fault exists, simultaneously press and hold both of the right-display scroll keys.

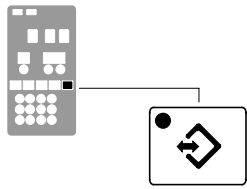
You can temporarily dismiss an F1 fault (RTD) and return to the automatic scan mode by pressing the **Clear/Reset** key. The heaters will, however, remain off. If the fault condition still exists two minutes after pressing the clear/reset key, the fault LED will turn back on.

When an F1 fault code appears, you can determine whether the fault was caused by an open or a shorted RTD by simultaneously pressing both of the right-display scroll keys. If the right display indicates OP, the RTD is open, if it indicates SH, the RTD has shorted.

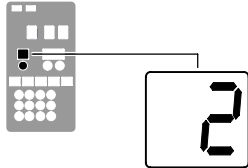
If, for any reason, a component reaches 235 °C (458 °F), an immediate F3 fault will occur (no two-minute monitoring period).

If F4 appears in the right display when you press the clock key, the internal clock function has failed.

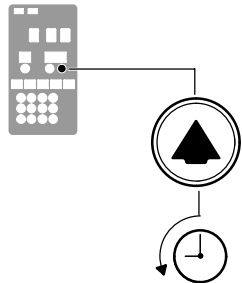
Monitor Melter Faults (contd)



Setup Key



Left display and scroll key



Scrolling through the fault log

To review the fault log

1. Press and hold the **Setup** key.

The automatic scan stops and operating parameter 1 appears in the left display.

2. Scroll the left display to parameter 2 (the fault log).

The right display indicates the last fault that occurred as follows:

- If the last fault was an F1, F2, or F3 fault, then the LED on the affected component key turns yellow.
- If the last fault to occur was an F4 fault, then the LEDs on all of the component keys turn off.
- The right display indicates the log entry for the last fault to occur. Table 4-3 provides the meaning of each digit in the log entry. Following the table are two example fault log entries.

3. Press the right-display scroll key to review each of the remaining nine log entries. Each press of the scroll key displays a progressively older log entry.

NOTE: The fault log only stores the last ten faults. After ten faults occur, the existing log entries are overwritten, beginning with the oldest entry, by the eleventh and following log entries.

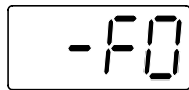
4. Press the **Setup** key to return to the automatic scan mode.

Table 4-3 Fault Log

First Digit	Second and Third Digits	Fourth Digit
<p><i>Component:</i></p> <p>1 = Tank or hose/gun 1 2 = Manifold or hose/gun 2 3 = Hose 3 or gun 3 4 = Hose 4 or gun 4 5 = Hose 5 or gun 5 6 = Hose 6 or gun 6</p>	<p>- F</p>	<p><i>Type of fault:</i></p> <p>0 = Unused log entry 1 = RTD (open or short) 2 = Component under temperature 3 = Component over temperature 4 = Processor or electrical failure</p>

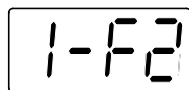
Fault Log Examples

Example 1:



An unused log entry.

Example 2:



If the LED on the tank key were on, this log entry would indicate that the tank is under temperature. If the LED on the hose key were on, this log entry would indicate that hose 1 is under temperature.

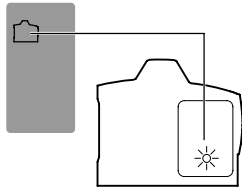


To view the number of heater hours that have elapsed since a log entry was created, simultaneously press both of the right-display scroll keys. The hours are indicated in the right display.

The melter will return to the automatic scan mode if the fault log is left open for a period of two minutes without any key being pressed.

When an F1 fault is the result of a hose/gun pair being disconnected from the melter, two fault log entries are created. The first entry is for the gun and the second entry is for the hose.

Monitor the Level of Hot Melt in the Tank



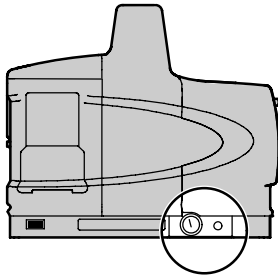
Low-level LED (yellow)

The tank contains a low-level float switch. When the volume of hot melt in the tank drops below one-half of the tank's rated capacity, the float switch turns on the low-level LED located inside the tank key.

Nordson recommends that the tank be kept at least one-half full while the melter is operating.

NOTE: The melter is also equipped with a low-level output that can be connected to a customer-supplied signaling device or process control system. Refer to Section 3, *Installing Melter Outputs*, for information about using the low-level output.

Monitor and Adjust the Operating Air Pressure



Pressure regulator and adjustment screw

The air pressure gauge located on the front of the melter indicates the air pressure that is supplied to the melter's pump. The air pressure must be adjusted to meet the requirements of your manufacturing process.

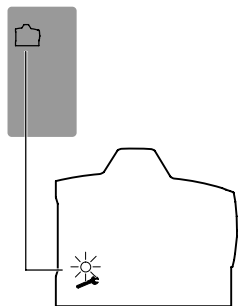
NOTE: The minimum operating air pressure is 0.7 bar (10 psi). Operating the melter with the air pressure set to less than 0.7 bar (10 psi) may cause the pump to function erratically.

Use the adjustment screw located to the right of the pressure gauge to adjust the operating air pressure.

Typically, adjustments to the operating air pressure are made in order to change the volume of hot melt dispensed by the guns. Other factors such as the temperature of the hot melt, the speed of the manufacturing line, and the type and size of the nozzles used on the guns also impact the volume of hot melt that is dispensed.

CAUTION: Do not force the air pressure adjustment screw beyond its normal range of adjustment. Forcing the adjustment screw beyond its normal range of adjustment will damage the pneumatic assembly.

Monitor the Service Interval

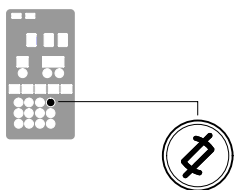


Service LED (yellow)

The melter can be set up so that the service LED located on the left side of the control panel turns on after a customer-defined time period elapses. The service LED may be used to signal the need to change the hot melt filter or to complete any other customer-specified maintenance activity. Once the specified maintenance is performed, the service LED must be reset.

To reset the service LED

With the melter in the scan mode, press the **Clear/Reset** key to turn off the service LED and reset the service interval time.



Clear/Reset key



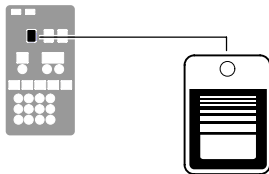
The default setting for the service interval time is 500 hours. Appendix B, *Parameter 5*

Adjusting Component Temperatures

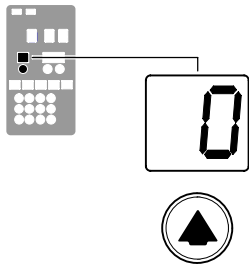
You can adjust the the set-point temperature of heated components using the following methods:

- **Global**—The tank and all hoses and guns are set to the same set-point temperature.
- **Global-by-component group**—All of the hoses or all of the guns are set to the same set-point temperature.
- **Individual Component**—The set-point temperature of the tank and each hose and gun is adjusted independently.

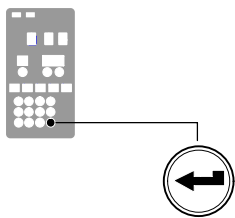
Before adjusting set-point temperatures, confirm that each hose/gun pair is connected to the correct hose/gun module. For example, hose/gun pair 1 should be connected to the first receptacle (lowest) on hose/gun module 1 (lowest module). Refer to *More About Heated Components*, earlier in this section for information about hose/gun modules.



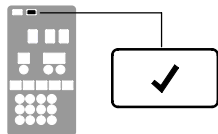
Tank key



Left display and scroll key



Enter key



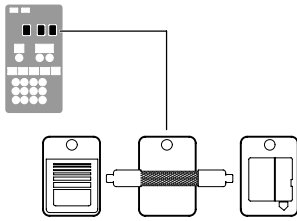
Ready LED

To adjust set-point temperatures using the global method

1. Press and hold the **Tank** key for three seconds.
The left display flashes 1.
2. Scroll the left display to 0 (flashing).
The right display indicates all dashes (- - -) and the LEDs on all of the component keys turn green.
3. Press the **Enter** key.
The right display flashes.
4. Use the keypad to enter the set-point temperature recommended by the manufacturer of the hot melt. Refer to the technical data sheet provided by the manufacturer of the hot melt to determine the optimal set-point temperature.

NOTE: If the keypad or the right-display scroll keys have no effect on the right display, the melter is password protected. You must enter a valid password before you can change set-point temperatures. Refer to *Enter the Melter Password*, later in this section.

5. Press the **Tank** key.
All components begin to heat or cool to the new global set-point temperature. When all of the components reach their set-point temperature, the ready LED turns on (green).



Tank, hose, and gun keys

To adjust the set-point temperature using the global-by-component method

1. Press and hold the **Hose** or **Gun** key for three seconds.

The left display indicates the number of the first sequential hose or gun. The right display indicates the current set-point temperature of the hose or the gun.

2. Scroll the left display to 0.

The right display indicates all dashes (- - -).

3. Press the **Enter** key.

The right display flashes.

4. Use the keypad to enter the set-point temperature recommended by the manufacturer of the hot melt. Refer to the technical data sheet provided by the manufacturer of the hot melt to determine the optimal set-point temperature.

NOTE: If the keypad or the right-display scroll keys have no effect on the right display, the melter is password protected. You must enter a valid password before you can change set-point temperatures. Refer to *Enter the Melter Password*, later in this section.

5. Press the **Enter** key.

The hoses or the guns begin to heat or cool to their new set-point temperature.

To adjust the set-point temperature of an individual component

1. Press and hold the **Tank**, **Hose**, or **Gun** key for three seconds.

If the tank key was pressed, the left display indicates 1 (Flashing). If a hose or gun key was pressed, the left display indicates the number of the first sequential hose or gun (Flashing). The right display indicates the current set-point temperature of the component indicated in the left display.

2. Scroll the left display to the number of the desired component.

The right display indicates the current set-point temperature of the component that you selected in the left display.

3. Press the **Enter** key.

The right display flashes.

To adjust the set-point temperature of an individual component (contd)

4. Use the keypad to enter the set-point temperature recommended by the manufacturer of the hot melt. Refer to the technical data sheet provided by the manufacturer of the hot melt to determine the optimal set-point temperature.

NOTE: If the keypad or the right-display scroll keys have no effect on the right display, the melter is password protected. You must enter a valid password before you can change set-point temperatures. Refer to *Enter the Melter Password*, later in this section.

5. Do *one* of the following:
 - To register the new set-point temperature and then move on to change the set-point temperature of the next sequential component, press the **Enter** key and then repeat steps 4 and 5.
 - To register the new set-point temperature and return to the automatic scan mode, go to step 6.
6. Press any component key (tank, hose, or gun).

The selected component begins to heat or cool to its new set-point temperature.



If you enter a valid set-point temperature for a hose/gun that is not connected to the melter or if you enter a set-point temperature that is out of range, the right display will indicate dashes (----) for three seconds and then change back to the original set-point temperature.

When the right display is flashing, you can quickly change the current set-point temperature to 0 degrees (off) by simultaneously pressing both of right-display scroll keys.

After removing a hose or a gun, use the individual component method of set-point temperature adjustment to set the component's temperature to zero degrees (off). This will avoid causing an F1 fault when a hose or gun is added.

The factory set-point temperature of the tank is 175 °C (350 °F). The factory set-point temperature of all others components is zero degrees (off).

When the units of temperature is set to degrees Celsius, the minimum and maximum set-point temperatures are 40 °C and 230 °C. When the units of temperature are set to degrees Fahrenheit, the minimum and maximum set-point temperatures are 100 °F and 450 °F.

When using the right-display scroll keys to adjust a set-point temperature, the right display automatically increments between 0, 175, and 230 °C or between 0, 350, and 450 °F.

If you make a mistake while you are changing a set-point temperature, but you have not yet pressed the enter key, press the **Clear/Reset** key to reset the right display to the original temperature.

The melter will exit the setup mode and return to the automatic scan mode two minutes after the last key is pressed.

A global set-point temperature of zero degrees (Celsius or Fahrenheit) turns all components off.

When scrolling through component numbers in the left display, component numbers that are associated with unused hose/gun receptacles are skipped.

The melter stores a record of the last ten changes made to the set-point temperatures (and operating parameters) in the change history log.

Section 3, Installation, Review Parameter and Set-point Temperature Changes

You can save set-point temperature changes by simultaneously pressing the **1** key and the **Setup** key.

Section 3, Operation, Save and Restore Melter Setting

Enter the Melter Password

If the melter is password protected, a valid password must be entered before any set-point temperature or melter parameter can be changed.

To enter a melter password

1. Press the **Setup** key.

The left display indicates parameter 0 (flashing) and the right display indicates 4000.

2. Press the **Enter** key.

The right display begins flashing.

3. Use the keypad to enter the melter password.

4. Press the **Enter** key.

One of the following occurs:

- If the password is correct, the left display indicates parameter 1.
- If the password is incorrect, the left display remains at 0 and the right display momentarily indicates dashes (----) and then returns to 4000.

If the password is incorrect, re-enter it and then press the **Enter** key.



The melter will automatically revert back to the password-protected mode two minutes after the last key press (any key). To force the melter back into the password protected mode before two minutes has elapsed, press the **Setup** key twice.

The melter password is created and enabled/disabled during system setup.

Section 3, *Setting Up the Melter*

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Using Melter Function Keys

The control panel provides the following standard and special function keys.

Standard function keys

- Heater
- Pump
- Setup

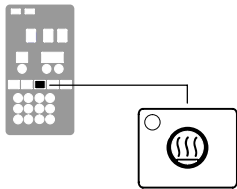
Special function keys

- Seven-day clock
- Standby



CAUTION: Unintentionally activating function keys can, under the correct circumstances, have undesirable effects on the melter or the manufacturing process. Only personnel who are familiar with the melter's setup and its connection with the manufacturing process should use the function keys. Improper use of the function keys can result in erratic process behavior or personal injury.

Heater Key

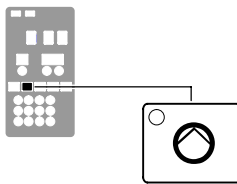


Heater key

Use the heater key to manually turn the component heaters on and off. Pressing the heater key overrides the control (on or off) of the heaters by either the seven-day clock feature or a remote input. The LED on the heater key turns on when the heaters are on.

When a fault occurs (Refer to *Monitor Melter Faults*, earlier in this section) the heaters automatically turn off. The heater key is used to turn the heaters back on after correcting a fault condition.

Pump Key



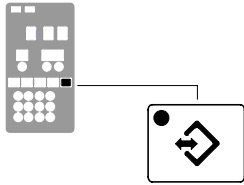
Pump key

Use the pump key to start or stop the pump. The LED on the pump key turns on (green) when the pump is running.

If the automatic pump on feature (parameter 8) is disabled, then the pump key must be used to start the pump when the melter is ready.

If any of the inputs are set up to use the pump enable/disable control option (option 3), the pump will not start until the pump key is pressed (LED on) *and* the correct voltage is applied to the input contacts. If the pump is enabled, but the input voltage is not present, the pump LED will flash green.

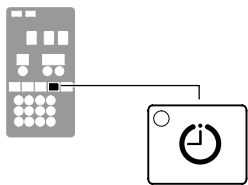
Setup Key



Setup key

Use the setup key to place the melter into and take the melter out of the setup mode. When the melter is placed into the setup mode, the automatic scan stops and the left and right displays are used to select and read or edit operating parameters.

Seven-day Clock Key



Seven-day clock key

Use the seven-day clock key to turn the melter's clock feature on and off. When the clock is on, the temperature of each heated component is automatically regulated based on a set of user-defined schedules.

To accommodate daily shift work and non-working days, four clock schedules are available. Schedules 1, 2, and 3 are used to specify when the heaters should turn on and off or when the melter should enter and exit the standby mode. Schedule 0 is used to keep the melter in the last condition dictated by the clock (heaters on or off, or standby).

When a clock schedule calls for the heaters to be on, the heaters are regulated at their pre-assigned set-point temperatures. When the clock activates the standby mode, the set-point temperature of each component is temporarily reduced by a pre-set standby delta.

Refer to Appendix B, *Operating Parameters, Seven-day Clock*, for information about setting up the seven-day clock and the standby delta.



If the melter is switched off while the clock is on, the clock will automatically turn back on the next time the melter is switched back on.

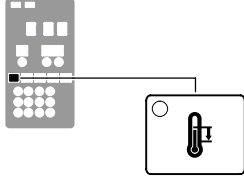
If the heaters are manually turned off at the time that a clock schedule calls for the heaters to be on, the heaters will not turn back on until the next clock schedule calls for them to be on.

The clock will still operate when the melter is faulting or is in the setup mode.

If F4 appears in the right display when you press the clock key, the internal clock function has failed. Section 7, *Troubleshooting*

Using Melter Function Keys *(contd)*

Standby Key



Standby key

Use the standby key to manually place the melter into, and take it out of, the standby mode. Using the standby mode during periods of time when the melter is inactive helps to conserve energy and allows heated components to quickly return to their set-point temperatures when the melter is once again needed.

When the melter is placed into the standby mode, the temperatures of all components are reduced down from their set-point temperature by a pre-set standby delta. The melter will remain in the standby mode until the standby key is pressed or the function of one of the operating parameters takes the melter out of the standby mode.

If the melter was set up to use the manual standby timer (parameter 26), pressing the standby key will place the melter in the standby mode for the period of time specified by the timer. After the manual standby time has elapsed, the melter will once again begin heating all of the components to their assigned set-point temperature.

Using the standby key overrides the control of the melter (on or off) by the seven-day clock or a remote input.

Refer to Section 3, *Operation Setting Up the Melter*, and to Appendix B, *Operating Parameters*, for information about setting the standby delta and the standby timer.



The melter may also be set up to enter the standby mode using a variety of operating parameters.

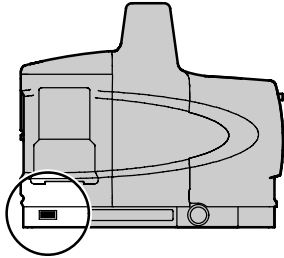
Appendix B, Parameters 23, 24, 25, 26, 30–33, 57, 62, and 67

Whenever manual standby is enabled, the standby LED blinks.

Appendix B, Parameter 26

Shutting Down the Melter

Shut down the melter when it will not be used for an extended period of time.



Melter control switch (on/off)

To shut the melter down

1. Switch the melter off.

The automatic pressure discharge (APD) valve relieves the hydraulic pressure in the manifold back to the tank.

2. Disable the guns as follows:

- Air-operated guns: Turn off the air supply to the guns.
- Electric guns: Turn off the gun driver, pattern controller, or timer.

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Section 5

Maintenance



WARNING: Allow only personnel with appropriate training and experience to operate or service the equipment. The use of untrained or inexperienced personnel to operate or service the equipment can result in injury, including death, to themselves and others, and damage to the equipment.

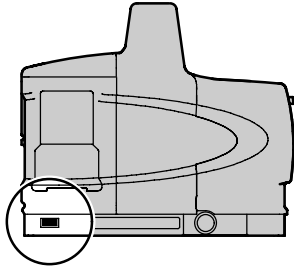
Table 5-1 describes the preventive maintenance tasks required to keep ProBlue melters operating within their specified limits and to prevent equipment malfunctions. For information about maintaining optional equipment that was supplied by Nordson, refer to the instructions provided with the equipment.

If the melter stops operating or is operating incorrectly, refer to Section 6, *Troubleshooting*, for information about diagnosing common problems and performing corrective maintenance.

Table 5-1 Preventive Maintenance Tasks

Task	Frequency	Reference
Relieving system pressure	Before performing any maintenance task that requires opening a hydraulic connection or port	<i>Relieving System Pressure</i>
Lockout external communications	Before performing any maintenance task	<i>Locking Out External Communications</i>
Cleaning the exterior of the melter, hoses, and guns	Daily	<i>Cleaning the Melter</i>
Replacing the filter	<ul style="list-style-type: none"> As needed When changing the type or grade of hot melt 	<i>Replacing the Filter</i>
Cleaning the tank	<ul style="list-style-type: none"> When changing the type or grade of hot melt When excessive charring occurs 	<i>Cleaning the Tank</i>
Removing the melter from the sub-base	<ul style="list-style-type: none"> As needed 	<i>Removing the Melter from the Sub-base</i>

Relieving System Pressure



Melter control switch (on/off)

Before disconnecting any hydraulic fitting or opening any pressurized port, always complete the following procedure to safely relieve hydraulic pressure that may be trapped inside the melter, hoses, and guns.

To relieve system pressure

1. Switch the melter off.

See Figure 5-1.

2. Lower the drain chute and place a suitable waste container under the drain port.
3. Using a flat-tip screwdriver, *slowly* turn the drain valve counterclockwise three turns.
4. Turn the drain valve clockwise until it stops (valve closed), and then wipe off and raise the drain chute.
5. Trigger the guns until hot melt no longer flows from the guns.

Locking Out External Communications



WARNING: Disable external inputs and fieldbus communications (if installed) with the melter before performing maintenance. Failure to disable external inputs or fieldbus communications with the melter can result in personal injury due to unexpected operation of the melter while performing maintenance.

To lockout external communications with the melter

- Set the control option for operating parameter 14 to 1 (Enabled).

Refer to Section 3, *Setting Up the Melter*, for information about changing operating parameters.

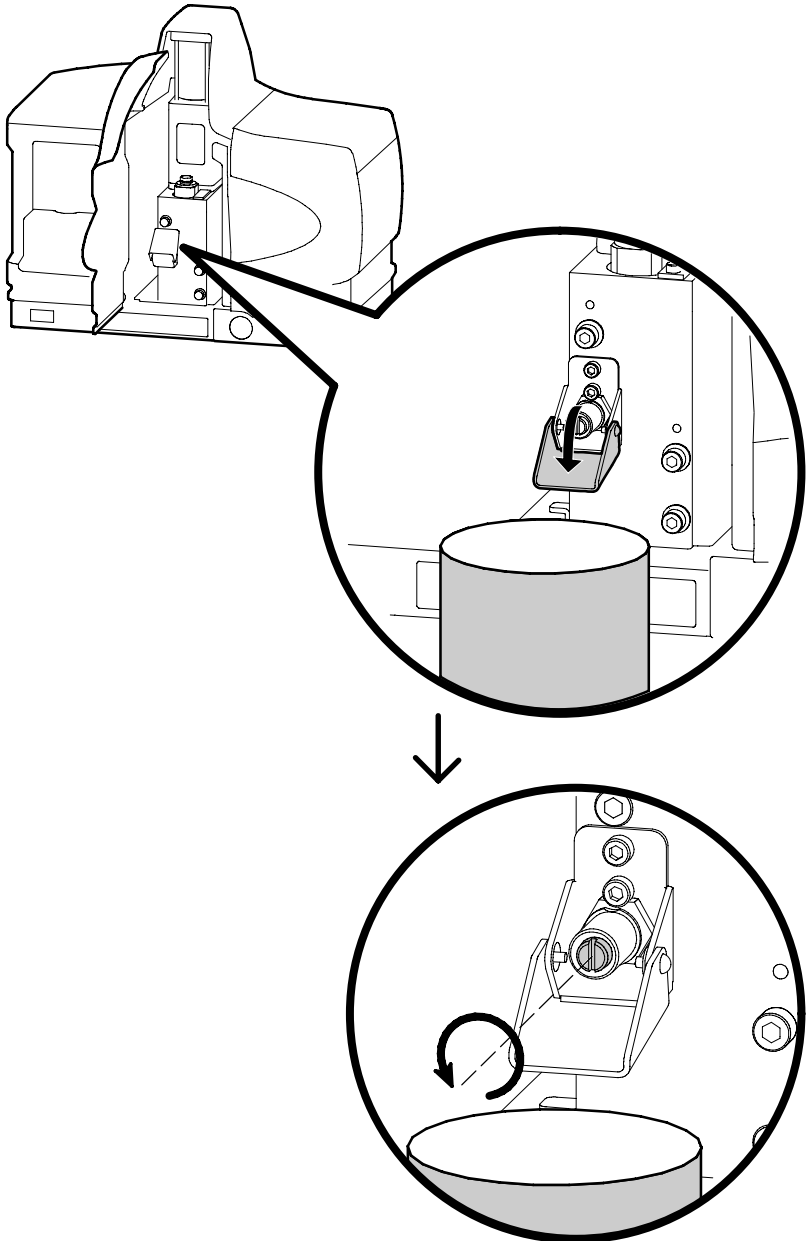


Figure 5-1 Lowering the drain chute and opening the drain valve

Cleaning the Melter

To prevent components from overheating due to heat build-up or loss of air circulation, regularly remove any hot melt that collects on the exterior of the melter, hoses, and guns.

If hot melt inadvertently spills inside the pump compartment or other interior spaces, the exterior panels can be removed in order to clean out the spilled hot melt.



WARNING: Risk of electricution and fire! Do not clean the melter with a direct stream of water or steam. Use only water or an appropriate, non-flammable cleaning solution that is applied using a clean cloth. Cleaning the melter using a direct stream of water or steam or a flammable solvent can result in property damage and personal injury, including death.

To clean the exterior of the melter

- Use citrus-based or other cleaning compounds that are compatible with polyester.
- Apply cleaning compounds using a soft cloth.
- Do not use pointed or sharp tools to clean the exterior surface.

To remove and replace the exterior panels

See Figure 5-2.

1. De-energize the melter. Refer to Section 1, *De-energizing the System*.
2. Turn off the plant air supply to the melter and then disconnect the air filter from the back of the melter.
3. Open the pump enclosure door (The door must be open in order to remove the top panel.).
4. Loosen the screws that secure panels P1, P2, P3, and P4 to the melter. Panel P4 has three screws.

NOTE: The location of the screws on the P7 and P10 melter vary slightly from Figure 5-2.

5. Remove each panel by sliding or rotating it in the direction shown in Figure 5-2.
6. To replace the panels, complete steps 2 through 4 in reverse order and then re-energize the system.

NOTE: When re-installing panel P4, ensure that the metal hooks on P4 engage the hinge pin before rotating the panel back into position.

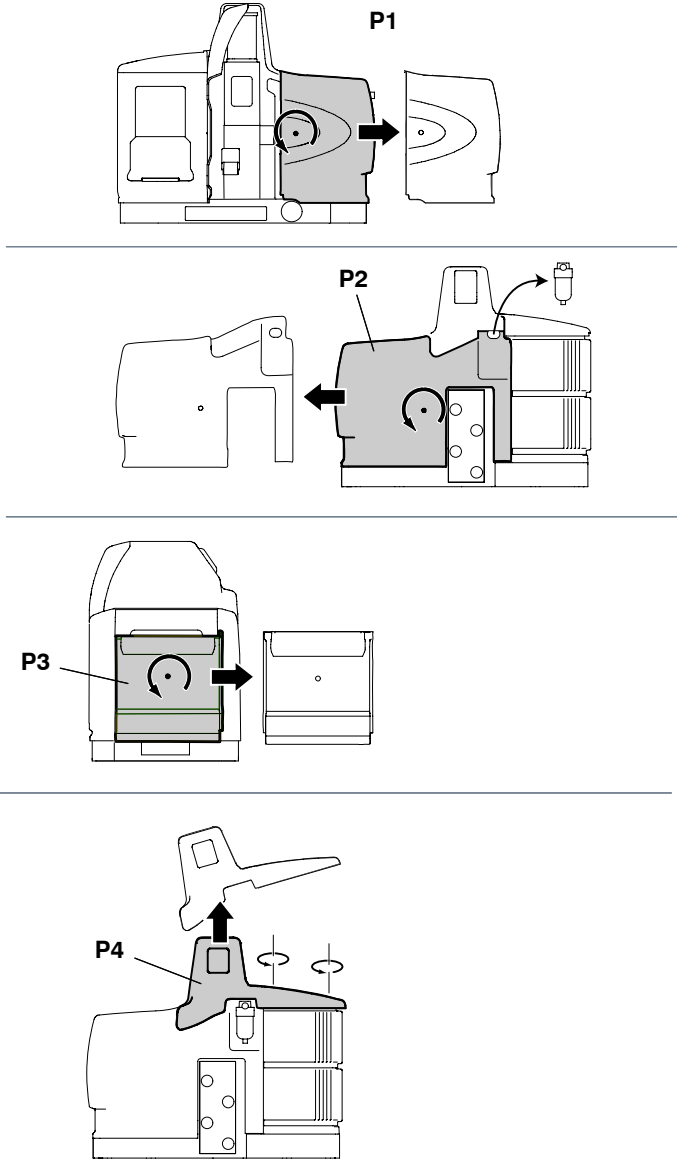
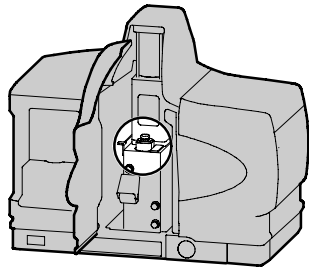


Figure 5-2 Removing the exterior panels

Replacing the Filter



Filter location

ProBlue melters are equipped with a 100-mesh (.15 mm) disposable hot melt filter. The filter removes debris and char from the hot melt as it flows from the tank. Hot melt flows from the inside to the outside of the filter, trapping contaminants inside the filter. There is no need to back-flush or clean the filter.

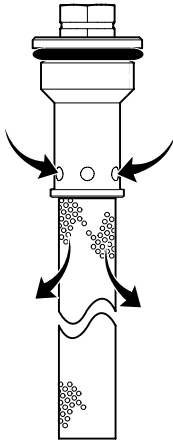
When the filter reaches the end of its service life, it should be replaced. The factors that determine the service life of the filter are:

- the type, grade, and purity of the solid-form hot melt
- the set point temperature of the tank
- the period of time that the hot melt remains in the tank

The filter should also be replaced when making the change to a different type or grade of hot melt.

To determine the optimal service life for the filter, monitor and compare the total number of hours that the heaters are on with observations of:

- the purity of the dispensed hot melt
- increases in operating pressure
- the frequency of gun nozzle replacement or cleaning



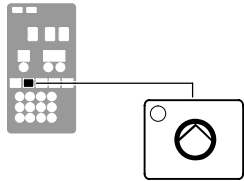
Hot melt flow path

Monitoring the Life of the Filter

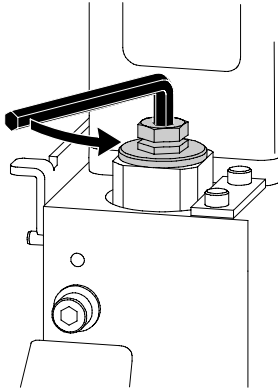
As an aid to ensuring that the filter is replaced at the end of its service life, the melter is equipped with a service LED that turns on at the end of a customer-defined time period. You can use this feature to alert you when it is time to change the filter. Refer to Section 3, *Setting Up the Melter*, for information about the service interval time.

When the service LED turns on, replace the filter, and then press the **Clear/Reset** key to reset the timer and turn off the service LED.

NOTE: The melter must be in the automatic scan mode when you press the Clear/Reset key.



Pump key



Loosening the filter

To replace the filter

NOTE: Instructions for replacing the filter are also provided on the inside of the pump enclosure door.

1. Relieve the system pressure. Refer to *Relieving System Pressure*, at the beginning of this section.
2. Use a 8 mm hex wrench or an adjustable wrench to loosen (counterclockwise) and then remove the filter.
3. Properly dispose of the old filter.
4. Confirm that the O-ring on the new filter is in good condition.
5. Screw the filter into the pump body and then tighten the filter to 4.5 N•m (40 in.-lb).
6. Resume normal operation.

Cleaning the Tank

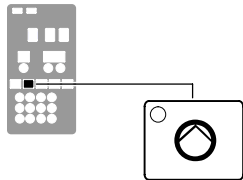
To avoid the problems that can occur when different hot melt materials are mixed or when hot melt char forms in the tank, clean the tank when:

- changing to a different type of hot melt
- excessive char builds up inside the tank

NOTE: The tank cleaning procedures provided in this section require that an appropriate hot melt cleaning fluid be used to soften or dissolve residual hot melt. Each type of hot melt should be supplied with a technical data sheet that names the appropriate cleaning fluid. If the technical data sheet is not available, contact the hot melt supplier.

To clean the tank when changing hot melt

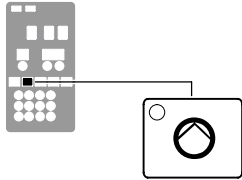
1. Operate the melter normally until the tank is empty.
2. Allow the melter to heat or cool to the temperature recommended by the manufacturer of the hot melt cleaning fluid.
3. Press the **Pump** key to stop the pump.
4. While wearing the appropriate protective equipment, wipe any residual hot melt from the inside of the tank.
5. Add the appropriate type and quantity of hot melt cleaning fluid to the tank.
6. Press the **Pump** key to start the pump.
7. Following the instructions provided with the cleaning fluid, pump all of the cleaning fluid from the tank.
8. Return the melter to normal operation and pump a minimum of one tank volume of the new type of hot melt through the tank, hoses, and guns.



Pump key

To clean the tank of excessive char

1. Remove the old hot melt and loose char as follows:
 - a. Operate the melter normally until the tank is empty.
 - b. Allow the melter to heat or cool to the temperature recommended by the manufacturer of the hot melt cleaning fluid.
 - c. Press the **Pump** key to stop the pump.
 - d. While wearing the appropriate protective equipment, wipe any residual hot melt and loose char from the inside of the tank.
 - e. Add the appropriate type and quantity of cleaning fluid to the tank.



Pump key

See Figure 5-1.

2. Lower the drain chute and place a suitable waste container under the drain valve.
3. Press the **Pump** key to start the pump.
4. Using a flat-tip screwdriver, *slowly* turn the drain valve counterclockwise until cleaning fluid begins to flow from the drain.
5. Continue to slowly open the drain valve to create a controlled flow of cleaning fluid from the drain.
6. Add cleaning fluid to the tank and clean the tank according to the instructions provided with the cleaning fluid.
7. Press the **Pump** key to stop the pump.
8. Turn the drain valve clockwise until it stops (valve closed).
9. Wipe any cleaning fluid or hot melt residue away from the drain chute and then raise the chute.
10. Change the filter. Refer to *Replacing the Filter*, earlier in this section.

Removing the Melter from the Sub-base

NOTE: For 400/480 VAC melters, refer to Appendix E.

1. Switch the melter off.
2. Relieve system pressure. Refer to *Relieving System Pressure* earlier in this section.
3. Disconnect the hoses.

See Figure 3-5.

4. Disconnect the power cable and ground lead.

See Figure 3-4.

5. Turn the locking screws counterclockwise approximately 16 turns until they stop.
6. Slide the melter forward, and then lift it clear of the sub-base (See Figure 3-4).

Section 6

Troubleshooting



WARNING: Allow only personnel with appropriate training and experience to operate or service the equipment. The use of untrained or inexperienced personnel to operate or service the equipment can result in injury, including death, to themselves and others, and damage to the equipment.

This section provides quick-reference information for diagnosing melter faults indications as well as comprehensive melter diagnostic information that is provided in flowchart format. When required, the troubleshooting flowchart will refer you to diagnostic procedures provided later in this section.

If you cannot resolve the problem using the troubleshooting flowchart, contact your Nordson representative for technical assistance.

400/480 Volt Melters

Refer to Appendix E for information about troubleshooting the transformer, 400/480 volt heater information, and information about parts that are specific to 400/480 volt melters.

NOTE: With the exception of power supply and heater failure problems, the information provided in this section applies to all ProBlue adhesive melters.

Safety

- Never disconnect cables from, or reconnect cables to, the main board while the melter is energized.
- Before breaking any hydraulic connection, always relieve system pressure. Refer to Section 5, *Relieving System Pressure*.
- Refer to the safety information provided with optional equipment.
- If the melter is removed from its sub-base for diagnostic checks or service, ensure that the ground lead between the chassis and the sub-base is re-attached when the melter is reconnected to the sub-base.

Melter Faults

Table 6-1 lists the four types of melter faults, potential causes, and expected corrective actions.

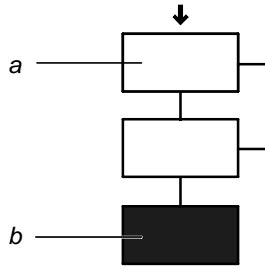
Table 6-1 Melter Faults

Display Code/Sub-code	Name	Affect on Melter	Cause	Corrective Action
F1/None	RTD	Heaters turn off	The RTD for the component indicated has failed or the component was disconnected from the melter.	Replace RTD Check hose/gun connections See flowchart T.2
F2/None	Under temperature	Heaters turn off	The actual temperature of the component indicated has dropped below the under temperature delta, which was set using parameter 22.	Check for conditions that may cause a drop in ambient temperature Raise the set-point temperature of the component Replace RTD See flowchart T.2
F3/None	Over temperature	Heaters turn off	The actual temperature of the component indicated has increased beyond the over temperature delta, which was set using parameter 21.	Replace RTD See flowchart T.2
F4/1	RAM test	Melter stops functioning	Internal RAM failure	Replace CPU
F4/2	Internal Clock time	Heaters remain on, but fault condition persists	Internal clock failure	Replace CPU
F4/4	Internal clock battery backed RAM	Heaters remain on, but fault condition persists	Battery-backed RAM failure	Replace CPU
F4/5	Internal clock battery	Heaters remain on, but fault condition persists	Battery-backed RAM battery dead	Replace CPU
F4/6	Analog-to-digital	Melter stops functioning	RTD analog-to-digital converter failed	Replace main board or CPU
F4/7	Analog-to-digital calibration	Melter stops functioning	Failed hose or gun RTD analog-to-digital converter could not be calibrated	Replace hose or gun. Note: Set setpoint to zero to avoid F1 fault. Replace main board or ribbon cable, or CPU
F4/8	Main board feedback	Melter stops functioning	Communication failure between main board and CPU	Replace main board, ribbon cable, or CPU

Continued...

Display Code/Sub-code	Name	Affect on Melter	Cause	Corrective Action
F4/A	Thermostat	Melter stops functioning	Tank or manifold thermostat is open	Replace thermostat, J7 harness, or main board
F4/d	Communications with optional I/O card	Heaters remain on, but fault condition persists	Communication failure between CPU and the optional I/O card	Replace the I/O card or CPU
F4/E	Fieldbus communications failure	Alert output (if output option 6 is selected) Melter continues to operate normally.	Fieldbus card failure.	Replace the Fieldbus card

Using the Troubleshooting Flowchart



Troubleshooting question and action blocks

a) Question b) Action

The flowchart, which is provided at the end of this section, is designed to assist you in diagnosing and correcting a complete or partial stop in hot melt output from the guns. The chart is organized in a simple question-action block format. If your response to a question is yes (Y), continue downward in the chart to the next question or action block. If your response is no (N), continue to the right to the next question or action block. All diagnostic paths within the chart end with an action block that specifies one of the following three courses of action:

- Refer to information provided elsewhere in this manual
- Replace a component
- Complete a diagnostic procedure (DP.x)

To return your melter to service as quickly as possible, the chart is designed under the assumption that it is preferable to immediately replace a faulty assembly as opposed to conducting detailed diagnostics and repair of the assembly while the melter is out of service.

Use of the chart assumes that the melter is installed correctly and that it is set up to support the current manufacturing process. Refer to Section 3, *Installation*, for information about installing and setting up the melter.

Troubleshooting Quick-checks

Before using the troubleshooting charts confirm:

- whether or not service was recently performed on the melter or the melter's settings were recently adjusted.
- the correct voltage plug is installed on terminal J1. Refer to Section 4, *Installation*, for information about selecting the correct voltage plug.
- external inputs (if used) are functioning properly.
- the standby or clock functions are not turned on (if not required or expected at the current time).

Returning the Melter Setup to Factory Settings

By returning the melter to its factory setting many common melter problems can be isolated to either a problem with the melter settings or the melter hardware.

To return the melter to its factory settings, simultaneously press and hold the Setup key and the right-display UP arrow key, and then, while holding down these keys, cycle the melter control switch off and on. When the melter restarts, release the two keys.

Identifying Electrical Components

Tables 6-2 through 6-5 describe the circuit board indicators, connection points, and test points that are referred to in the troubleshooting flowchart. Figure 6-1 illustrates the location of each of these circuit board components.

Table 6-2 Main PCA

Item Number	Type	Description
<i>Indicators</i>		
DS1	LED (Yellow)	Control signal for tank heater
DS2	Neon (Orange)	Power available for tank and manifold heaters after fuses F1/F2
DS3	LED (Yellow)	Control signal for manifold heater
DS4	Neon (Orange)	Power available into main board after fuses F3/F4
DS5	LED (Green)	+5 VDC control voltage present on board
<i>Fuses</i>		
F1/F2	—	15 A, 250 V, Fast-acting, 1/4 inch
F3/F4	—	2 A, 250 V, Slow-blow, 5 x 20 mm
<i>Connection Points</i>		
J1/J2	Jumper	Voltage configuration plug with and without neutral
TB1	Input	AC power into board
TB2	Input/output	Output contacts 1–6. Input contacts 7–14
J5	Input/output	Control signal between main board and 6-hose expansion board
J6	Output	Power harness for tank and manifold heaters
J7	Input/Output	Control signal harness (RTD, control switch, thermostat, solenoid). See Figure 6-2 for pin-out.
J8	Input/Output	Analog/digital signal cable
J9	Output	Control signal to 400/480 VAC transformer
J10	Input	AC power out to 6-hose expansion board

Table 6-3 CPU board

Item Number	Type	Description
<i>Indicators</i>		
Red LED	—	Indicates that CPU board has failed
Green LED	—	+ 5 VDC control voltage is present at the CPU board
<i>Connection Points</i>		
J1	Input/Output	Control signal between main PCA and CPU
J5	Input/Output	Control signal between I/O expansion card or Anybus card and the CPU
<i>Test Points</i>		
TP2/TP4	Contacts	4.75–5.25 V control voltage present at CPU

Table 6-4 Hose/Gun Power Module

Item Number	Type	Description
<i>Indicators</i>		
DS1	LED (Yellow)	Control power present for odd numbered hose
DS2	LED (Yellow)	Control power present for odd numbered gun
DS3	LED (Yellow)	Control power present for even numbered hose
DS4	LED (Yellow)	Control power present for even numbered gun
DS5	Neon (Orange)	AC power present at module for odd hose/gun pair
DS6	Neon (Orange)	AC power present at module for even hose/gun pair
<i>Fuses</i>		
F1/F2 and F3/F4	—	6.3 A, 250 V, Fast-acting, 5 x 20 mm

Table 6-5 6-Hose Expansion Board (optional)

Item Number	Type	Description
<i>Connection Points</i>		
J1	Input/output	Control signal between 6-hose expansion board and main board J5
J2	Input	AC power input to 6-hose expansion board from main board J10

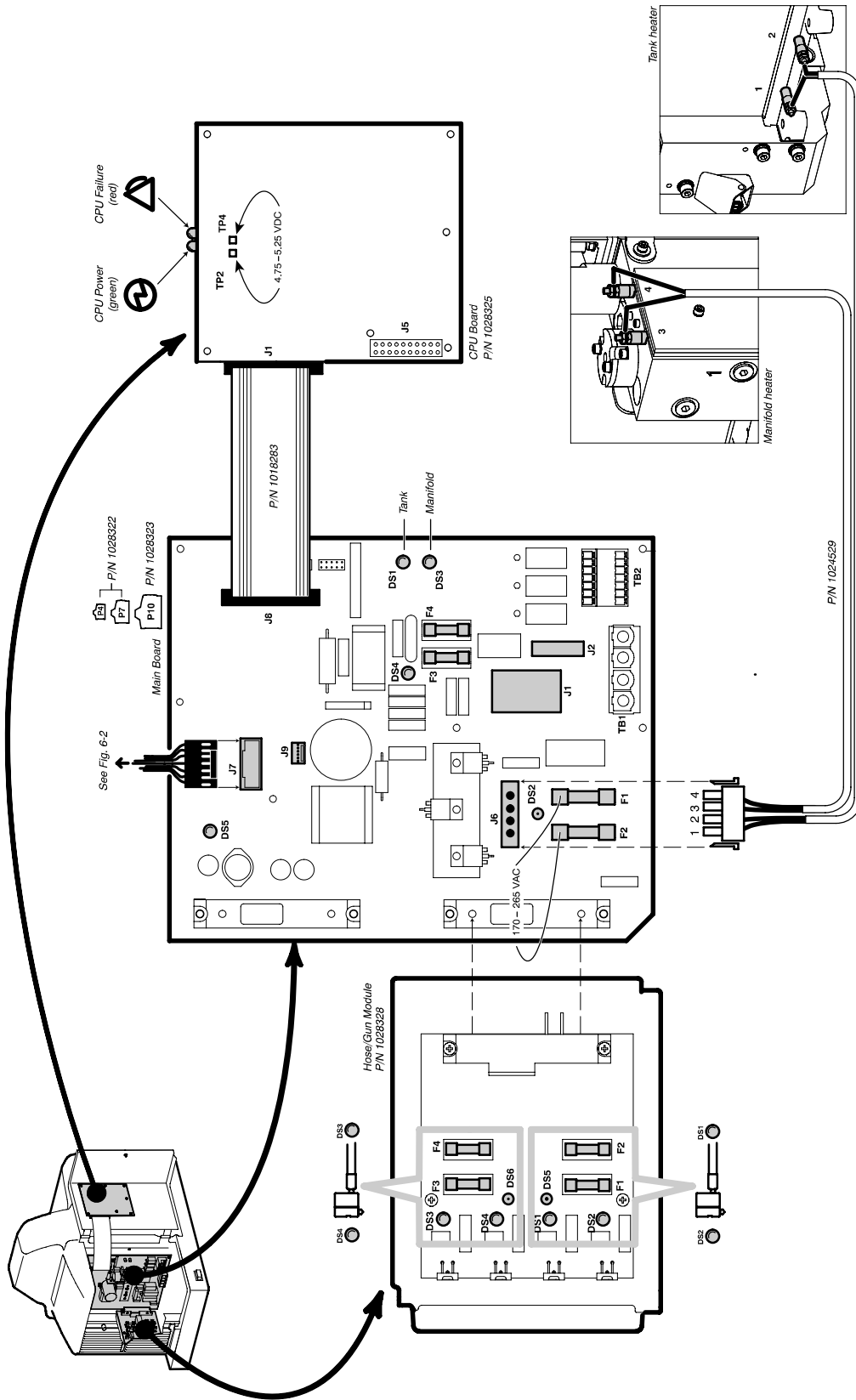


Figure 6-1 Electrical components

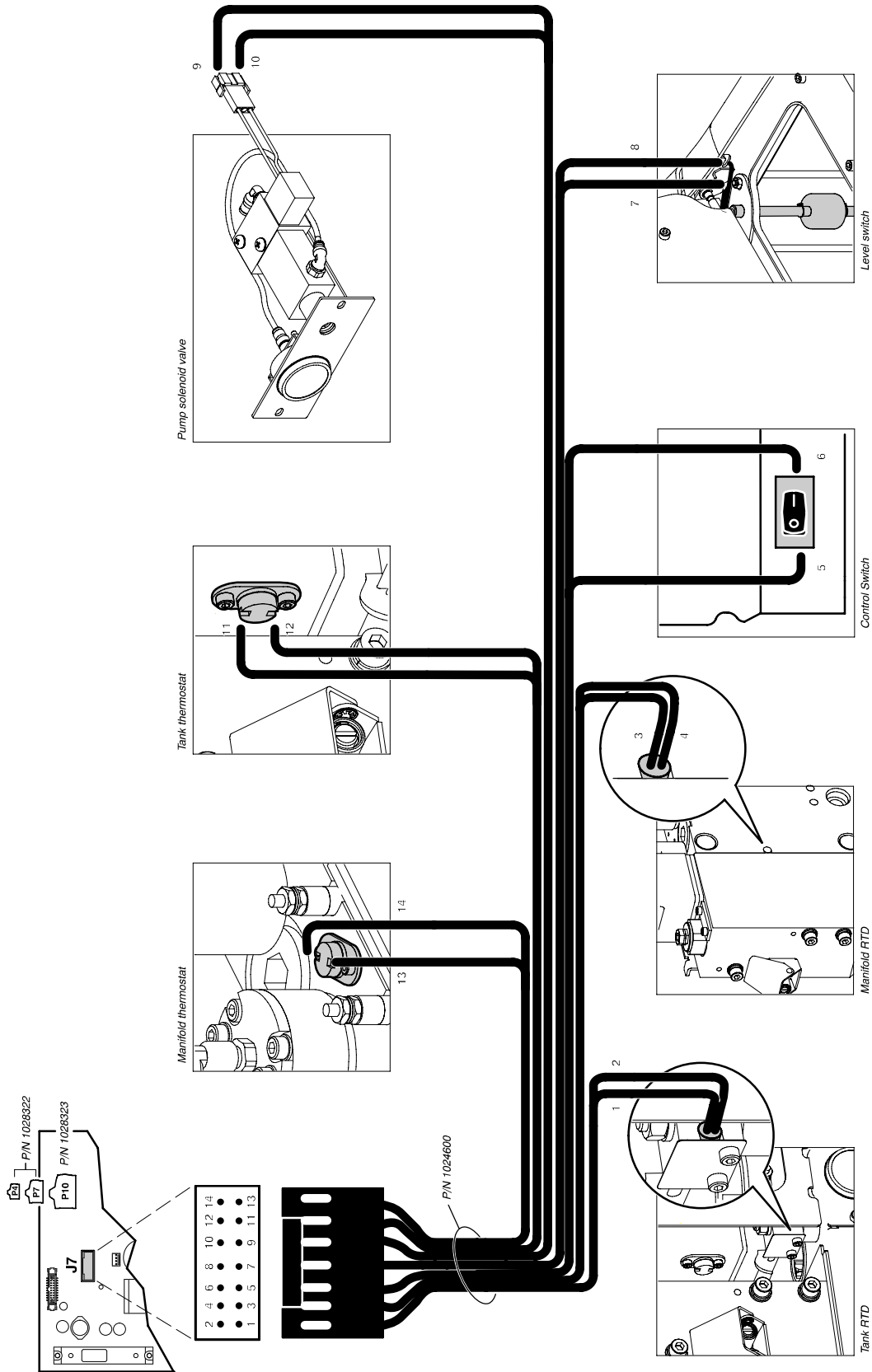


Figure 6-2 Power and control harness

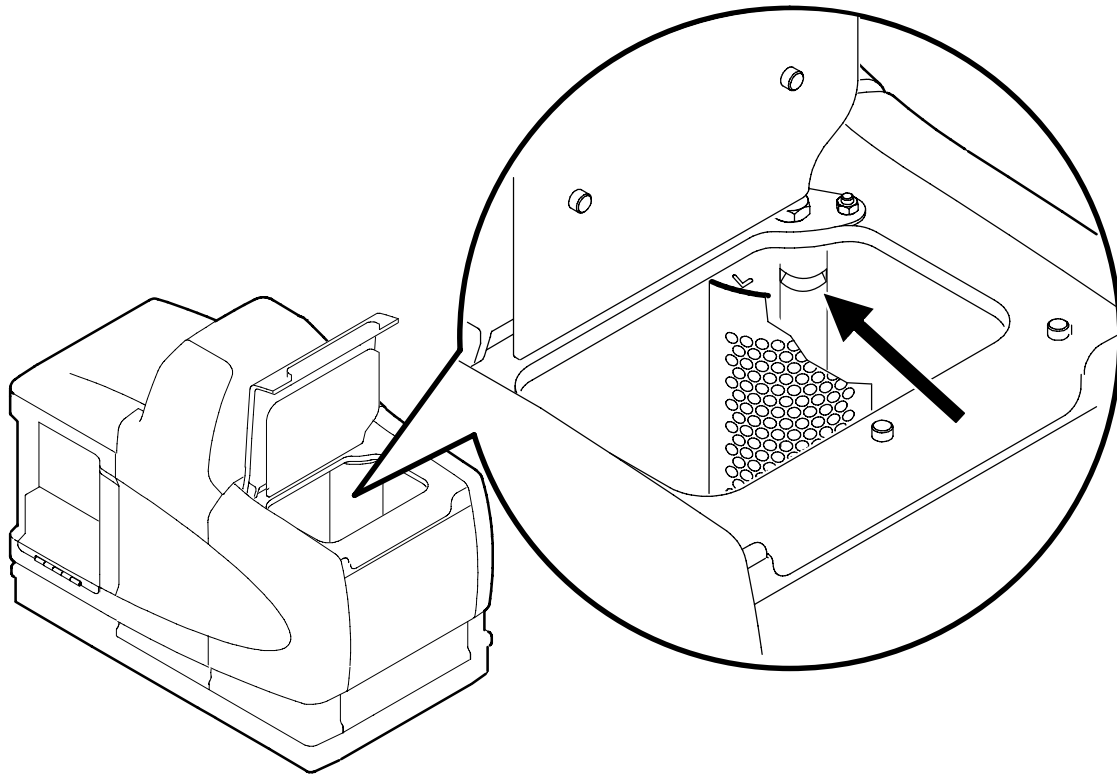


Figure 6-3 Location of the return port

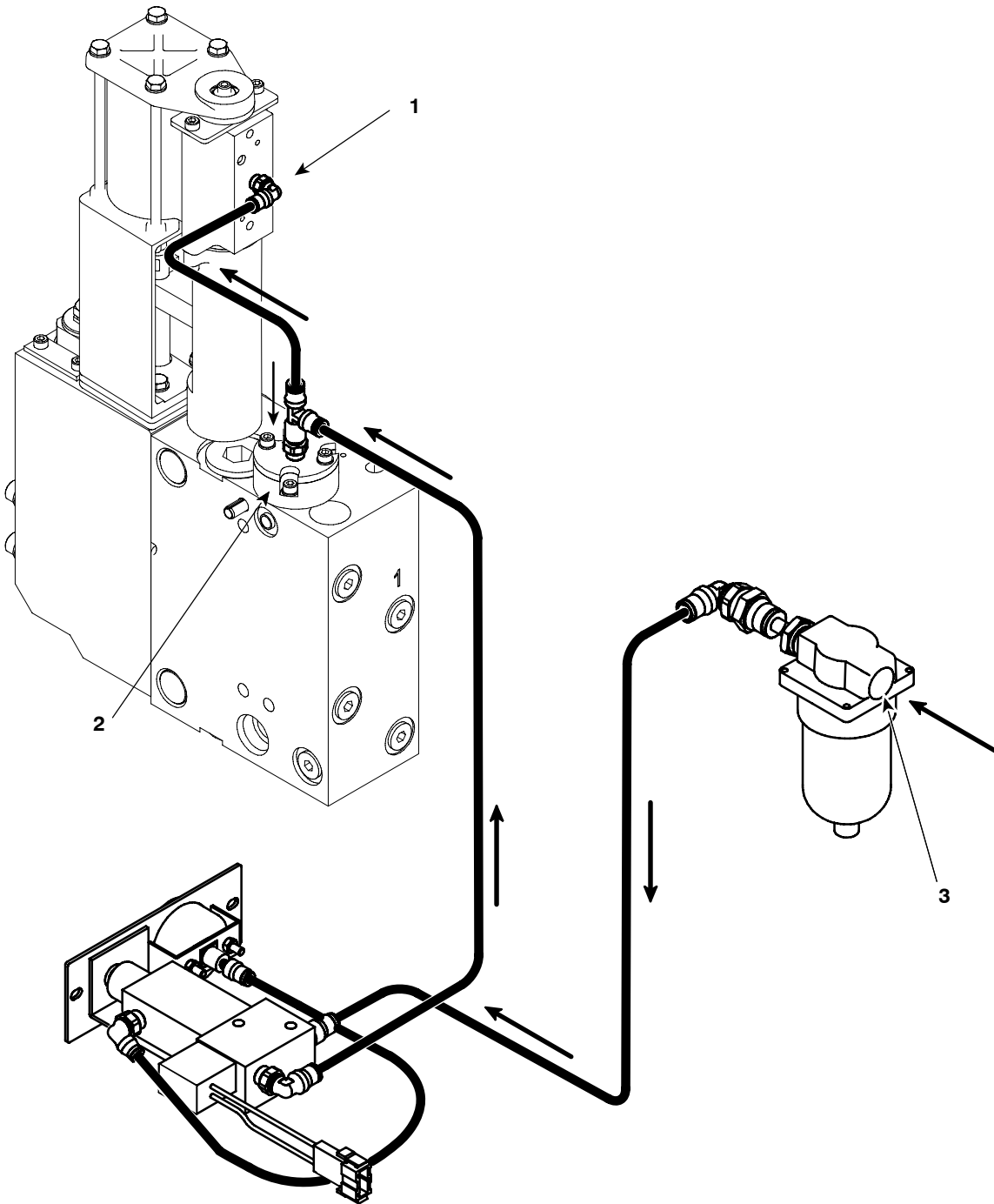


Figure 6-4 Pneumatic flow diagram

- 1. Pump air inlet
- 2. Pressure discharge valve
- 3. Melter air supply inlet

Diagnostic Procedures

Use these diagnostic procedures when directed by the troubleshooting flowchart. If a diagnostic procedure fails to identify or correct the problem, return to the troubleshooting flowchart or contact your Nordson representative for technical assistance.

DP.1 Isolate a Failed Control Component

1. De-energize the melter. Refer to Section 1, *Safety*.

See Figure 6-1.

2. Disconnect the ribbon cable (P/N 1018283) from the main board.
3. Remove all of the hose/gun modules.
4. Re-energize the melter.
5. Check LED DS5 on the main board, and then do *one* of the following:
 - If DS5 does *not* illuminate, replace the main board (P4 or P7 melters, use P/N 1028322; P10 melter, use P/N 1038323).
 - If DS5 does illuminate, go to step 6.
6. Complete the following steps to isolate the cause of the problem by individually checking *each* of the components that were disconnected from the main board in steps 2 and 3 (CPU and each hose/gun module).
 - a. De-energize the melter.
 - b. Reconnect each component (ribbon cable, and then each hose/gun module).
 - c. Re-energize the melter.
 - d. Observe LED DS5 (main board).

Replace the component (CPU or hose/gun module) that causes LED DS5 *not* to illuminate when the melter is re-energized.

DP.2 Check the Tank or Manifold RTD

1. Check the left display to determine which RTD (tank or manifold) is faulting. The display indicates 1 if the tank RTD is faulting or 2 if the manifold RTD is faulting.
2. De-energize the melter. Refer to Section 1, *Safety*.

NOTE: If the melter has already cooled down, solidified hot melt within the pump/manifold will prevent you from removing the pump. To remove the pump, you must reheat the melter. Refer to *Reheating the Melter During an F1 Fault* at the end of this procedure.

See Figure 6-2.

3. Remove the RTD from its retention slot.
 - For the tank RTD, refer to *Remove the Tank RTD*.
 - For the manifold RTD, refer to *Remove the Manifold RTD*.
4. Allow the RTD to cool to room temperature or use a pyrometer to accurately determine the temperature of the RTD.
5. When the temperature of the RTD is known, measure the resistance of the RTD across terminals 1 and 2 (tank RTD) or 3 and 4 (manifold RTD).

See Figure 6-5.

6. Determine the expected resistance of the RTD at the known temperature. Compare the expected and measured resistance values and then do *one* of the following:
 - If the measured resistance is within the expected resistance range, the RTD is functioning properly. Replace the main board (P4 or P7 melters, use P/N 1028322; P10 melter, use P/N 1038323).
 - If the measured resistance is not within the expected resistance range, the RTD is defective. Replace the RTD (P/N 1028320).

Reheating the Melter During an F1 Fault

1. While holding both the **Setup** key and the **Tank** key, cycle the system control switch off and then on.

The left display will flash dashes at one second intervals to indicate that the melter is heating in the override mode. The melter will remain in the override mode for 20 minutes and then automatically switch off.



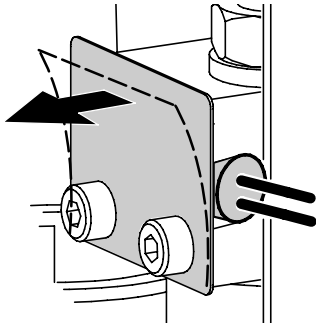
WARNING: Risk of electrocution!

The control switch will remain in the on position when the melter automatically switches off after 20 minutes. Ensure that the control switch is moved back to the off position.

2. If necessary, repeat step 1 to continue reheating the melter.

Remove the Tank RTD

1. De-energize the melter. Refer to Section 1, *Safety*.
2. Open the pump enclosure door.
3. While gently pulling the retention clip away from the RTD, slide the RTD out of its retention slot.



Removing the tank RTD

NOTE: If the RTD is functioning properly, apply thermal compound (provided in RTD service kit P/N 1028320) to the RTD before replacing it in the retention slot.

Remove the Manifold RTD

1. Relieve system pressure. Refer to Section 5, *Relieving System Pressure*.

See Figure 6-6.

2. Isolate the pump from the manifold by rotating the isolation valve handle to its full vertical position (valve closed).
3. Remove the three pump-mounting bolts from the front of the pump body.
4. Rotate the top of the pump slightly toward the front of the melter, and then pull the pump up and away from the manifold.

NOTE: The face of the pump body contains two M6 threaded holes. Bolts can be threaded into these holes to gain leverage when removing the pump.

5. Remove the air line from the back of the pump.
6. Lift the pump clear of the melter.
7. Remove the RTD from its retention slot.
8. To replace the RTD and pump, reverse the order of steps 2 through 7.

CAUTION: Before replacing the pump, ensure that the cross-over tube is in-place between the pump and the manifold.

NOTE: Before replacing the RTD, apply thermal compound (P/N 1023441) to the RTD and its retention slot. To avoid damage to the RTD, ensure that the RTD is correctly inserted into its retention slot before replacing the pump.

DP.3 Check the Operation of the Power Relay or Thermostats

The pre-conditions for this diagnostic procedure are as follows:

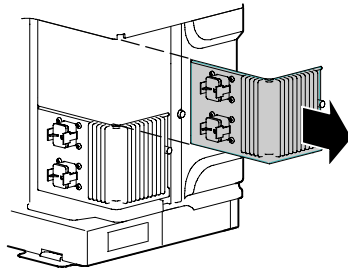
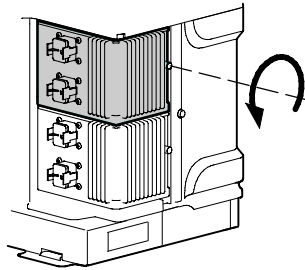
- The heater LED is illuminated.
- Indicator DS2 on the main board is *not* illuminated.
- Indicators DS5 and DS6 on all hose/gun modules are *not* illuminated.

1. De-energize the melter. Refer to Section 1, *Safety*.
2. Remove all of the hose/gun modules.
3. Re-energize the melter.

NOTE: If an F1 fault re-occurs after re-energizing the melter, reset the melter and turn the heaters back on.

4. Press the **Heaters** key.

See Figure 6-1.



Removing a hose/gun module

5. Check indicator DS2 on the main board, and then do *one* of the following:
 - If indicator DS2 *does* illuminate, go to step 6.
 - If indicator DS2 does *not* illuminate, got to step 7.
6. Locate a failed hose/gun module by *individually* replacing and checking each module as follows:
 - a. De-energize the melter.
 - b. Replace the hose/gun module.
 - c. Re-energize the melter.
 - d. Check if LED DS5 illuminates.

Replace the hose/gun module that causes LED DS5 *not* to illuminate when the melter is re-energized.

7. Complete *one* or *both* of the following checks to determine if the main board or a thermostat has failed:
 - a. Check for 21–27 VDC across receptacle J9, pins 1 and 6. If the voltage is *incorrect*, replace the main board, otherwise go to b.
 - b. Check for 21–27 VDC across receptacle J9, pins 2 and 6. If the voltage is *incorrect*, one or both of the thermostats or the wire harness connected to receptacle J7 has failed. Refer to *DP.6 Check the Resistance of the Tank/Manifold Thermostat*. If the voltage is *correct*, replace the main board.

DP.4 Check the Operation of the Tank or Manifold TRIAC

See Figure 6-1.



WARNING: Risk of electrocution! Ensure that disconnect switch that serves the melter is in the off position and locked.

1. De-energize the melter. Refer to Section 1, *Safety*.
2. Remove the protective rubber cover from the tank or the manifold heater terminals (Whichever component is faulting).
3. Re-energize the melter and turn the heaters back on.
4. Press the **Heaters** key.
5. While watching LEDs DS1 and DS3 on the main board, measure the voltage across the heater terminals as follows:
 - For an F2 fault, voltage across the terminals should be within 10 VAC of the voltage being supplied to the melter when DS1 and DS3 are illuminated.
 - For an F3 fault, voltage across the terminals should be less than 5 VAC when DS1 and DS3 are *not* illuminated.

Replace the main board if either of the above voltage conditions are incorrect (P4 or P7 melters, use P/N 1028322/P10 melter, use P/N 1038323).

DP.5 Check the Resistance of the Tank and Manifold Heaters



WARNING: Risk of electrocution! Ensure that disconnect switch that serves the melter is in the off position and locked.

1. De-energize the melter. Refer to Section 1, *Safety*.

See Figure 6-1.

2. Disconnect the power harness plug (P/N 1024529) from receptacle J6 on the main board.
3. Measure the resistance across pins 1 and 2 (tank) or pins 3 and 4 (manifold) on the power harness plug, and then do *one* of the following:
 - If the resistance *is* within the range shown in Table 6-6, go to step 4.
 - If the resistance is *not* within the range shown in Table 6-6, go to step 8.

NOTE: Refer to Appendix E for 400/480 Volt heater resistance data.

Table 6-6 Heater Resistance

Model	Resistance	
	Tank	Manifold
P4	46–58 ohms	46–58 ohms
P7	40–50 ohms	
P10		

4. Individually check the resistance between the chassis and pins 1 and 2 (tank) or pins 3 and 4 (manifold) on the power harness plug, and then do *one* of the following:
 - If the resistance is greater than 1 Meg ohm, return to the troubleshooting chart.
 - If the resistance is less than 1 Meg ohm, go to step 5.
5. Remove the front and rear panels from the melter. Refer to Section 5, *Cleaning the Melter*, for the procedure to remove the panels.

CAUTION: Use two wrenches and minimal force when loosening or tightening the heater terminal connections. Using a single wrench or excessive force to remove or tighten the terminal nuts can damage the heater.

DP.5 Check the Resistance of the Tank and Manifold Heaters (contd)

6. Using two wrenches, loosen the nuts that hold the power harness leads to the tank or the manifold heater terminal posts.
7. Individually check the resistance between the chassis and *each* tank or each manifold heater terminal post, and then do *one* of the following:
 - If the resistance is *greater* than 1 Meg ohm, replace the power harness (P/N 1024529).
 - If the resistance is *less* than 1 Meg ohm for the tank heater, replace the tank. If the resistance is less than 1 Meg ohm for the manifold, replace the manifold heater. Refer to Section 7, *Parts*.
8. Remove the front and rear panels from the melter. Refer to Section 5, *Cleaning the Melter*, for the procedure to remove the panels.
9. Measure the resistance across the tank heater posts and the manifold heater posts terminals, and then do *one* of the following:
 - If the resistance *is* within the range shown in Table 6-6, replace the power harness (P/N 1024529).
 - If the resistance is *not* within the range shown in Table 6-6 replace the tank or replace the manifold heater.

NOTE: The tank heater cannot be replaced independently.

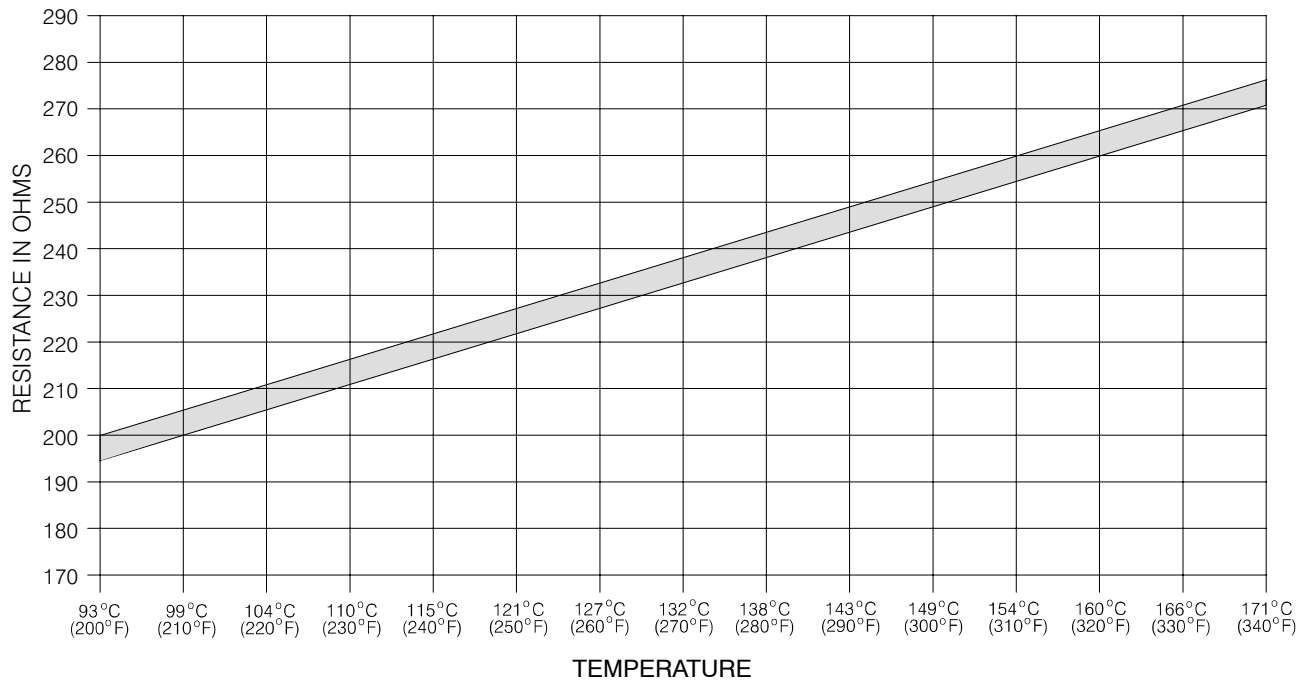
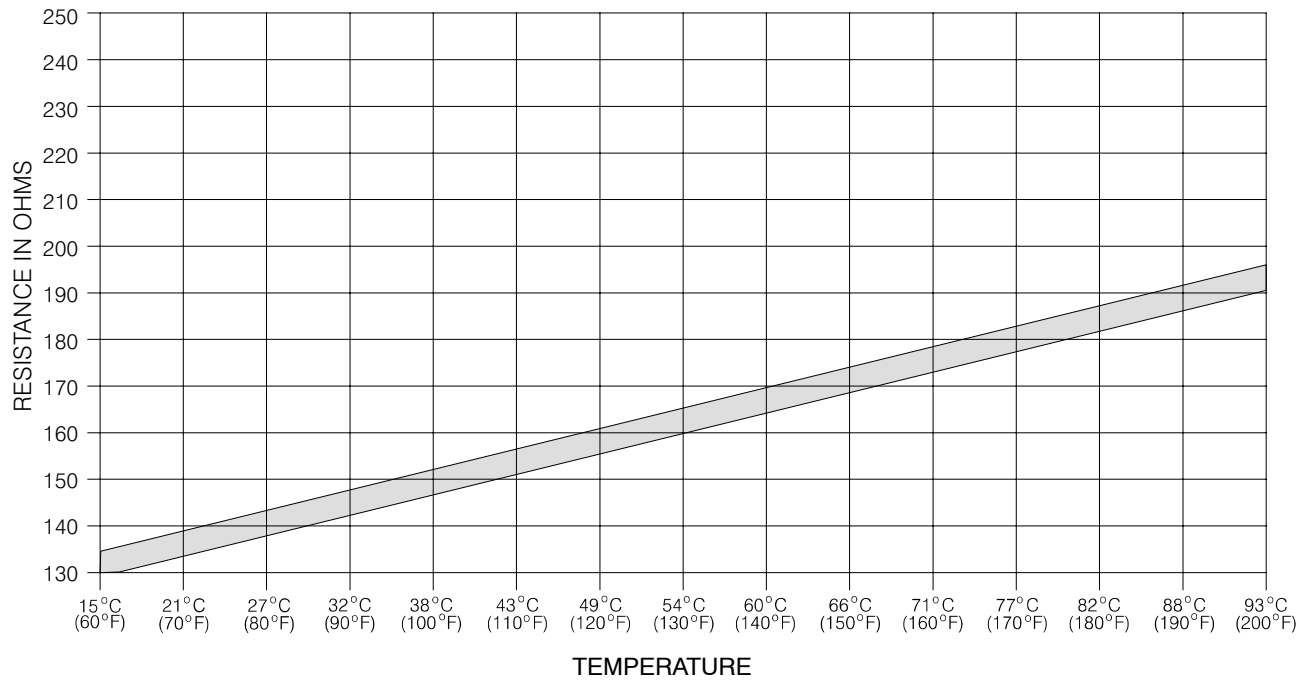


Figure 6-5 RTD resistance vs. temperature

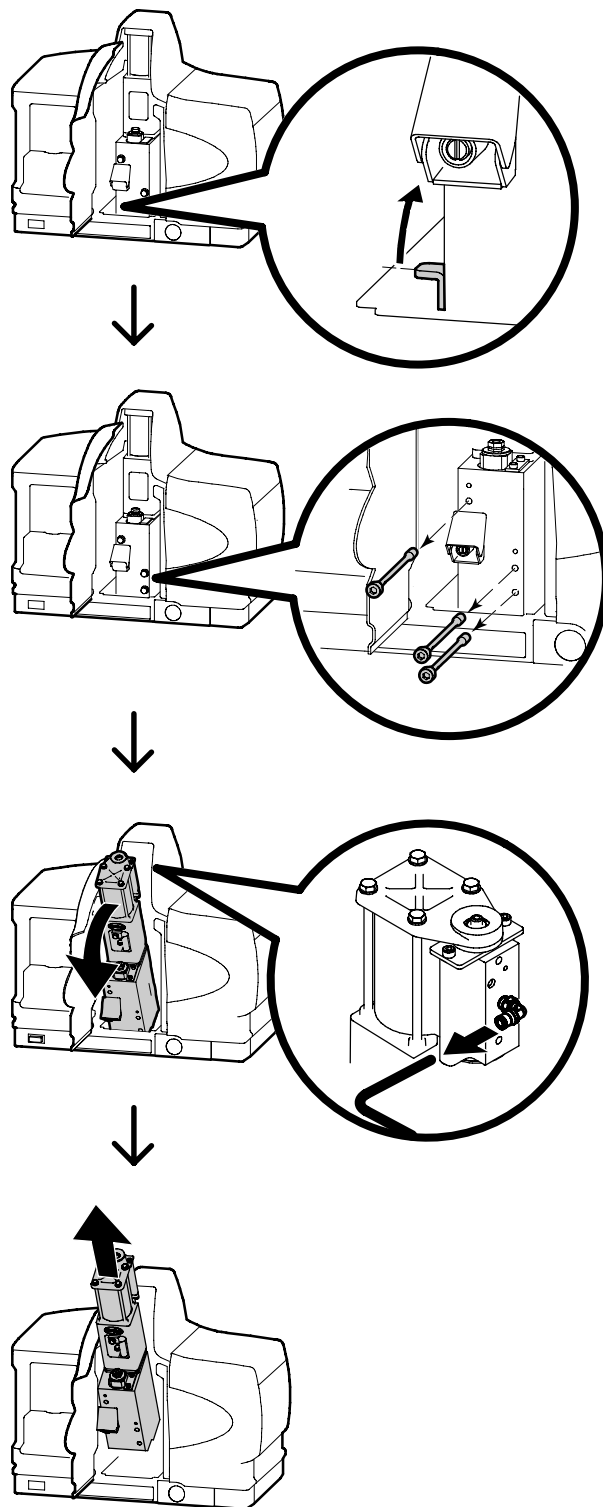
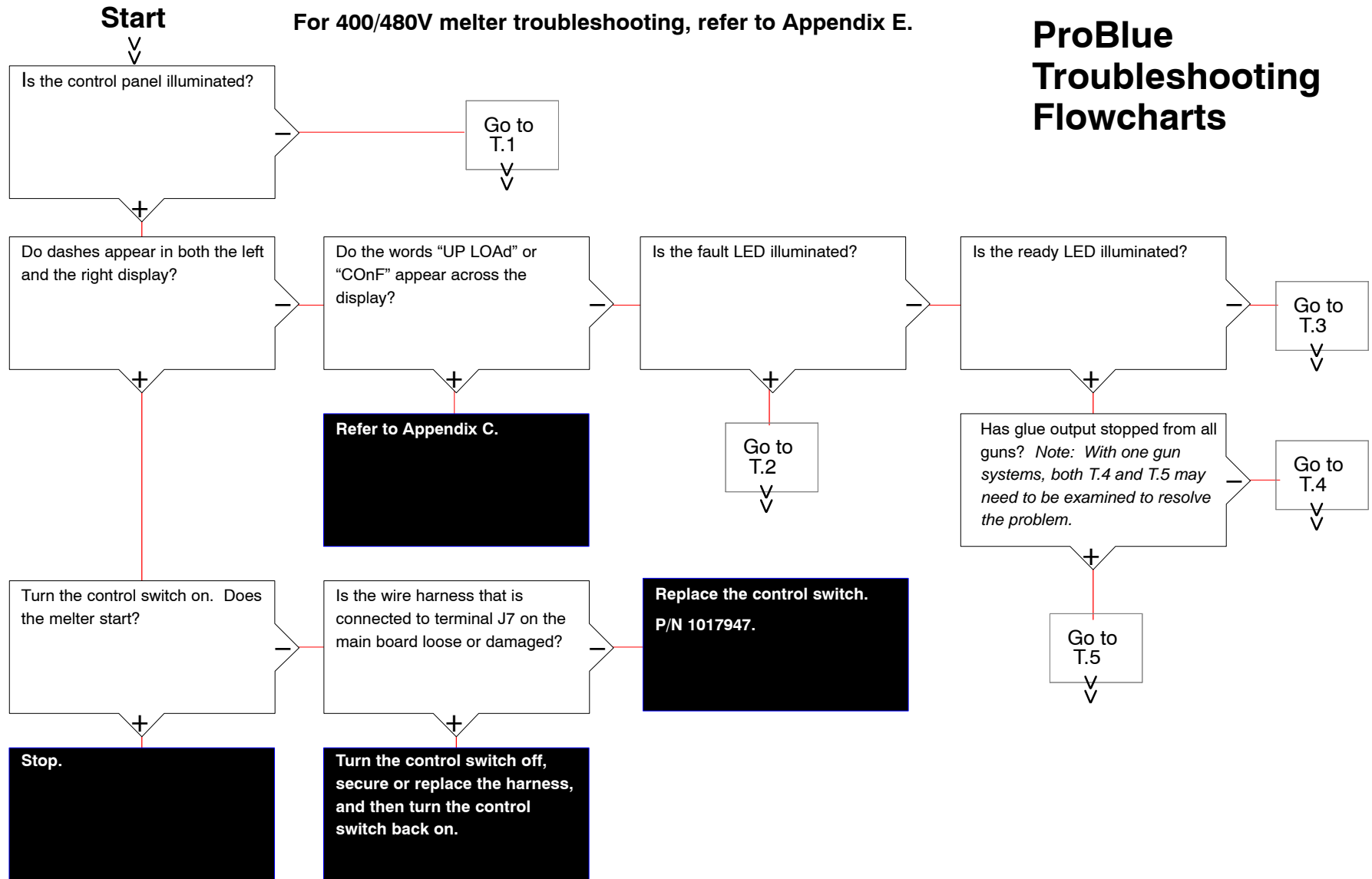


Figure 6-6 Removing the pump

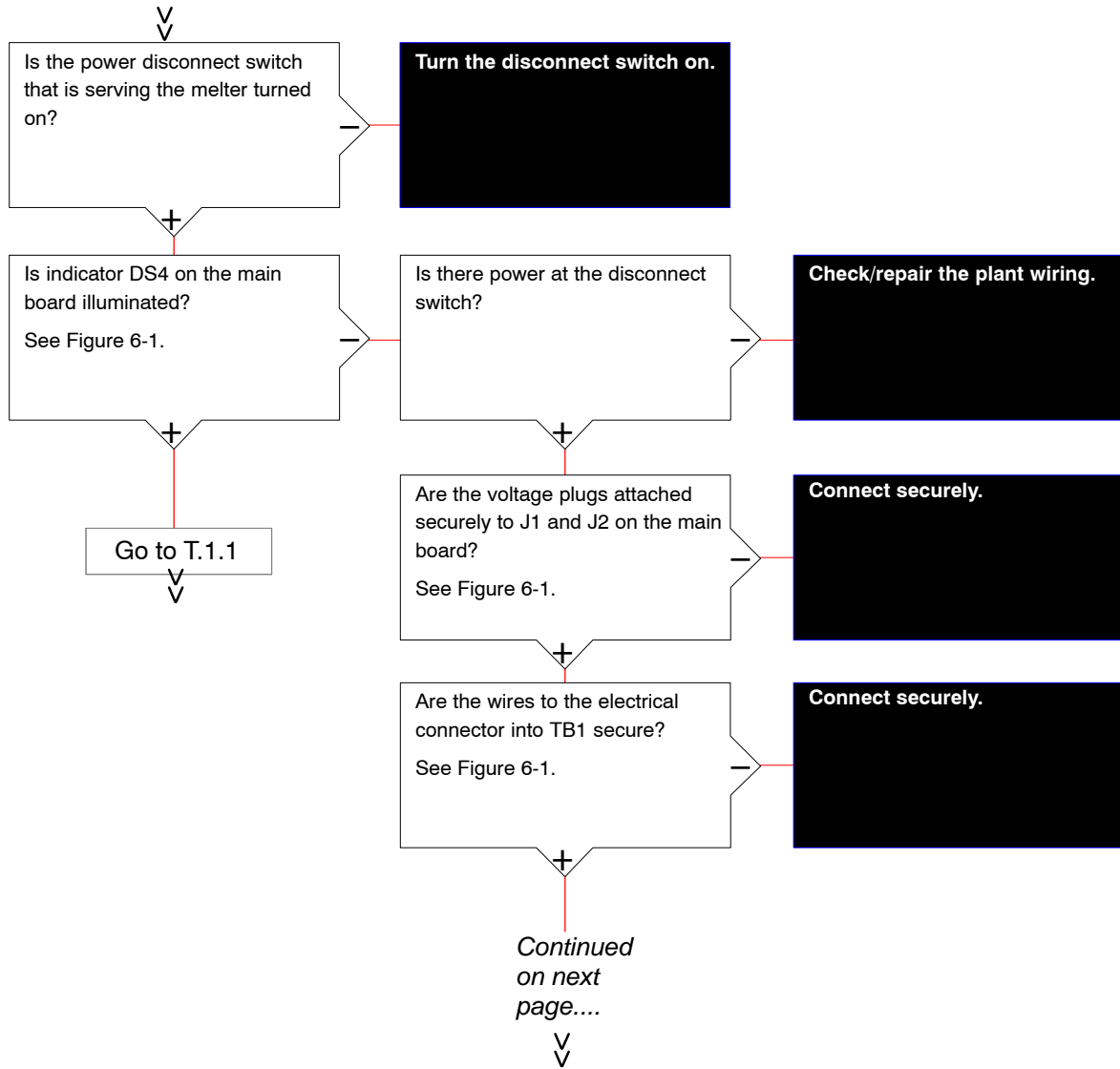
For 400/480V melter troubleshooting, refer to Appendix E.

ProBlue Troubleshooting Flowcharts



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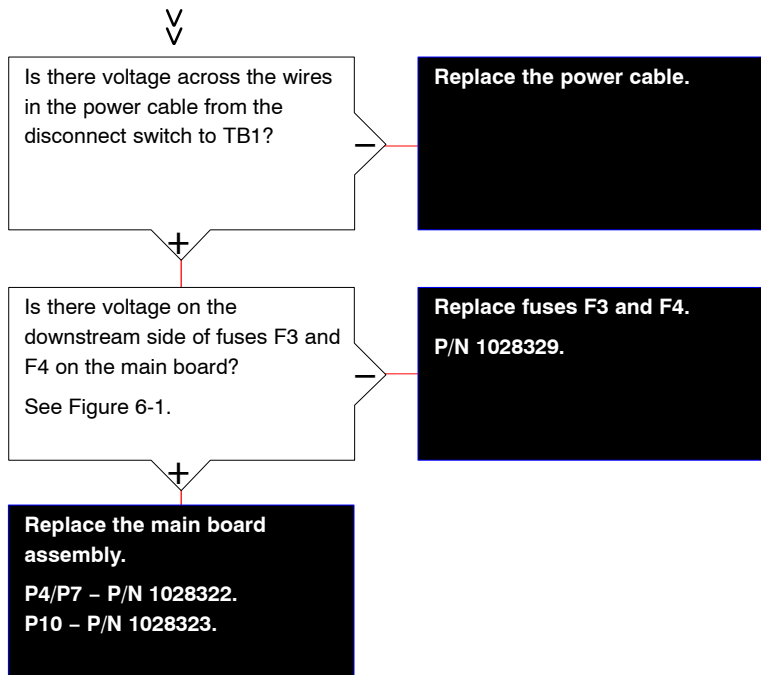
Quick Check: Verify that the voltage plug is correct



T.1

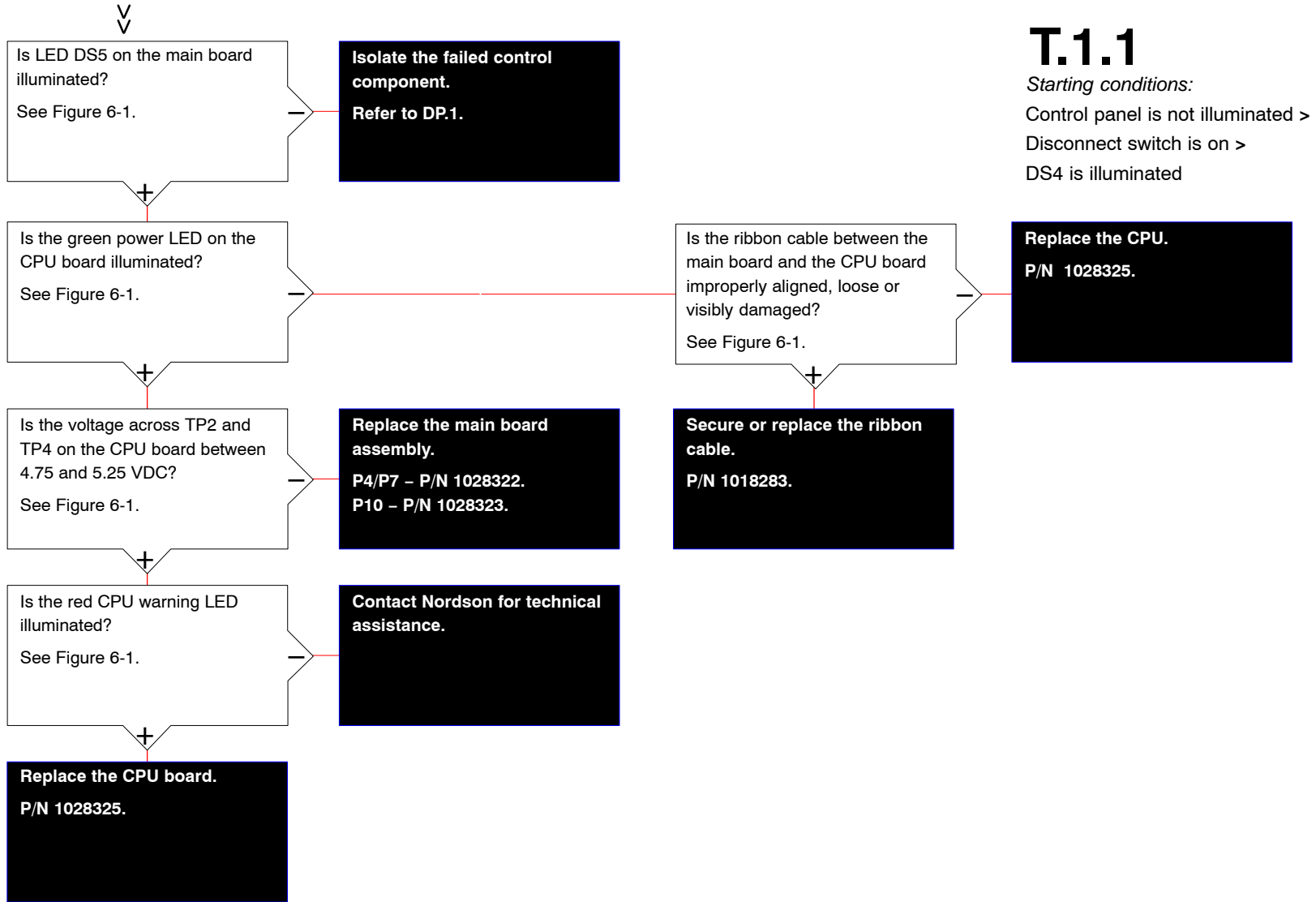
Starting Condition:
Control panel is not illuminated

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T.1

Starting Condition:
Control panel is not illuminated



T.1.1

Starting conditions:

Control panel is not illuminated >

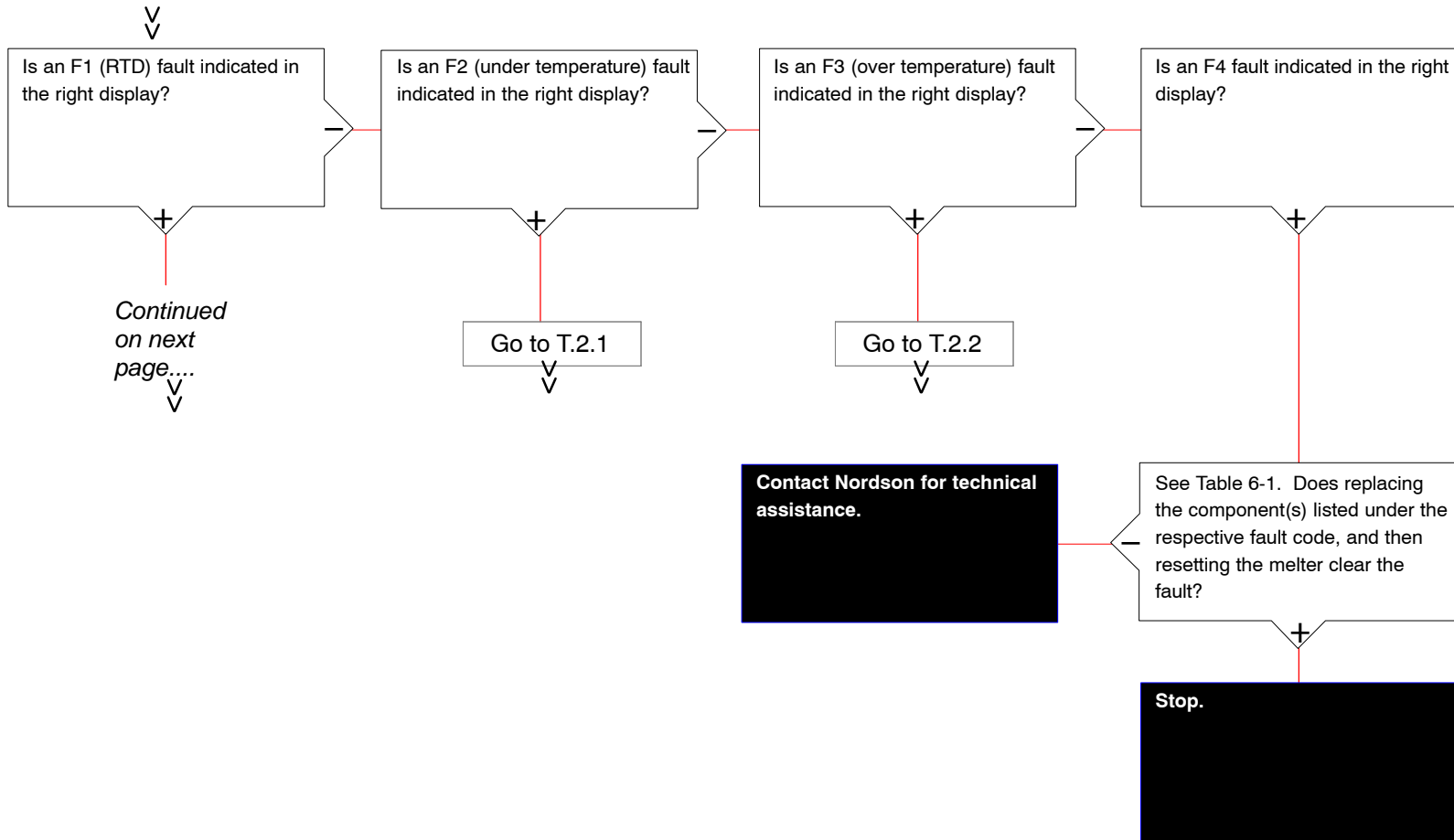
Disconnect switch is on >

DS4 is illuminated

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T.2

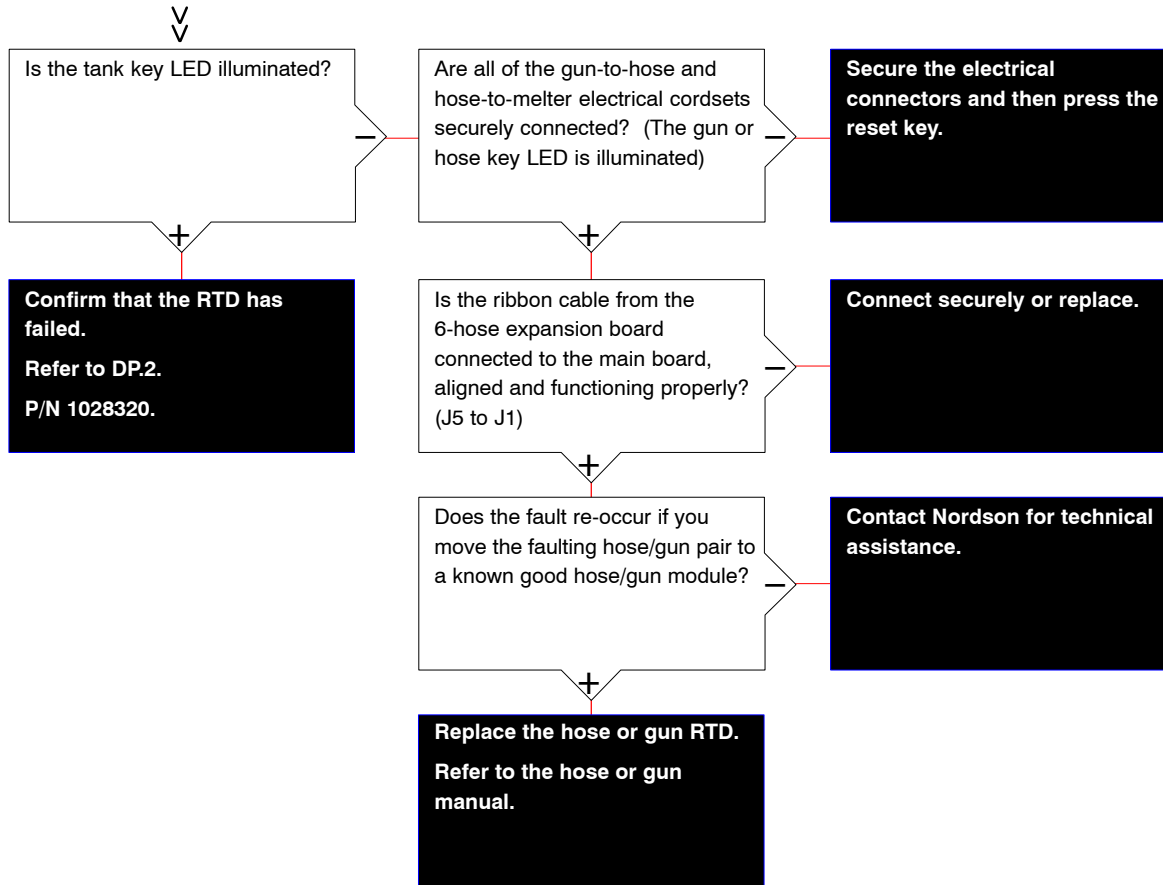
Starting Condition:
Fault LED is illuminated



T.2

Starting Condition:
Fault LED is illuminated

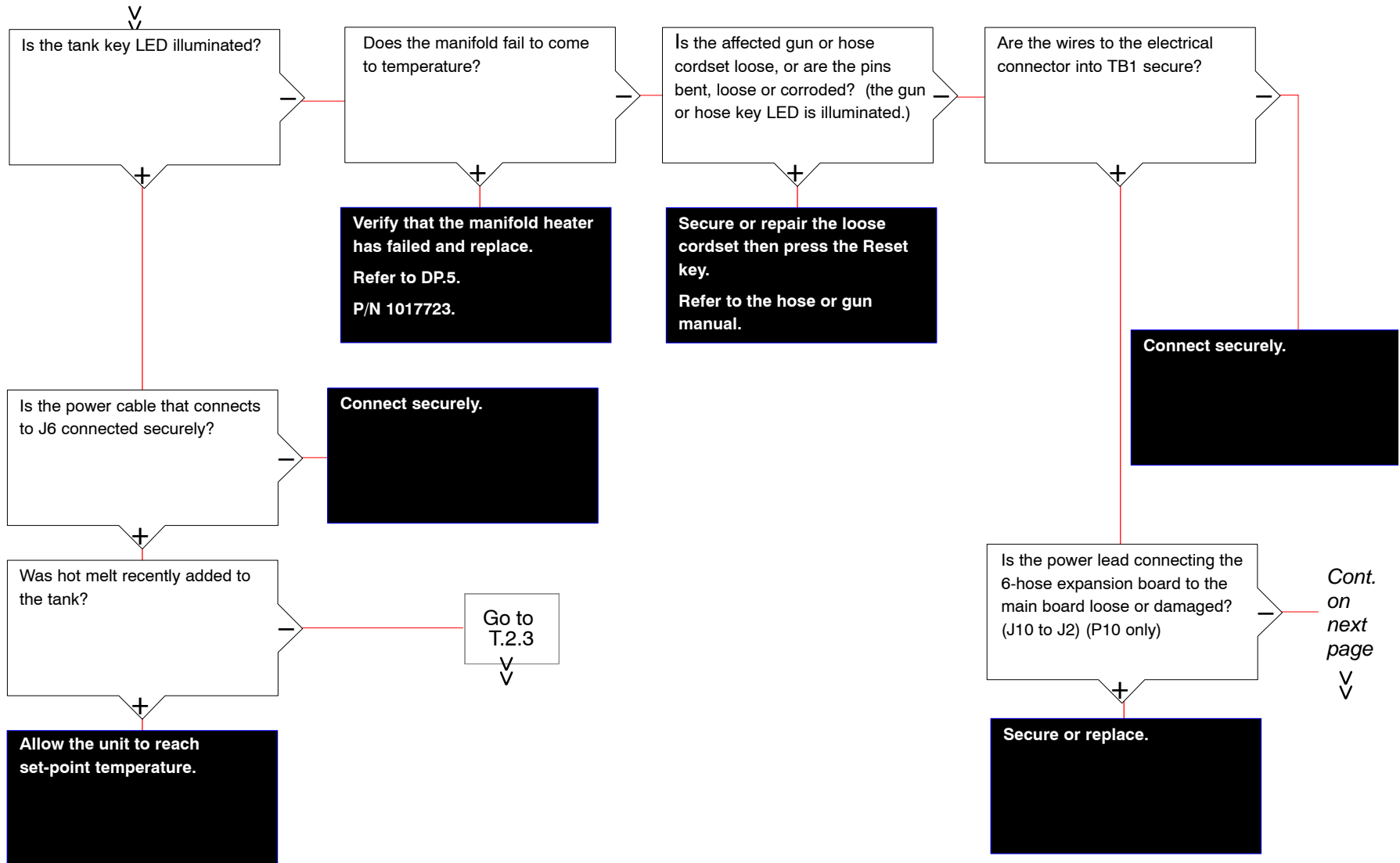
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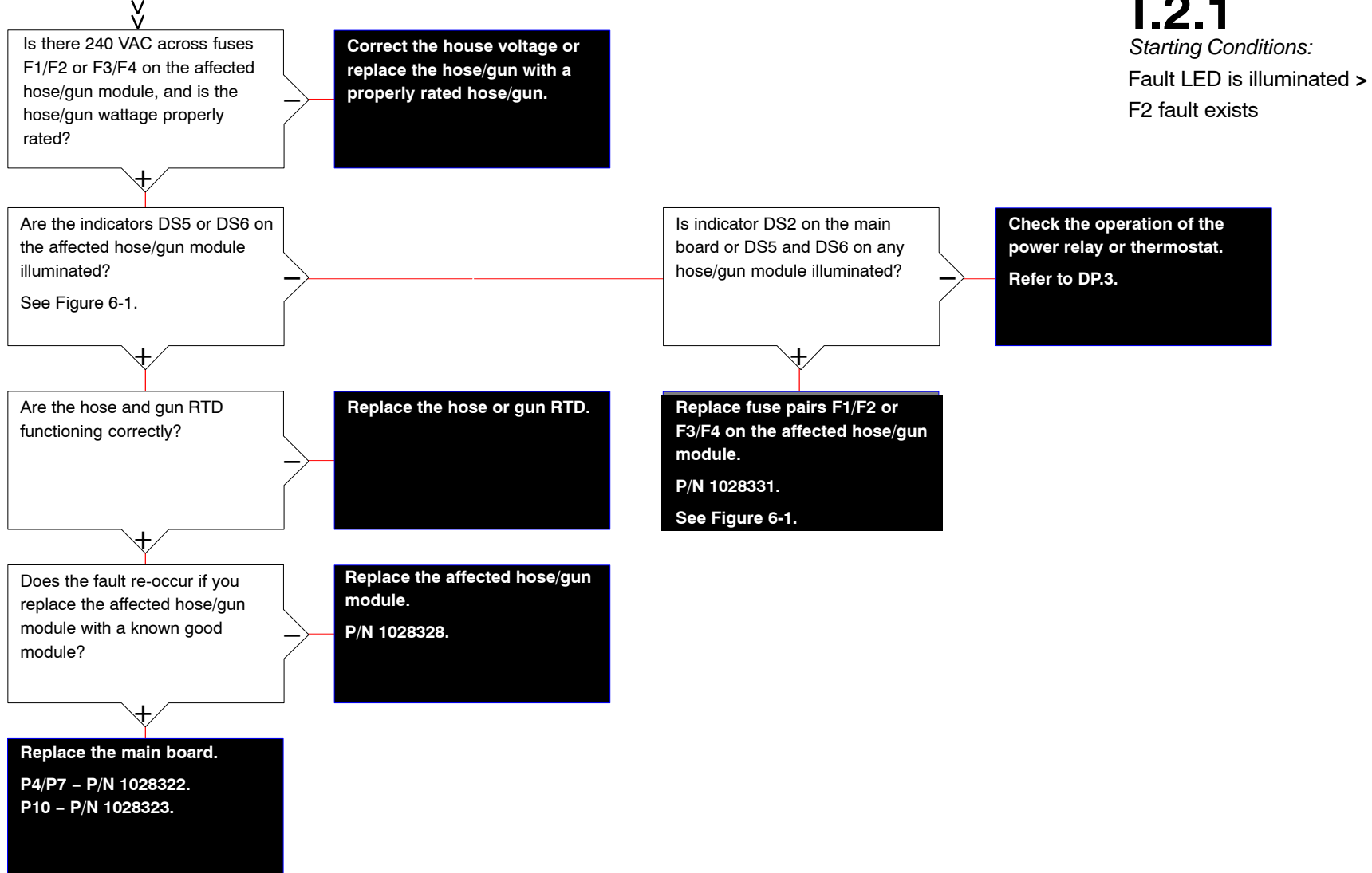
Reset the melter and turn the heaters back on. Allow the unit to come to temperature.

T.2.1

Starting Conditions:
Fault LED is illuminated >
F2 fault exists



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T.2.1

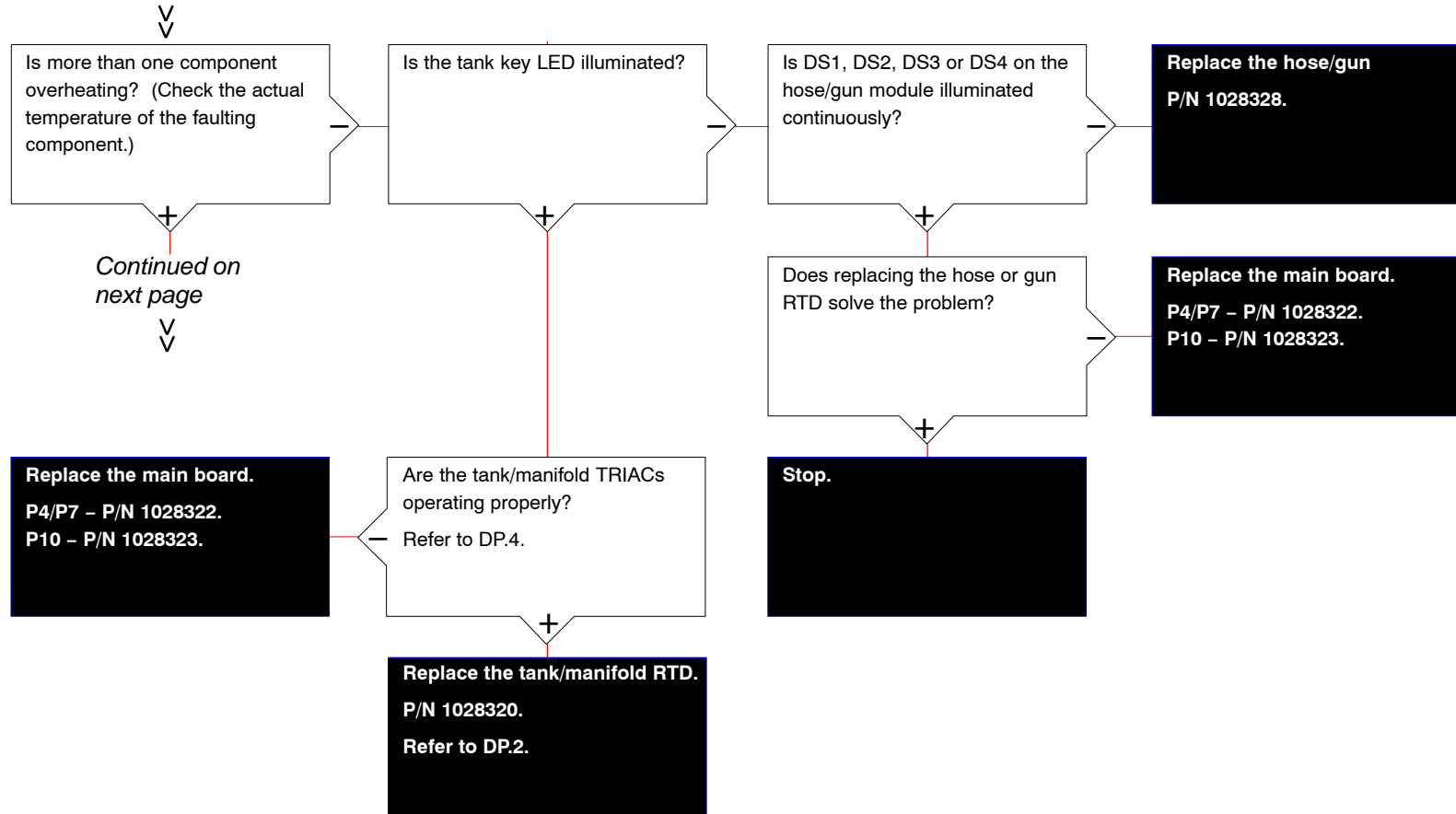
Starting Conditions:

Fault LED is illuminated >
F2 fault exists

T.2.2

Starting conditions:
Fault LED is illuminated >
F3 fault exists

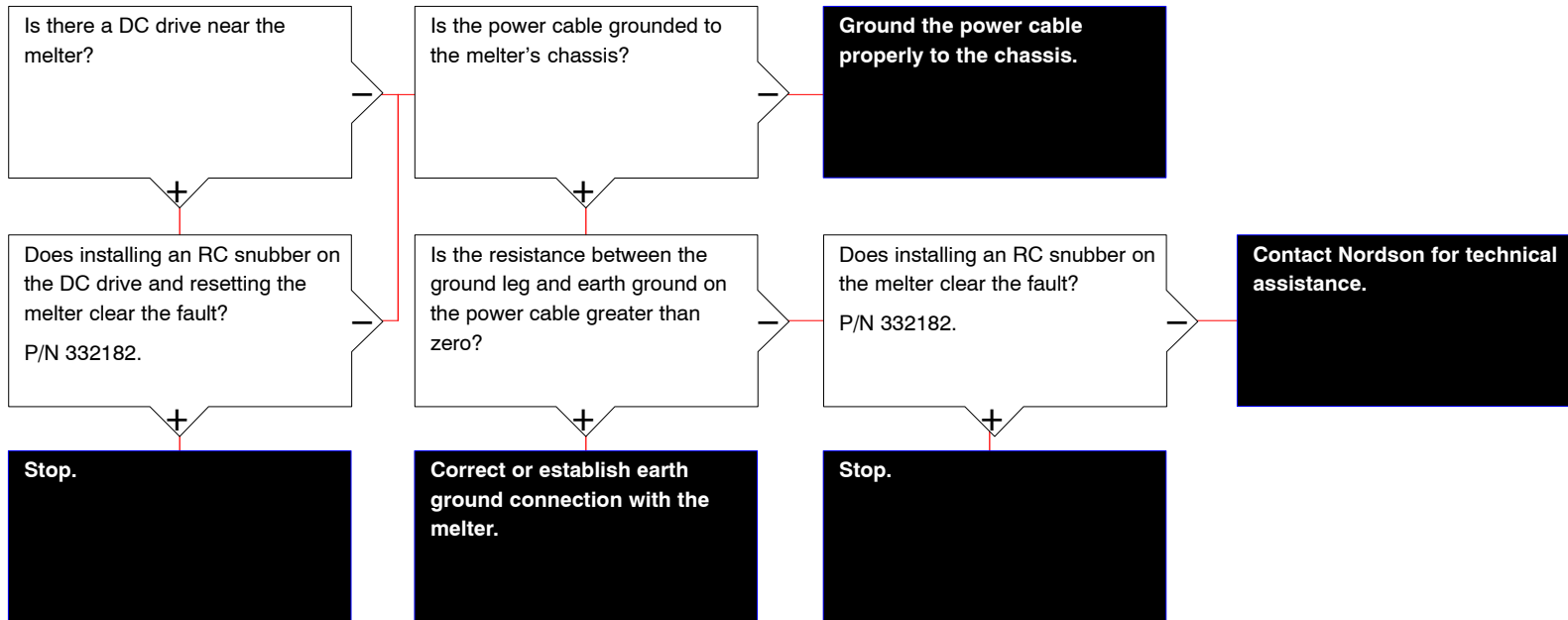
Reset the melter and turn the heaters back on. Allow the unit to come to temperature.

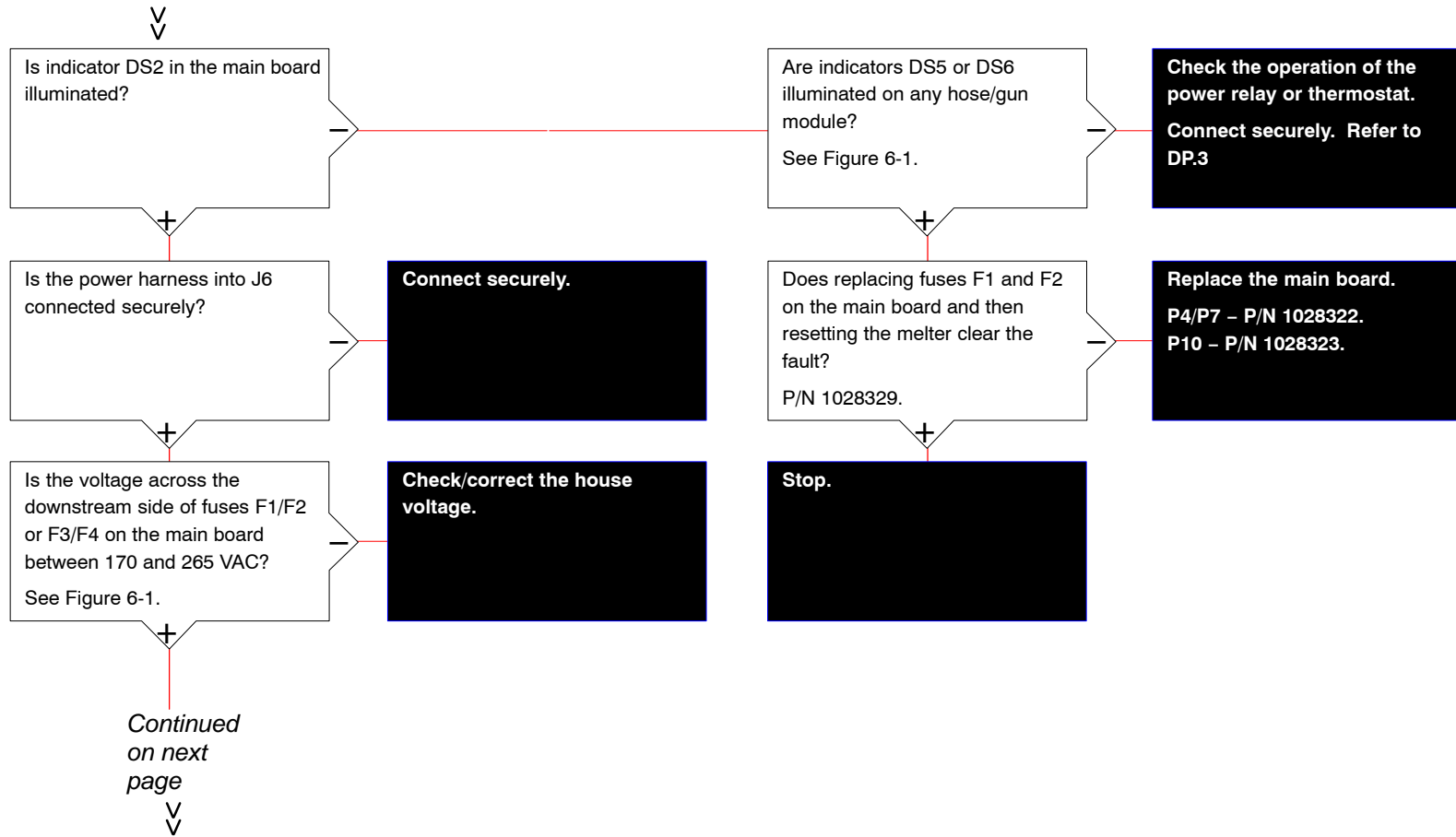


T.2.2

Starting conditions:
Fault LED is illuminated >
F3 fault exists

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T.2.3

Starting conditions:

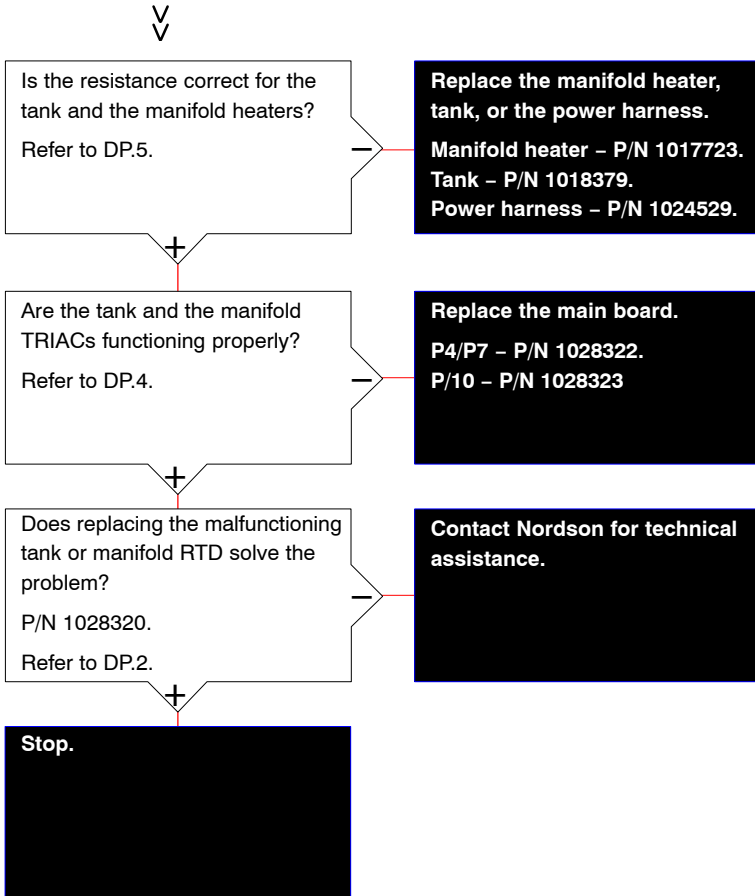
Fault LED is illuminated >

F2 fault exists >

Tank key LED is illuminated >

Hot melt has not been added

Continued from previous page....



T.2.3

Starting conditions:

Fault LED is illuminated >

F2 fault exists >

Tank key LED is illuminated >

Hot melt has not been added

Quick check: Manually activating the heater key or the pump key will override and eliminate remote inputs as the cause of a down condition.

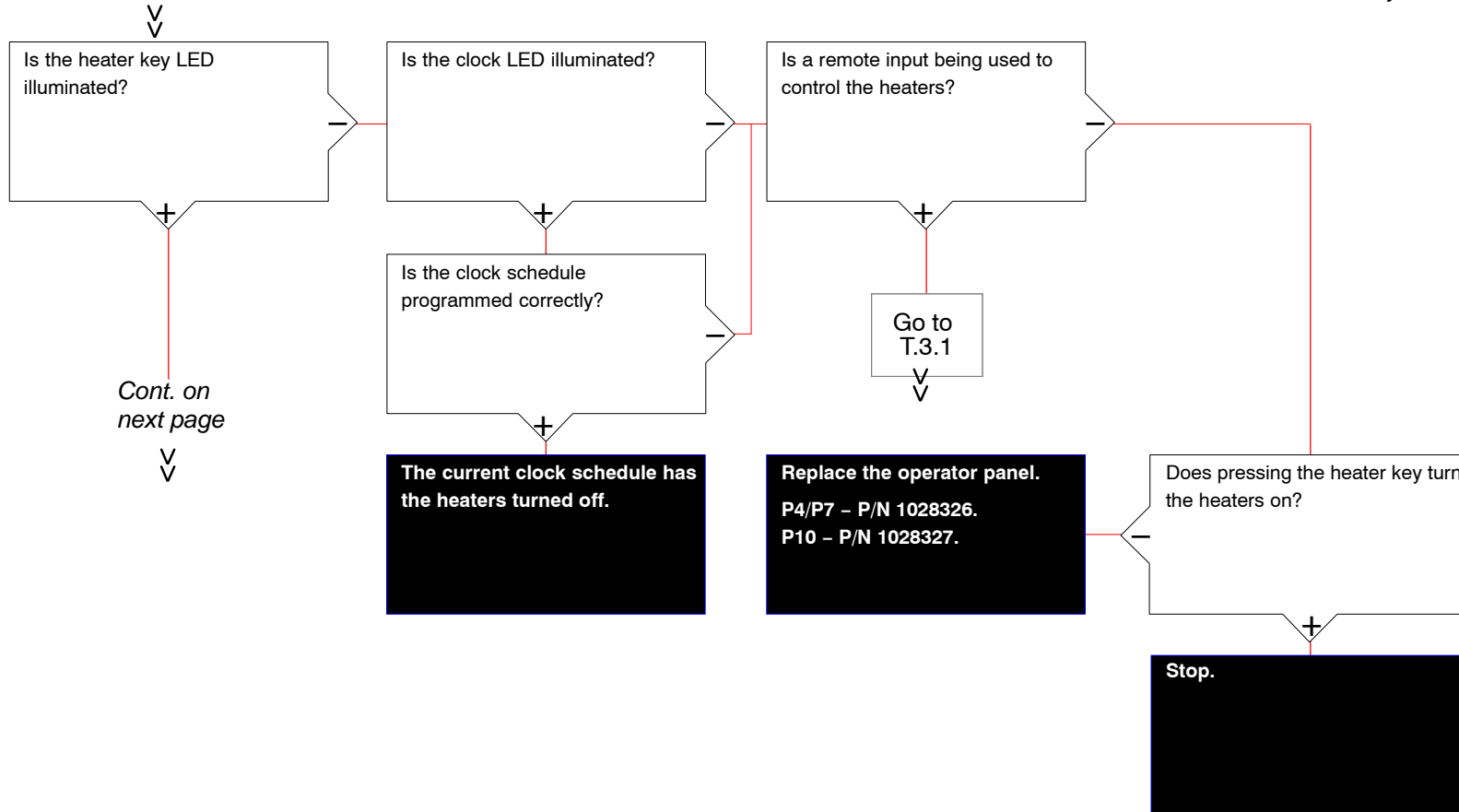
Quick check: Save settings and reset the melter to factory default settings. If the melter functions normally, isolate the input or output problem.

T.3

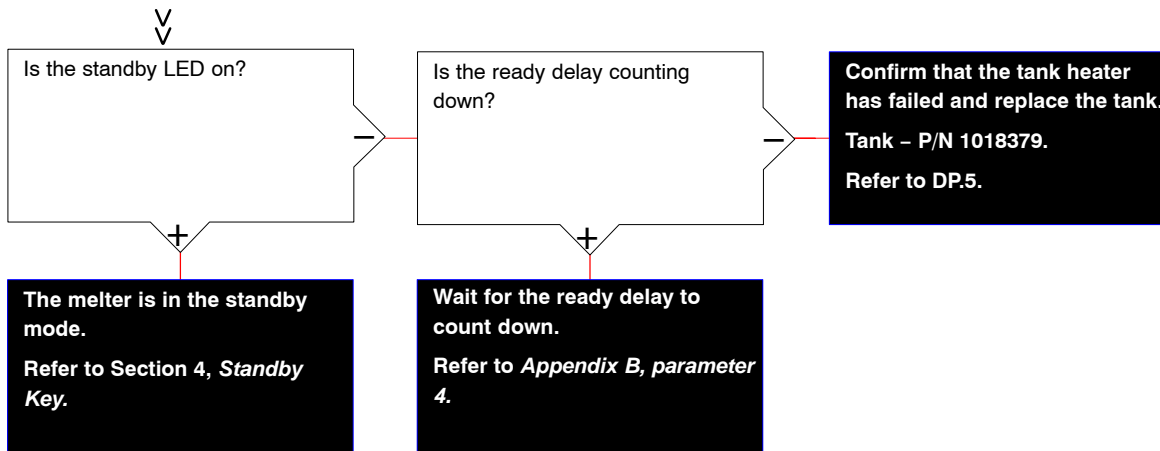
Starting conditions:

No faults >

Ready LED is not illuminated



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T.3

Starting conditions:

No faults >

Ready LED is not illuminated

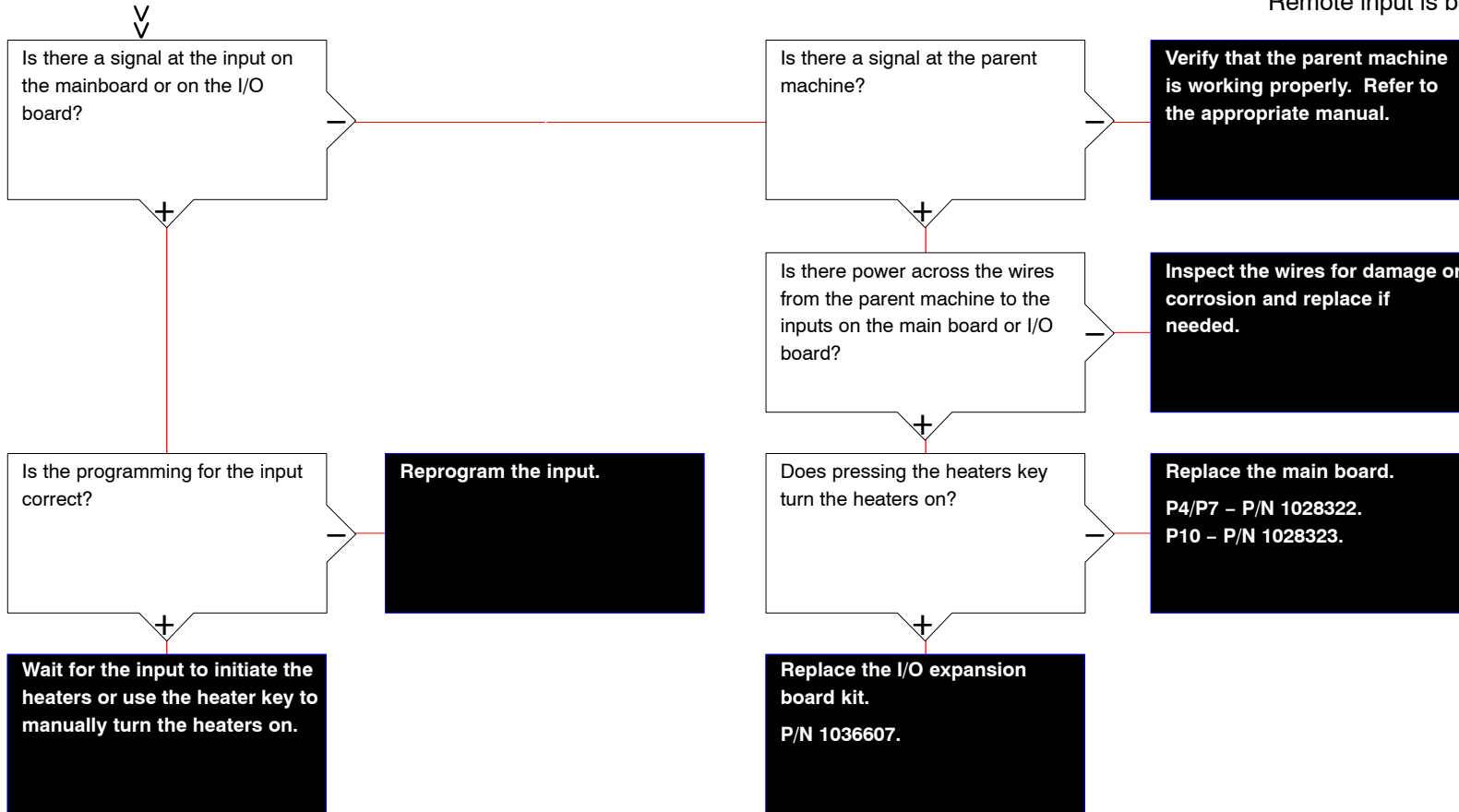
T.3.1

Starting conditions:

No faults >

Ready LED is not illuminated >

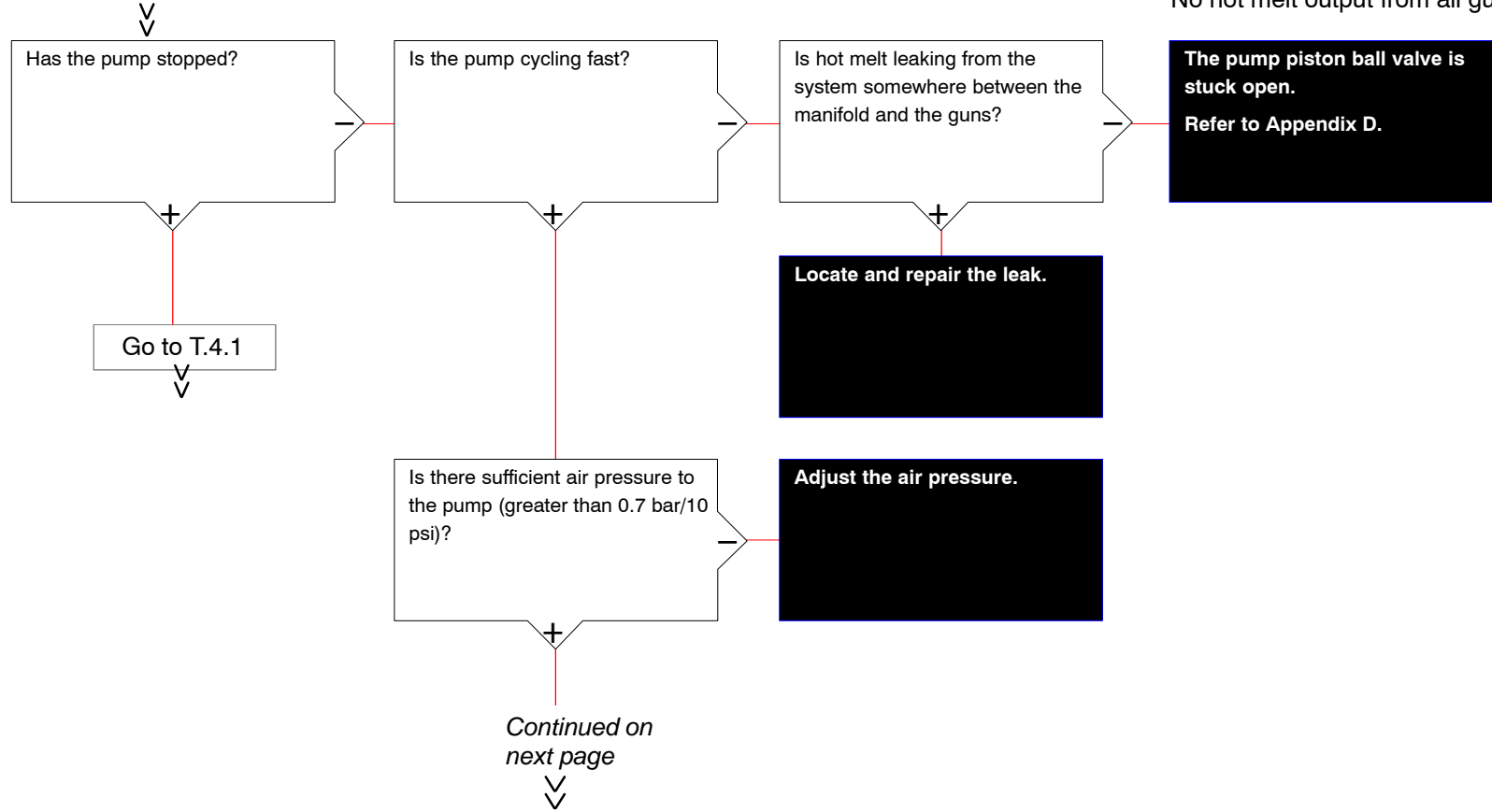
Remote input is being used



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Quick check: Save settings and reset the melter to factory default settings. If the melter functions normally, isolate the input or output problem.

Quick check: Manually activating the heater key or the pump key will override and eliminate remote inputs as the cause of a down condition.



T.4

Starting conditions:

No faults >

Ready LED is illuminated >

No hot melt output from all guns

**The pump piston ball valve is stuck open.
Refer to Appendix D.**

Locate and repair the leak.

Adjust the air pressure.

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T.4

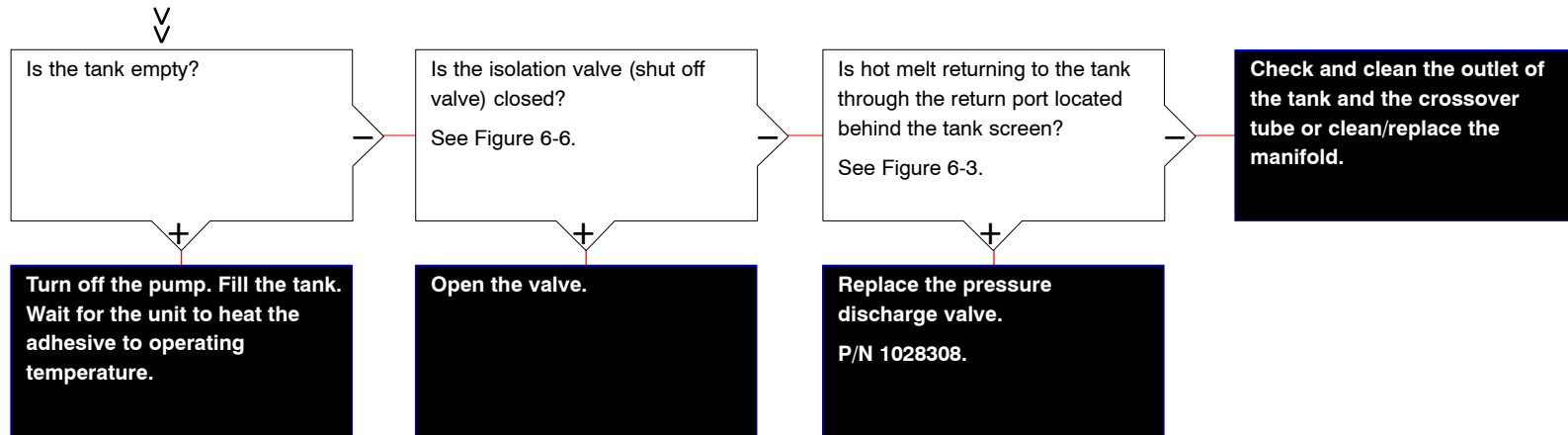
Starting conditions:

No faults >

Ready LED is illuminated >

No hot melt output from all guns

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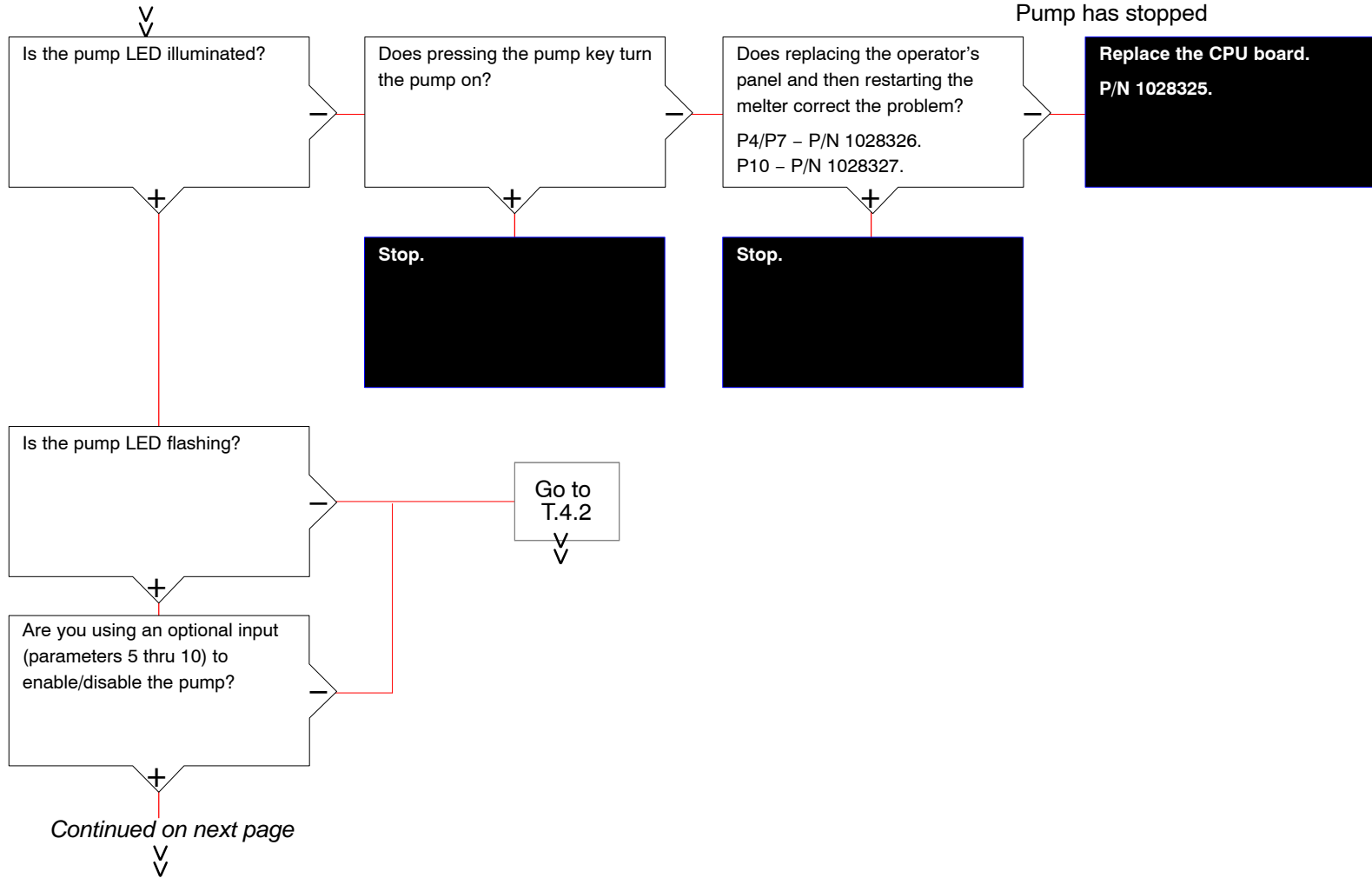


T.4.1

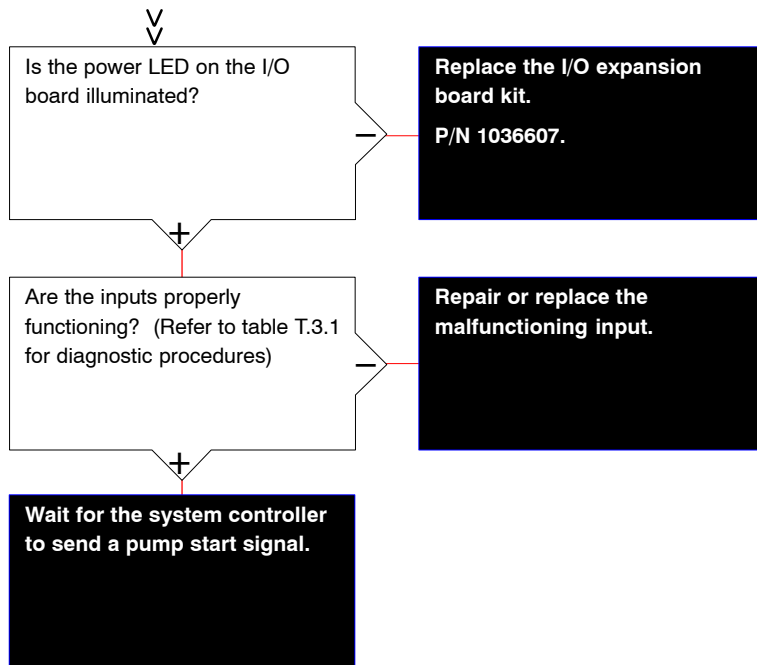
Starting conditions:

- No faults >
- Ready LED is illuminated >
- No hot melt output from all guns >
- Pump has stopped

Quick check: Manually activating the heater key or the pump key will override and eliminate remote inputs as the cause of a down condition.



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T.4.1

Starting conditions:

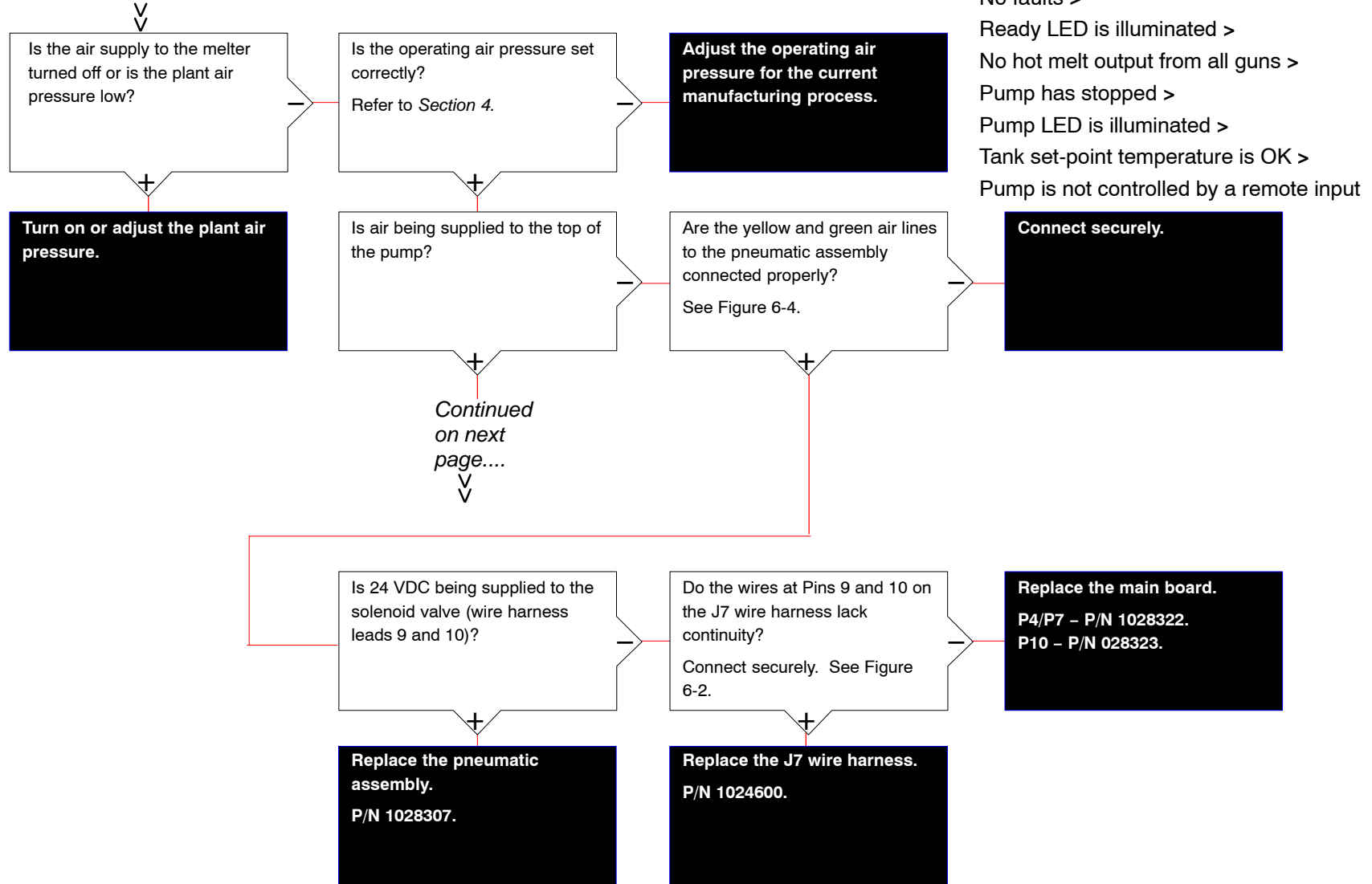
No faults >

Ready LED is illuminated >

No hot melt output from all guns >

Pump has stopped

Problem



T.4.2

Starting conditions:

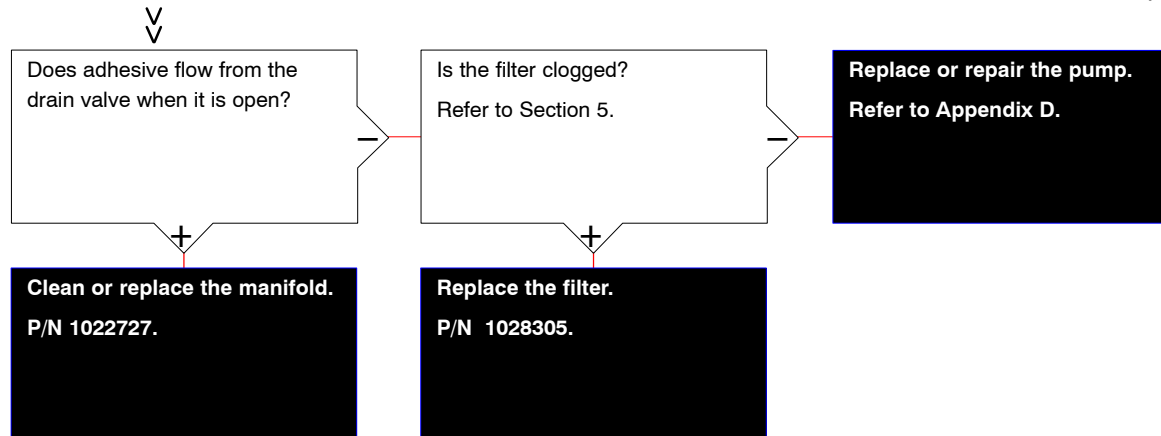
- No faults >
- Ready LED is illuminated >
- No hot melt output from all guns >
- Pump has stopped >
- Pump LED is illuminated >
- Tank set-point temperature is OK >
- Pump is not controlled by a remote input

T.4.2

Starting conditions:

- No faults >
- Ready LED is illuminated >
- No hot melt output from all guns >
- Pump has stopped >
- Pump LED is illuminated >
- Tank set-point temperature is OK >
- Pump is not controlled by a remote input

Continued from previous page....



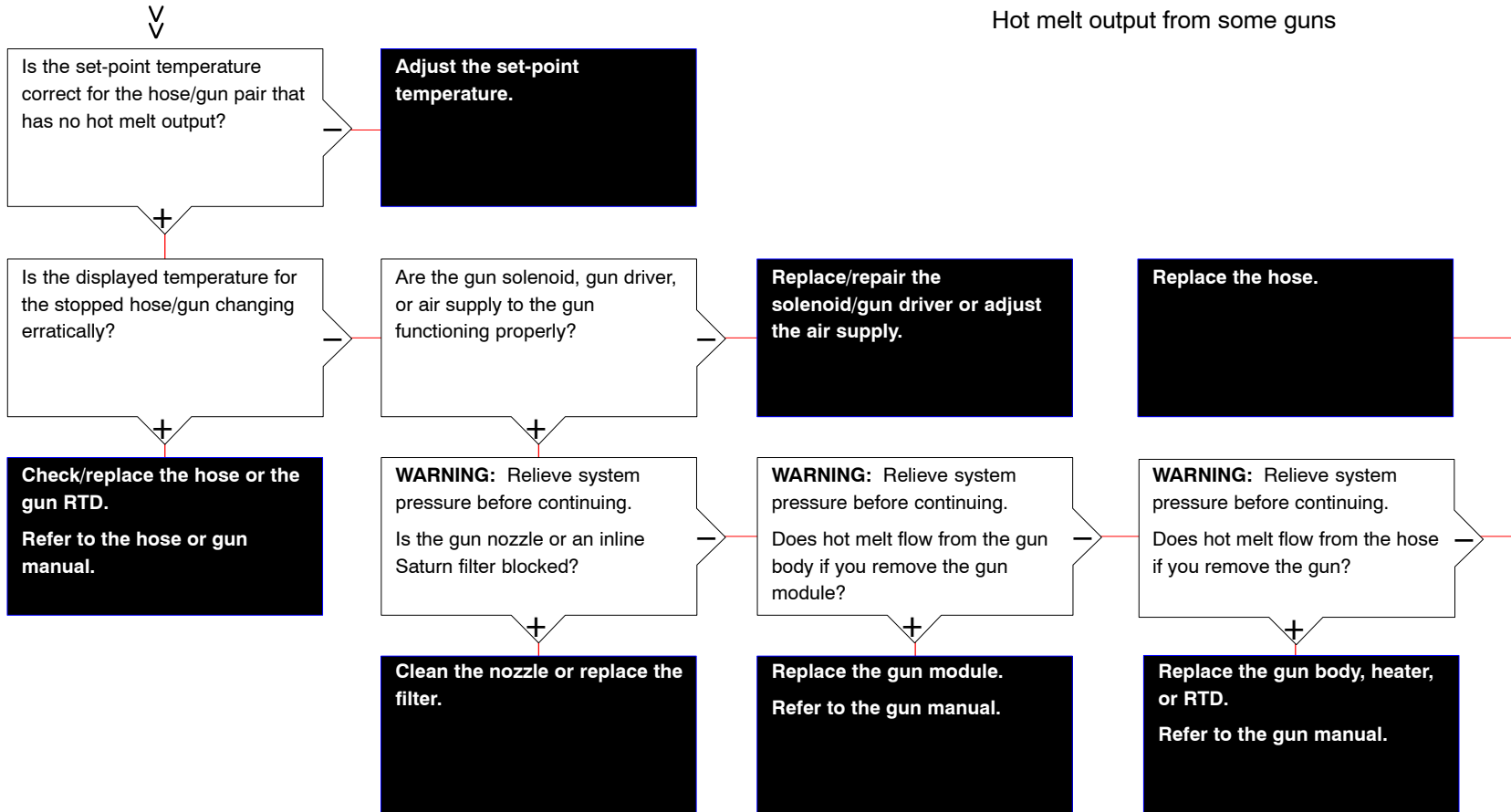
T.5

Starting conditions:

No faults >

Ready LED is illuminated >

Hot melt output from some guns



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Section 7

Parts

NOTE: Refer to Appendix E for information about 400/480 Volt melter parts.

Using the Illustrated Parts List

The parts lists provided in this section are organized into the following columns:

Item—Identifies illustrated parts that are available from Nordson Corporation.

Used—Identifies the melters in which the part is used. A blank entry indicates that the part is used in all ProBlue melters.

Part—Provides the Nordson Corporation part number for each saleable part shown in the illustration. A series of dashes in the parts column (- - - - -) means the part cannot be ordered separately.

Description—Provides the part name, as well as its dimensions and other characteristics when appropriate. Bullets in the description, indicate the relationships between assemblies, subassemblies, and parts.

Quantity—The quantity required per unit, assembly, or subassembly. The code AR (As Required) is used if the part number is a bulk item ordered in quantities or if the quantity per assembly depends on the product version or model.

NOTE: Illustrations of the model P4 are used throughout this section to represent all ProBlue melters. Refer to the *Used* column to determine the part number associated with your melter.

Fasteners

Fasteners are called out in each illustration using the convention *F*x, where “x” is the fastener number used in the *Schedule of Fasteners*, which is located at the end of this section.

Tank, Pump, and Manifold Parts List

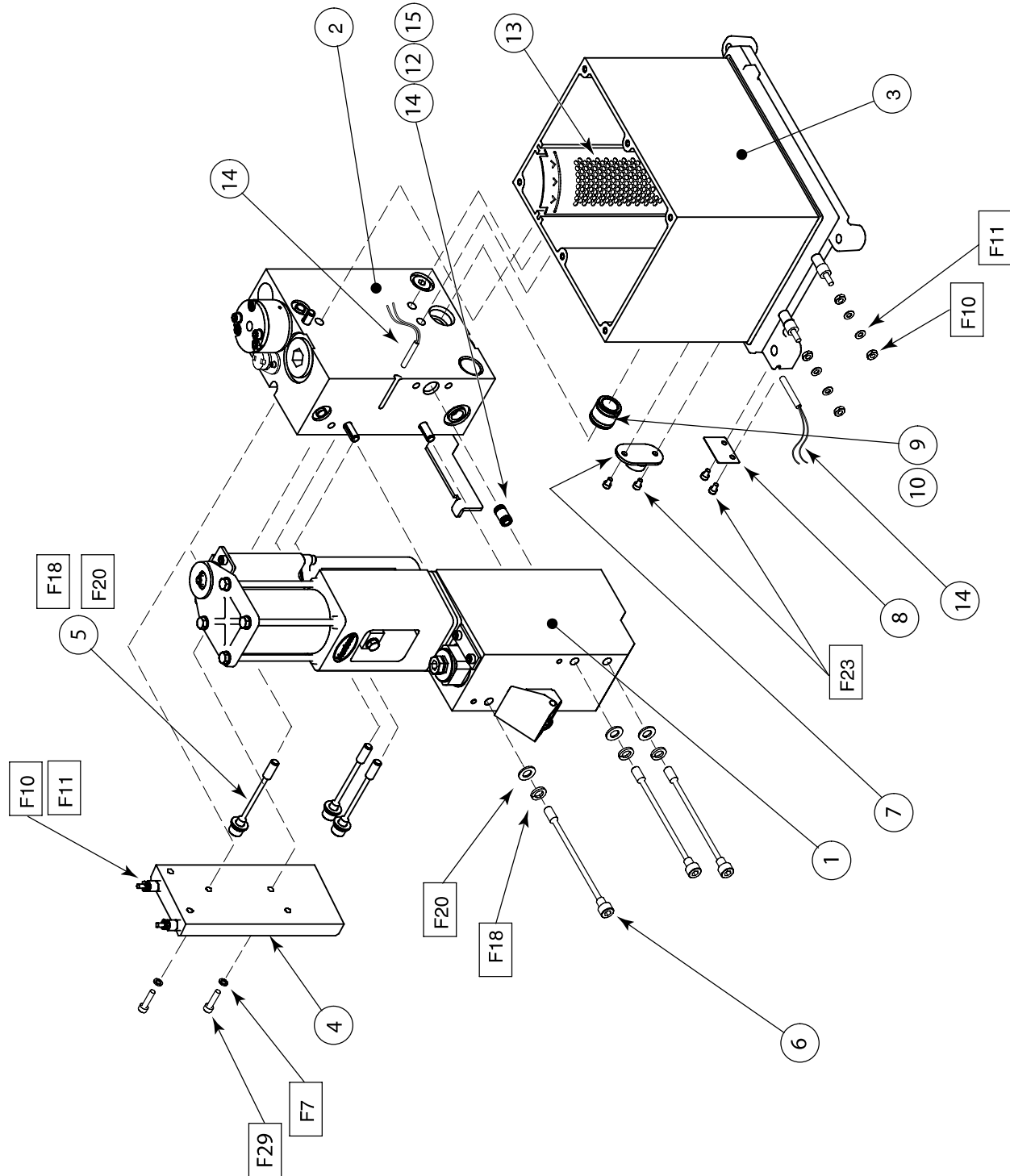


Figure 7-1 Tanks, pump and manifold

Item	Used	Part	Description	Quantity	Note
1		-----	Pump, piston, 14:1	1	A, B
2	P4, P7	-----	Manifold assembly, 4-hose, 230 V	1	C
	P10	-----	Manifold assembly, 6-hose, 480 V	1	C
	P4, P7	-----	Manifold assembly, 6-hose, 230 V	1	C
	P10	-----	Manifold assembly, 6-hose, 480 V	1	C
3	P4	1051033	Kit, service, tank, P4, 230V	1	F
	P7	1051034	Kit, service, tank, P7, 230V	1	F
	P10	1051035	Kit, service, tank, P10, 230V	1	F
4		-----	Heater block, ProBlue	1	F, G
5		1017009	Screw, manifold mounting, M8	3	
6		1017060	Screw, pump mounting, M8	3	
7		-----	Thermostat, OOR, 500 degree, push-on	1	D
8		1018189	Clip, retaining, RTD	1	
9		1017186	Tube, cross-over, tank	1	
10		941161	• O-ring, Viton, 0.750 x 0.938 x 0.094 in.	2	
11		1017189	Tube, cross-over, pump	1	
12		940133	• O-ring, Viton, 0.426 x 0.070 in.	2	
13	P4	1022747	Screen, inlet, pump, P4	1	
	P7	1025885	Screen, inlet, pump, P7	1	
	P10	1017892	Screen, inlet, pump, P10	1	
14		1028320	Sensor, temperature, RTD	2	E
15		954013	Backup ring, Teflon	2	
NS	P4	1029997	Insulation, tank, P4	1	
	P7	1030557	Insulation, tank, P7	1	
	P10	1030556	Insulation, tank, P10	1	

NOTE A: Refer to *Pump Assembly Parts Lists*
B: Included in service kit P/N 1028303
C: Included in service kit P/N 1064651, 1064652, 1064653, or 1064654. Refer to *Service Kits*.
D: Included in service kit P/N 1028321
E: Kit P/N 1028320 contains 1 RTD
F: Refer to Appendix E for 400/480 Volt melter parts

Manifold Assembly Parts List

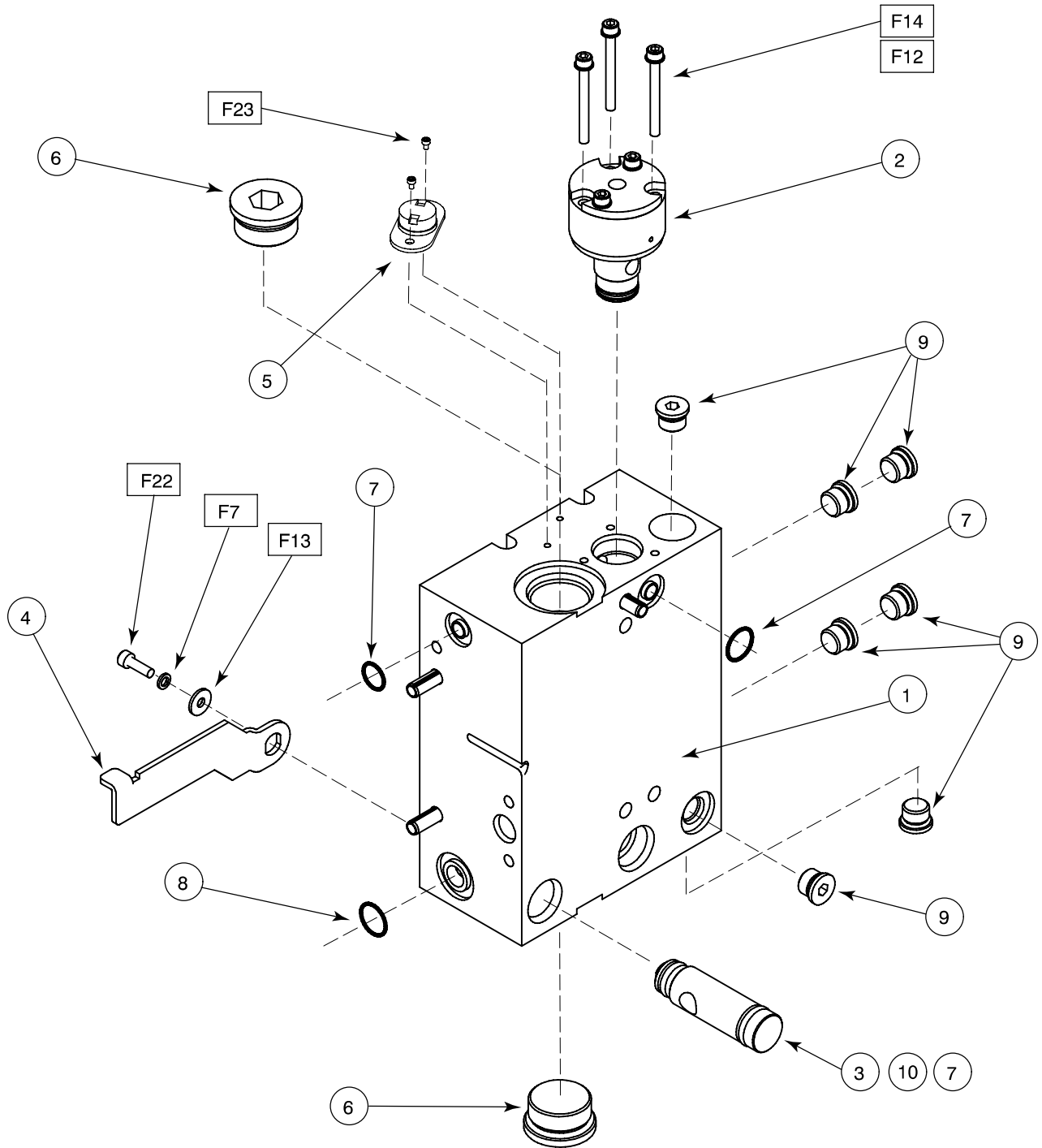


Figure 7-2 Manifold assembly

Item	Used	Part	Description	Quantity	Note
—	P4, P7	1022727	Manifold assembly, 4-hose	1	
—	P10	1018812	Manifold assembly, 6-hose	1	
1	P4, P7	-----	• Manifold, 4-hose	1	
	P10	-----	• Manifold, 6-hose	1	
2		-----	• Valve assembly, pressure discharge	1	A
3		1017212	• Valve, shut-off	1	
4		1017211	• Handle, shut-off	1	
5		-----	• Thermostat, 500 F, 00R	1	B
6		973583	• Plug, O-ring, straight thread, 1 ⁵ / ₁₆ -12	2	
7		1019515	• O-ring, Viton, 0.50 x 0.75 x 0.125 in.	3	C
8		942111	• O-ring, Viton, 0.812 x 0.062 x 0.125 in.	1	C
9		973574	• Plug, O-ring, straight thread, ⁹ / ₁₆ -18	7	
10		942080	• O-ring, Viton, 0.625 x 0.875 in.	1	C
<p>NOTE A: Included in service kit P/N 1028308 B: Included in service kit P/N 1028321 C: Included in service kit P/N 1028309</p>					

Pump Assembly Parts List

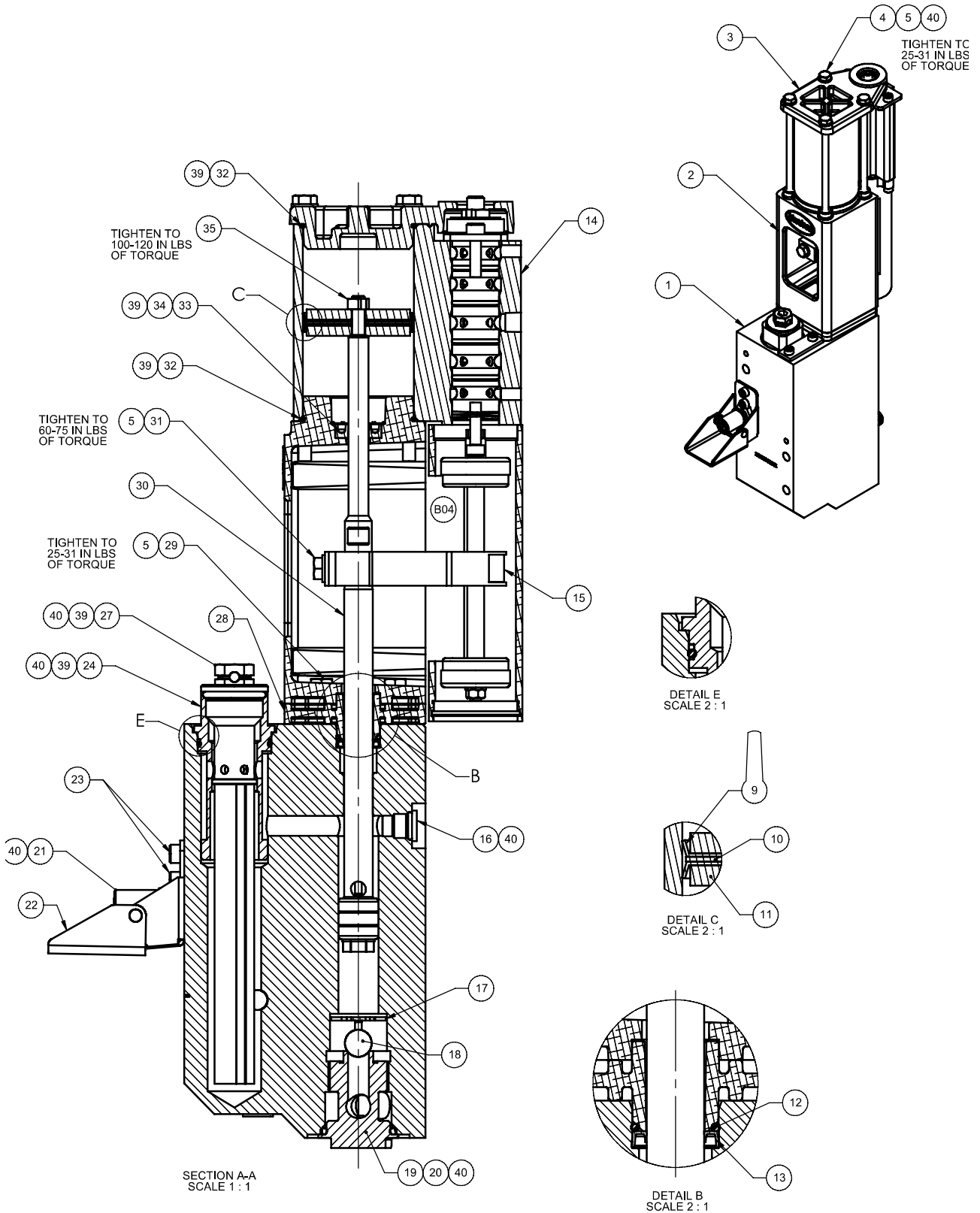


Figure 7-3 Standard Double-Acting pump (Part 1)

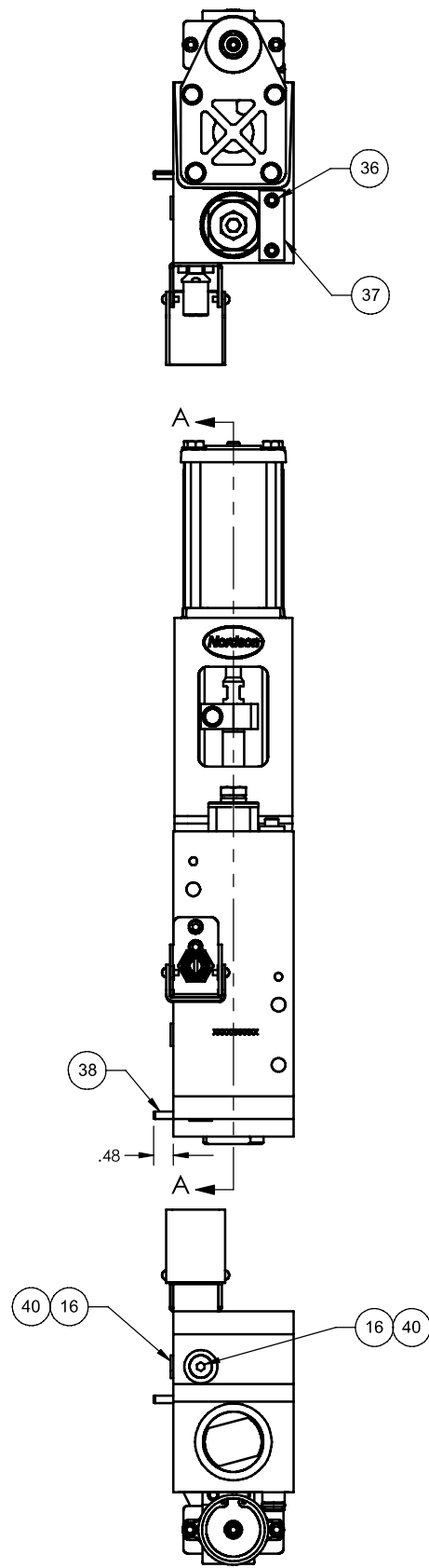


Figure 7-4 Standard Double-Acting pump (Part 2)

7-8 Parts

Item	Part	Description	Quantity	Note
1	1016863	BODY,PUMP-FILTER	1	
2	1016339	FRAME,PUMP,MACHINE	1	
3	333137	HEAD,CYLINDER,SP,MACHIN	1	
4	982147	SCR,HEX,CAP,M6X120,ZN	4	
5	983410	WASHER,FLT,M,NARROW,M6,STL,ZN	9	
6	1017189	TUBE,CROSSOVER,PUMP	1	
7	940133	O RING,VITON,.426ID X .070W,BR,10413	2	
8	954013	BACK-UP RING,SINGLE,7/16X9/16	2	
9	163039	CUP,PISTON,SP	2	
0	983445	WASHER,PISTON SEAL,SP	1	
11	983446	WASHER,PISTON CUP,SP	2	
12	940172	O RING,VITON,.676ID X .070W,BR	1	
13	273139	SEAL,PUMP.	1	
14	1024465	SHIFTER ASSEMBLY,G1/8	1	B
15	166880	SERVICE KIT, FORK,MAGNETIC,ASSY	1	A
16	973543	PLUG,O RING,STR THD,7/16-20	3	
17	503696	CAGE,BALL,SIPHON	1	
18	900001	BALL,440SSTL,.500, 50	1	
19	1017320	SEAT,BALL,LOWER	1	
20	945037	O RING,VITON,1 TUB	1	
21	276024	VALVE ASSY,DRAIN	1	
22	1022779	CHUTE,DRAIN,ASSY	1	
23	982780	SCR,SKT,M5X10,ZN	2	
24	1021955	ADAPTER,FILTER,ASSY	1	
27	1028305	FILTER,SATURN,MELTER,100 MESH,W/ O-RING	1	A
	945039	• O-Ring	1	D
28	1017307	INSULATOR,PUMP	1	
29	982237	SCR,HEX,CAP,M6X35,ZN	4	
30	1022658	PISTON ASSY,HYDRAULIC,PROBLUE	1	C
31	982135	SCR,HEX,CAP,M6X30,ZN	1	
32	940332	O RING,VITON, 2X2.125X.063	2	
33	952100	CUP,U,VITON	1	
34	986331	RETAINING RING,INT,100,PUSHON	1	
35	984092	NUT,HEX,LOCK,TORQUE,M6,CLASS10	1	
36	982372	SCR,SKT,M5X12,BL	2	
37	1021270	PLATE,FILTER,ANTI ROTATE	1	
38	985401	PIN,ROLL,.188X1,STL,ZN	2	
39	900493	LUBRICANT,PARKER HI-TEMP,11208	0	
40	900344	LUBRICANT,NEVER SEEZ,8OZ CAN	0	

NOTE A: Refer to *Service Kits* for kit contents.

B: See Figure 7-5 for exploded view

C: See Figure 7-6 for exploded view

D: O-ring service kit P/N 1028305

NOTE: Refer to Appendix D, *SP Pump Diagnostics and Repair* for detailed information about pump disassembly and maintenance.

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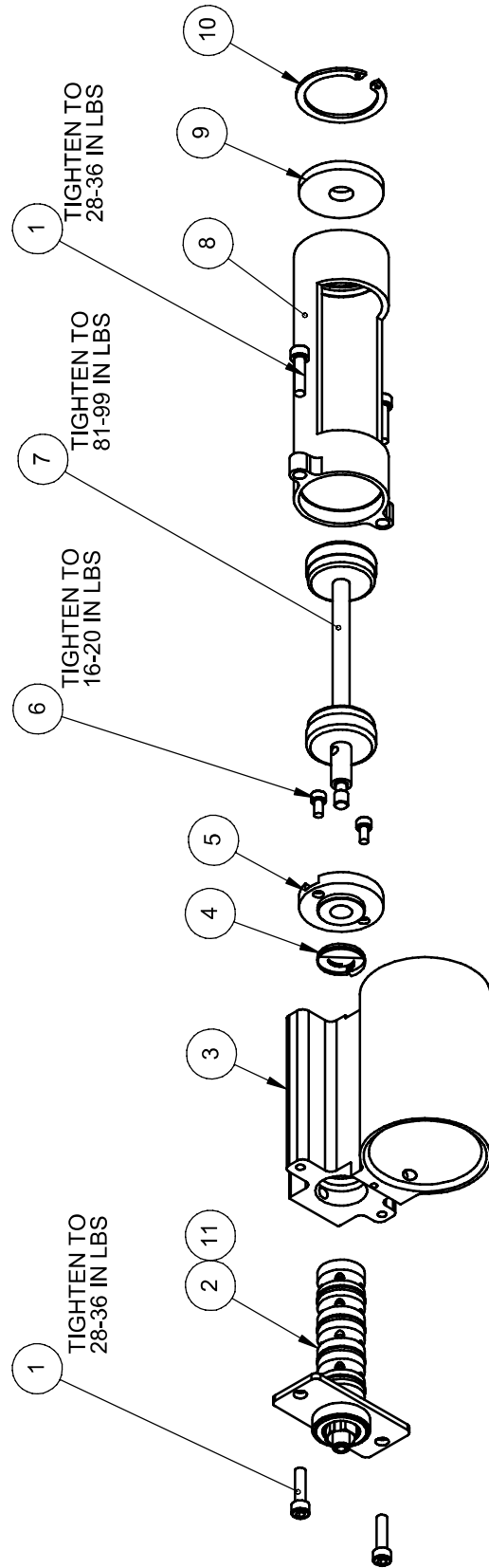


Figure 7-5 Shifter assembly/Standard Double-Acting pump

Item	Part	Description	Quantity	Note
1	982028	SCR,SKT,M5X20,BL	4	
2	1006027	SERVICE KIT, VALVE ASSY SP	1	
3	1021998	MANIFOLD,AIR,G1/8 PORT,PUMP	1	
4	333560	SPRING,WAVE,INCONEL,SP PUMP	1	
5	155057	DETENT,UPPER,SP	1	
6	982059	SCR,SKT,M4X8,BL	2	
7	164606	SERVICE KIT, ACTUATOR,MAGNETIC,ASSY,SP	1	A
8	155068	CAN,SP	1	
9	155067	DETENT,LOWER ,SP	1	
10	986714	RETAINING RING,INT,156,BOWED	1	
11	900493	LUBRICANT,PARKER HI-TEMP,11208	0	

NOTE A: Refer to *Service Kits* for kit contents.

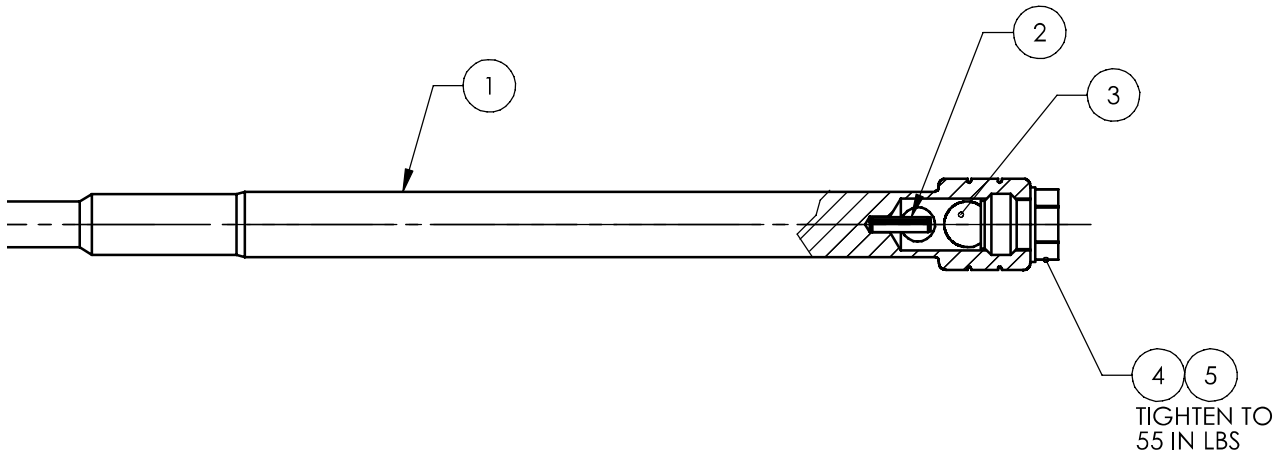


Figure 7-6 Piston assembly/Standard Double-Acting pump

Item	Part	Description	Quantity	Note
1	-----	PISTON,PUMP,15:1	1	
2	985302	PIN,ROLL,.125X .500,STL,ZN	1	
3	900000	BALL,440SSTL,.375, 50	1	
4	503709	SEAT,BALL,PRESSURE	1	
5	900470	ADHESIVE,LOCTITE 272,RED,HI TEMP,50ML	0	

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Pneumatic Components Parts List

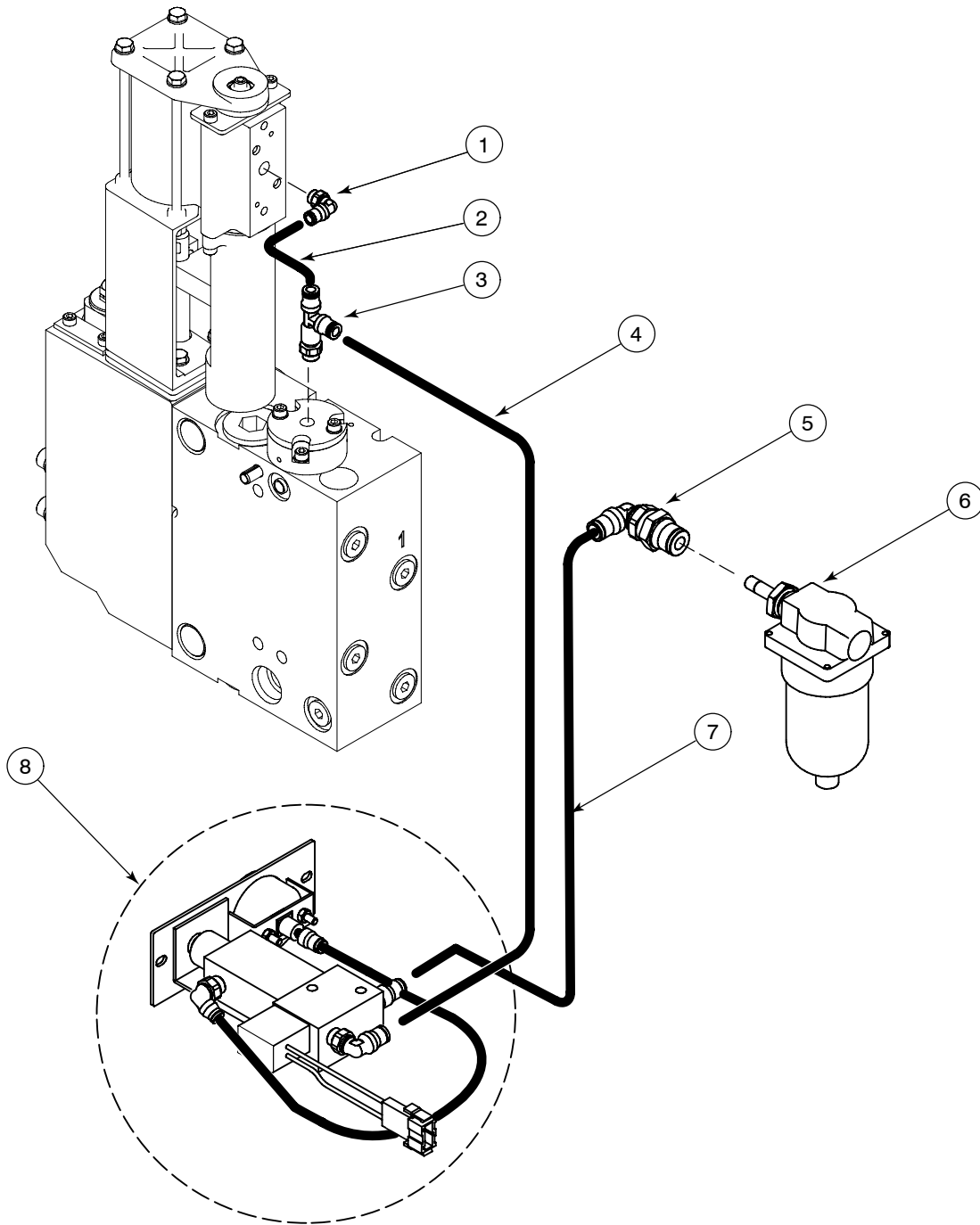


Figure 7-7 Pneumatic components

Item	Used	Part	Description	Quantity	Note
1		1023307	Elbow, male, 6 mm tube x G ¹ / ₈	1	
2		1023855	Tubing, PDV-to-pump, 6 mm tube	1	
3		1019511	Tee, run, 6 mm tube, G ¹ / ₈	1	
4		1023853	Tubing, regulator-to-PDV, 6 mm tube (yellow)	1	
5		1023290	Fitting, bulkhead, 90-degree, 6 mm tube	1	
6		1023267	Filter assembly, air, 6 mm BSPP	1	
7		1023854	Tubing, filter-to-regulator, 6 mm tube (blue)	1	
8		-----	Pneumatic panel assembly	1	A
NOTE A: Included in service kit P/N 1028307					

Electrical Enclosure Parts List

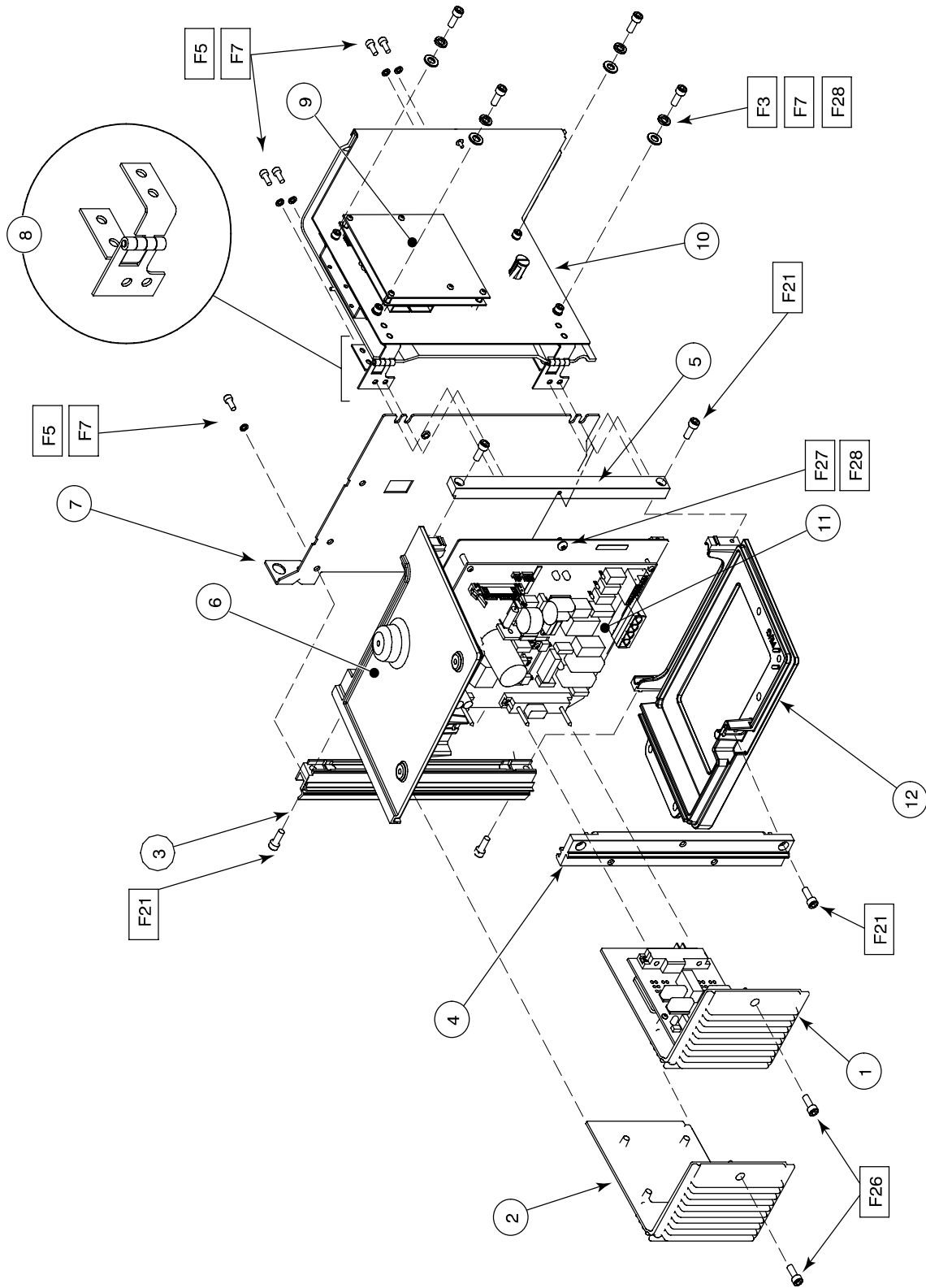


Figure 7-8 Electrical enclosure

Item	Used	Part	Description	Quantity	Note
1		-----	Module assembly, power, removable	AR	A
2		1017223	Frame, blank module	AR	
3	P4, P7	1042411	Column, rear, electrical enclosure, P4/P7	1	
	P10	1042414	Column, rear, electrical enclosure, P10	1	
4	P4, P7	1042412	Column, side, electrical enclosure, P4/P7	1	
	P10	1042415	Column, side, electrical enclosure, P10	1	
5	P4, P7	1042410	Column, front, electrical enclosure, P4/P7	1	
	P10	1042413	Column, front, electrical enclosure, P10	1	
6		1039649	Frame, machined, upper, keyed	1	
7	P4, P7	1020572	Panel, divider, P4/P7	1	
	P10	1025470	Panel, divider, P10	1	
8		1017896	Hinge assembly	2	
9		-----	Printed circuit assembly, display/CPU	1	B
10	P4, P7	-----	Panel assembly, front, P4/P7	1	C
	P10	-----	Panel assembly, front P10	1	D
11	P4, P7	-----	Mounting plate assembly, main PCA, P4/P7	1	E
	P10	-----	Mounting plate assembly, main PCA, P10	1	F, G
12		1039647	Frame, machined, lower, keyed	1	

NOTE A: Included in service kit P/N 1028328
 B: Included in service kit P/N 1028325
 C: Included in service kit P/N 1028326
 D: Included in service kit P/N 1028327
 E: Included in service kit P/N 1028322
 F: Included in service kit P/N 1028323
 G: If only the PCA expansion board is required, order service kit P/N 1028324

Exterior Panels Parts List

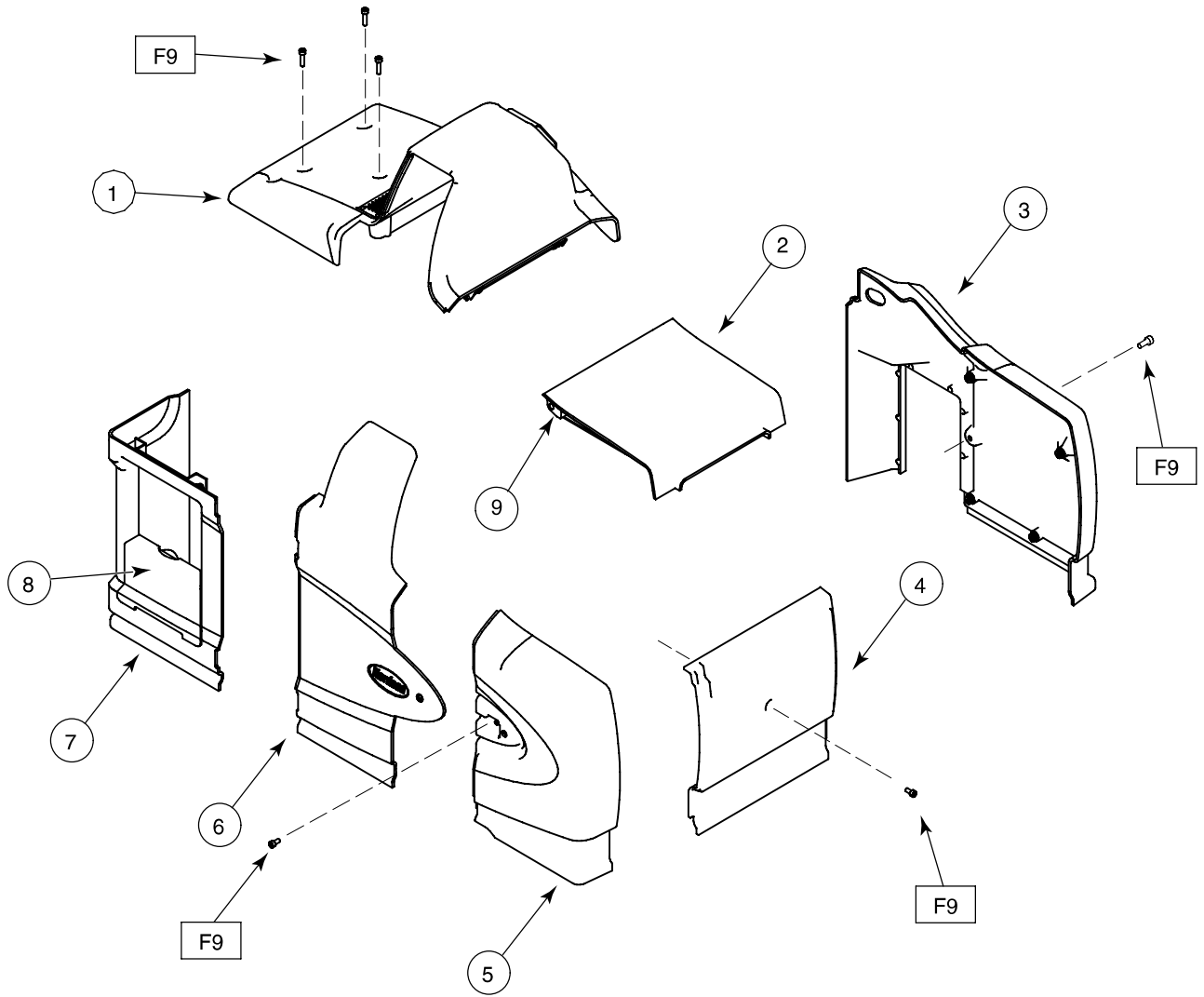


Figure 7-9 Exterior panels

Item	Used	Part	Description	Quantity	Note
1	P4, P7	1041735	Cover, pump, P4/P7	1	
	P10	1041741	Cover, pump, P10	1	
2	P4	1024464	Lid assembly, P4	1	A
	P7, P10	1025579	Lid assembly P7/P10	1	A
3	P4	1041733	Panel assembly, rear, P4	1	
	P7	1041737	Panel assembly, rear, P7	1	
	P10	1041740	Panel assembly, rear, P10	1	
4	P4	1021346	Panel assembly, end, P4	1	
	P7	1025591	Panel assembly, end, P7	1	
	P10	1028495	Panel assembly, end, P10	1	
5	P4	1022948	Panel assembly, front, P4	1	
	P7	1025594	Panel assembly, front, P7	1	
	P10	1028494	Panel assembly, front, P10	1	
6	P4, P7	1041736	Door assembly, filter P4/P7	1	
	P10	1041739	Door assembly, filter, P10	1	
7	P4, P7	1041734	Cover assembly, ebox door, P4/P7	1	
	P10	1041738	Cover assembly, ebox door, P10	1	
8	P4	1041742	Door, graphics, P4	1	
	P7	1041743	Door, graphics, P7	1	
	P10	1041745	Door, graphics, P10	1	
9		1049528	Replacement hinge pin service kit P4/P7/P10	1	
NOTE A: Includes hinge pin P/N 1021345					

Chassis Components Parts List

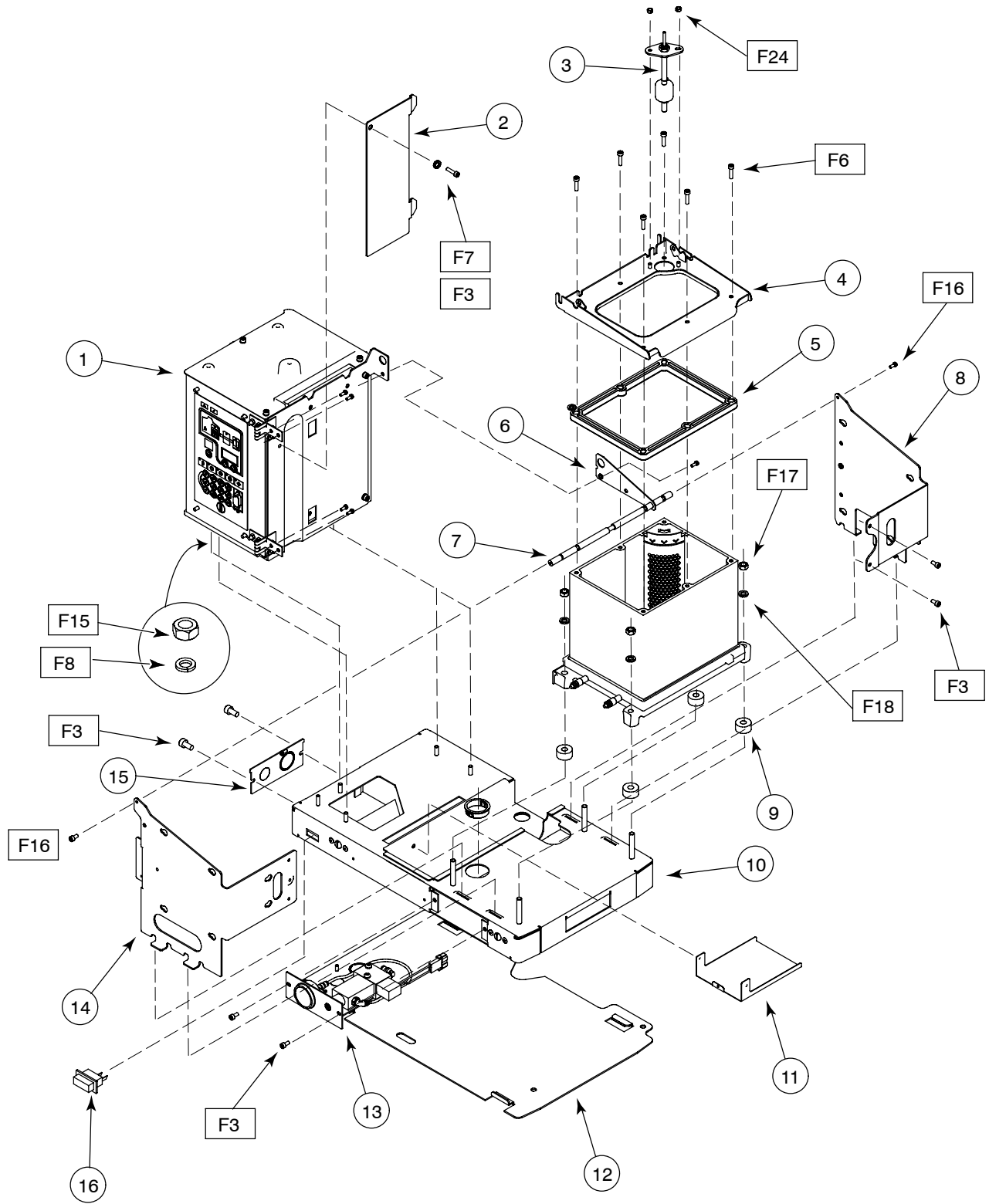


Figure 7-10 Chassis components

Item	Used	Part	Description	Quantity	Note
1		-----	Electrical box assembly	1	A
2		1023714	Cover, wireway, electrical enclosure	1	
3	P4, P7	1038971	Switch, level, assembly, P4/P7	1	B
	P10	1038972	Switch, level, assembly, P10	1	C
4	P4	1022749	Cover, tank, P4	1	
	P7, P10	1018190	Cover, tank, P7/P10	1	
5	P4	1018691	Insulator, tank top, P4	1	
	P7/P10	1025640	Insulator, tank top , P7/P10	1	
6		1022840	Brace, P4/P7/P10	1	
7		1021653	Rod, retaining, cover	1	E
8	P4	1021655	Bracket, panel, rear, P4	1	
	P7	1025642	Bracket, panel, rear, P7	1	
	P10	1028525	Bracket, panel, rear, P10	1	
9		1017603	Spacer, bottom, tank	4	
10	P4	1021660	Chassis, P4	1	
	P7, P10	1018822	Chassis, P7/P10	1	
11		1024525	Tray, drip, manifold	1	
12	P4	1021661	Sub-base, P4	1	
	P7, P10	1018819	Sub-base, P7/P10	1	
13		-----	Pneumatic assembly	1	D
14	P4	1021656	Bracket, panel, front, P4	1	
	P7	1025641	Bracket, panel, front, P7	1	
	P10	1028526	Bracket, panel, front, P10	1	
15		1018821	Plate, conduit, chassis	1	
16		1017947	Switch, rocker, SPST, 250V, 16A	1	

NOTE A: Refer to the *Electrical Enclosure Parts List*
B: Included in service kit P/N 1038971
C: Included in service kit P/N 1038972
D: Included in service kit P/N 1028307
E: For the tank lid hinge pin, refer to the *External Panel* parts list

Ribbon Cable Parts List

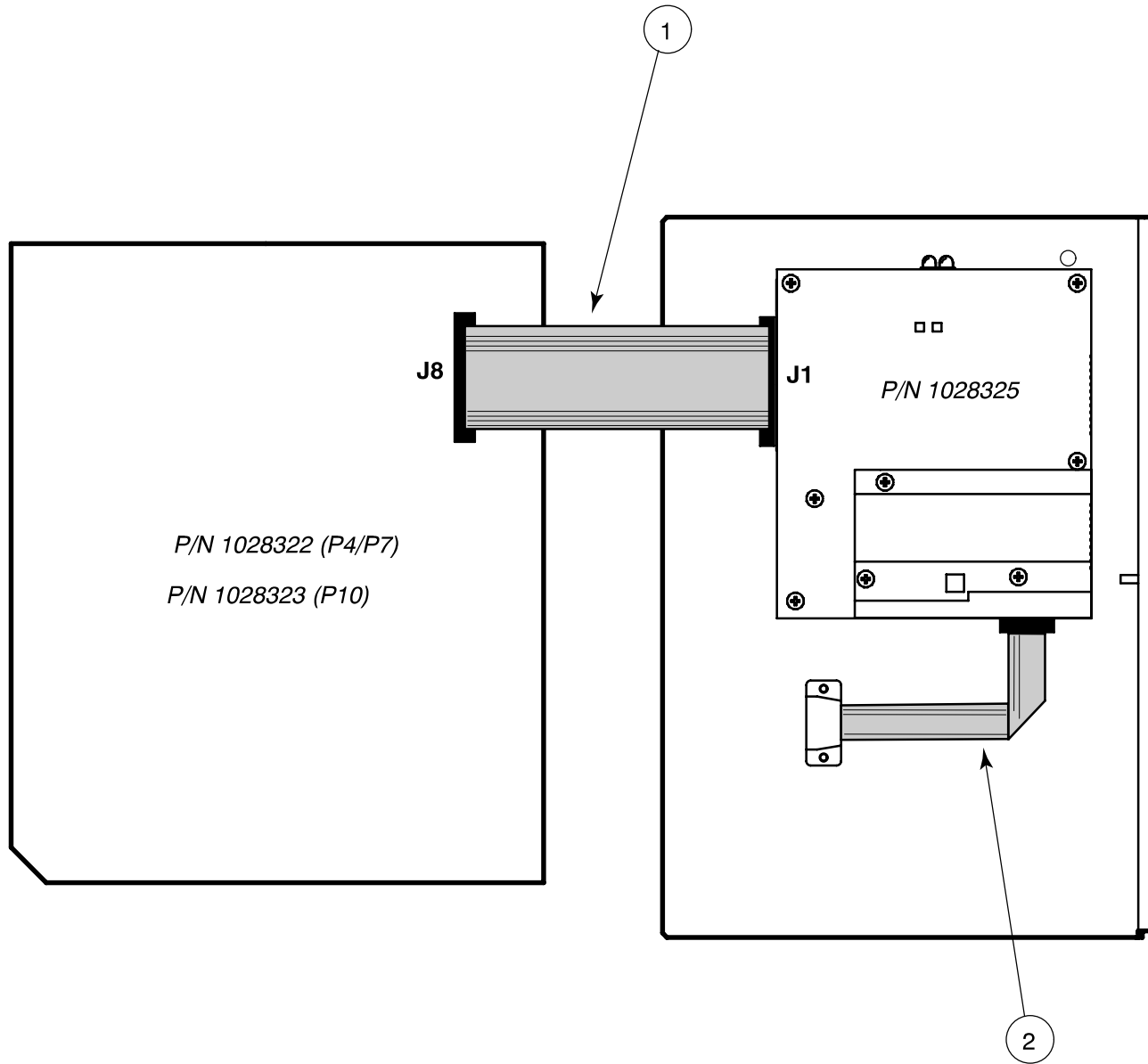


Figure 7-11 Ribbon cables

Item	Used	Part	Description	Quantity	Note
1		1018283	Cable assembly, ribbon, main	1	
2		1018284	Cable assembly, serial port	1	A

NOTE A: Included in service kit P/N 1028326 (P4/P7) and kit P/N 1028327 (P10)

Service Kits

Pump Replacement

Part	Description	Quantity
1028303	Kit, service, pump assembly, P4/P7/P10	—
-----	• Pump, piston, 14:1	1
-----	• O-ring, Viton, 0.50 x 0.75 x 0.125 in.	1
-----	• O-ring, Viton, 0.812 x 0.062 x 0.125 in.	1
-----	• Elbow, male, 6 mm tube, G 1/8	1
-----	• Lubricant, Parker, hi-temperature, 1/2 oz.	1

Pump General Service

Part	Description	Quantity
1028304	Kit, service, pump, P4/P7/P10	—
940133	• O-ring, Viton, 0.426 x 0.070 in.	2
940332	• O-ring, Viton, 2.00 x 2.125 x 0.063 in.	2
1019515	• O-ring, Viton, 0.50 x 0.75 x 0.125 in.	1
942111	• O-ring, Viton, 0.812 x 0.062 x 0.125 in.	1
940181	• O-ring, Viton, 0.739 x 0.70 in.	4
952100	• Cup, U, Viton	1
954013	• Backup ring, single, 7/16 x 9/16	2
163039	• Cup, piston	2
273139	• Seal, pump	1
986331	• Retaining ring, internal, 100, push-on	1
984092	• Nut, hex, lock, torque, M6	1
982147	• Screw, hex, cap, M6 x 120	4
982237	• Screw, hex, cap, M6 x 35	4
983410	• Washer, flat, M6	8
940172	• O-ring, Viton, 0.676 x 0.070	1
-----	• Lubrication, Parker, 1/2 oz.	1
940261	• O-ring, Viton, 1.25 x 1.375 x .063	1
1017849	• Backup ring, Teflon, 1.273 x .045 thick	1
945037	• O-ring, Viton, 1-inch tube	1
973543	• Plug, O-ring, 7/16-20	3
211228	Service kit, SP lubricating oil	—

Filter

Part	Description	Quantity
1028305	Filter, Saturn, 100-mesh	—
-----	• Filter assembly, 100-mesh	
945039	• • O-ring	

Pneumatic Panel

Part	Description	Quantity
1028307	Kit, service, pneumatic panel assembly	—
-----	• Pneumatic panel assembly	1
-----	• Screw, mounting	2

Pressure Discharge Valve

Part	Description	Quantity
1028308	Kit, service, pressure discharge valve	—
-----	• Valve assembly, pressure discharge	1
-----	• Screw, hex, M5 x 50	3
-----	• Tee, run, 6-mm tube, G ¹ / ₈	1

Manifold Service Kit

Part	Description	Quantity
1028309	Kit, service, manifold, P4/P7/P10	—
1019515	• O-ring, Viton, 0.050 x 0.75 x 0.125 in.	3
-----	• O-ring, Viton, 0.625 x 0.875 in.	1
942111	• O-ring, Viton, 0.812 x 0.062 x 0.125 in.	1
-----	• O-ring, Viton, 0.750 x 0.938 x 0.094 in.	2
-----	• Lubricant, Parker, 1/2 oz	1

RTD

Part	Description	Quantity
1028320	Kit, service, RTD, P4/P7/P10	—
-----	• Sensor, temperature, RTD	1
-----	• Screw, hex, M3 x 20	1
-----	• Washer, lock, spring, M3	1
-----	• Terminal block, 380 V	1
1019515	• O-ring, Viton, 0.50 x 0.75 x 0.125 in.	1
942111	• O-ring, Viton, 0.812 x 0.062 x 0.125 in	1
-----	• Compound, thermal, 1 gram	1

Thermostat

Part	Description	Quantity
1028321	Kit, service, thermostat, melter	—
-----	• Thermostat, OOR, 500 degree, push-on	1
-----	• Screw, hex, M4 x 6	2
-----	• Compound, thermal, 1 gram	1

Main Circuit Board

Used	Part	Description	Quantity
P4, P7	1028322	Kit, service, main PCA	—
P10	1028323	Kit, service, main PCA	—
	-----	• Mounting plate assembly, main PCA	1

Central Processor Unit (CPU)

Part	Description	Quantity
1028325	Kit, service, central processor unit	—
-----	• PCA, display/CPU	1
-----	• Stand-off, hex, M3 x 8 mm	6
-----	• Washer, lock, M3	6

Operator's Panel

Used	Part	Description	Quantity
P4, P7	1028326	Kit, service, operator's panel/enclosure, P4/P7	—
P10	1028327	Kit, service, operator's panel/enclosure, P10	—
	-----	• Panel assembly, front, electrical enclosure	1

Hose/Gun Module

Part	Description	Quantity
1028328	Kit, service, hose/gun module, P4/P7/P10	—
-----	• Module assembly, power, removable	1

Main Circuit Board Fuses

Part	Description	Quantity
1028329	Kit, service, fuse, main circuit board, P4/P7/P10	—
-----	• Fuse, 15.00, nontime-delay, 250 V	2
-----	• Cover, fuse, 0.25 x 1.25 in.	2
-----	• Fuse, time-lag, 2A, 5 x 20 mm, ceramic	2
-----	• Cover, fuse, 5 x 20 mm	2
NOTE A: Refer to Table 6-2 for fuse types and locations		

Hose/Gun Module Fuses

Part	Description	Quantity
1028331	Kit, service, fuse, hose/gun module, P4/P7/P10	—
-----	• Fuse, 6.30, fast-acting, 250 V, 5 x 2	4
-----	• Cover, fuse, 5 x 20 mm	4
NOTE A: Refer to Table 6-4 for fuse types and locations		

Basic Spare Parts

Part	Description	Quantity
1028332	Kit, basic spare parts, P4/P7/P10	—
1028305	• Filter, Saturn, melter, 100-mesh	1
1028320	• Kit, service, RTD, P4/P7/P10	1
1028321	• Kit, service, thermostat, melter	1
1028328	• Kit, service, hose/gun module, P4/P7/P10	1
1028329	• Kit, service, fuse, main circuit board, P4/P7/P10	1
1028331	• Kit, service, fuse, hose/gun module, P4/P7/P10	1

Expanded Spare Parts

Part	Description	Quantity
1028333	Kit, basic expanded parts, P4/P7/P10	—
1028305	• Filter, Saturn, melter, 100-mesh	5
1028320	• Kit, service, RTD, P4/P7/P10	1
1028321	• Kit, service, thermostat, melter	1
1028328	• Kit, service, hose/gun module, P4/P7/P10	1
1028329	• Kit, service, fuse, main circuit board, P4/P7/P10	1
1028331	• Kit, service, fuse, hose/gun module, P4/P7/P10	1
1028304	• Kit, service, pump, P4/P7/P10	1
1028309	• Kit, service, manifold, P4/P7/P10	1
1023267	• Filter assembly, air, 6 mm BSPP	1

Level Switch

Used	Part	Description	Quantity
P4, P7	1038971	Kit, switch, level, P4/P7	—
	-----	• Switch, level, assembly, P4/P7	1
	-----	• Nut, hex, M5	2
P10	1038972	Kit, switch, level, P10	—
	-----	• Switch, level, assembly, P10	1
	-----	• Nut, hex, M5	2

Manifold Guard (P4)

Part	Description	Quantity
1032154	Kit, manifold guard, P4	—
-----	• Shield, manifold, snap-on, P4	1

Manifold Guard (P10)

Part	Description	Quantity
1031871	Kit, manifold guard, 6-hose, P10	—
-----	• Guard, wire frame, manifold, 6-hose	1
-----	• Mount, lower, wire guard, 6-hose	2
-----	• Mount, upper B, wire guard, 6-hose	1
-----	• Mount, upper A, wire guard, 6-hose	1
-----	• Screw, socket-head, M5 x 20	3

Vent Guard (P10)

Part	Description	Quantity
1048884	Guard kit assembly, vent , screen, P10	—
-----	• Guard, screen, pump cover, P10	1
-----	• Reference drawing, guard kit, vent, screen, P10	1

Replacement Tank

Part	Description	Quantity
1051033	Kit, service, tank, P4, 230V	1
1051034	Kit, service, tank, P7, 230V	1
1051035	Kit, service, tank, P10, 230V	1

Tank Lid Hinge Pin

Part	Description	Quantity
1049528	Replacement hinge pin service kit, P4/P7, P10	—
-----	• Pin, hinge, lid, P4/P7/P10	1
-----	• Tube, spacer, pin, hinge, P4/P7/P10	1
-----	• Spring, compression, .360 x .038 x 1.75 long	1
-----	• Retaining, ring, external, 18, E-ring	2

Heater-Block 230V

Part	Description	Quantity
1064649	SVC KIT,HEATER BLOCK,230V,PROBLUE	—
-----	• HEATER BLOCK,PROBLUE,230V	1
-----	• SCR,SKT,M5X25,BL	2
-----	• WASHER,LK,M,SPT,M5,STL,ZN	2
-----	• COMPOUND,HEATSINK,10CC SYRINGE	1

Manifold 4 or 6-hose/230V or 480V

Part	Description	Quantity
1064651	SVC KIT,MANIFOLD 4-H,W/HTR BLOCK,230V,PB	—
1064652	SVC KIT,MANIFOLD 4-H,W/HTR BLOCK,480V,PB	—
1064653	SVC KIT,MANIFOLD 6-H,W/HTR BLOCK,230V,PB	—
1064654	SVC KIT,MANIFOLD 6-H,W/HTR BLOCK,480V,PB	—
-----	• HEATER BLOCK,PROBLUE,230V, or	1
-----	• HEATER BLOCK,PROBLUE,480V	1
-----	• MANIFOLD ASSY, 4 HOSE, or	1
-----	• MANIFOLD ASSY, 6 HOSE	1
-----	• SCR,SKT,M5X25,BL	2
-----	• WASHER,LK,M,SPT,M5,STL,ZN	2
-----	• O RING, VITON, .50 X .75 X .125	2
-----	• O RING,VITON, .812X1.062X.125	1
-----	• O RING,VITON, .750X .938X.094	2
-----	• O RING,VITON,.426ID X .070W,BR,10413	2
-----	• GREASE,HI-TEMP,.50OZ,SLUBE 884-.50	1
-----	• COMPOUND,HEATSINK,10CC SYRINGE	1

Option Kits

6-Hose Extension

Part	Description	Quantity
1028324	Kit, 6-hose extension, board, P10	—
-----	• PCA, P10, expansion	1
-----	• Harness, expansion, 6 hose/gun	1
-----	• Cable assembly, 20 position, ribbon cable	1
-----	• Screw, machine, pan-head, M3 x 12	4

Input/Output Expansion Card

Part	Description	Quantity
1036607	Kit, I/O expansion card	—
-----	• PCA, optional I/O	1
-----	• Terminal block connector, 10 position (1–10)	1
-----	• Terminal block connector, 10 position (11–20)	1
-----	• Screw, machine, pan-head, M3 x 6	8

Fill Master

Part	Description	Quantity
771415	Kit, sensor, P4/P7/P10	A, B
771417	Kit, lid, P7/P10	B
771416	Kit, lid, P4	B
NOTE	A: Requires lid kit P/N 771417 or 771416 B: Fill Master system is not included	

Ethernet Card

Part	Description	Quantity
1053289	KIT,ETHERNET CARD	—
-----	• PCA,ANYBUS-S,ETHERNET,17MM PINS,PROGRAMM	1
-----	• MACH SCRMM,PAN,REC,M3X6,SEMS	3

Devicenet Card

Part	Description	Quantity
1053288	KIT,DEVICENET CARD	—
-----	• PCA,ANYBUS-S,DEVICENET,17MM PINS	1
-----	• MACH SCRMM,PAN,REC,M3X6,SEMS	3

Profibus Card

Part	Description	Quantity
1053300	KIT, PROFIBUS CARD	—
-----	• PCA,ANYBUS-S,PROFIBUS,17MM PINS	1
-----	• MACH SCRMM,PAN,REC,M3X6,SEMS	3

P10 8 H/G Expansion Base

Part	Description	Quantity
1061030	8 H/G, BASE,EXPANSION	—
-----	• BASE,EXPANSION,8 H/G,P10	1
-----	• KIT,SHIP WITH,2 H/G BASE,P10	1

Schedule of Fasteners

Number	Description
F1	Screw, socket, M6 x 120
F2	Washer, flat, M6
F3	Screw, socket, M5 x 10
F4	Screw, socket, M6 x 35
F5	Screw, socket, M5 x 12
F6	Screw, socket, M5 x 20
F7	Washer, lock, split, M5
F8	Washer, lock, split, M6
F9	Screw, socket, M5 x 10
F10	Nut, hex, 10-32
F11	Washer, flat, 10
F12	Washer, flat, M5
F13	Washer, flat, oversized, M5
F14	Screw, socket, M5 x 50
F15	Nut, hex, M6
F16	Screw, socket, M4 x 10
F17	Nut, hex, M8
F18	Washer, lock, split, M8
F19	Screw, socket, M4 x 8
F20	Washer, flat, M8
F21	Screw, socket, M6 x 16
F22	Screw, socket, M5 x 16
F23	Screw, socket, M4 x 6
F24	Nut, hex, M5, Zn
F25	Screw, socket, M5 x 12
F26	Screw, pan-head, M4 x 12
F27	Screw, pan-head, cross-rec, M5 x 8
F28	Washer, flat, regular, 8
F29	Screw, socket, M5 x 25

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Section 8

Technical Data

General Specifications

Item	Data	Note
Weight of empty melter		
P4	42 kg (93 lb)	
P7	43 kg (95 lb)	
P10	46 kg (101 lb)	
Weight of melter with full tank		
P4	46 kg (101 lb)	
P7	50 kg (110 lb)	
P10	56 kg (123 lb)	
Weight of 3.0 kva transformer (400/480 VAC melters only)	25 kg (55 lb)	
Weight of 1.5 kva transformer (400/480 VAC melters only)	18 kg (40 lb)	
Hose ports	4 to 6	A
Melt rate		
P4	4.3 kg/hr (9.5 lb/hr)	
P7	8.2 kg/hr (18 lb/hr)	
P10	11 kg/hr (24 lb/hr)	
Noise	64dB (A) at maximum pump speed	B
Workplace temperature	-5 to 50°C (23 to 122 °F)	
Throughput rate		
P4	8.9 kg/hr (19.6 lb/hr)	
P7	10.9 kg/hr (24 lb/hr)	
P10	12.4 kg/hr (27 lb/hr)	
Pump rate	32.7 kg/hr (72 lb/hr)	
NOTE	A: Depends on the melter's configuration and whether optional hose/gun modules are installed. B: The noise level is measured at a distance of 1 m (3.3 ft.) from the surface of the melter.	

Electrical Specifications

Item	Data	Note
Hose/gun heating capacity	2, 4, or 6 hose/gun pairs	A
Control temperature range	40 to 230 °C (100 to 450 °F)	
Control temperature accuracy	±1 °C	B
International Protection (IP) rating	IP54	
Input voltage tolerance	+10%, -15%	
NOTE A: Dependent on melter configuration and addition of optional hose/gun modules B: Flow setpoint at RTD		

Pump Specifications

Item	Data
Air pressure while running	70 to 689 kPa (10 to 100 psi)
Minimum air pressure	0.7 bar (10 psi)
Viscosity range	800 to 10,000 cps
Maximum hydraulic pressure	8.7 10.3 MPa (1500 psi)
Air consumption at 415 kPa (60 psi) and maximum pump speed	46 l/min. (1.6 scfm)
Displacement	7.20 ml/stroke (0.44 in ³ /stroke)
Maximum speed	90 strokes/min.

Melter Power Requirements

Melter	Number of Hose/Guns	1-Phase Power Draw (Amps)	3-Phase Power (Amps)	
			Without Neutral	With Neutral
P4	2	17	15	9
	4	26	23	17
P7	2	18	16	10
	4	27	24	17
P10	2	18	16	10
	4	27	24	17
	6	35	31	18

Dimensions

P4 Melter

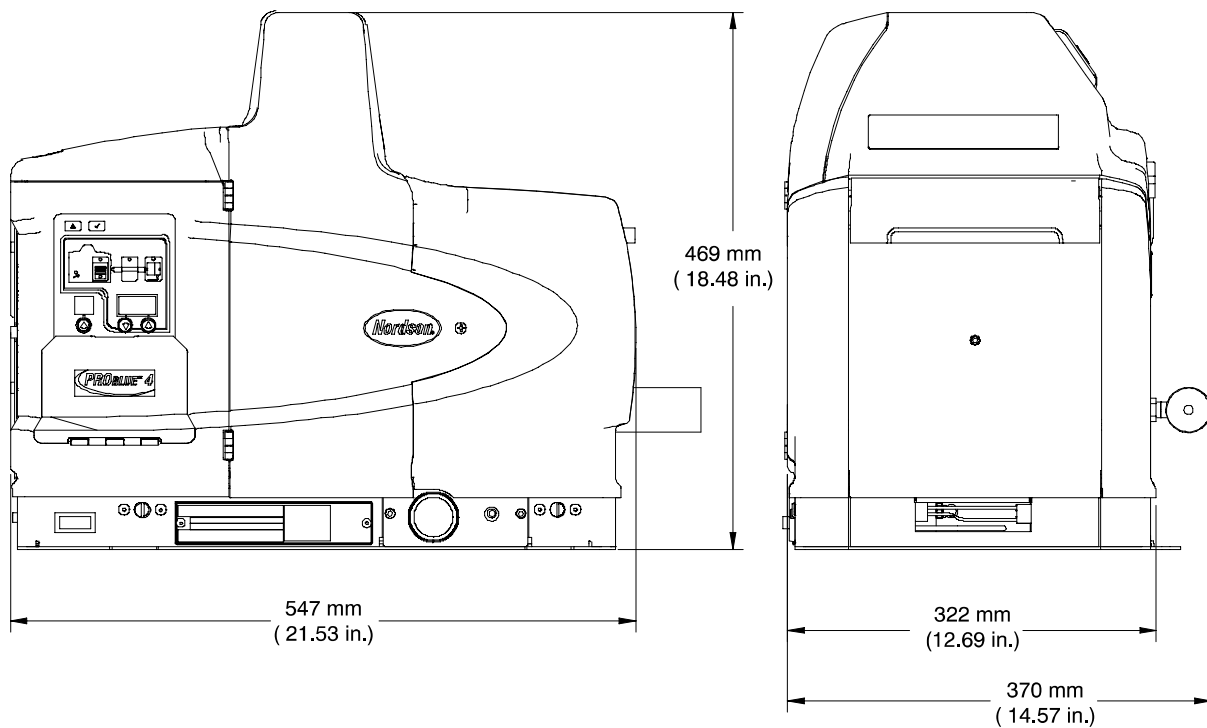


Figure 8-1 P4 Melter dimensions

P7 Melter

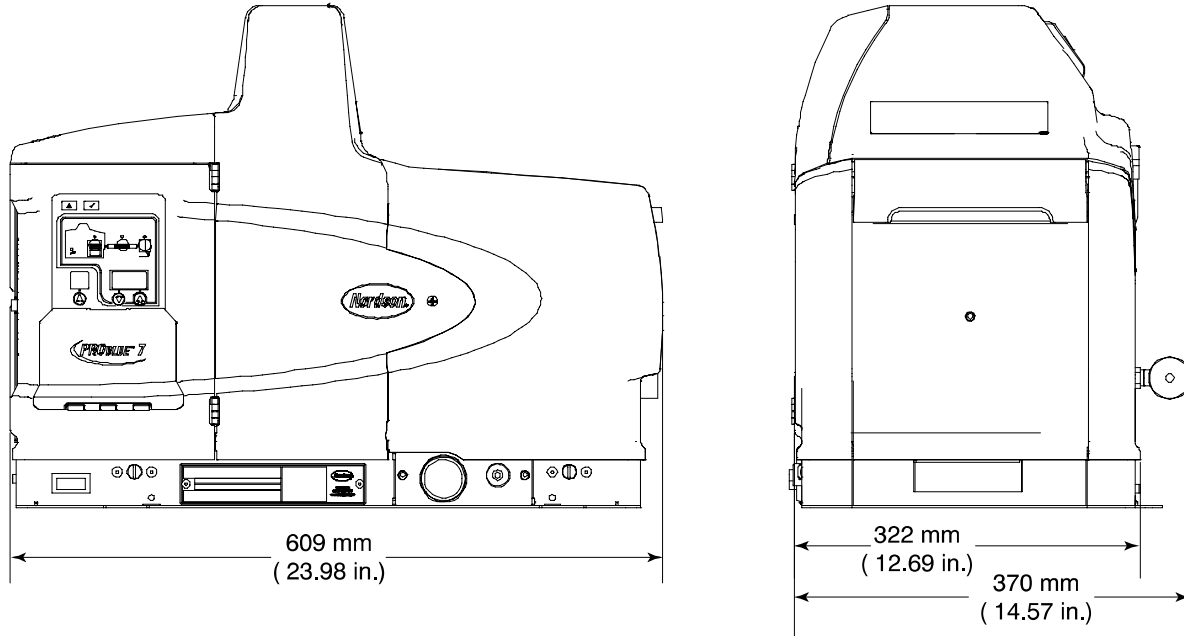


Figure 8-2 P7 Melter dimensions

P10 Melter

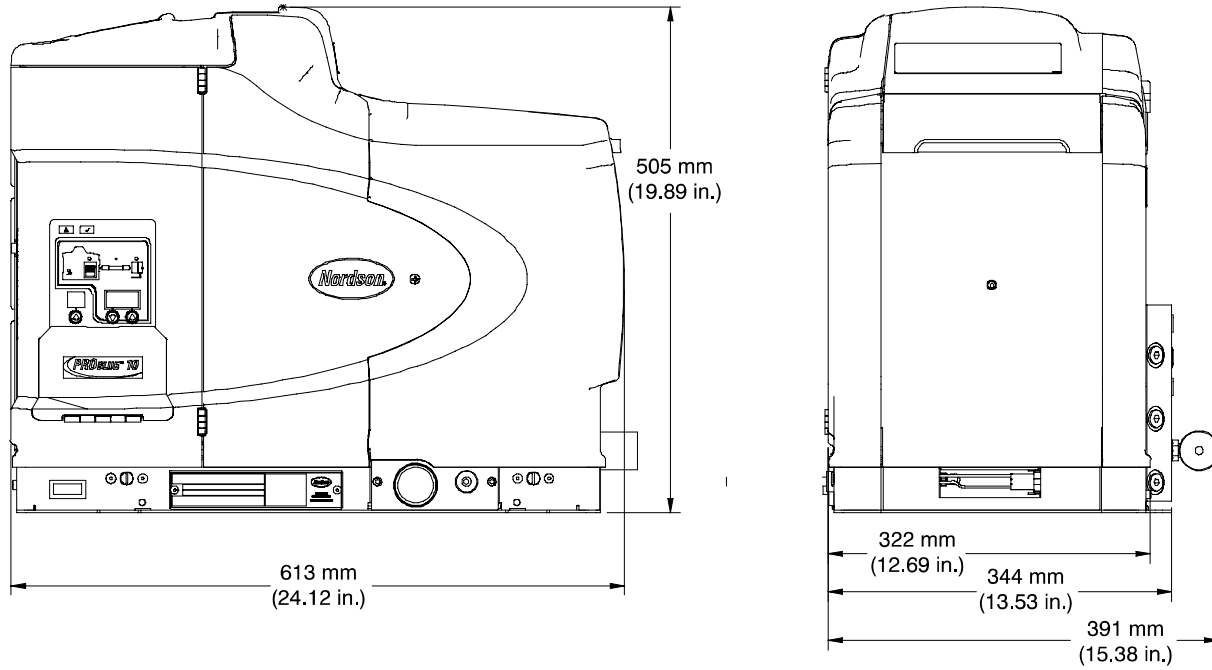


Figure 8-3 P10 Melter dimensions

Sub-base

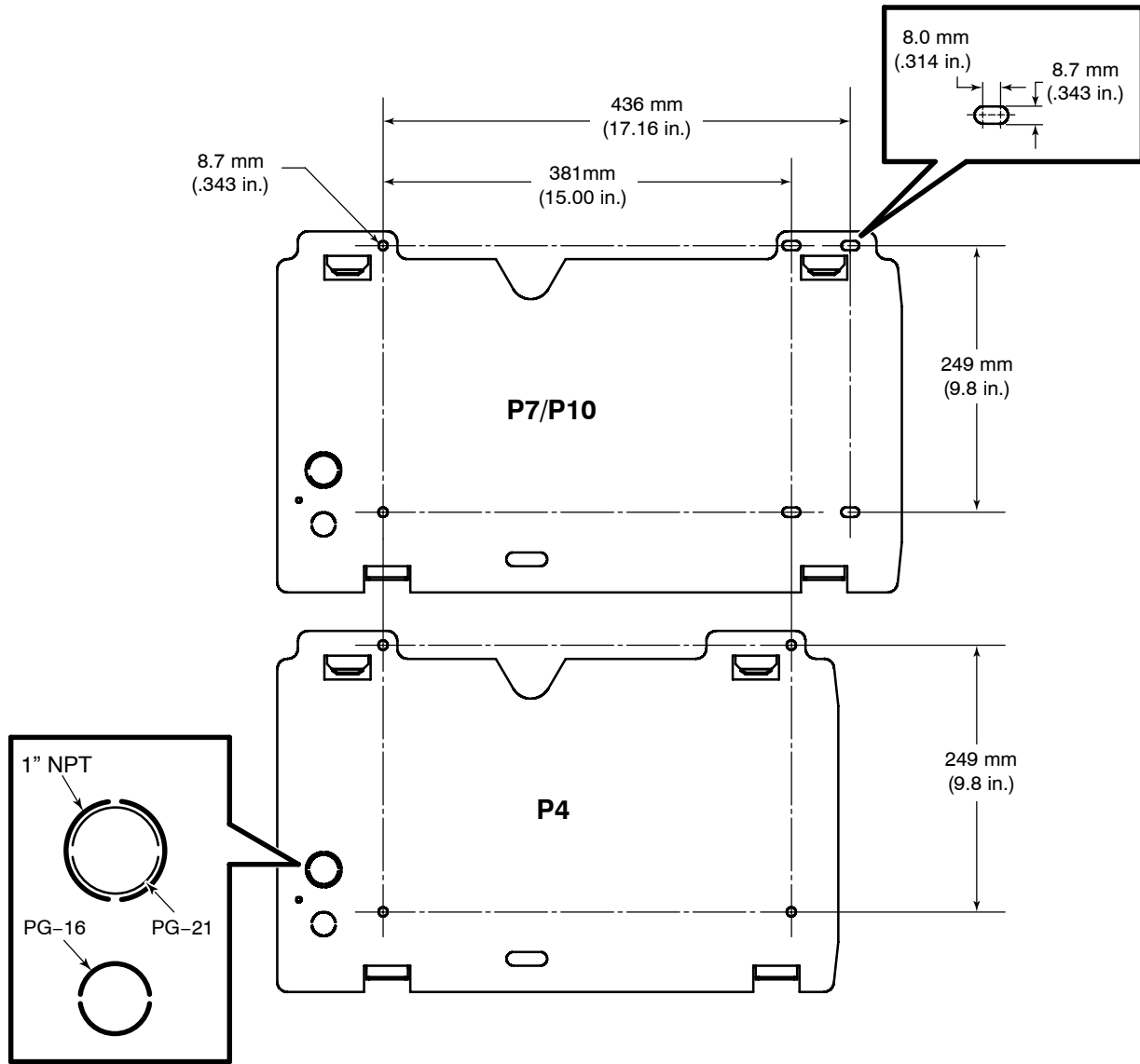
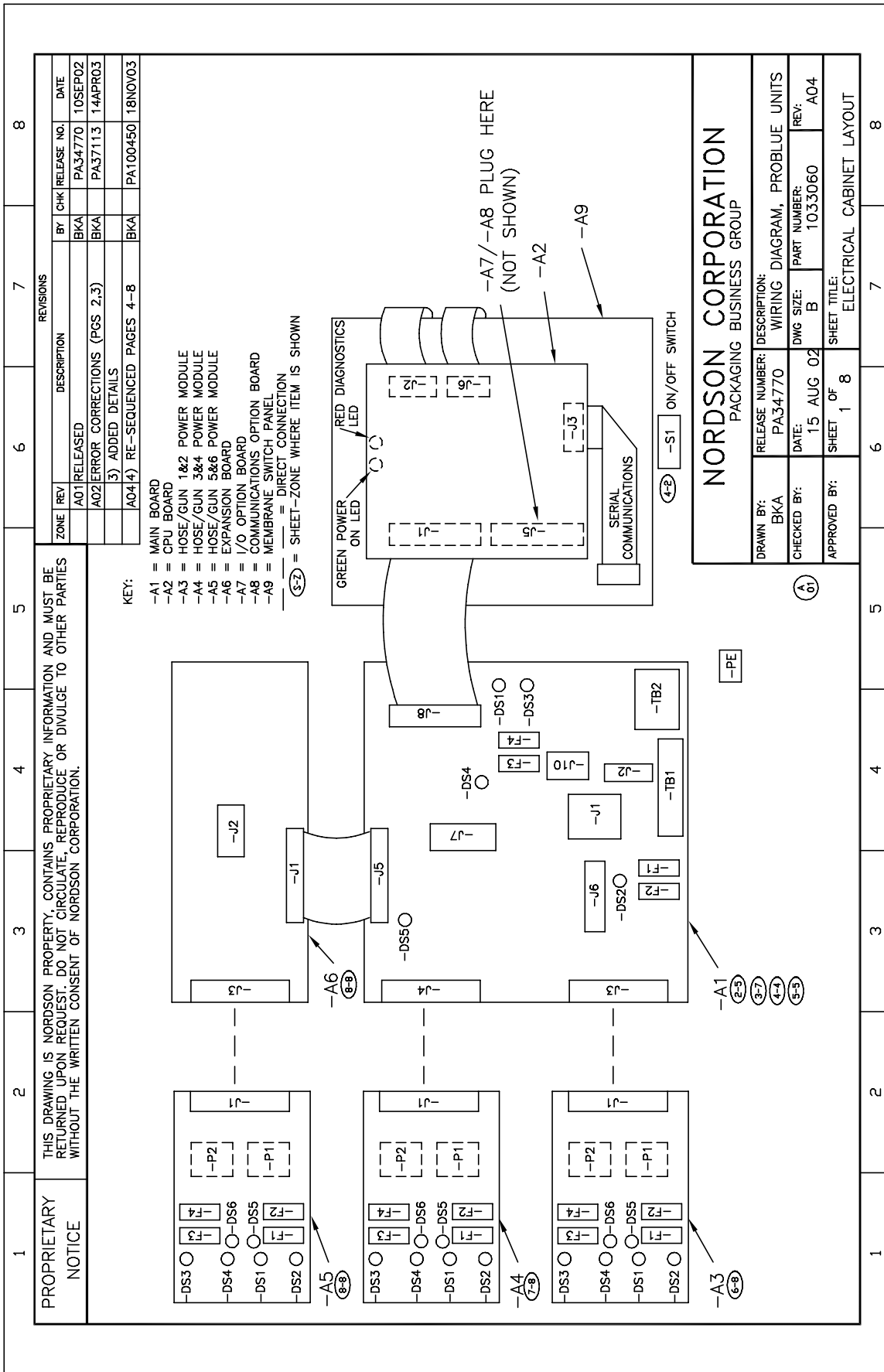


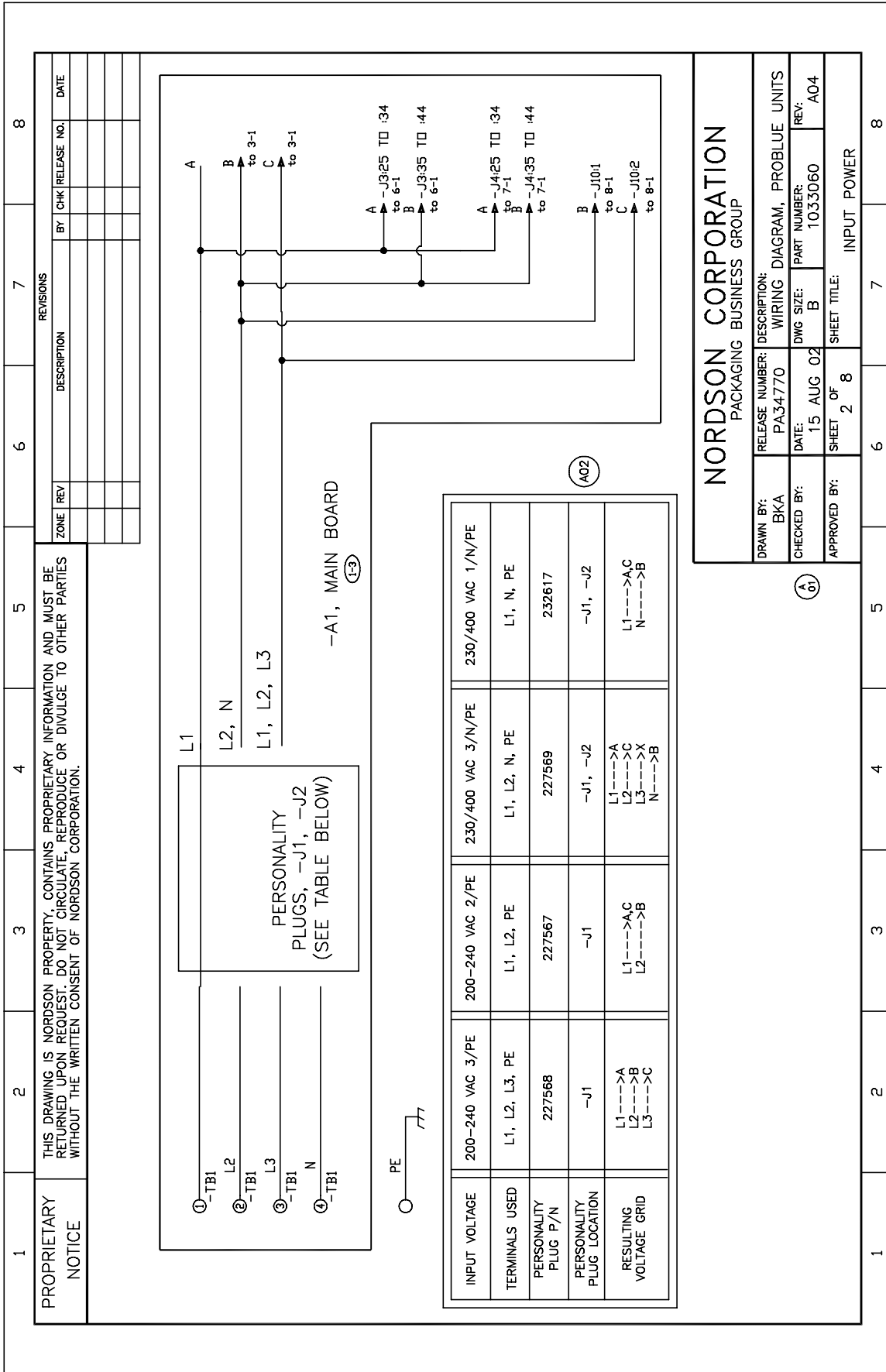
Figure 8-4 Sub-base dimensions

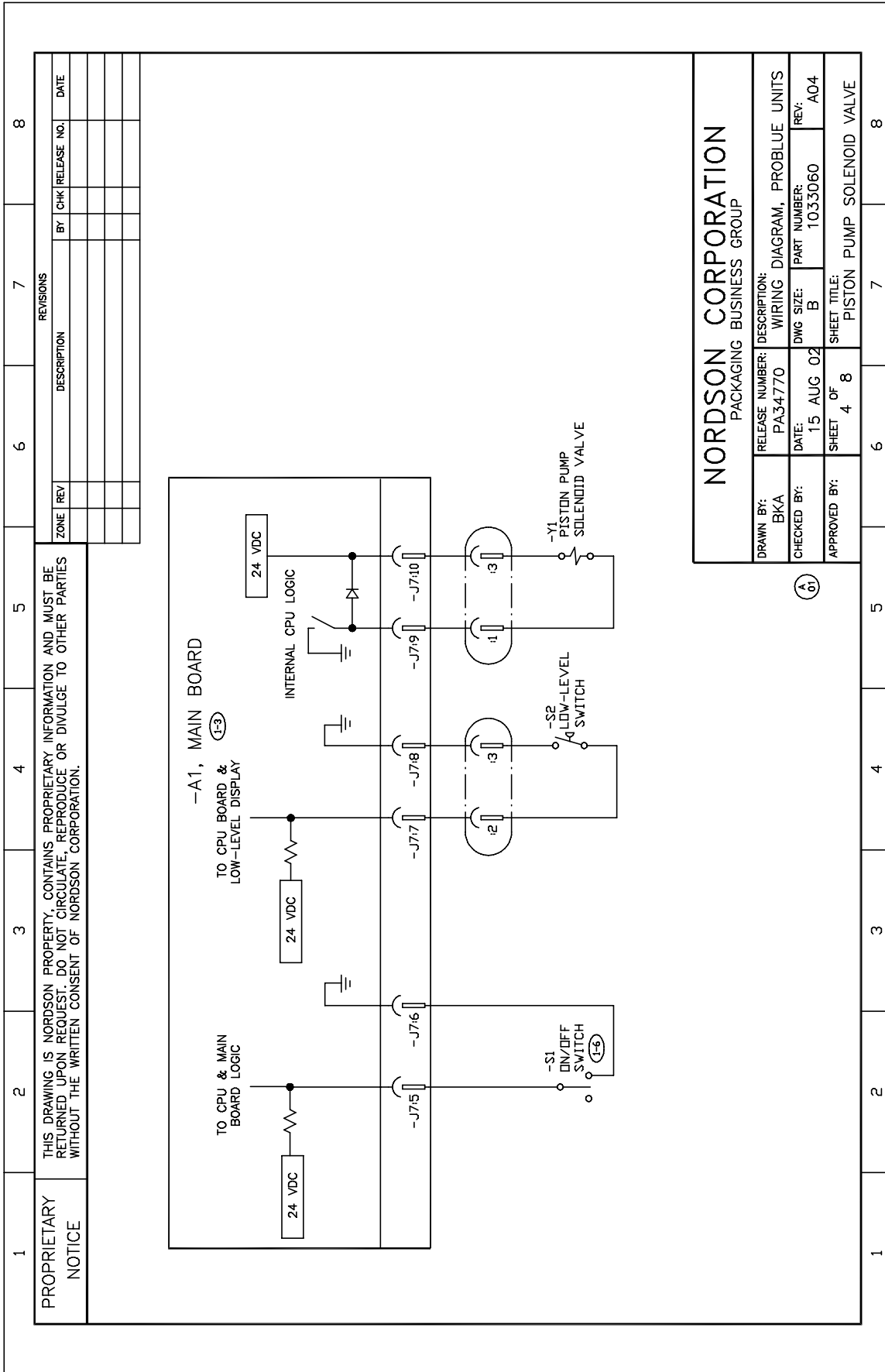
Wiring Diagrams—200/240 VAC Melter

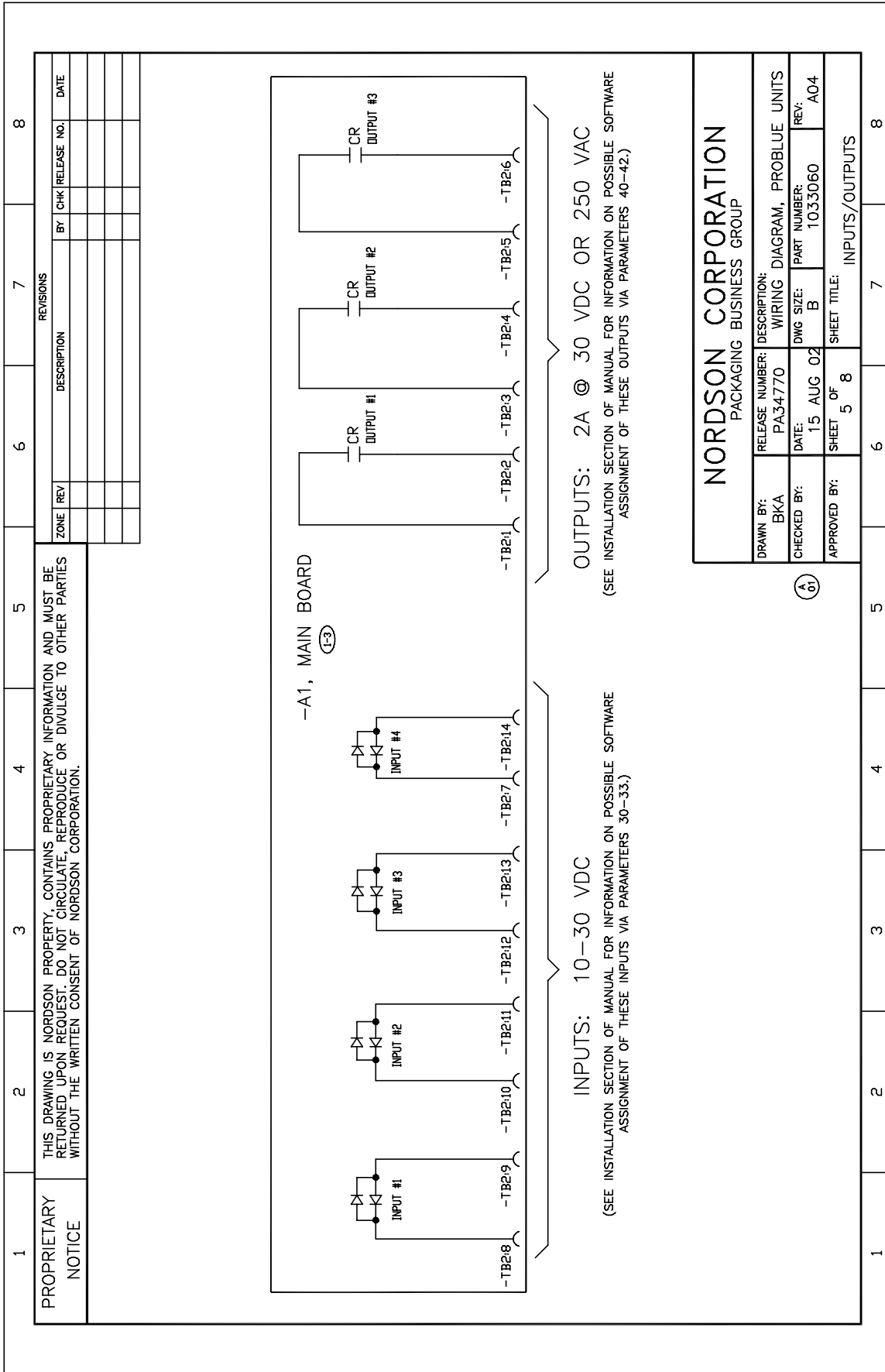
See next eight pages.

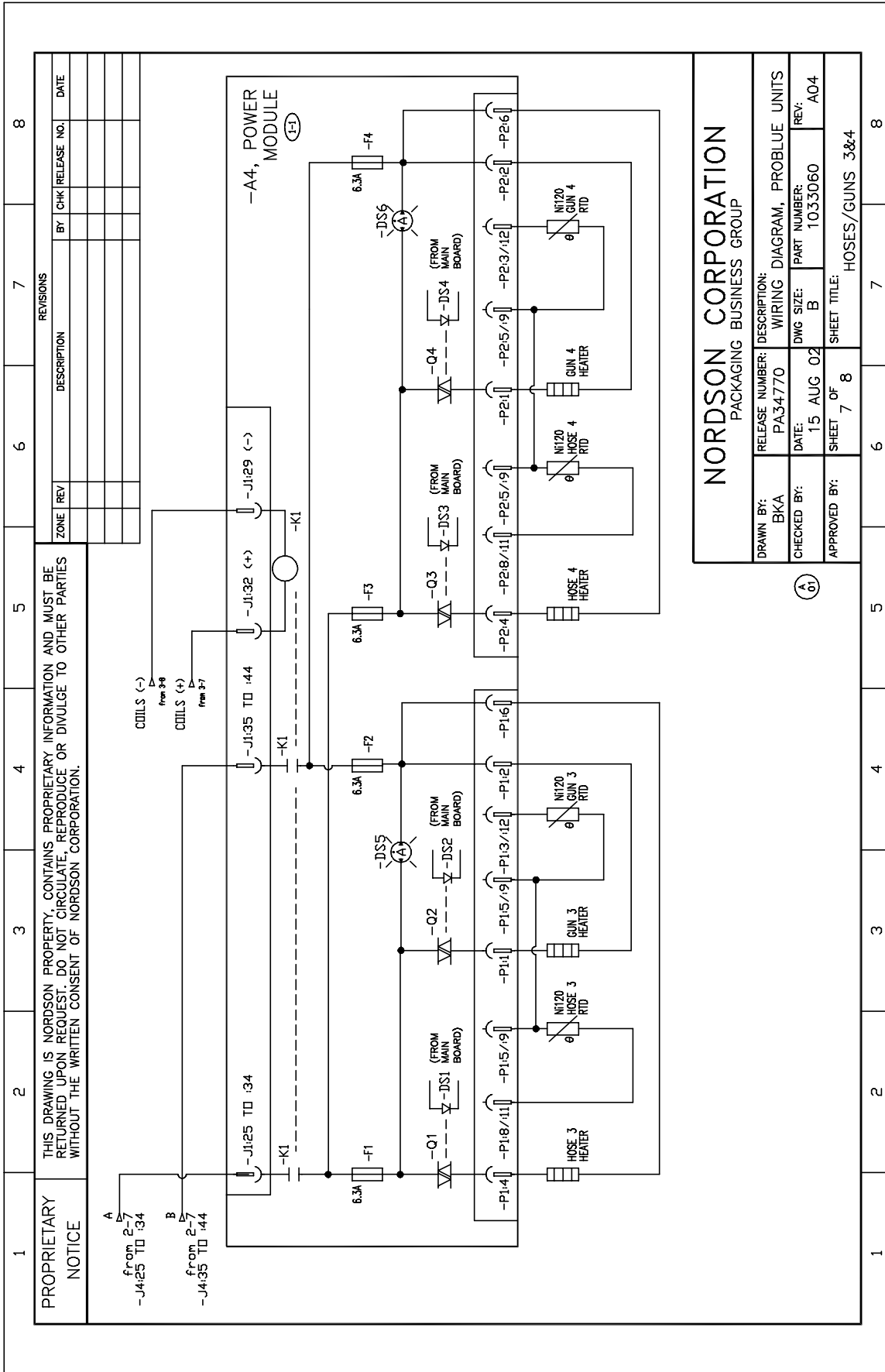
NOTE: For 400/480 Volt melters, refer to Appendix E.











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ZONE	REV	DESCRIPTION	BY	CHK	RELEASE NO.	DATE

REVISIONS

ZONE	REV	DESCRIPTION	BY	CHK	RELEASE NO.	DATE

NORDSON CORPORATION
PACKAGING BUSINESS GROUP

DRAWN BY:	RELEASE NUMBER:	DESCRIPTION:	WIRING DIAGRAM, PROBLEU UNITS
BJA	PA34770		
CHECKED BY:	DATE:	DWG SIZE:	PART NUMBER:
	15 AUG 02	B	1033060
APPROVED BY:	SHEET OF:	SHEET TITLE:	REV:
	7 8	HOSES/GUNS 3&4	A04

Appendix A

Calculating Melter Power Requirements

Before locating the melter on the production floor or attaching hoses and guns to the melter, you must calculate the electrical power required by the hoses and guns and confirm that the required power does not exceed maximum allowable wattages. Properly calculating melter power requirements will prevent damage to the melter and identify the maximum allowable distance between the melter and the point at which the hot melt is dispensed.

The following three maximum wattages must be considered when calculating the power required by the hoses and guns.

- **Single-component maximum**—The wattage of any single hose or gun
- **Hose/gun pair maximum**—The wattage of any hose and gun (hose/gun pair)
- **Hose/gun module maximum**—The wattage of any two hoses and two guns (two hose/gun pairs)

If your Nordson representative has already calculated the hose/gun power requirements and confirmed that the maximum allowable wattages will not be exceeded, then no further calculation is necessary. However, you should re-evaluate the hose and gun power requirements before you:

- add a new hose or gun to the melter that was not factored into the original wattage evaluation
- replace an existing hose with a longer hose or an existing gun with a larger gun

To evaluate the hose/gun power requirements

1. Match each hose and gun pair and then match each pair to the hose/gun module it will be connected to on the back of the melter.
2. Examine the identification tag or plate on each hose and gun and record the wattage of each in Table A-1.
3. Add the sum of the wattages for each hose/gun pair and the combined total wattage for each hose/gun module.
4. Compare the wattages tabulated in Table A-1 with the associated maximum allowable wattages listed in Table A-2.
5. Do *one* of the following:
 - If each of the wattages calculated in step 3 *does not* exceed the associated maximum allowable wattages listed in Table A-2, then the power required by the hoses and guns is within acceptable limits.
 - If any of the wattages calculated in step 3 *does* exceed an associated maximum allowable wattage listed in Table A-2, then the configuration or position of the hose/gun pairs must be rearranged or shorter hoses must be used in order to reduce the power requirement.

Table A-1 Hose/Gun Wattages

Module	Component Number	Type/Size	Wattage	Total Wattage
Hose/Gun Module 1	Hose 1			
	Gun 1			
	Hose 2			
	Gun 2			
Total wattage of hose/gun module 1 =				
Hose/Gun Module 2	Hose 3			
	Gun 3			
	Hose 4			
	Gun 4			
Total wattage of hose/gun module 2 =				
Hose/Gun Module 3	Hose 5			
	Gun 5			
	Hose 6			
	Gun 6			
Total wattage of hose/gun module 3 =				

Table A-2 Maximum Allowable Wattages

Component	Plant Voltage			
	200 VAC	220 VAC	230 VAC	240 VAC
Any hose or gun	870 W	957 W	1000 W	1043 W
Any hose/gun pair	1071 W	1179 W	1233 W	1286 W
Any hose/gun module	1740 W	1913 W	2000 W	2086 W

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Appendix B

Operating Parameters

Operating parameters are organized in this appendix according to the logical groups listed in Table B-1. For information about selecting and editing operating parameters, refer to Section 3, *Installation, Setting Up the Melter*.

NOTE: Parameter numbers that are reserved or that are not used do not appear in this appendix.

Table B-1 Parameter Groups

Group	Parameters	Description
Standard	0 to 11 and 14	Frequently used parameters
Temperature Control	20 to 26	Control heater function
Input Setup	30 to 39	Configure the standard and optional inputs
Output Setup	40 to 46	Configure the standard and optional outputs
Seven-day Clock	50 to 77	Configure the clock feature

Standard

0 Enter Password

Description:	A user-defined password that prevents unauthorized changes to set-point temperatures and operating parameters.
Value:	0 to 9999
Resolution:	1
Default Value:	4000
Format:	—
Use:	This parameter only appears if a password is created using parameter 11 and then enabled using parameter 10. NOTE: The melter remains in the password-protected mode for two minutes after the last key press. After exiting the setup mode, attempting to re-enter the setup mode, even before two minutes has elapsed, will require you to re-enter the password.

1 Total Hours with Heaters On (Noneditable)

Description:	A non editable value that indicates the total number of hours that the heaters have been on.
Value:	999,999 (using abbreviated convention described below)
Resolution:	1 hour
Default Value:	0
Format:	—
Use:	The right display indicates up to 9999 hours of heater operation. When the accumulated heater hours reaches 10,000, the display alternates every two seconds between the three left most digits (thousands) and the three right digits (hundreds). For example, 10,001 hours would be displayed as "10," for two seconds and then "001" for two seconds. The comma is present if parameter 20, <i>Temperature Units</i> , is set to degrees Fahrenheit. A period is present if parameter 20 is set to degrees Celsius.

2 Fault Log (Noneditable)

Description:	Stores a record of the last ten faults.
Value:	—
Resolution:	—
Default Value:	_-F0 (unused log entry)
Format:	F1, F2, F3, and F4
Use:	Use the right-display scroll keys to review the log entries for the last ten faults. Empty log entries are indicated by "_-F0." Refer to <i>Monitor the Melter</i> in Section 4, <i>Operation</i> .

3 Change History Log**(Noneditable)**

Description:	Records the last ten changes made to either the set-point temperatures or the operating parameters.
Value:	—
Resolution:	—
Default Value:	P-_ (unused log entry)
Format:	Refer to Section 3, <i>Installation. Review Parameter and Set-point Temperature Changes.</i>
Use:	Use the right-display key to review the log entries for the last ten changes that were made to the operating parameters or the set-point temperatures. Empty log entries are indicated by “P-_.”

4 Ready Delay Time

Description:	The amount of time that will elapse after all of the components have reached their set-point temperature before the ready LED will turn on. The ready delay time only functions when the temperature of the tank, at the time the melter is turned on, is more than 27 °C (50 °F) from its set-point temperature. The ready delay time begins when all components are within 3 °C (5 °F) of their respective set-point temperature.
Value:	0 to 60 minutes
Resolution:	1 minute
Default Value:	0 minutes
Format:	Left display “rd”. Right display, minutes or seconds remaining
Use:	The ready delay allows the contents of the tank an additional amount of time to heat before pump turns on. NOTE: The time remaining on the ready delay is indicated in minutes in the right display at the end of every automatic scan cycle. The left display indicates “rd” whenever the time remaining appears. When the delay time reaches 1 minute, the time remaining appears in seconds.

5 Service Interval Time

Description:	The number of heater-on hours that must elapse before the service LED turns on.
Value:	0 hours (disabled) to 8736 (one year)
Resolution:	1 hour
Default Value:	500 hours
Format:	—
Use:	Set the service interval time to signal a user-defined service check or maintenance event, such as changing the filter. The service LED will turn on after the pre-set time elapses. With the melter in the scan mode, press the Clear/Reset key to turn off the service LED and reset the time.

Standard *(contd)*

6

Service LED Heater Hours

(Noneditable)

Description:	A timer indicates how many more hours the heaters need to remain on before the service LED illuminates (service required).
Value:	0 hours (disabled) to 9999
Resolution:	1 hour
Default Value:	0
Format:	—
Use:	The service interval time (parameter 5) must be enabled before this parameter will work. Note: Heater hours accumulate whenever the heaters LED is illuminated.

8

Automatic Pump On

Description:	Determines if the pump will turn on automatically when the melter is ready.
Value:	0 = disabled or 1 = enabled
Resolution:	—
Default Value:	1 (enabled)
Format:	—
Use:	If Automatic Pump On is disabled, you must press the pump key to turn the pump on.

9

Automatic Pump On Temperature

Description:	Sets the temperature at which the pump will automatically turn on. CAUTION: Unnecessary starting of the pump before the hot melt is fully melted can lead to premature pump wear.
Value:	0° = The pump turns on when the ready LED turns on OR 1 °C to 230 °C (1 °F to 450 °F) = The pump turns on when the tank reaches the selected temperature.
Resolution:	1°
Default Value:	0°
Syntax:	—
Use:	Parameter is only used when parameter 8 is set to 1 (enabled). If a specific temperature value is used (as opposed to the default value of 0), only enter a set-point temperature that is lower than the set-point temperatures of the tank. A set-point temperature greater than the set-point of the tank will be ignored, and the pump will turn on when the melter is ready.

10 Enable or Disable the Melter Password

Description:	Activates or deactivates the melter password. When password protection is activated, component set-point temperatures or melter operating parameters cannot be changed until a valid password is entered using parameter 0.
Value:	0 (disabled) 1 (enabled)
Resolution:	—
Default Value:	0
Format:	—
Use:	A password must first be created using parameter 11 before it can be enabled or disabled using parameter 10.

11 Create Password

Description:	A user-defined password that prevents unauthorized changes to operating parameters or set-point temperatures.
Value:	0 to 9999
Resolution:	1
Default Value:	5000
Format:	—
Use:	Refer to Section 4, <i>Operation Enter the Melter Password</i> . NOTE: When the password is created and enabled, parameter 10 will not appear again in the right display until the password is entered.

14 External Communications Lock-out

Description:	Used as a safety feature when performing maintenance on the melter. Prevents external control of the melter through standard or optional inputs/outputs or network communications (optional)
Value:	0 (disabled) or 1 (enabled)
Resolution:	—
Default Value:	0 (disabled)
Format:	—
Use:	Set parameter to 1 (enabled) before performing any maintenance on the melter. When enabled, all external control of the melter stops until the parameter is once again set to 0 (disabled).

Temperature Control

20 Temperature Units

Description:	Sets the units for temperature display.
Value:	C (degrees Celsius) or F (degrees Fahrenheit)
Resolution:	1 degree
Default Value:	C
Format:	—
Use:	—

21 Over Temperature Delta

Description:	The number of degrees that the temperature of any component can increase over its assigned set-point temperature before an over temperature fault (F3) will occur.
Value:	5 °C (10 °F) to 60 °C (110 °F)
Resolution:	1°C 1°F
Default Value:	15 °C (25 °F)
Format:	—
Use:	—

22 Under Temperature Delta

Description:	The number of degrees that the temperature of any component can decrease from its set-point temperature before an under temperature fault (F2) occurs.
Value:	5 °C (10 °F) to 60 °C (110 °F)
Resolution:	1°C 1°F
Default Value:	25 °C (50 °F)
Format:	—
Use:	—

23 Standby Delta

Description:	The number of degrees by which all heated components will be decreased when the melter is placed into the standby mode.
Value:	5°C to 190°C (10°F to 350°F)
Resolution:	1°C 1°F
Default Value:	50 °C (100 °F)
Format:	—
Use:	A standby delta should be selected that results in a balance between melter energy savings during periods of inactivity, the amount of time and energy required to bring the melter back up to set-point temperature, and a temperature at which the hot melt can be held in the tank for extended periods of time without charring. Refer to Section 4, <i>Operation, Using Melter Function Keys</i> . NOTE: The standby delta does not affect the under temperature delta (parameter 22).

24 Automatic Standby Timeout

Description:	The amount of time that must elapse after the last signal (gun driver) is sent to input 1 before the melter will enter the standby mode. The automatic standby timeout feature saves energy by allowing the melter to automatically go into the standby mode if the melter detects that the guns are no longer firing.
Value:	0 to 1440 minutes (24 hours)
Resolution:	1 minute
Default Value:	0 (disabled)
Format:	—
Use:	1. Change parameter 23 if required. 2. Set the control option for parameter 30 (input 1) to option 10 (automatic standby) NOTE: Only enable parameter 24 when a 24 VDC signal voltage is connected to input 1. If there is no voltage on the input contacts when the melter is ready, the melter will enter the standby mode after the automatic standby time.

Temperature Control *(contd)*

25 Automatic Heaters Off Time

Description:	The amount of time that must elapse after the automatic standby time elapses (parameter 24) before the heaters turn off.
Value:	0 to 1440 minutes (24 hours)
Resolution:	1 minute
Default Value:	0 (disabled)
Format:	—
Use:	Set parameter 24 (automatic standby timeout) to the desired value before setting parameter 25.

26 Manual Standby Time

Description:	The amount of time that the melter will remain in the standby mode after the standby key is pressed.
Value:	0 to 180 minutes
Resolution:	1 minute
Default Value:	0
Format:	—
Use:	<p>Set the standby time when you want the operator to be able to place the melter into the standby mode for a limited period of time (break, lunch, etc.). When manual standby is enabled (value greater than 0 minutes), the standby LED blinks.</p> <p>Set the standby delta (parameter 23) to the desired value before setting parameter 26.</p> <p>Note: When a time value equal to or greater than 1 minute is entered, the standby LED will flash to indicate that the manual standby timer is counting down.</p>

Input Setup

30 Standard Input 1

Description:	Control options that determine the function of input 1.
Value:	<ul style="list-style-type: none"> 0 – Input Disabled 1 – Standby On/Off 2 – Heaters On/Off 3 – Pump Enable/Disable 4 – Hose/Gun 1 Enable/Disable 5 – Hose/Gun 2 Enable/Disable 6 – Hose/Gun 3 Enable/Disable 7 – Hose/Gun 4 Enable/Disable 8 – Hose/Gun 5 Enable/Disable 9 – Hose/Gun 6 Enable/Disable 10 – <i>Automatic standby</i> 11 – Motor 2 Enable/Disable (DuraBlue adhesive melters only)
Resolution:	1
Default Value:	10
Format:	—
Use:	Multiple inputs can be set to the same input value. After one or more inputs that have the same input value are energized, the input functionality will not be considered inactive (off) until all of the inputs with the same input value are de-energized (Multiple inputs set to the same input value are logical ORed.).

31 Standard Input 2

Description:	Control options that determine the function of input 2.
Value:	<ul style="list-style-type: none"> 0 – Input Disabled 1 – Standby On/Off 2 – Heaters On/Off 3 – Pump Enable/Disable 4 – Hose/Gun 1 Enable/Disable 5 – Hose/Gun 2 Enable/Disable 6 – Hose/Gun 3 Enable/Disable 7 – Hose/Gun 4 Enable/Disable 8 – Hose/Gun 5 Enable/Disable 9 – Hose/Gun 6 Enable/Disable 11 – Motor 2 Enable/Disable (DuraBlue adhesive melters only)
Resolution:	1
Default Value:	1
Format:	—
Use:	Multiple inputs can be set to the same input value. After one or more inputs that have the same input value are energized, the input functionality will not be considered inactive (off) until all of the inputs with the same input value are de-energized (Multiple inputs set to the same input value are logical ORed.).

Input Setup *(contd)*

32 Standard Input 3

Description:	Control options that determine the function of input 3.
Value:	0 – Input Disabled 1 – Standby On/Off 2 – Heaters On/Off 3 – Pump Enable/Disable 4 – Hose/Gun 1 Enable/Disable 5 – Hose/Gun 2 Enable/Disable 6 – Hose/Gun 3 Enable/Disable 7 – Hose/Gun 4 Enable/Disable 8 – Hose/Gun 5 Enable/Disable 9 – Hose/Gun 6 Enable/Disable 11 – Motor 2 Enable/Disable (DuraBlue adhesive melters only)
Resolution:	1
Default Value:	2
Format:	—
Use:	Multiple inputs can be set to the same input value. After one or more inputs that have the same input value are energized, the input functionality will not be considered inactive (off) until all of the inputs with the same input value are de-energized (Multiple inputs set to the same input value are logical ORed.).

33 Standard Input 4

Description:	Control options that determine the function of input 4.
Value:	0 – Input Disabled 1 – Standby On/Off 2 – Heaters On/Off 3 – Pump Enable/Disable 4 – Hose/Gun 1 Enable/Disable 5 – Hose/Gun 2 Enable/Disable 6 – Hose/Gun 3 Enable/Disable 7 – Hose/Gun 4 Enable/Disable 8 – Hose/Gun 5 Enable/Disable 9 – Hose/Gun 6 Enable/Disable 11 – Motor 2 Enable/Disable (DuraBlue adhesive melters only)
Resolution:	1
Default Value:	4
Format:	—
Use:	Multiple inputs can be set to the same input value. After one or more inputs that have the same input value are energized, the input functionality will not be considered inactive (off) until all of the inputs with the same input value are de-energized (Multiple inputs set to the same input value are logical ORed.).

34 – 39 **Optional Inputs 5, 6, 7, 8, 9, and 10**

Description: Control options that determine the function of the six optional inputs provided when the optional I/O expansion card is installed on the CPU board.

Value: 0 – Input Disabled
1 – Standby On/Off
2 – Heaters On/Off
3 – Pump Enable/Disable
4 – Hose/Gun 1 Enable/Disable
5 – Hose/Gun 2 Enable/Disable
6 – Hose/Gun 3 Enable/Disable
7 – Hose/Gun 4 Enable/Disable
8 – Hose/Gun 5 Enable/Disable
9 – Hose/Gun 6 Enable/Disable
11 – Motor 2 Enable/Disable (DuraBlue adhesive melters only)

Resolution: 1

Default Value: 0 (disabled)

Format: —

Use: Multiple inputs can be set to the same input value. After one or more inputs that have the same input value are energized, the input functionality will not be considered inactive (off) until all of the inputs with the same input value are de-energized (Multiple inputs set to the same input value are logical ORed.).

Output Setup

40 – 42 Standard Outputs 1, 2, and 3

Description:	Determines the function of the output.
Value:	0 = Output Disabled 1 = Ready 2 = Ready and Pump is on 3 = Fault 4 = Low level 5 = Service LED is on 6 = Alert (Potential fault)
Resolution:	1
Default Value:	Output 1 = 1 Output 2 = 3 Output 3 = 4
Format:	—
Use:	Refer to <i>Installing Melter Outputs</i> in Section 3, <i>Installation</i> , for information on setting up outputs. When control option 6, <i>Alert</i> is selected, the output is active whenever the melter enters the two minute fault monitoring period. If the potential fault condition clears before the end of the two minute period, the output signal ends. Refer to Section 4, <i>Operation, Monitor Melter Faults</i> , for information about fault monitoring.

43 – 46 Optional Outputs 4, 5, 6, and 7

Description:	Control options that determine the function of the four optional outputs provided when the optional I/O expansion card is installed on the CPU board.
Value:	0 = Output Disabled 1 = Ready 2 = Ready and Pump is on 3 = Fault 4 = Low level 5 = Service LED is on 6 = Alert (Potential fault)
Resolution:	1
Default Value:	0 (all optional outputs)
Format:	—
Use:	Refer to the instruction sheet provided with the optional I/O expansion card for information about wiring and setting up the optional outputs. When control option 6, <i>Alert</i> is selected, the output is active whenever the melter enters the two minute fault monitoring period. If the potential fault condition clears before the end of the two minute period, the output signal ends. Refer to Section 4, <i>Operation, Monitor Melter Faults</i> , for information about fault monitoring.

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Seven-day Clock

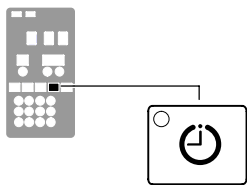
Before setting up the clock, refer to *Using Melter Function Keys* in Section 4, *Operation*, to familiarize yourself with the function and use of the clock feature.

If you are unfamiliar with the procedure for accessing and editing operating parameters, refer to Section 3, *Installation, Setting Up the Melter*.

To set the clock

Refer to the examples on the next page.

1. Use parameter 50 to select the current day of the week.
2. Use parameter 51 to set the current time of day.
3. Create schedule 1 by:
 - a. Setting parameters 55 and 56 to the time of the day that the heaters should turn on and off.
 - b. Setting parameters 57 and 58 to the time of the day that the melter should enter and exit the standby mode.
4. Using parameters 60 through 68, create schedules 2 and 3 by repeating step 3.
5. Use parameters 71 through 77 to assign which of the four schedules should be used on each day of the week. Up to three schedules may be assigned each day (to support three work shifts). Each of the eight control options (0 to 7) that is available in parameters 71 through 77 assigns a different combination of the three schedules. Option 0 is used hold the melter in the state dictated by the last clock transition until the next clock transition occurs.
6. Press the **Clock** key.



Seven-day clock key



In order for the clock to operate continuously throughout the week, a valid schedule must be assigned to every day of the week (parameters 71 through 77).

To prevent unintentional activation of the clock the default setting for parameters 71 through 77 is schedule 0, which has no time values assigned to it. With the default set to schedule 0, unintentionally pressing the clock key will have no affect on the melter.

Example 1

To turn the heaters on at 0600 and turn them off at 0015 every day of the week:

Par 55 = 0600

Par 56 = 0015

Par 60 = - - - -

Par 61 = - - - -

Par 71 through 77 = 1

Example 2

To turn the heaters on at 0700 and off at 1700 Monday through Friday, and turn the heaters off Saturday and Sunday:

Par 55 = 0700

Par 56 = 1700

Par 57 = - - - -

Par 58 = - - - -

Par 71 through 75 = 1

Par 76 and 77 = 0

Example 3

To turn the heaters on at 0600 each morning, go into standby for lunch at 1130, come out of standby after lunch at 1230, and turn the heaters off at 1600 at the end of the day, every day of the week:

Par 50 = 1

Par 51 = *current time*

Par 55 = 0600

Par 56 = 1600

Par 57 = 1130

Par 58 = 1230

Par 71 through 75 = 1

Par 76 and 77 = 1

Seven-day Clock *(contd)*

50 Current Day

Description:	Used to set the current day of the week.
Value:	1 to 7 (1 = Monday, 2 = Tuesday, etc.)
Resolution:	1
Default Value:	—
Format:	—
Use:	Refer to Section 4, <i>Operation, Using Melter Function Keys</i> , for information about the use and affects of the seven-day clock feature.

51 Current Hour

Description:	Used to set the local time of the day.
Value:	0000 to 2359 (European time format)
Resolution:	1 minute
Default Value:	(Time set at factory)
Format:	<i>Hours, Hour: Minute, Minute</i>
Use:	This setting only needs to be made once for all daily schedules

55 Schedule 1 Heaters On

Description:	Used to set the time that the clock will turn on the heaters during schedule 1.
Value:	0000 to 2359, - - - -
Resolution:	1 minute
Default Value:	0600
Format:	<i>Hours, Hour: Minute, Minute</i>
Use:	Set the desired time for the heaters to turn on. To disable this parameter, set the parameter's value to "- - - -" by simultaneously pressing both of the right-display scroll keys.

56 Schedule 1 Heaters Off

Description:	Used to set the time that the clock will turn off the heaters during schedule 1.
Value:	0000 to 2359, - - - -
Resolution:	1 minute
Default Value:	1700
Format:	<i>Hours, Hour: Minute, Minute</i>
Use:	Set the desired time for the heaters to turn off. To disable this parameter, set the parameter's value to "- - - -" by simultaneously pressing both of the right-display scroll keys.

57 Schedule 1 Enter Standby

Description:	Used to set the time that the melter will enter the standby mode during schedule 1.
Value:	0000 to 2359, - - - -
Resolution:	1 minute
Default Value:	- - - -
Format:	<i>Hour, Hour: Minute, Minute</i>
Use:	Set the time that the melter will enter the standby mode during schedule 1. To disable this parameter, set the parameter's value to "- - -" by simultaneously pressing both of the right-display scroll keys. Note: Do not set an enter standby time that is outside of the time period defined by the schedule's heater on and off time. The melter cannot enter the standby mode when the heaters are off.

58 Schedule 1 Exit Standby

Description:	Used to set the time that the melter will exit the standby mode during schedule 1.
Value:	0000 to 2359, - - - -
Resolution:	1 minute
Default Value:	- - - -
Format:	<i>Hour, Hour: Minute, Minute</i>
Use:	Set the time that the melter will exit the standby mode during schedule 1. To disable this parameter, set the parameter's value to "- - -" by simultaneously pressing both of the right-display scroll keys. Note: Do not set an exit standby time that is outside of the time period defined by the schedule's heater on and off time. The melter cannot enter the standby mode when the heaters are off.

60 Schedule 2 Heaters On

Description:	Used to set the time that the clock will turn on the heaters during schedule 2.
Value:	0000 to 2359, - - - -
Resolution:	1 minute
Default Value:	- - - -
Format:	<i>Hours, Hour: Minute, Minute</i>
Use:	Set the desired time for the heaters to turn on. To disable this parameter, set the parameter's value to "- - -" by simultaneously pressing both of the right-display scroll keys.

Seven-day Clock *(contd)*

61 Schedule 2 Heaters Off

Description:	Used to set the time that the clock will turn off the heaters during schedule 2.
Value:	0000 to 2359, - - - -
Resolution:	1 minute
Default Value:	- - - -
Format:	<i>Hours, Hour: Minute, Minute</i>
Use:	Set the desired time for the heaters to turn off. To disable this parameter, set the parameter's value to "- - - -" by simultaneously pressing both of the right-display scroll keys.

62 Schedule 2 Enter Standby

Description:	Used to set the time that the melter will enter the standby mode during schedule 2.
Value:	0000 to 2359, - - - -
Resolution:	1 minute
Default Value:	- - - -
Format:	<i>Hour, Hour: Minute, Minute</i>
Use:	Set the time that the melter will enter the standby mode during schedule 2. To disable this parameter, set the parameter's value to "- - - -" by simultaneously pressing both of the right-display scroll keys. Note: Do not set an enter standby time that is outside of the time period defined by the schedule's heater on and off time. The melter cannot enter the standby mode when the heaters are off.

63 Schedule 2 Exit Standby

Description:	Used to set the time that the melter will exit the standby mode during schedule 2.
Value:	0000 to 2359, - - - -
Resolution:	1 minute
Default Value:	- - - -
Format:	<i>Hour, Hour: Minute, Minute</i>
Use:	Set the time that the melter will exit the standby mode during schedule 2. To disable this parameter, set the parameter's value to "- - - -" by simultaneously pressing both of the right-display scroll keys. Note: Do not set an exit standby time that is outside of the time period defined by the schedule's heater on and off time. The melter cannot enter the standby mode when the heaters are off.

65 Schedule 3 Heaters On

Description:	Used to set the time that the clock will turn on the heaters during schedule 3.
Value:	0000 to 2359, - - - -
Resolution:	1 minute
Default Value:	- - - -
Format:	<i>Hours, Hour: Minute, Minute</i>
Use:	Set the desired time for the heaters to turn on. To disable this parameter, set the parameter's value to "- - - -" by simultaneously pressing both of the right-display scroll keys.

66 Schedule 3 Heaters Off

Description:	Used to set the time that the clock will turn off the heaters during schedule 3.
Value:	0000 to 2359, - - - -
Resolution:	1 minute
Default Value:	- - - -
Format:	<i>Hours, Hour: Minute, Minute</i>
Use:	Set the desired time for the heaters to turn off. To disable this parameter, set the parameter's value to "- - - -" by simultaneously pressing both of the right-display scroll keys.

67 Schedule 3 Enter Standby

Description:	Used to set the time that the melter will enter the standby mode during schedule 3.
Value:	0000 to 2359, - - - -
Resolution:	1 minute
Default Value:	- - - -
Format:	<i>Hour, Hour: Minute, Minute</i>
Use:	Set the time that the melter will enter the standby mode during schedule 3. To disable this parameter, set the parameter's value to "- - - -" by simultaneously pressing both of the right-display scroll keys. Note: Do not set an enter standby time that is outside of the time period defined by the schedule's heater on and off time. The melter cannot enter the standby mode when the heaters are off.

Seven-day Clock *(contd)*

68 Schedule 3 Exit Standby

Description:	Used to set the time that the melter will exit the standby mode during schedule 3.
Value:	0000 to 2359, - - - -
Resolution:	1 minute
Default Value:	- - - -
Format:	<i>Hour, Hour: Minute, Minute</i>
Use:	Set the time that the melter will exit the standby mode during schedule 3. To disable this parameter, set the parameter's value to "- - - -" by simultaneously pressing both of the right-display scroll keys. Note: Do not set an exit standby time that is outside of the time period defined by the schedule's heater on and off time. The melter cannot enter the standby mode when the heaters are off.

71 Schedules for Monday

Description:	Used to select which schedule(s) should be used on Monday.
Value:	0 – Remain at last clock transition 1 – Use just schedule 1 2 – Use just schedule 2 3 – Use just schedule 3 4 – Use schedule 1 and 2 5 – Use schedule 2 and 3 6 – Use schedule 1 and 3 7 – Use schedule 1, 2, and 3
Resolution:	1
Default Value:	0
Format:	—
Use:	Selects the active schedule(s) for the day. NOTES: If the 0 schedule option is used, the heaters will not turn on again until the next scheduled heaters on time arrives.

72 Schedules for Tuesday

Description:	Used to select which schedule(s) should be used on Tuesday.
Value:	0 – Remain at last clock transition 1 – Use just schedule 1 2 – Use just schedule 2 3 – Use just schedule 3 4 – Use schedule 1 and 2 5 – Use schedule 2 and 3 6 – Use schedule 1 and 3 7 – Use schedule 1, 2, and 3
Resolution:	1
Default Value:	0
Format:	—
Use:	Selects the active schedule(s) for the day. NOTES: If the 0 schedule option is used, the heaters will not turn on again until the next scheduled heaters on time arrives.

73 Schedules for Wednesday

Description:	Used to select which schedule(s) should be used on Wednesday.
Value:	0 – Remain at last clock transition 1 – Use just schedule 1 2 – Use just schedule 2 3 – Use just schedule 3 4 – Use schedule 1 and 2 5 – Use schedule 2 and 3 6 – Use schedule 1 and 3 7 – Use schedule 1, 2, and 3
Resolution:	1
Default Value:	0
Format:	—
Use:	Selects the active schedule(s) for the day. NOTES: If the 0 schedule option is used, the heaters will not turn on again until the next scheduled heaters on time arrives.

Seven-day Clock *(contd)*

74 Schedules for Thursday

Description:	Used to select which schedule(s) should be used on Thursday.
Value:	0 – Remain at last clock transition 1 – Use just schedule 1 2 – Use just schedule 2 3 – Use just schedule 3 4 – Use schedule 1 and 2 5 – Use schedule 2 and 3 6 – Use schedule 1 and 3 7 – Use schedule 1, 2, and 3
Resolution:	1
Default Value:	0
Format:	—
Use:	Selects the active schedule(s) for the day. NOTES: If the 0 schedule option is used, the heaters will not turn on again until the next scheduled heaters on time arrives.

75 Schedules for Friday

Description:	Used to select which schedule(s) should be used on Friday.
Value:	0 – Remain at last clock transition 1 – Use just schedule 1 2 – Use just schedule 2 3 – Use just schedule 3 4 – Use schedule 1 and 2 5 – Use schedule 2 and 3 6 – Use schedule 1 and 3 7 – Use schedule 1, 2, and 3
Resolution:	1
Default Value:	0
Format:	—
Use:	Selects the active schedule(s) for the day. NOTES: If the 0 schedule option is used, the heaters will not turn on again until the next scheduled heaters on time arrives.

76 Schedules for Saturday

Description:	Used to select which schedule(s) should be used on Saturday.
Value:	0 – Remain at last clock transition 1 – Use just schedule 1 2 – Use just schedule 2 3 – Use just schedule 3 4 – Use schedule 1 and 2 5 – Use schedule 2 and 3 6 – Use schedule 1 and 3 7 – Use schedule 1, 2, and 3
Resolution:	1
Default Value:	0
Format:	—
Use:	Selects the active schedule(s) for the day. NOTES: If the 0 schedule option is used, the heaters will not turn on again until the next scheduled heaters on time arrives.

77 Schedules for Sunday

Description:	Used to select which schedule(s) should be used on Sunday.
Value:	0 – Remain at last clock transition 1 – Use just schedule 1 2 – Use just schedule 2 3 – Use just schedule 3 4 – Use schedule 1 and 2 5 – Use schedule 2 and 3 6 – Use schedule 1 and 3 7 – Use schedule 1, 2, and 3
Resolution:	1
Default Value:	0
Format:	—
Use:	Selects the active schedule(s) for the day. NOTES: If the 0 schedule option is used, the heaters will not turn on again until the next scheduled heaters on time arrives.

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Appendix C

Melter Communications

This appendix describes the installation and use of the Nordson Configuration Manager (NCM) communications utility. With this utility you can:

- transfer operating parameters and temperature set-points between melters
- upgrade or reload your melter's firmware

Software Availability

If you do not already have the NCM utility, you can download it from the internet by navigating to www.enordson.com/support.

If you do not have a connection to the internet, you can request a software CD from your Nordson representative.

System Requirements

The following hardware and software requirements are necessary to install and run Blue Series software:

- Any ProBlue adhesive melter or a DuraBlue 10/16 adhesive melter
- Serial cable
- Personal computer with:
 - CD-RW drive or 3.5-inch floppy drive
 - Available COM port
 - 640 x 480 color monitor
 - Windows 95, 98 (second edition), ME, XP, or 2000
 - Internet Explorer version 4.0 or later (IE 5.0 is recommended)
 - Administrative privileges (Windows XP, 2000, and NT)

Installing the Software

To meet your specific installation conditions, two versions of the software are available. Refer to Table C-1 to determine which version you need.

Table C-1 Blue Series Software Versions

Version	Use When...
Single installation file: <i>BlueSeries.exe</i>	You are downloading the software from www.enordson.com <i>and</i> the PC you are downloading onto is connected or can be connected to the melter OR You are downloading the software from www.enordson.com onto a PC that can not be connected to the melter, but the PC does have a CD-RW <i>and</i> the PC that is connected to the melter does have a CD drive OR You have a CD with the software <i>and</i> you have a PC with a CD drive that can be connected to the melter
Self-extracting span diskette set: <i>BlueSeriesSpan.exe</i>	You are downloading the software from www.enordson.com onto a PC that cannot be connected to the melter <i>and</i> the PC that is connected to your melter only has a 3.5-inch floppy drive

When the installation file is executed, an installation wizard will detect your operating system and start the installation routine.

NOTE: Installing the NCM for the first time also installs the latest version of the melter's firmware.

To install Blue Series software

1. Do *one* of the following:
 - **If you are installing using the single file installation**, locate and double-click on the file *BlueSeries.exe*.
 - **If you are installing from the span diskette set**, insert *Disk 1*, and then locate and double-click on the file *Setup.exe*.

The **Blue Series Software Setup** wizard appears.

2. Click **Next**, and then follow the on-screen instructions. If you are installing from the span disk set, you will be prompted to insert additional diskettes (2 through 5) as required by your operating system.

NOTE: When prompted to select an installation location, Nordson Corporation recommends that you select the default location offered.

3. When the installation complete message appears, click **Finished**.

Removing the Software from Your PC

Use the *Remove* feature provided by the Blue Series InstallShield™ Wizard to remove the software from your PC. Removing Blue Series software from your PC will not remove melter settings files that you have saved using the NCM. Settings files (.ncm extension) are stored in your Windows *My Documents* folder.

NOTE: Windows XP, 2000, and NT users must have administrator rights in order to remove software from their PC.

To remove Blue Series software

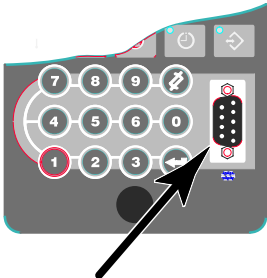
1. From the Windows **Start** menu, select *Settings > Control Panel*, and then double-click **Add/Remove Programs**.

The **Add/Remove Programs** dialog box appears.

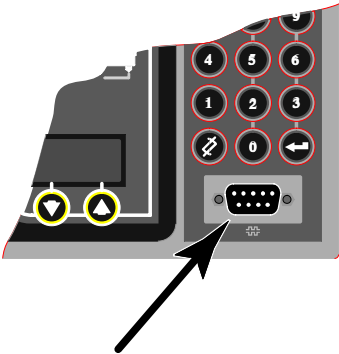
2. Select *Blue Series Software* from the list, and then click **Remove**.

Connecting the PC and the Melter

Connect a serial cable between the PC COM port (selected during the software installation routine) and the serial port connection (COM port) on your melter's control panel.



ProBlue serial port



DuraBlue serial port

Using Nordson Configuration Manager



Configuration Manager
desktop icon

Configuration Manager is launched from your Windows desktop using the icon shown to the left.

Use Configuration Manager when you want to...

- copy melter settings from one melter to another melter
- create and save more than one version of melter settings
- upgrade or restore a melter's firmware

Configuration Manager communicates with your melter through a PC connected to your melter's serial port. Once connected, Configuration Manager offers the choice of saving settings, restoring settings, or upgrading the melter's firmware.

The first time you download and install Configuration Manager, the latest version of the melter's firmware is also downloaded.

Saving and Restoring Melter Settings

Saving settings copies all current set-point and operating parameter values to your PC. Saved settings can be transferred back to the same melter or to any other compatible Blue Series adhesive melter.

To save melter settings

1. Place the melter into the configuration mode by simultaneously pressing the **Standby** and **Setup** keys.

"**CO**nF" appears in the right display.

2. Double-click the **NCM** icon on the Windows desktop.

The **NCM** dialog box appears.

3. Click **Select Device**.

The **Select Product** dialog box appears.

4. Select your melter from the list, and then click **Ok**.

The **Select COM Port** dialog box appears.

5. Select the COM port you are using to connect to the melter, and then click **Ok**.

The PC and melter establish communications and a picture of the melter you selected appears in the device status area. The right side of the status area indicates "**CONNECTED**".

6. Click **Save Settings**.

The **Save As** dialog box appears.

NOTE: The default location for saving settings files is Windows *My Documents* folder. To avoid losing saved settings files, Nordson Corporation recommends that you do not change the default save location.

7. Type a file name to identify the group of settings you are saving, and then click **Save**.

The save settings progress bar indicates the status of the save. When the save is complete, the melter automatically returns to the scan mode.

NOTE: If you are using the NCM to save multiple variations of melter settings, use a file naming convention that will allow you to easily associate each settings file (.ncm extension) with its related process or end-use.

8. Click **Ok** to close the NCM.

To restore melter settings

1. Follow steps 1 through 5 of *To save melter settings*.
2. Click **Restore Settings**.

The **Open** dialog box appears.

3. Select the settings file (.ncm extension) that you want to restore, and then click **Open**.

The **Restore Settings** progress bar indicates the status of the restore. When the restore is complete, the melter automatically returns to the scan mode.

Upgrading or Restoring Melter Firmware

Use the NCM to upgrade your melter to a newer version of firmware or reload the current version of the firmware. The version of Blue Series adhesive melter firmware that is currently available is posted on the internet at www.enordson.com/support.

NOTE: The version of firmware that is loaded on your melter appears on the control panel when the melter is first switched on.

During the upgrade process, all current melter settings are downloaded and saved on your PC. After upgrading or restoring a melter's firmware, you can use the NCM to restore the pre-upgrade settings.

CAUTION: The upgrade process returns the melter's settings to factory configuration, with the exception that current heater hours data is saved. Data in both the fault log and the change log is lost after upgrading the firmware.

Upgrading or Restoring Melter Firmware (contd)

To upgrade or reload melter firmware

1. Connect your PC to the melter. Refer to *Connecting the PC and the Melter* earlier in this guide.
2. Place the melter into the upgrade mode by pressing and holding both the **Setup** and left display **Scroll** key, and then switching the melter off and then on again.
3.
UPLOAd appears in the right display.
4. Double-click the **NCM** icon on the Windows desktop.
The **NCM** dialog box appears.
5. Click **Select**.
The device dialog box appears.
6. Select your melter from the list, and then click **Ok**.
The **Select COM Port** dialog box appears.
7. Select the COM port you are using to connect to the melter, and then click **Ok**.
The PC and melter establish communications and a picture of the melter you selected appears in the device status area. The right side of the status area indicates *Connected*.
8. Click **Upgrade**.
The **Select Upgrade** dialog box appears.
9. In the **Available Upgrades** list, select the firmware version you want to upload to the melter, and then click **Ok**.
The upgrade warning message appears.
10. Click **OK**.
The **Upgrade in Progress** dialog box appears. The upgrade can take as long as 12 minutes. When the upgrade is complete, the **Success** dialog box appears and the melter restarts.

To upgrade or reload melter firmware (contd)

CAUTION: Once the upgrade progress bar appears, do not interrupt the upgrade process for any reason. Interrupting the upgrade can corrupt the melter's firmware, which will require replacement of the IC chip (IC service kit P/N 1018817).

11. Click **OK**.

The communications link between the melter and the PC is terminated.

12. Do *one* of the following:

- To restore pre-upgrade melter settings, go to *To restore pre-upgrade melter settings* on the next page.
- To close the NCM, click **Exit**.
- To restore melter settings other than the settings that were in use by the melter before the upgrade, go to *Saving and Restoring Melter Settings* earlier in this guide.

To restore pre-upgrade melter settings1. Place the melter into the configuration mode by simultaneously pressing the **Standby** and **Setup** keys.

"**CO**nF" appears in the right display.

2. Click **Connect**.

The **Select COM Port** dialog box appears.

3. Select the COM port you are using to connect to the melter, and then click **Ok**.

The PC and melter establish communications and a picture of the melter you selected appears in the device status area. The right side of the status area indicates "**CONNECTED**".

4. Click **Restore Pre-Upgrade Settings**.

The pre-upgrade settings are restored and the melter returns to the scan mode.

5. Click **Exit** to close the NCM.

Troubleshooting

Using Nordson Configuration Manager

Symptom/Message	Action
After selecting a device and the COM port, an <i>Access Denied</i> message appears.	PC-to-Blue communications may be running or another application may be using the COM port. Close Internet Explorer and end the communications connection (if prompted). Close all other applications.
Melter in UPLOAd mode, the update process has not been initiated, and you want to stop and exit the UPLOAd mode, but you cannot get the melter out of UPLOAd.	Cycle power to the melter at the local power disconnect switch. CAUTION: Ensure that the firmware update process is not running before taking power off of the melter.
UPLOAd does not appear on the melter's display when you press the Setup and left display scroll keys.	You must cycle the control switch while holding the Setup and left display scroll keys.
Attempted a firmware update, but the melter display still indicates UPLOAd. OR Attempted a firmware update, but the PC has stopped responding or was interrupted during the update process.	Using the local power disconnect switch, cycle power to the melter, and then re-attempt the update. If the update is unsuccessful or the melter will not reboot, the central processor chip may be corrupted. Replace the CPU board.

Appendix D

SP Pump Diagnostics and Repair



WARNING: Allow only personnel with appropriate training and experience to operate or service the equipment. The use of untrained or inexperienced personnel to operate or service the equipment can result in injury, including death, to themselves and others, and damage to the equipment.

Introduction

This appendix provides comprehensive diagnostic and repair information for the SP pump used in all ProBlue adhesive melters. Before using the information provided in this appendix to diagnose or repair your pump, ensure that you have eliminated all conditions that might otherwise be mistaken for a failure of the pump. Refer to Section 6, *Troubleshooting*.

Pump Function

The pump is double-acting—material is discharged from the pump during both the upward and downward stroke of the piston.

The pump consists of an air section and a hydraulic section. Air is supplied to the pump through an air filter and a regulator. From the regulator, air flows to an air valve inside the air section. The air valve directs air into either the upper or lower portion of the air cylinder, which forces the piston assembly up or down. The lower end of the piston assembly contains a pressure ball valve. At the bottom of the hydraulic section is a siphon ball valve.

When the air valve directs the stroke of the piston upwards, the piston creates suction within the pump body, which opens the siphon ball valve and closes the pressure ball valve. As the piston moves upwards, material is simultaneously drawn into the pump below the pressure ball valve and forced out of the pump chamber above the pressure ball valve. Material leaving the pump chamber passes through a filter and then into a manifold, where it is distributed to the hoses/guns.

Attached to the piston assembly is a shifter fork. The fork travels along the shaft of the actuator assembly that has a magnet at both ends. When the stroke of the piston carries the shifter fork upwards, a magnet in the shifter fork attracts the magnet at the end of the actuator, which shifts the position of the air valve. When the valve shifts, air is redirected to the opposite side of the air cylinder, which forces the piston downwards.

Pump Function *(contd)*

On the piston downward stroke, material pressure below the piston closes the siphon ball valve and opens the pressure ball valve. As the piston moves downwards, material below the pressure ball valve is displaced, and forced through the pressure ball valve and out of the pump chamber, where again, it passes through the filter and into the manifold.

Pump Isolation Valve

To prevent siphoning of the tank when the pump is removed from the manifold, the manifold is equipped with an isolation valve.

Pressure Discharge Valve

The manifold is equipped with a pressure discharge valve. When the pump is switched off at the control panel, air is removed from the top of the valve causing it to open. When the valve opens, pressurized material within the pump and manifold is bypassed through the pressure discharge valve back to the tank.

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Pump Diagnostics

To determine why the pump has failed, you will, in most cases, have to partially or fully disassemble the pump. To assist you in determining the appropriate level of disassembly, Table D-1 provides a logical breakdown of the three types of pump failures, the potential conditions that could produce each failure, and the disassembly procedure(s) in which potential condition(s) can be examined.

Disassembly procedures are provided in *Pump Disassembly and Reassembly*.

Table D-1 Pump Diagnostics

Problem	Possible Cause	Corrective Action
1. Pump not Stroking	Air valve dirty or damaged	<i>Remove the Valve Spool and Sleeve</i>
	Valve sleeve O-rings damaged or deteriorated	<i>Remove the Valve Spool and Sleeve</i>
	Air leaking from between the cylinder head and the air cylinder or between the air cylinder and the pump frame	<i>Remove The Actuator and the Air Cylinder Assembly</i>
	Piston cups damaged	<i>Remove the Piston Cups</i>
	Shifter fork damaged, slipped out of position on piston, installed upside down, or magnets loose	<i>Removing the Shifter Fork</i>
	Magnets on actuator assembly loose	<i>Remove the Magnetic Actuator Assembly</i>
	Piston damaged or has char buildup	<i>Remove the Lower Ball Seat Assembly and the Piston</i>
2. Pump Leaking Adhesive	O-ring and/or pump seal deteriorated or damaged	<i>Remove the Pump O-ring and the Pump Seal</i>
	O-rings on cross-over tubes or between the pump and manifold damaged or deteriorated	<i>Removing the Pump from the Melter</i>
3. Pump Strokes Erratically	Siphon ball, seat and/or cage is damaged, deteriorated, or has char buildup	<i>Disassemble the Lower Ball Seat and Pressure Ball Assemblies</i>
	Pressure ball and/or seat has char buildup or is scratched or pitted	<i>Disassemble the Lower Ball Seat and Pressure Ball Assemblies</i>
	Piston has char buildup	<i>Remove the Lower Ball Seat Assembly and the Piston</i>
	Pump body dirty	<i>Remove the Lower Ball Seat Assembly and the Piston</i>

Pump Disassembly and Reassembly

This part provides sequential pump disassembly procedures. Unless otherwise noted in the *Special Reassembly Instructions*, which are provided in each procedure, reassembly of the pump is the reverse of the disassembly.

Within each disassembly procedure, is a check/repair table that describes what specific conditions (from Table D-1) to inspect for while disassembling the pump, service details, and component part numbers.

Melter Preparation

The melter must be brought up to operating temperature before the pump can be removed and disassembled. Once the pump is removed, the molten material within the pump will remain workable only for a short period of time. If necessary, use a heat gun to warm the pump assembly during disassembly.

Required Tools and Materials

Tools

- Heat gun
- 4-mm hex wrench
- 5-mm hex wrench
- 6-mm hex wrench
- 1/8-in. steel rod or equivalent tool
- 8 mm open-end wrench
- 10 mm socket and ratchet
- Bench vise or suitable mount to hold the pump during repairs
- Suitable vessel to heat Type-R fluid



WARNING: Do not heat Type R fluid with an open flame or in an unregulated heating device. Do not heat Type R fluid above 246 °C (475 °F).





Service Parts

In most cases, you will need the pump service kit P/N 1028304 to complete pump repairs. This kit contains all of the seals, O-rings, and other parts that are necessary to service the pump. Refer to the *Parts* at the end of this appendix for a complete listing of the service kit and the pump assembly parts.

Supplies

The following table described the lubricants and other compounds that are required during the re-assembly of the pump. Lubricants and other compounds are indicated in the illustrations by the symbols shown in Table D-2.

Table D-2 Lubricants and Compounds

Description	Part Number	Symbol
Never-Seez™	900344	
Parker™ Hi-Temp Lubricant	1029063	
Loctite 272™ Threadlocking Adhesive	900470	
SP Lubricating Oil	211228	
Type-R Fluid (1 gal)	270755	--

Remove the Pump from the Melter

1. Relieve system pressure. Refer to *Relieving System Pressure* in Section 5.

See Figure D-1.

2. Isolate the pump from the manifold by rotating the isolation valve handle to its full vertical position (valve closed).
3. Remove the three M8 pump-mounting bolts from the front of the pump body.
4. Rotate the top of the pump slightly toward the front of the melter while pulling the pump away from the manifold.

NOTE: The face of the pump body contains two M6 threaded holes. Bolts can be threaded into these holes to gain leverage when removing the pump.

5. Remove the air line from the back of the pump.
6. Lift the pump clear of the melter, and place it in a bench vise or other suitable mount.

Check/Repair		
Pump-to-manifold O-rings P/N 1019515 P/N 942111	Inspect for nicks, gouging, or swelling	Apply Parker lubricant during reassembly
Cross-over tube O-rings P/N 940133 (2) Teflon back-up ring P/N 954013	Inspect for nicks, gouging, or swelling	Apply Parker lubricant during reassembly

Special Reassembly Instructions

- Before reinstalling the pump, lubricate the O-rings on the cross-over tubes and the two O-rings between the pump and the manifold.

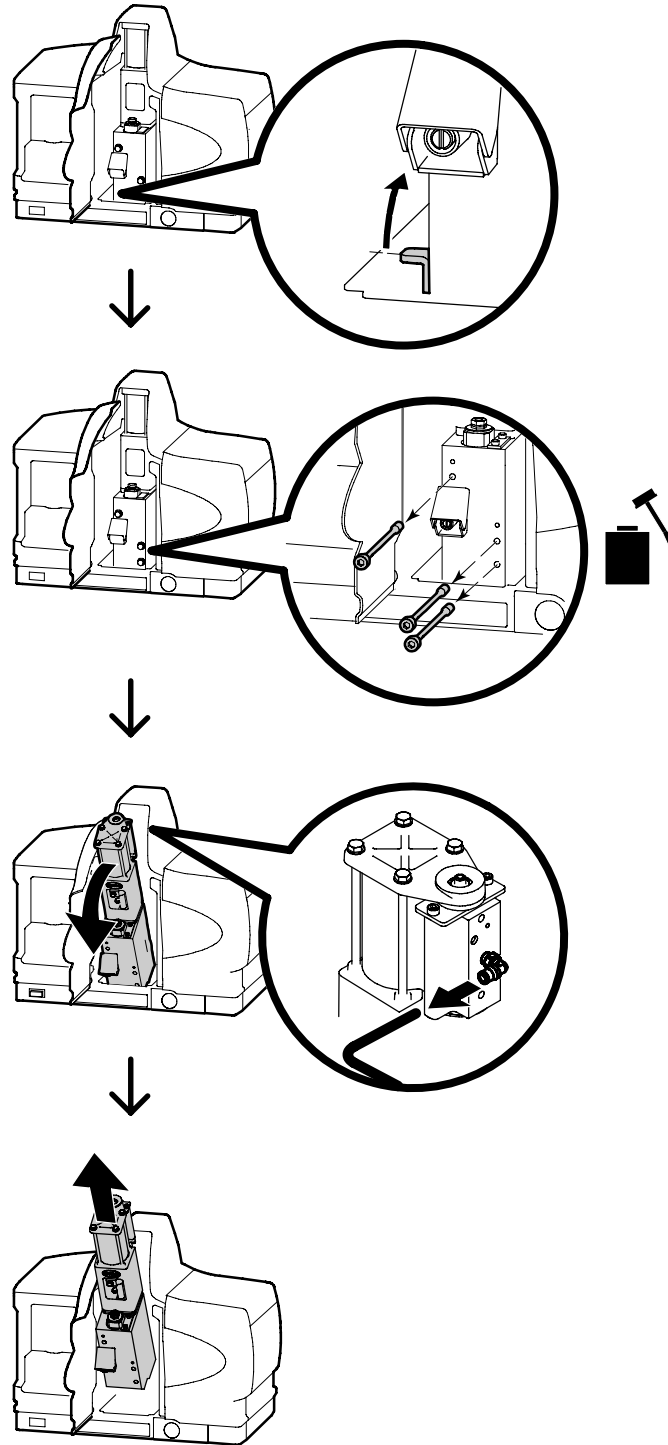


Figure D-1 Removing the pump

Remove the Actuator and Air Manifold and the Cylinder Assembly

See Figure D-2.

1. Remove the four M6 screws (1) and washers (2) from the cylinder head (3), and then separate the cylinder head from the cylinder (4).
2. Lift the cylinder off of the piston cups (7), and then rotate the cylinder/can assembly (4 and 5) away from the shifter fork assembly (6).
3. Remove the two O-rings (8).

Check/Repair		
O-rings P/N 940332	Inspect for nicks, gouging, or swelling	Apply Parker lubricant during reassembly

Special Reassembly Instructions

- Slide the cylinder over the half of the piston cup assembly (Which was installed as described in *Removing the Piston Cup Assembly, Special Reassembly Instructions*); and then remove the torque nut, assemble the remaining piston cup (cupped side facing up) and seal washer, and then replace the torque nut.
- Before rotating the cylinder/can assembly onto the shifter fork, center the fork inside the pump frame.

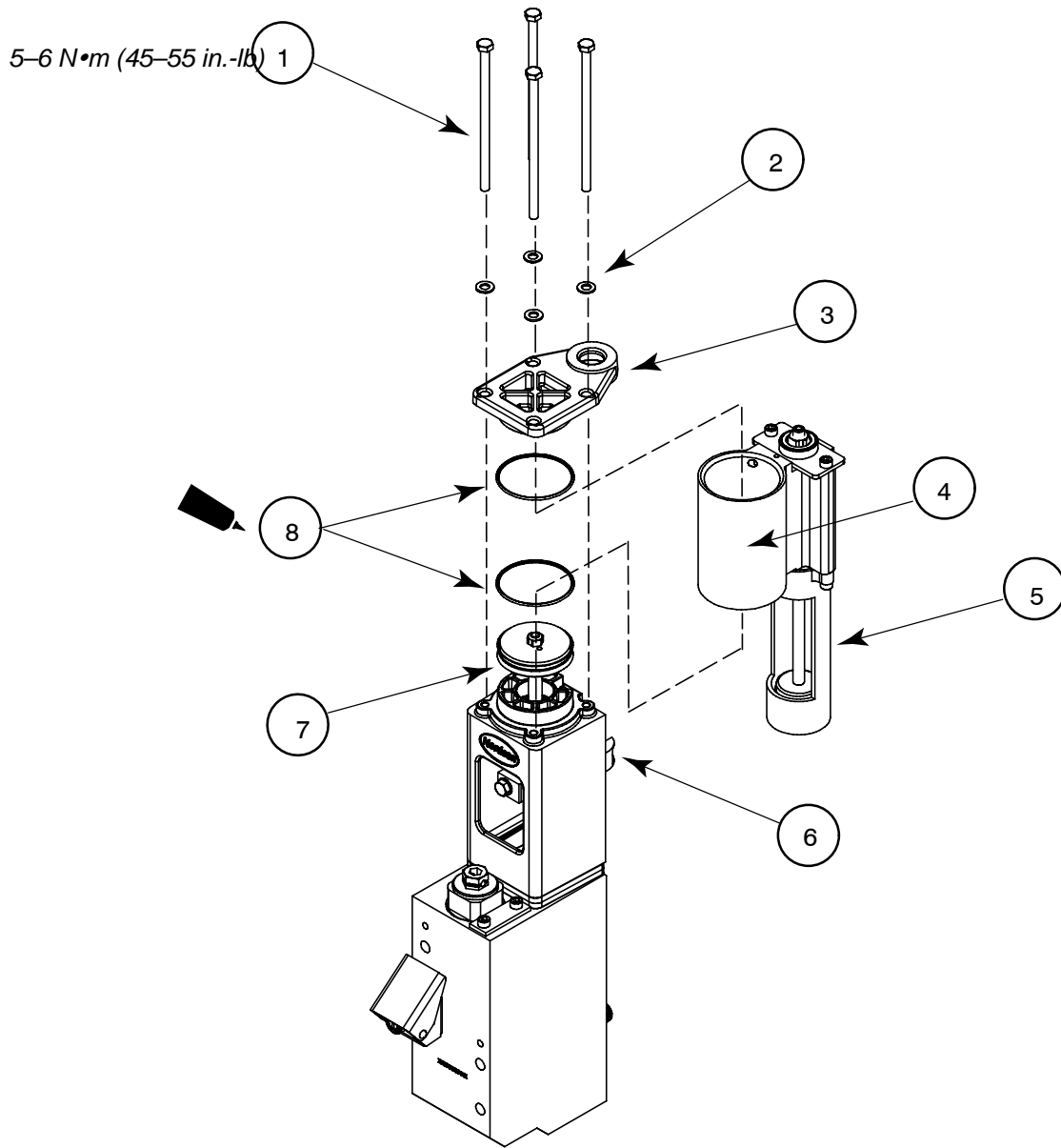


Figure D-2

- | | |
|------------------|----------------------------|
| 1. M6 screw (4) | 4. Cylinder |
| 2. M6 washer (4) | 5. Can |
| 3. Cylinder head | 6. Shifter fork assembly |
| | 7. Piston cup/seal washers |
| | 8. O-rings (2) |

Remove the Magnetic Actuator Assembly

See Figure D-3.

1. Remove the two M5 screws (3), and then pull the can (2) off of the actuator assembly (1).

See Figure D-4.

2. Pull the actuator assembly away from the upper detent (4) to expose the small tool hole in the shaft (3).
3. Place a 1/8-in. steel rod or similar tool into the tool hole to prevent the actuator from rotating.
4. With the actuator assembly held in position with the 1/8-in. steel rod/tool, remove the valve spool nut (1), and then remove the bumper assembly (2).

See Figure D-5.

5. While holding the valve spool by the wrench flats (1) to prevent the spool from rotating, unscrew the actuator assembly (2).

Check/Repair		
Magnetic Actuator P/N 164606	Magnets are secured to the actuator shaft, undamaged, and free of debris	Clean, tighten the magnets, or replace as needed
Bumper assembly P/N 1014650	Check for wear	Replace if worn

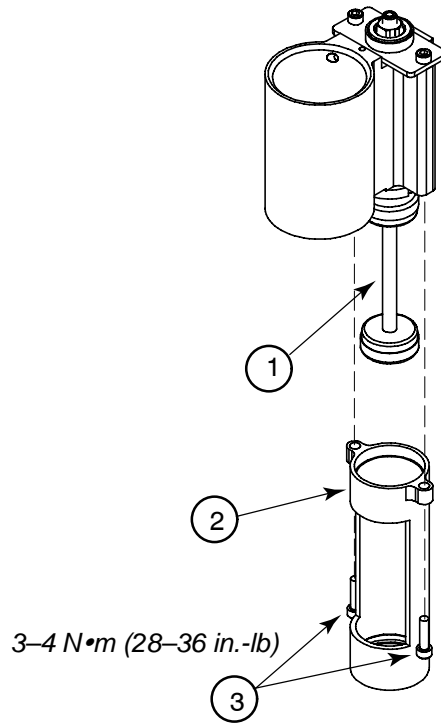


Figure D-3

- | | |
|----------------------|-----------------|
| 1. Actuator assembly | 3. M5 screw (2) |
| 2. Can | |

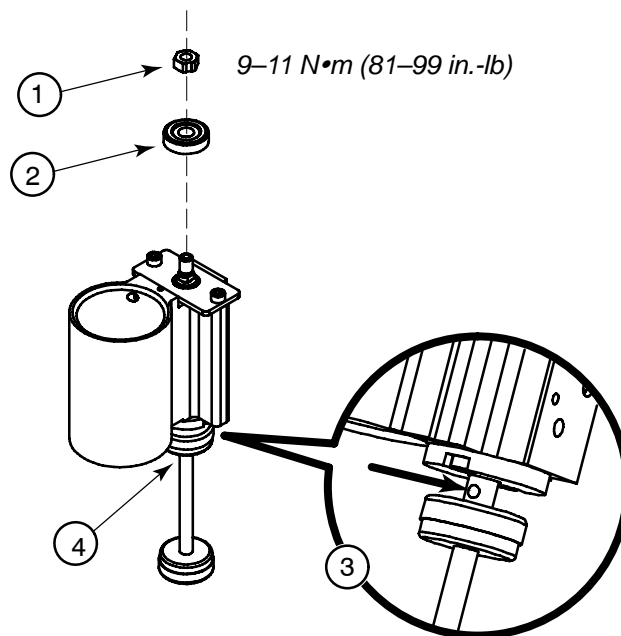


Figure D-4

- | | |
|--------------------|-----------------|
| 1. Valve spool nut | 3. Tool hole |
| 2. Bumper assembly | 4. Upper detent |

Remove the Magnetic Actuator Assembly (contd)

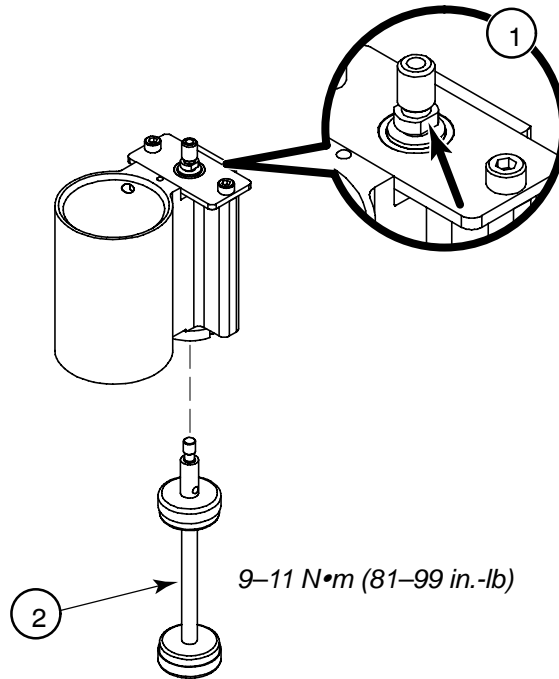


Figure D-5

1. Wrench flats
2. Actuator assembly

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Remove the Valve Spool and Sleeve

CAUTION: Handle the valve spool with care. Damaging the precision machined surface of the spool can cause the air valve to seize.

See Figure D-6.

1. Carefully slide the valve spool (1) out of the valve sleeve (2). Set the valve spool aside onto a clean cloth.

See Figure D-7.

2. Remove the two M4 screws (5), and then separate the upper detent (6) and spring (4) from the air manifold (3).
3. Remove the two M5 screws (2), and then remove the flange (1).

See Figure D-8.

4. Use a socket or similar object to push the valve sleeve out of the air manifold.

NOTE: The valve spool and sleeve are a matched set and cannot be exchanged with parts from another air valve assembly. If either the spool or sleeve is damaged, they must be replaced with a new valve assembly.

CAUTION: Do not scrape the valve spool or sleeve. Clean them with mineral spirits or any non-chlorinated cleaning solvent and a soft cloth. Do not use abrasives such as sandpaper or emery cloth. Be careful not to round off the sharp edges of the spool lands.

Check/Repair		
Valve spool*	Spool lands are nicked, gouged, corroded, or dirty	Clean with mineral spirits or any non-chlorinated solvent and a soft cloth. Apply SP lubricating oil to the lands before inserting the spool back into the sleeve
Valve sleeve*	Broken, corroded, or dirty	Clean with mineral spirits or any non-chlorinated solvent and a soft cloth
O-rings P/N 940181	Inspect for nicked, gouged, or swollen	Apply Parker lubricant during reassembly

*Available only as part of valve assembly P/N 1006027

Special Reassembly Instructions

- Use the flange to press the sleeve back into the air manifold.
- Apply only one drop of lubricating oil to each spool land.
- Ensure that the valve spool slides freely inside the sleeve.

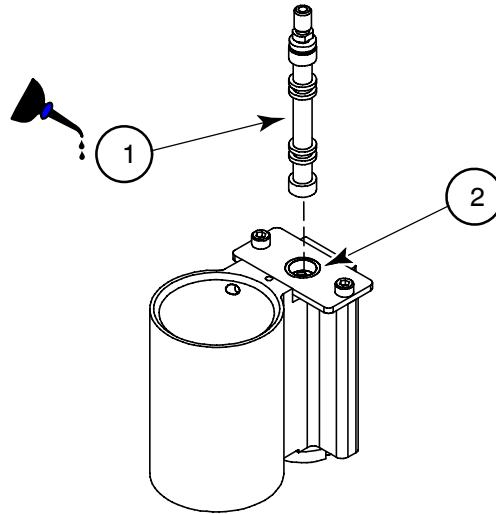


Figure D-6

- 1. Spool lands
- 2. Valve sleeve

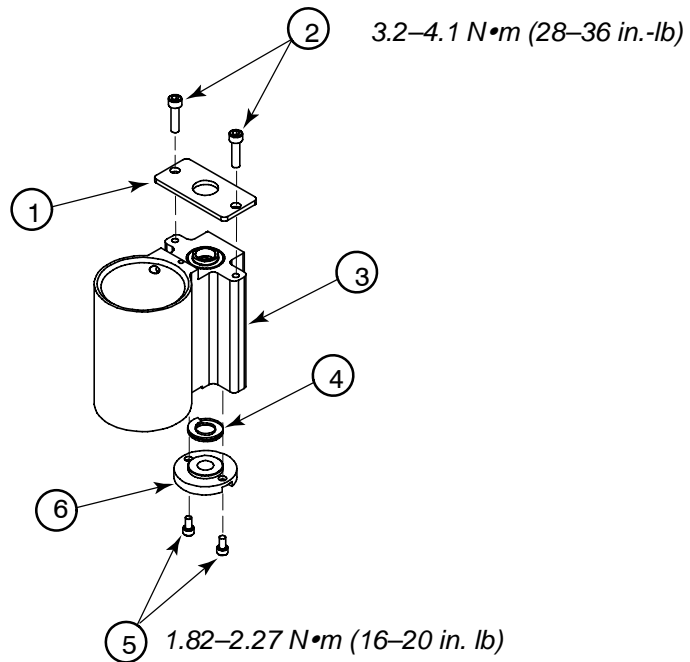


Figure D-7

- 1. Flange
- 2. M5 screws (2)
- 3. Air manifold
- 4. Spring
- 5. M4 screws
- 6. Upper detent

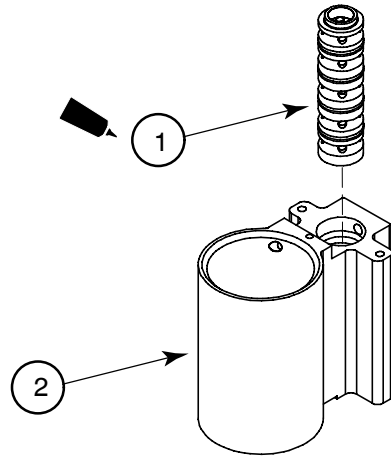


Figure D-8

1. Valve sleeve
2. Air manifold

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Remove the Shifter Fork

CAUTION: Handle the shifter fork with care. Dropping or otherwise mishandling the shifter fork may damage the magnet.

See Figure D-9.

1. Remove the hex-head screw (2) and the washer (1) from the shifter fork (3).
2. Remove the shifter fork from the piston by sliding the fork up to the narrowest point on the piston.

Check/Repair		
Shifter fork assembly P/N 166880	Word "UP" is facing upwards Securely attached to piston Resting on piston shoulder Bent Magnets secure/undamaged	Replace fork if bent or magnet is damaged

Special Reassembly Instructions

- The fork must be resting on the shoulder of the piston (See Figure D-9, item 4).
- The word "UP" must be facing the top of the pump frame.

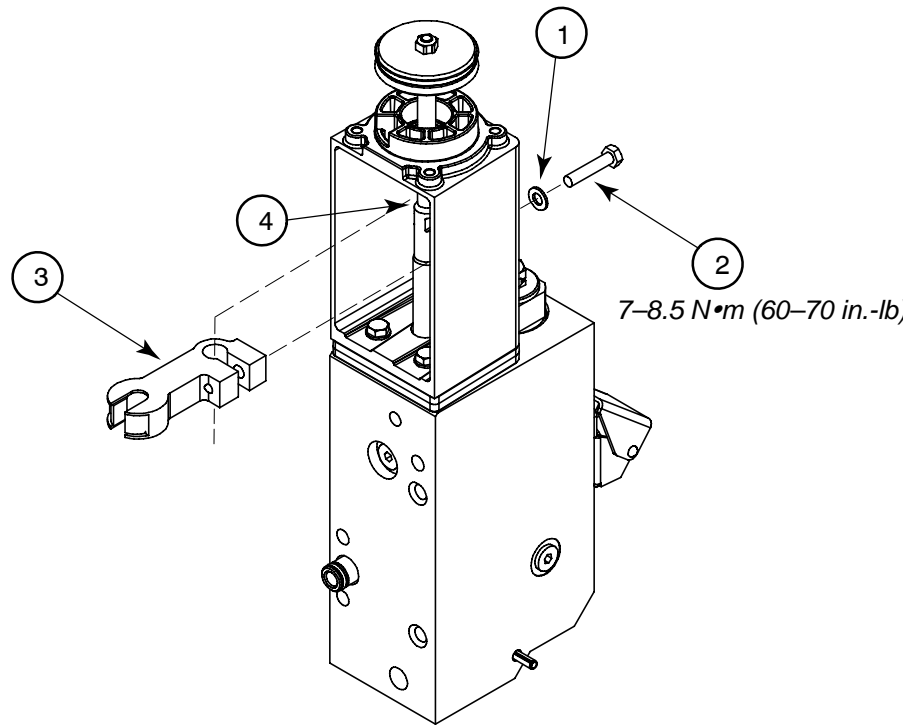


Figure D-9

- 1. Washer
- 2. Hex-head screw
- 3. Shifter fork assembly
- 4. Piston shoulder

Remove the Piston Cups

See Figure D-10.

1. While holding the piston in-place by its wrench flats, remove the M6 torque nut (1).
2. Remove the two piston cups (4) and the piston seal washers (2 and 3).

Check/Repair		
Piston cups P/N 163039	Not torn or deteriorated Pliable	Apply Parker lubricant during reassembly

Special Reassembly Instructions

- To prevent damage to the upper piston cup when reinstalling the cylinder, install only the bottom seal washer, the bottom piston cup, center seal washer, and the torque nut (loose). The remaining piston cup and washer are not installed until after the cylinder is in-place.

Refer to *Remove the Actuator and Air Manifold and the Cylinder Assembly*.

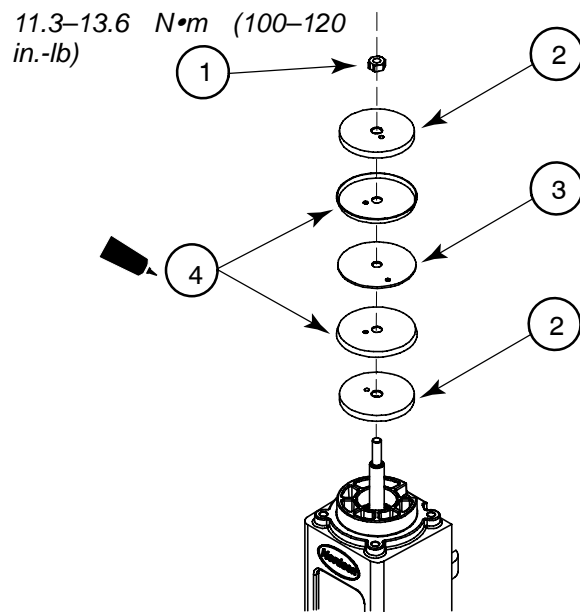


Figure D-10

1. Torque nut
2. Piston cup washer (2)
3. Piston seal washer
4. Piston cup (2)

Remove the Pump Frame and the Insulator

See Figure D-11.

1. Remove the four hex-head screws (1) and washers (4).
2. Lift the pump frame (2) and the insulator (3) off of the piston.

See Figure D-12.

3. If necessary (see Checks/Repairs), remove the retaining ring (1) and the U-cup (2) from the frame.

Check/Repair		
Pump insulator P/N 1017307	Cracked or warped	
U-cup piston seal P/N 952100	Nicked, cut, or deteriorated	Apply Parker lubricant during reassembly

Special Reassembly Instructions

- Before reinstalling the insulator and pump frame, place the O-ring and piston seal over the piston.

NOTE: Install the pump seal with the open side facing the pump body.

- Install the insulator with the words “This side up” facing upwards.
- Use the insulator to seat the O-ring and pump seal into the groove in the pump body.
- The tapered end of the insulator and pump frame face the filter.

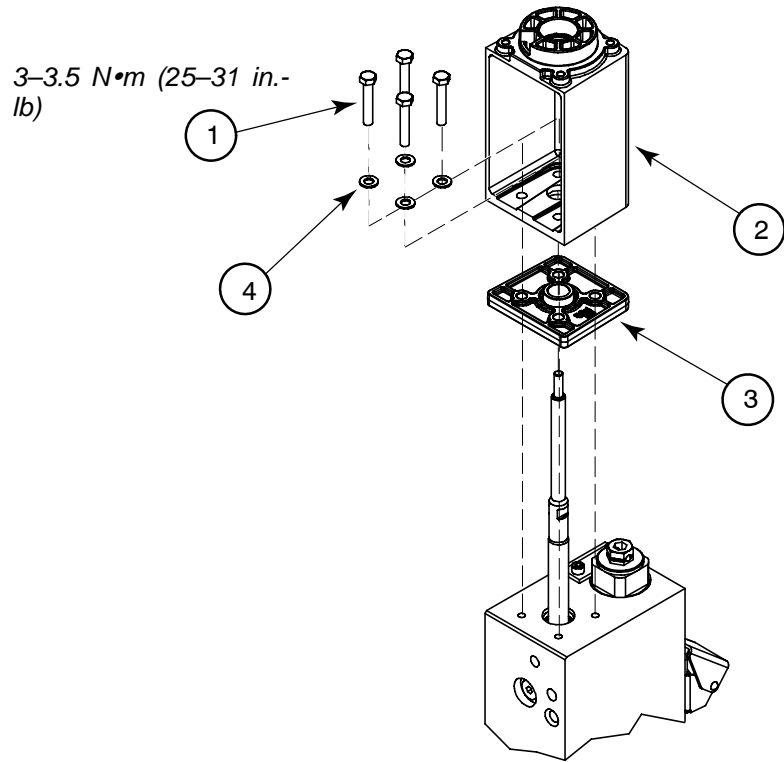


Figure D-11

- 1. Hex-head screw (4)
- 2. Pump frame
- 3. Insulator
- 4. Washers (4)

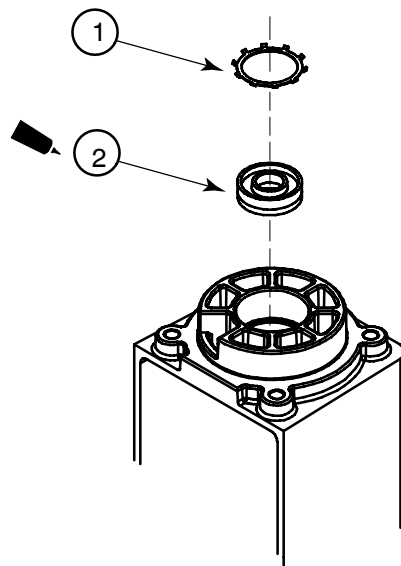


Figure D-12

- 1. Retaining ring
- 2. U-cup

Remove the Lower Ball Seat Assembly and the Piston

CAUTION: Handle the piston with care. Damaging the precision machined surface of the piston can result in failure of the pump.

See Figure D-13.

1. Unscrew the lower ball seat assembly (2) from the pump body.
2. Pull the piston (1) out of the bottom of the pump body.

Check/Repair	
Pump body P/N 1016863	Remove solidified adhesive before reassembly
Piston P/N 1022658	Nicked or worn Remove solidified adhesive before reassembly

Special Reassembly Instructions

- Apply Never-seez to the threads of the lower ball seat before reinstalling the seat into the pump body.
- Apply O-ring lubricant to the lower ball seat O-ring.

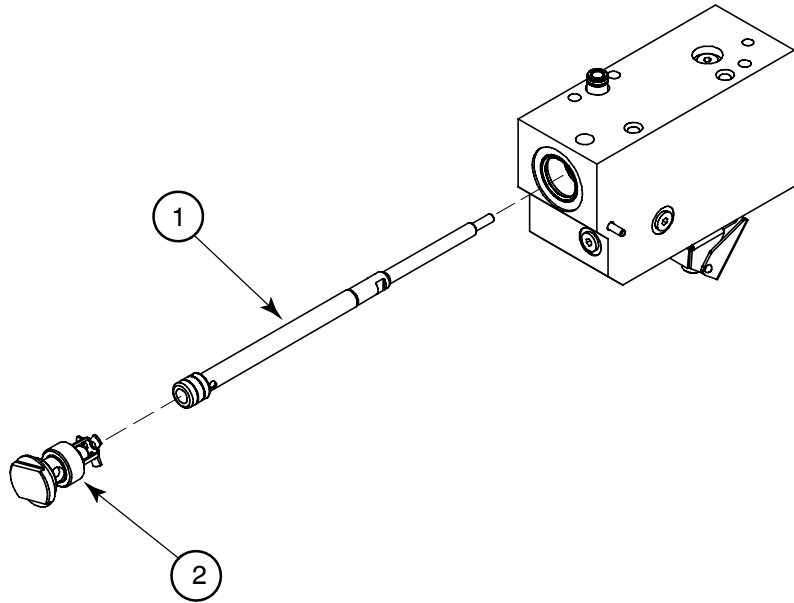


Figure D-13

- 1. Piston
- 2. Lower ball seat assembly

Disassemble the Lower Ball Seat and the Pressure Ball Assemblies

See Figure D-14.

1. Pull the siphon ball cage (1) off of the lower ball seat (4), and then remove the siphon ball (2).
2. Remove the O-ring (3) from the lower ball seat.

See Figure D-15.

3. Unscrew the pressure ball seat (3) from the piston (1), and then remove the pressure ball (2).

Check/Repair		
Siphon ball P/N 900001	Char buildup	
Pressure ball P/N 900000		
Ball seats P/N 1017320	Char buildup or damage	Apply Never-seez during reassembly
Siphon ball cage P/N 503696	Char buildup or damage	
Lower ball seat O-ring P/N 945037	Nicked, gouged, deteriorated, or swollen	Apply Parker lubricant during reassembly

NOTE: Clean all hydraulic components in a container of Type R fluid before reassembling them.

Special Reassembly Instructions

- If the siphon ball cage does not fit tightly onto the lower ball seat, gently bend the legs of the cage together to create a spring-fit onto the seat.

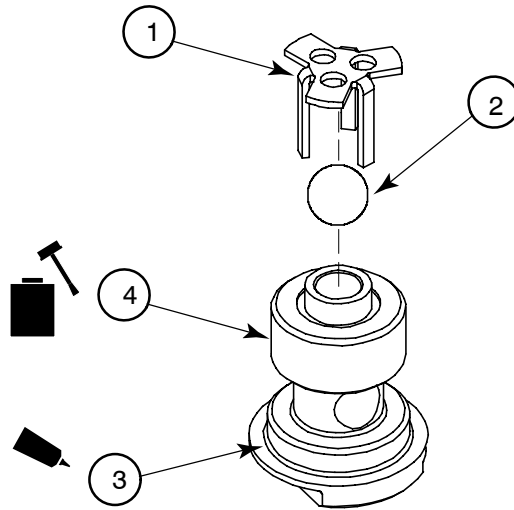


Figure D-14

1. Siphon ball cage
2. Siphon ball
3. O-ring
4. Lower ball seat

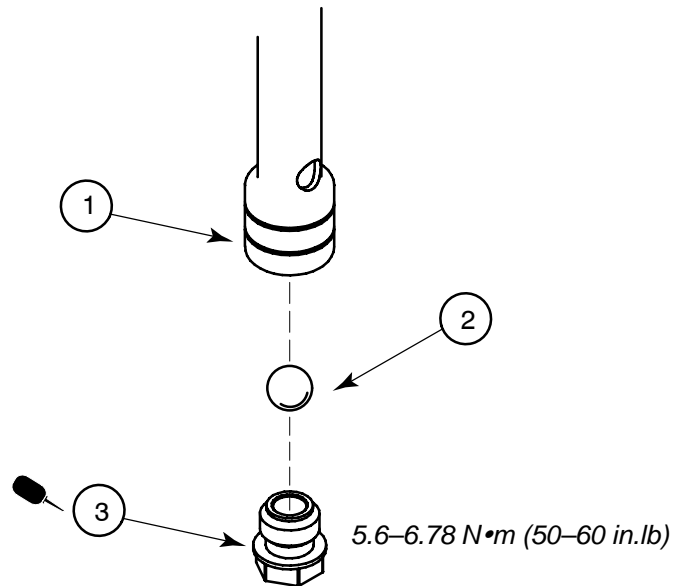


Figure D-15

1. Piston
2. Pressure ball
3. Pressure ball seat

Remove the O-ring and the Pump Seal

See Figure D-16.

Remove the O-ring (1) and pump seal (2) from the pump body.

Check/Repair		
O-ring P/N 940172	Nicked, cut, deteriorated, or swollen	Apply Parker lubricant during reassembly
Pump Seal P/N 273139	Nicked, cut, deteriorated, or deformed	Apply Parker lubricant during reassembly

Special Reassembly Instructions

- The O-ring and the pump seal are replaced after the piston is reinstalled, but before the insulator and pump frame are installed. Refer to *Removing the Pump Frame and the Insulator* for information about reinstalling the O-ring and the pump seal.

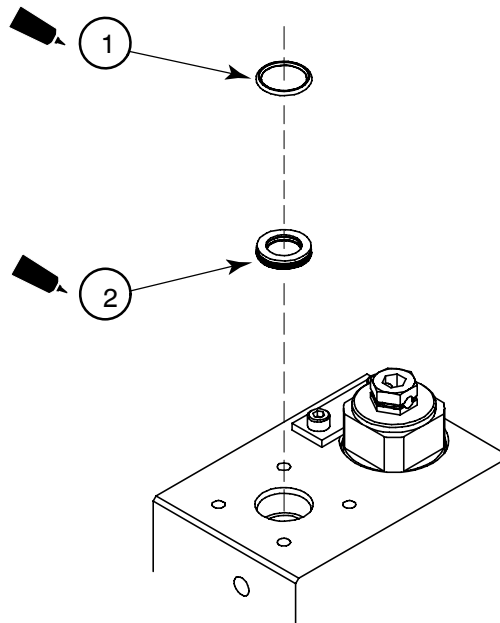
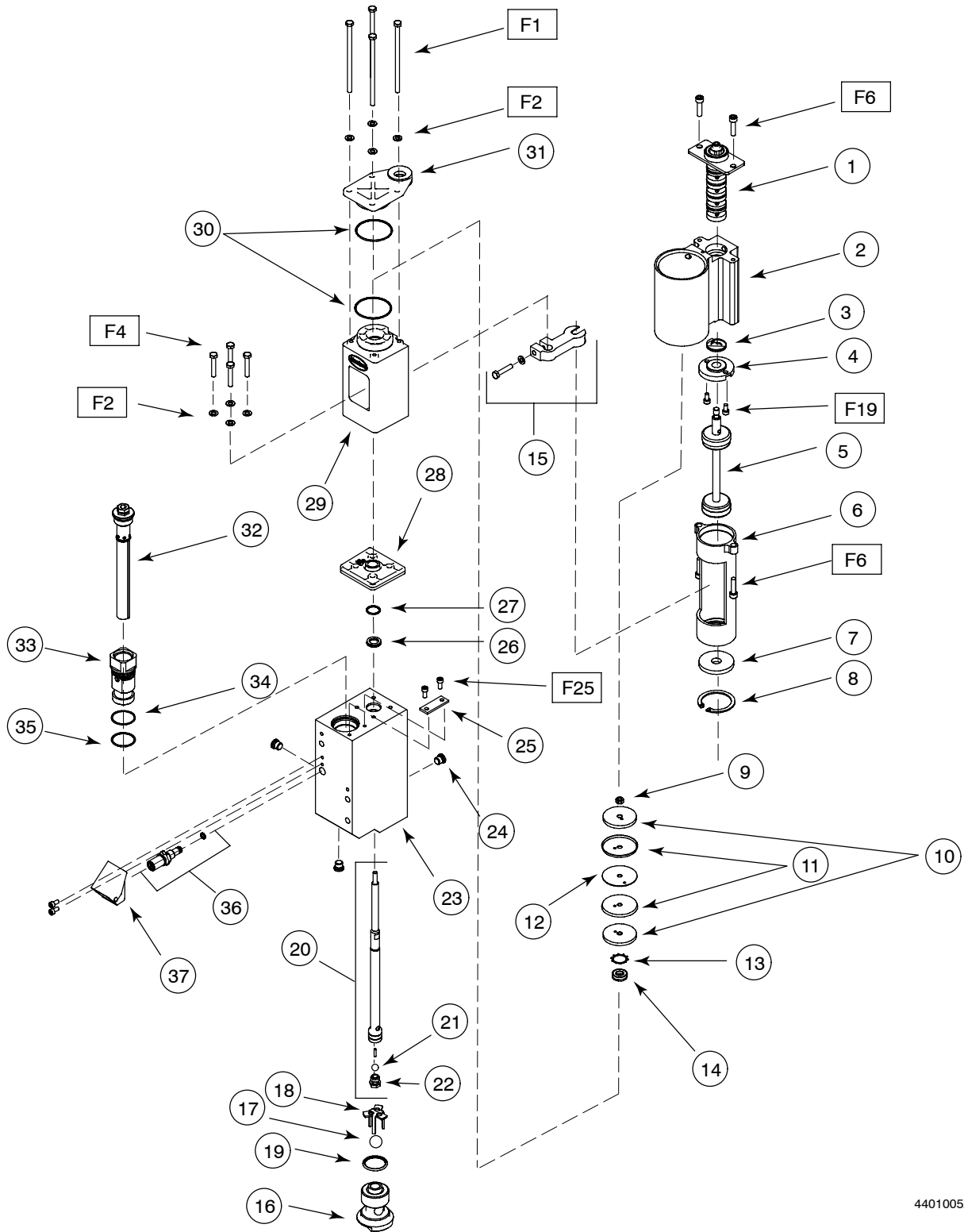


Figure D-16

- O-ring
- Pump Seal

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Pump Assembly Parts List



4401005A

Item	Used	Part	Description	Quantity	Note
—		-----	Pump, piston, 14:1	1	A
1		1006027	• Service kit, valve assembly, G2SP	1	
2		1021998	• Manifold, air, G ¹ / ₈ in. port	1	
3		333560	• Spring, wave, Inconel,	1	
4		155057	• Detent, upper	1	
5		164606	• Service kit, magnetic actuator	1	
6		155068	• Can	1	
7		155067	• Detent, lower	1	
8		986714	• Retaining ring, internal, 156, bowed	1	
9		984092	• Nut, hex, lock, torque, M6, class 10	1	
10		983446	• Washer, piston cup	2	
11		163039	• Cup, piston	2	
12		983445	• Washer, piston seal	1	
13		986331	• Retaining ring, internal, 100, push-on	1	
14		952100	• Cup, U, Viton	1	
15		166880	• Service kit, fork magnetic	1	
16		1017320	• Seat, ball, lower	1	
17		900001	• Ball, 440 stainless steel, 0.500 in.	1	
18		503696	• Cage, ball, siphon	1	
19		945037	• O-ring, Viton, 1 in. tube	1	
20		1022658	• Piston assembly	1	
21		900000	• • Ball, 440 stainless steel, 0.375 in.	1	
22		503709	• • Seat, ball, pressure	1	
23		1016863	• Body, pump filter	1	
24		973543	• Plug, O-ring, straight thread, ⁷ / ₁₆ -20	3	
25		1021270	• Plate, filter, anti-rotation	1	
26		273139	• Seal, pump	1	
27		940172	• O-ring, Viton, 0.676 x 0.070	1	
28		1017307	• Insulator, pump	1	
29		1016339	• Frame, pump	1	
30		940332	• O-ring, 2.000 x 2.125 x 0.063 in.	2	
31		333137	• Head, cylinder	1	
32		-----	• Filter assembly, 100-mesh, with O-ring	1	B
33		1021955	• • Adapter, filter assembly	1	
34		1017849	• • Backup ring, Teflon, 0.273 x 0.045	1	
35		940261	• O-ring, Viton, 1.250 x 0.375 x 0.063 in.	1	
36		276024	• Valve assembly, drain	1	
37		1022779	• Chute assembly, drain	1	

NOTE A: Included in service kit P/N 1028303
 B: Included in service kit P/N 1028305

Pump Service Kit

Part	Description	Quantity
1028304	Kit, service, pump, P4/P7/P10	—
940133	• O-ring, Viton, 0.426 x 0.070 in.	2
940332	• O-ring, Viton, 2.00 x 2.125 x 0.063 in.	2
1019515	• O-ring, Viton, 0.50 x 0.75 x 0.125 in.	1
942111	• O-ring, Viton, 0.812 x 0.062 x 0.125 in.	1
940181	• O-ring, Viton, 0.739 x 0.70 in.	4
952100	• Cup, U, Viton	1
954013	• Backup ring, single, $\frac{7}{16} \times \frac{9}{16}$	2
163039	• Cup, piston	2
273139	• Seal, pump	1
986331	• Retaining ring, internal, 100, push-on	1
984092	• Nut, hex, lock, torque, M6	1
982147	• Screw, hex, cap, M6 x 120	4
982237	• Screw, hex, cap, M6 x 35	4
983410	• Washer, flat, M6	8
940172	• O-ring, Viton, 0.676 x 0.070	1
-----	• Lubrication, Parker, $\frac{1}{2}$ oz.	1
940261	• O-ring, Viton, 1.25 x 1.375 x .063	1
1017849	• Backup ring, Teflon, 1.273 x .045 thick	1
945037	• O-ring, Viton, 1-inch tube	1
973543	• Plug, O-ring, $\frac{7}{16}$ -20	3
211228	Service kit, SP lubricating oil	—

Other Pump Maintenance Kits

Part	Description	Quantity
1006027	Service kit, valve assembly, G2SP	—
164606	Service kit, magnetic actuator	—
166880	Service kit, fork magnetic	—

Schedule of Fasteners

Part	Description
F1	• Screw, hex, cap, M6 X 120 mm
F2	• Washer, flat, M, narrow, M6
F4	• Screw, hex, cap, M6 X 35 mm
F6	• Screw, hex, cap, M5 X 20 mm
F19	• Screw, hex, cap, M4 X 8 mm

Appendix E

400/480 Volt ProBlue Adhesive Melters



WARNING: Allow only personnel with appropriate training and experience to operate or service the equipment. The use of untrained or inexperienced personnel to operate or service the equipment can result in injury, including death, to themselves and others, and damage to the equipment.

This appendix provides information about the 400/480 volt versions of the ProBlue adhesive melter. Key information provided in this appendix, which does not appear in the body of this manual, includes:

- Installation instructions that are specific to the 400/480 volt melters and transformers
- Transformer sizing guidance
- Transformer troubleshooting
- Parts and service kits that are specific to the 400/480 volt melters and transformers

For setup, operation, troubleshooting, and parts information that is common to all ProBlue adhesive melters, refer to the appropriate section of this manual.

Introduction

Safety

Before installing or operating the transformer or melter, read the safety information provided in Section 1, *Safety*.

Intended Use

- The 1.5 kVA and 3.0 kVA transformers can only be used with ProBlue adhesive melters that are specifically designed for 400/480 volt electrical service.
- Use an input electrical service rated at 400 volts 3-phase without a neutral or 480 volts 3-phase without a neutral.

Unintended Use

- Water wash-down environments
- Explosive atmospheres

Transformer Sizing

Review the following transformer sizing procedure to ensure that your transformer is correctly sized for the number and type of hoses/guns you intend to use.

To size your transformer

1. Determine the total power consumption (in watts) at 230 volts for all of your hoses and guns. Table E-1 lists the wattages of common hoses and guns that are sold by Nordson Corporation. If your hose or gun is not listed in Table E-1, refer to the identification tag that is affixed to the hose/gun.
2. Calculate the kVA rating of the required transformer by dividing the total wattage calculated in step 1 by 1000.

Example

From Table E-1, an application requires two 1.8 m Auto hoses at 155 watts each and two H-402 (T-LP) guns at 185 watts each.

The combined wattage of the selected hoses and guns is 680 watts.

$$680 \div 1000 = \mathbf{0.68 \text{ kVA}}$$

In this example, the 1.5 kVA transformer would be adequate.

Table E-1 Hose and Gun Power Consumption

Hose/Gun	Wattage (230 Volts)
<i>Hoses</i>	
Auto hose 0.6 m (2 ft.)	45
Auto hose 1.2 m (4 ft.)	100
Auto hose 1.8 m (6 ft.)	155
Auto hose 2.4 m (8 ft.)	205
Auto hose 3 m (10 ft.)	265
Auto hose 3.6 m (12 ft.)	315
Auto hose 4.8 m (16 ft.)	420
Auto hose 7.2 m (24 ft.)	635
Manual hose 2.4 m (8 ft.)	205
Manual hose 4.8 m (16 ft.)	420
<i>Guns</i>	
H-201 or 401 (T or T-L)	140
H-202 or 402 (T or T-L)	210
H-204 or 404 (T or T-L)	260
H-208 or 408 (T or T-L)	405
H-202 or 402 (T-E or T-E-L)	335
H-204 or 404 (T-E or T-E-L)	350
H-202 or 402 (T-LP or T-LP-L)	185
H-204 or 404 (T-LP or T-LP-L)	285
H-208 or 408 (T-LP or T-LP-L)	390
H-20 (T or T-L0)	135
H-20 w/micro (T)	160

Transformer Function

Input electrical service of 400 or 480 volts is split between the melter heaters and the transformer(s). The melter's manifold and tank heaters operate on line voltage, which is passed through the transformer to the melter using a special wire harness. The melter's CPU controls the duty cycle of the heaters. No change in melter programming is required in order for the transformer to operate.

The transformer(s) reduces the input electrical service to 230 volts and directs the reduced voltage to the melter's main circuit board. The main circuit board uses this voltage to power the hoses and guns and provide control power to the CPU.

CPU-generated control signals are fed to a driver board in the transformer which uses high-power TRIACs to switch power to the manifold and tank heaters.

Installation

Before installing the transformer, familiarize yourself with the Section 3, *Installation*.

NOTE: ProBlue 400/480 volt transformers can only be used in conjunction with ProBlue adhesive melters that are specifically designed for use with 440/480 volt electrical service.

Clearances

Figure E-1 illustrates the *minimum* clearances that are required between the melter and surrounding objects. Table E-2 describes each clearance.

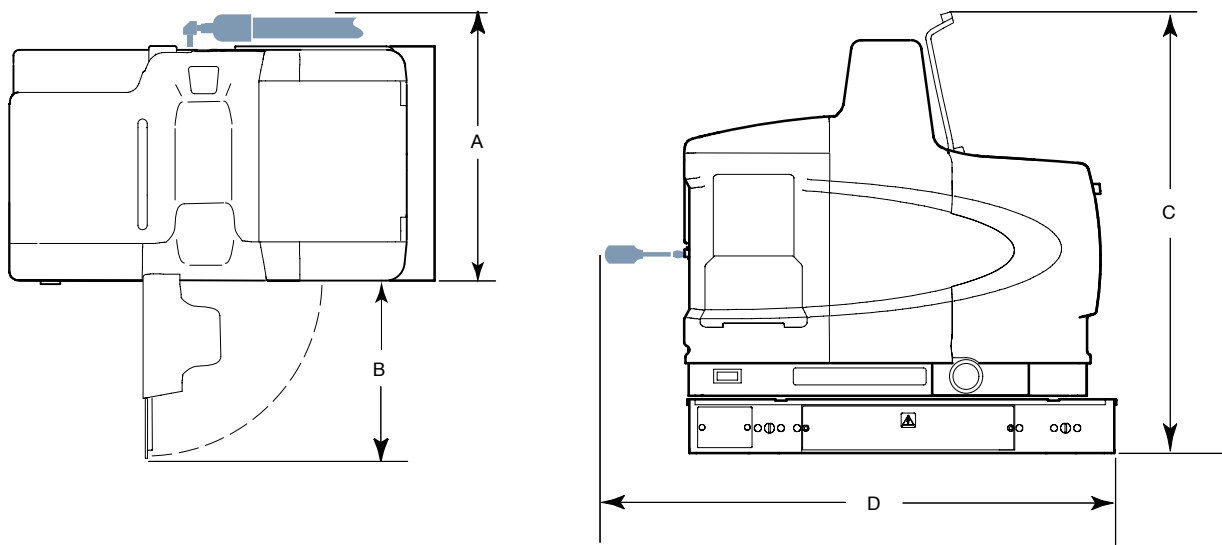


Figure E-1 Minimum installation clearances (P4 top and front views shown)

Table E-2 Installation Clearances

Item	Description	Required Clearance
A	The distance from the outside edge of a 5/16-inch Nordson hose to the front face of the melter when a short 90-degree hose fitting is to connect the hose to the melter	P4 = 370 mm (14.5 in.) P7 = 370 mm (14.5 in.) P10 = 391 mm (15.4 in.)
B	The clearance required to open the pump enclosure door	P4 = 243 mm (9.6 in.) P7 = 243 mm (9.6 in.) P10 = 268 mm (10.55 in.)
C	The distance from the melter sub-base to the front edge of the tank lid when the lid is at its highest point.	P4 = 575 mm (22.6 in.) P7 = 637 mm (25.1 in.) P10 = 729 mm (28.7 in.)
D	The clearance required on the left side of the melter to open the electrical enclosure door or remove a hose/gun module.	P4 = 689 mm (27.1 in.) P7 = 752 mm (29.6 in.) P10 = 755 mm (29.7 in.)

Installation Kit Components

The following components are shipped with the transformer.

NOTE: These components are in addition to the components that are provided in the melter installation kit.

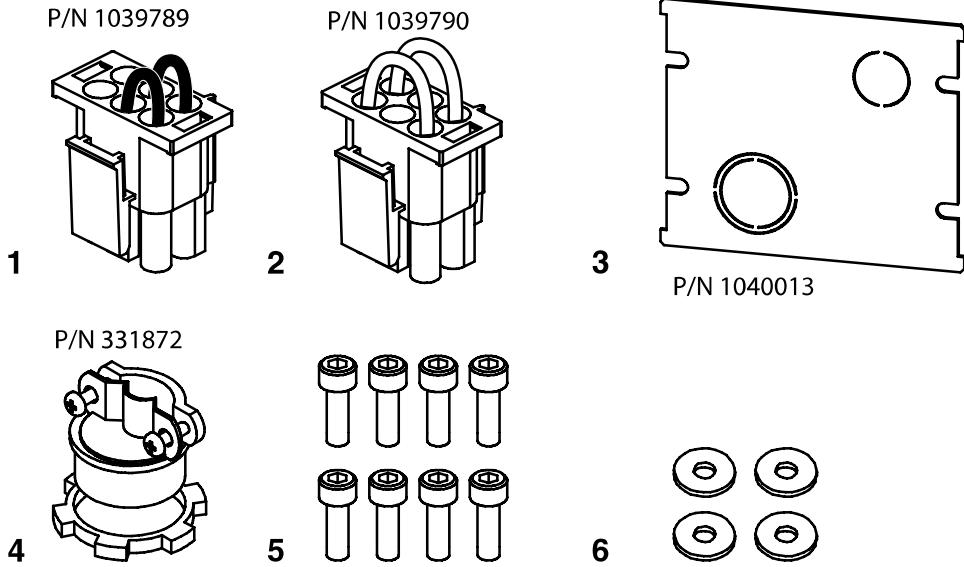


Figure E-2 Installation Kit

- | | | |
|---|------------------|-------------------|
| 1. Voltage plug, 400 volt (Black wires) | 3. Conduit plate | 5. M5 x 10 screws |
| 2. Voltage plug, 480 volt (White wires) | 4. Cable clamp | 6. M5 Washers |

Prepare the Transformer for Installation

See Figure E-3.

1. Remove the transformer lid.

NOTE: The lid is connected to the transformer by a ground lead.

2. Disconnect the ground lead from the sub-base.
3. Turn both locking screws counter-clockwise until they stop.
4. Remove the transformer from the sub-base by pulling the transformer forward approximately $\frac{1}{2}$ inch, and then lifting it clear of the sub-base.

See Figure E-4.

5. Attach the 400-volt plug (P/N 1039789/Black wires) or the 480-volt plug (P/N 1039790/White wires) to the power distribution module.

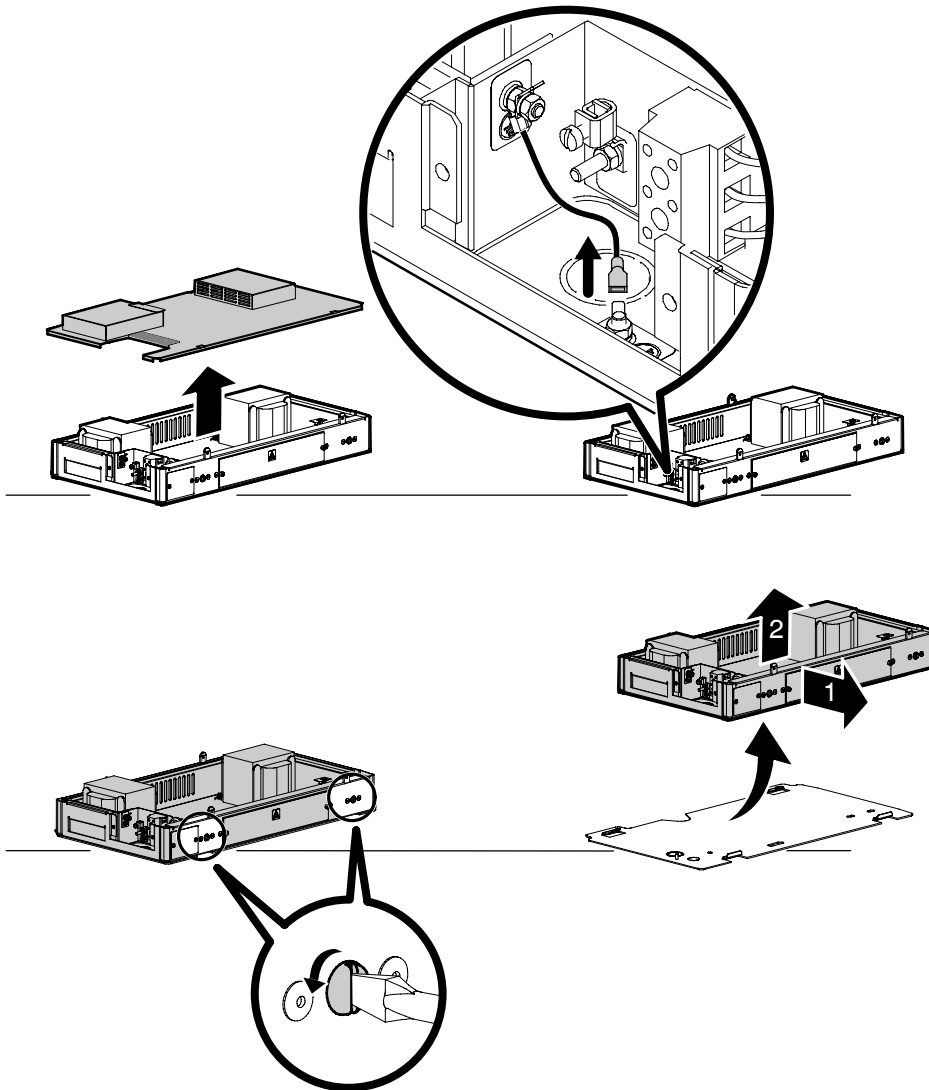


Figure E-3 Preparing the transformer

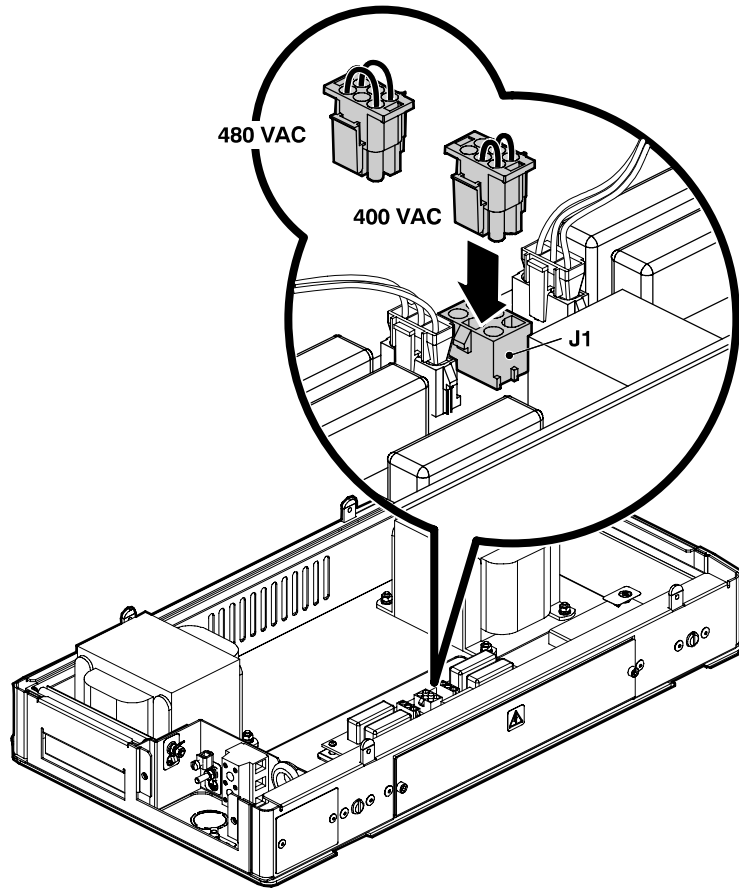
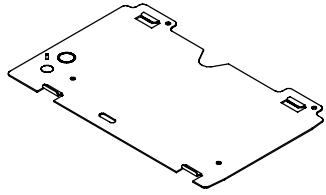


Figure E-4 Installing the voltage plug

Mount the Transformer to the Parent Machine



Sub-base

The transformer is shipped with a sub-base that is used to mount the transformer/melter to the parent machine.

NOTE: If you are converting an existing 230 volt ProBlue melter installation to a 400/480 volt ProBlue installation, you must use the sub-base provided with the transformer.

NOTE: The transformer (with sub-base) can be mounted directly to any parent machine that is already configured for mounting either a model 3100V or a model 3400V adhesive melter.

To mount the transformer

See Figure E-5.

1. Attach the sub-base to the parent machine using four 8-mm ($\frac{5}{16}$ -inch) bolts with locking hardware (customer supplied).
2. Remove the 1-inch conduit knockout from the sub-base and install the cable clamp that is provided in the installation kit.
3. Mount the transformer onto the sub-base, and then lock the transformer to the sub-base by turning both of the locking screws clockwise until they stop.

NOTE: Ensure that the ground leads between the transformer chassis and the power distribution module and between the transformer chassis and the transformer lid are connected before replacing the lid.

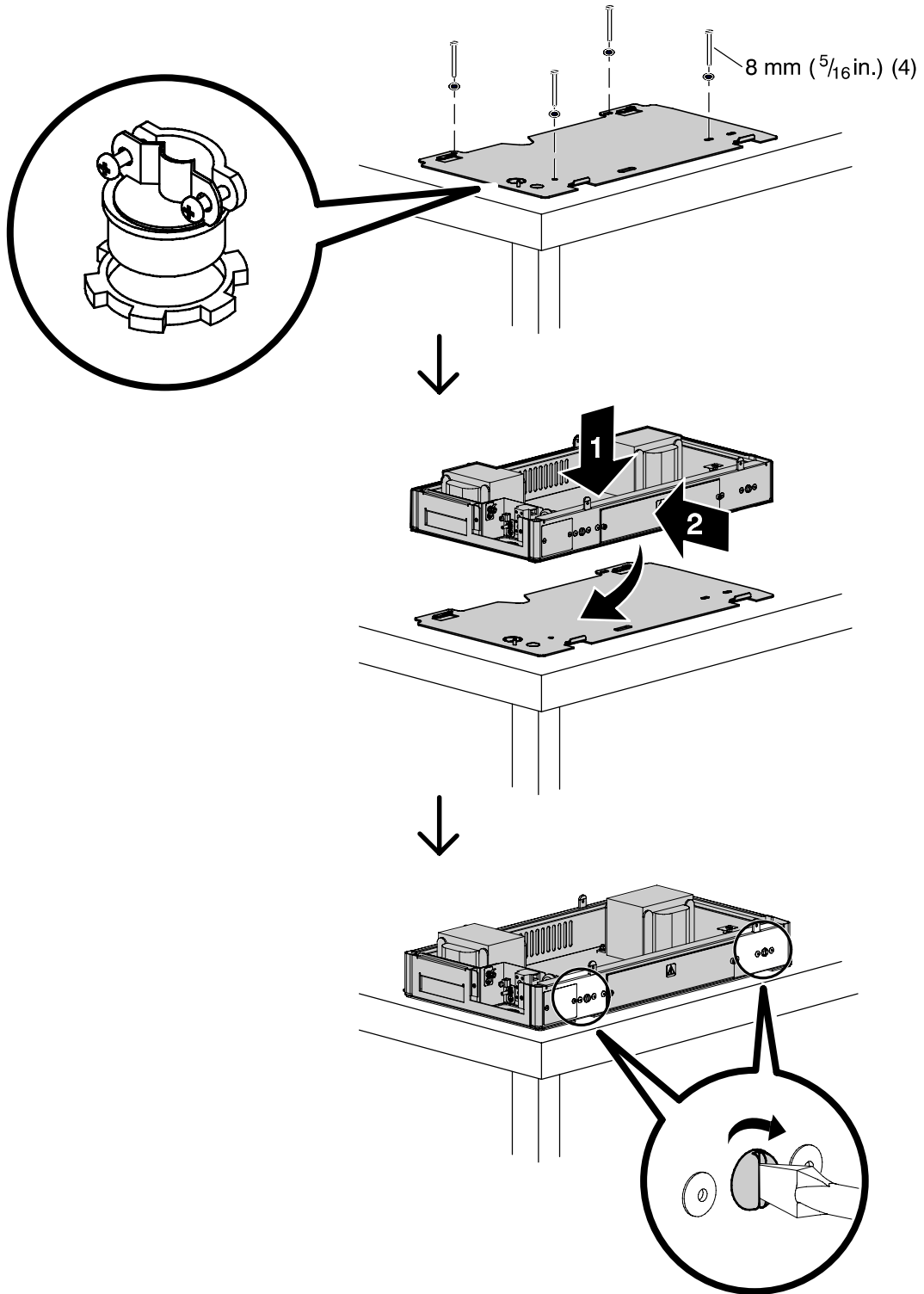


Figure E-5 Mounting the sub-base and the transformer

Connect the Electrical Service to the Transformer

1. Select a 3-wire (plus ground) power cable rated for the maximum amperage required by the melter. Ensure that the power cable meets applicable electrical codes and standards. Table E-3 lists the maximum amperages (per line) for 400/480 volt ProBlue adhesive melters.

Table E-3 Maximum Melter Amperages

Transformer	Maximum Amperage
1.5 kVA	8 A
3.0 kVA	11 A



WARNING: Risk of electrocution! ProBlue melters must be installed with a lockable power disconnect switch that completely de-energizes the melter by isolating it from its power source. Failure to de-energize the melter when required can result in personal injury, including death.



WARNING: Risk of electrical shock or short circuit. Use rigid or flexible conduit or an appropriately sized strain relief to protect the power cable from the sharp edge of the conduit knockout.

2. Route the power cable between the power disconnect switch and the transformer. Secure the power cable to the transformer sub-base using the cable clamp provided in the installation kit (P/N 331872).

See Figure E-6.

3. Flip the splash shield away from the terminal block, and then connect the power cable to the terminal block (terminals 1, 2, and 3).
4. Connect the power cable ground lead to the ground lug that is located on the transformer chassis.
5. Re-connect the ground lead on the transformer chassis to the ground post on the sub-base.
6. Replace the transformer lid.

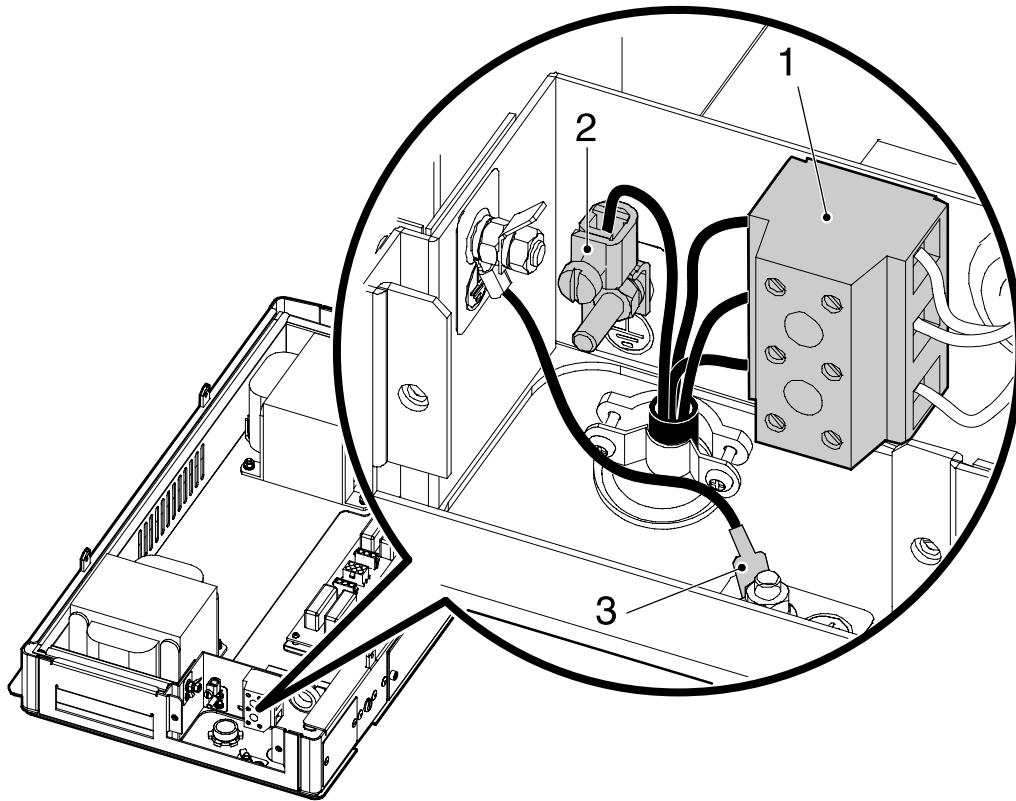


Figure E-6 Connecting the electrical service

- 1. Terminal block
- 2. Ground lug
- 3. Sub-base ground post

Mount the Melter to the Transformer

1. Coil the three transformer wire harnesses and temporarily stow them in the area of the terminal block.

See Figure E-7.

CAUTION: Ensure that the transformer wire harnesses are not pinched between the transformer and the melter.

2. Set the melter down onto the transformer so that the four tabs on the transformer enter the slots in the base of the melter.
3. Secure the melter to the transformer using the four M5 X 10 screws that are provided in the installation kit.

See Figure E-8.

4. Connect the ground lead from the melter to the ground connection on the transformer chassis.

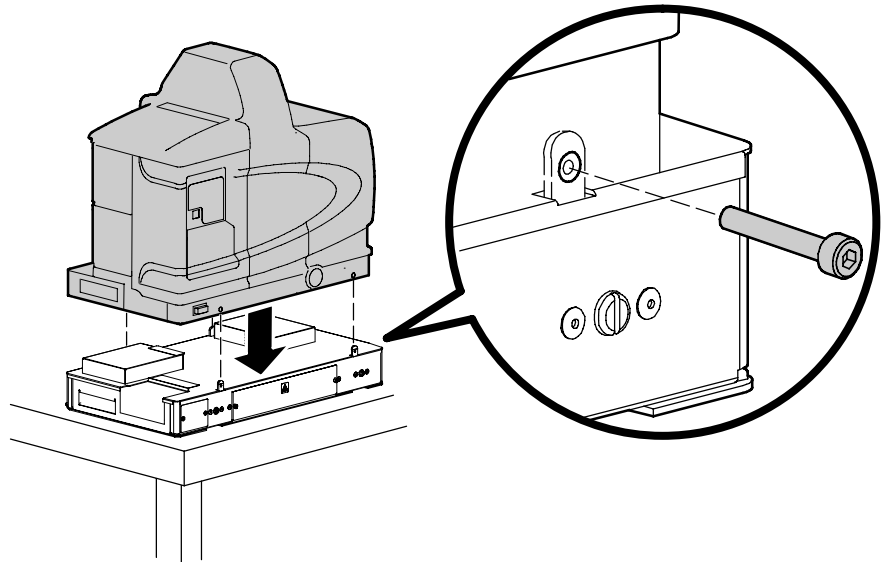


Figure E-7 Mounting the melter to the transformer

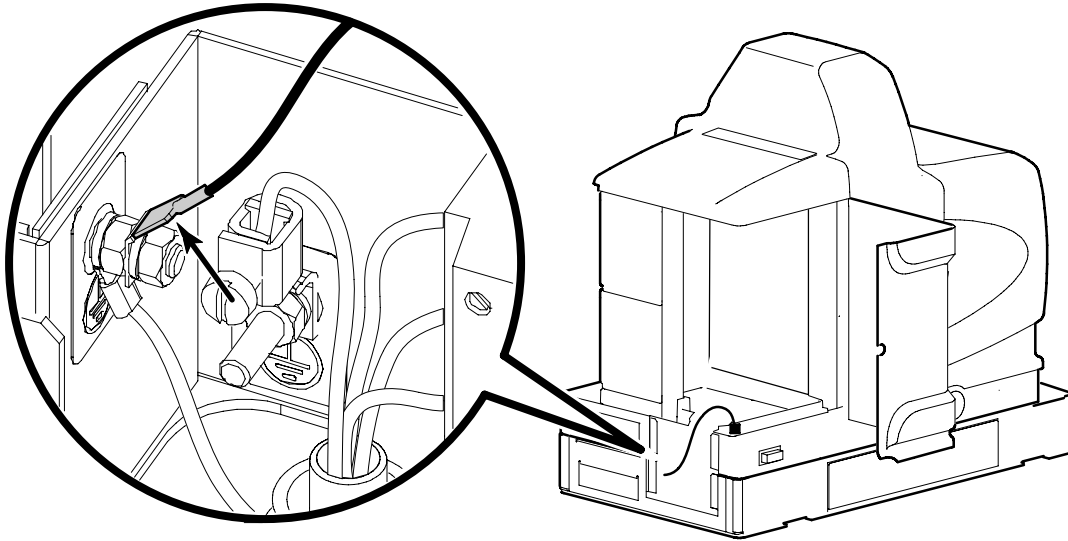


Figure E-8 Connecting the melter ground lead to the transformer chassis

Connect the Transformer to the Melter

1. Route the three wire harnesses from the transformer up into the melter's electrical enclosure.

See Figure E-9.

2. Connect the power harness to terminal J1 on the melter main board.
3. Connect the control harness to terminal J9 on the melter main board.
4. Connect the heater power harness from the transformer to the heater power harness plug that enters the bottom of the melter's electrical enclosure.

See Figure E-10.

5. Use the conduit plate, M5 screws, and washers provided in the installation kit to cover the service entrance on both the transformer and the melter.
6. Refer to the ProBlue adhesive melter product manual, Section 3, *Installation, Setting Up the Melter*.

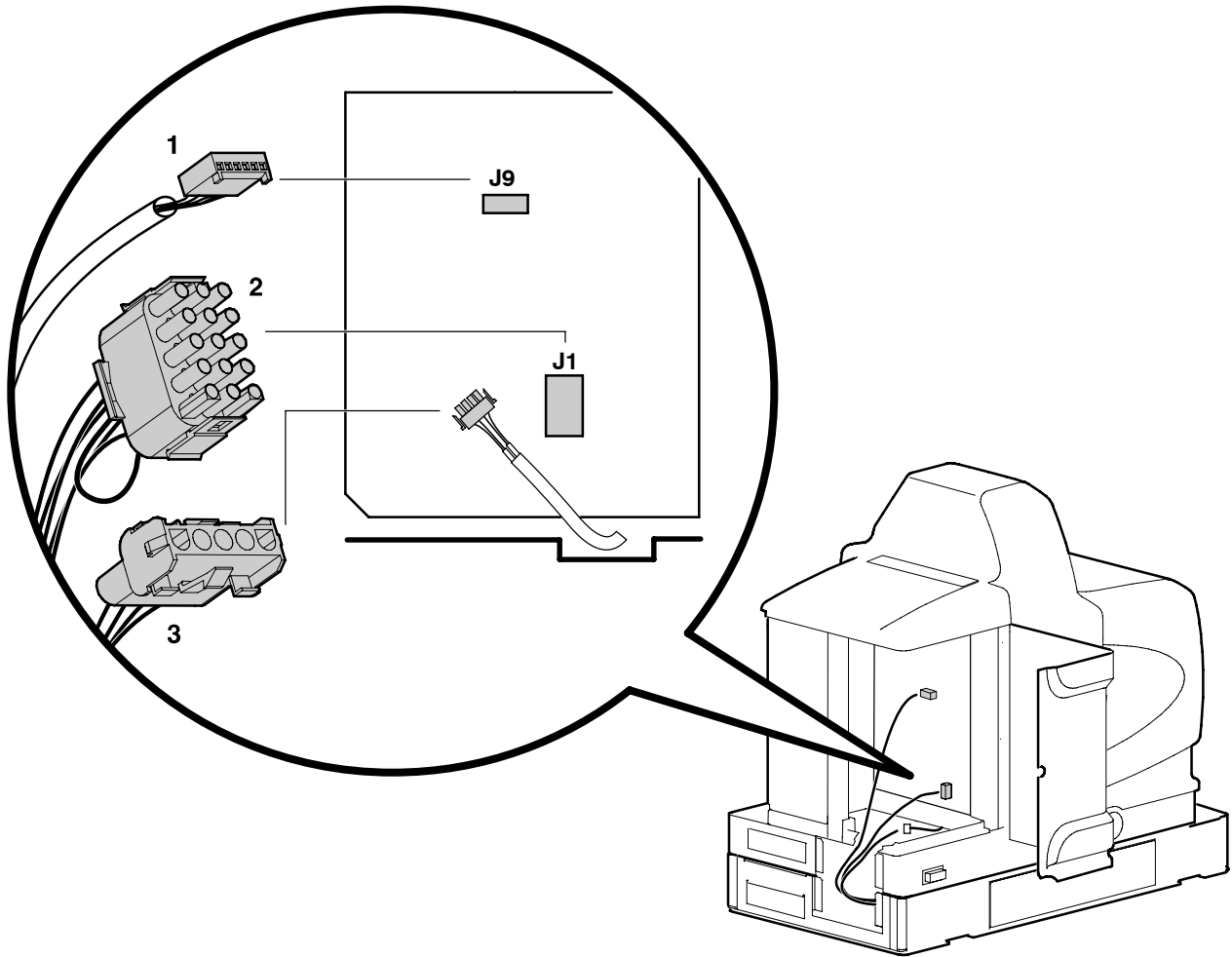


Figure E-9 Connecting the transformer electrical harnesses

- 1. Control harness
- 2. Power harness
- 3. Heater power harness

Connect the Transformer to the Melter *(contd)*

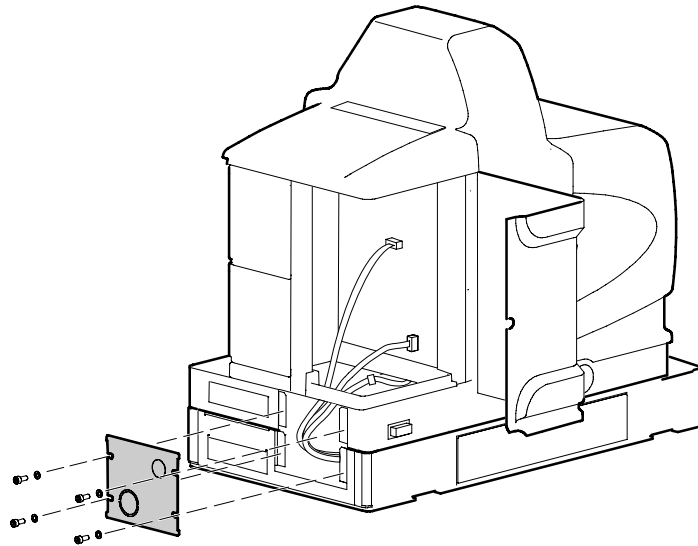


Figure E-10 Covering the service entrance

Troubleshooting

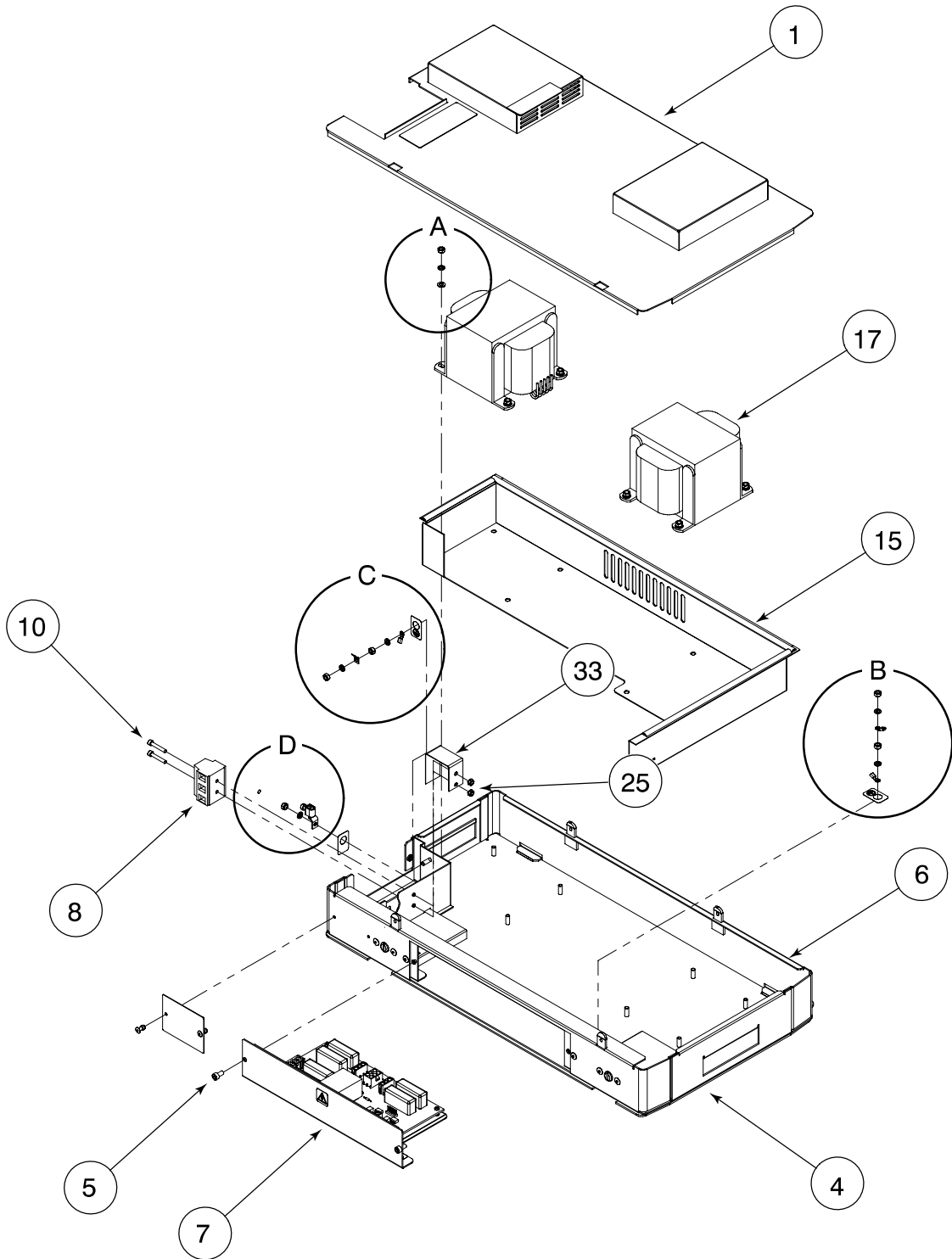
The following table provides transformer-specific troubleshooting guidance. Refer to the Section 6, *Troubleshooting* for general melter troubleshooting information.

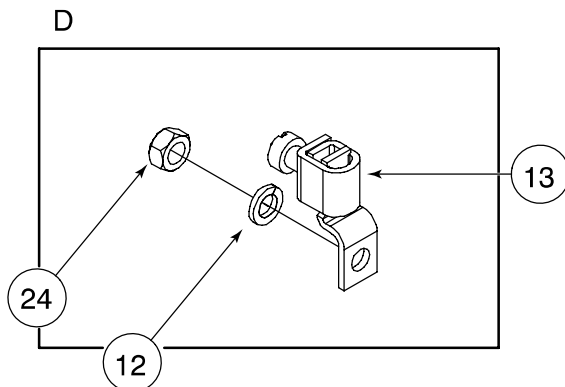
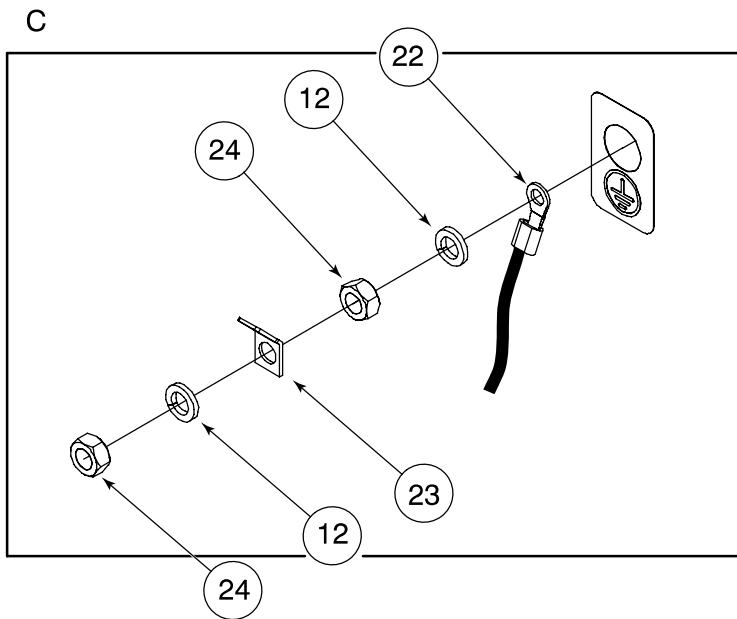
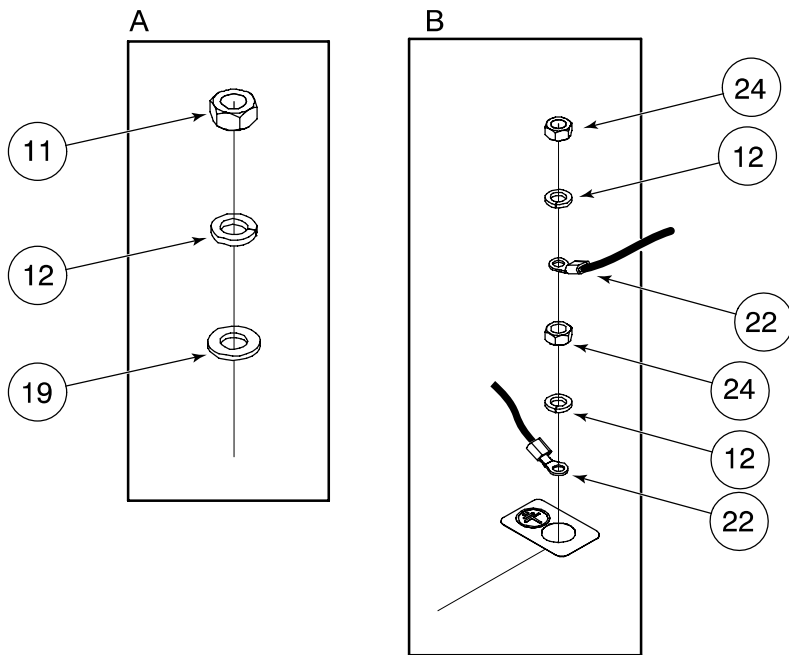
Problem	Possible Cause	Corrective Action
1. No power to melter	Problem with customer power source No voltage plug installed Loose/disconnected cables Blown fuse Problem with transformer	Check all three phases at terminal block Install correct voltage plug Check cable between transformer and J1 on main board Check connections between transformer service terminal block and J2 on power distribution module Check fuses F3, F4, F5, and F6 Check voltage into primary of transformer(s) and voltage at secondaries.
2. Tank and/or manifold not heating, but power to melter	Programming/control issue Loose/disconnected cables Problem in heater Blown fuse Power problem Problem with power distribution module	Turn heaters on/check that tank setpoint is correct (not 0) Check connection at J9 on main board Check connections along heater harness (intermediate connections, terminals of heaters, connection back to J3 on power distribution module) Check for open or short. Cold resistance values are: Manifold 175 to 203 ohms Tank P4 – 175 to 203 ohms P7 – 145 to 169 ohms P10 –145 to 169 ohms Check F1/F2 on main board Check all three phases at terminal block Replace module
3. Fuse(s) fail frequently	F1 or F2 fault: short circuit in heater or harness F3, F4, F5, or F6: Transformer is overloaded	Locate and correct short Verify that total hose/gun power does not exceed capability of transformer
4. F3 fault on tank or manifold	Shorted TRIAC(s) Noise problem	Replace power distribution module Isolate sources of noise, change phases of incoming supply, or add filter/snubber to incoming supply line

Parts

Transformer Assembly

Item	Part	Description	Quantity	Note
—	1039840	Base assembly, 1.5 kVA, transformer, ProBlue		
—	1039841	Base assembly, 3.0 kVA, transformer, ProBlue		
1	1040005	• Cover, assembly, encl, transformer, ProBlue	1	
4	1018819	• Sub-base, P7/P10	1	
5	-----	• Screw, socket, M5 x 10	8	
6	1039994	• Base, transformer, ProBlue	1	
7	-----	• Module assembly, power, distribution	1	B
8	1040056	• Panel, terminal block, 3-position, 750 V, 76 A	1	
10	-----	• Screw, socket, M4 x 25	2	
11	-----	• Nut, hex, M5	4/8	A
12	-----	• Washer, lock, spit, M5	14	
13	-----	• Terminal lug, ground, 6–14 AWG	1	
15	1040002	• Shield assembly, water, transformer, ProBlue	1	
17	-----	• Power transformer, automatic, 1.5 kVA	1/2	A/B
19	-----	• Washer, flat, regular, M5	4/8	A
22	-----	• Wire assembly, ground, 10 gauge	4	
23	-----	• Lug, 45 degree, single, M5 x .032	2	
24	-----	• Nut, hex, M5	6	
25	-----	• Nut, hex, external tooth, M4	2	
33	-----	• Shield, splash, terminal	1	
NS	1040015	• Harness assembly, transformer	1	
NS	1039789	• Plug, voltage, 400 V	1	
NS	1039790	• Plug, voltage, 480 V	1	
NS	1040013	• Plate, conduit	1	
<p>NOTE A: The first number in the quantity column is for 1.5 kVA transformer base assemblies, the second is for 3.0 kVA transformer base assemblies.</p> <p>B: Refer to <i>Service Kits</i></p> <p>NS: Not Shown</p>				





400/480-Volt Melter-Specific Components

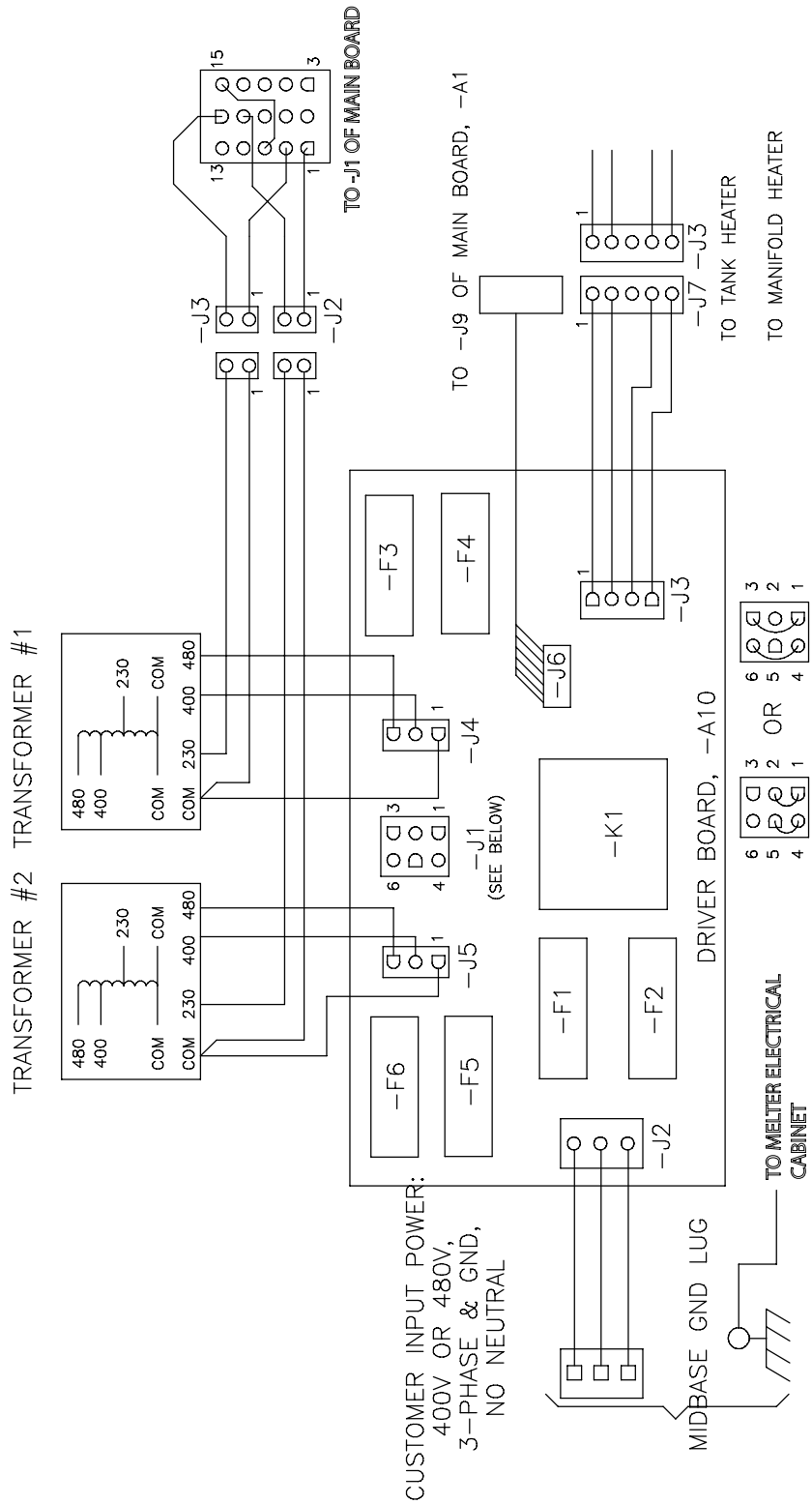
The following table lists melter components that are specific to 400/480 volt melters. Refer to the ProBlue product manual, Section 7, *Parts* for information about melter components that are common to both standard and 400/480 volt melters.

Item	Part	Description	Quantity	Note
NS	1032085	Heating element, manifold, 480 V	1	
NS	1037490	Weldment, tank, machined, P4, 480 V	1	
NS	1037491	Weldment, tank, machined, P7, 480 V	1	
NS	1037492	Weldment, tank, machined, P10, 480 V	1	
NS	1033838	Harness, heater, transformer, P4, P7, P10	1	

Service Kits

Part	Description	Quantity
1041660	Service kit, transformer, 400/480 V, ProBlue	—
	• Power transformer, automatic, 1.5 kVA, 400/480 volt	1
1041662	Service kit, driver board, 400/480 volt, ProBlue	—
	• Module assembly, power distribution	1
1041661	Service kit, fuse, 400/480 volt, ProBlue	—
	• Fuse, 8A, fast-acting, 600 V, CC-REJ	2
	• Fuse, 5A, time-delay, 600 V, CC-REJ	4

Wiring Diagram



DECLARATION of CONFORMITY

(For CE Certified Adhesive/Sealant Application Equipment)

PRODUCT:

ProBlue® Melters, Models P4, P7, and P10

APPLICABLE DIRECTIVES:

98/37/EC (Machinery Directive)

73/23/EEC (Low Voltage Directive)

89/336/EEC (Electromagnetic Compatibility Directive)

STANDARDS USED TO VERIFY COMPLIANCE:

EN ISO 12100

EN60204-1

EN563

EN61000-6-2

EN55011

PRINCIPLES:

This product has been manufactured according to good engineering practice.

The product specified conforms to the directive and standards described above.


John J. Keane, Senior Vice President

Date: 24 April, 2006



Nordson Corporation • Duluth, Georgia