

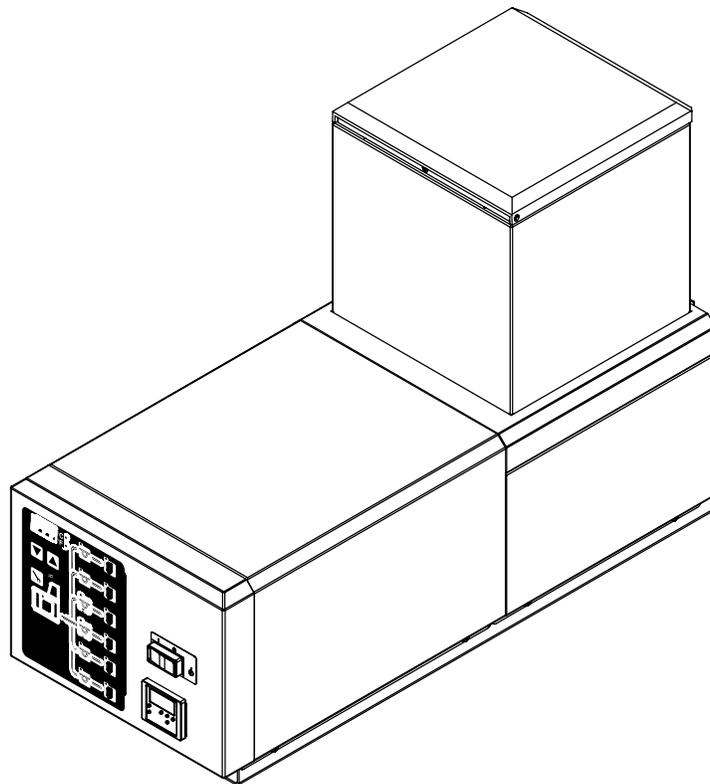
ITW Challenger  
An Illinois Tool Works Company  
31 Volunteer Drive  
Hendersonville, TN 37075 USA  
Telephone 615.824.3634  
FAX 615.264.5222  
www.itwchallenger.com

OPERATIONS & SERVICE MANUAL  
Manual #20-48  
Revised 10/12/09



## C22 & C45 ADHESIVE SUPPLY UNITS OPERATIONS AND SERVICE MANUAL

with Software Version V1.2



### **IMPORTANT ! - READ ALL INSTRUCTIONS BEFORE OPERATING THIS EQUIPMENT**

It is the customer's responsibility to have all operators and service personnel read and understand this information. Contact your ITW Challenger customer service representative for additional copies.

**NOTICE! Please be sure to include the serial number of your application system each time you order replacement parts and/or supplies. This will enable us to send you the correct items that you need.**

**ITW Challenger Service Parts Direct Dial: 1-800-538-9540  
ITW Challenger Technical Service Direct Dial: 1-800-654-6711**



# SAFETY INSTRUCTIONS

## GENERAL CONSIDERATIONS

1. Read and follow these instructions. Failure to do this could result in severe personal injury or death.
2. Additional safety instructions and/ or symbols are located throughout this manual. They serve to warn maintenance personnel and operators about potentially hazardous situations.
3. Inspect the machine for unsafe conditions daily and replace all worn or defective parts.
4. Keep work area uncluttered and well lit.
5. All covers and guards must be in place before operating this equipment.

***For precautions and definitions of safety symbols, refer to the Safety Chapter of the service manual.***

## SERVICING EQUIPMENT

1. Only trained personnel are to operate and service this equipment.
2. Never service or clean equipment while it is in motion.
3. Shut off the equipment and lock out all input power and air supply at their sources before attempting any maintenance.
4. Follow the maintenance and service instructions in the manual.

## SIGNS

1. Read and obey all of the warning labels, signs and caution statements on the equipment.
2. Do not remove or deface any of the warning labels, signs and caution statements on the equipment.
3. Replace any warning labels, signs and caution statements which have been removed or defaced. Replacements are available.

## ADDITIONAL CONSIDERATIONS

1. To ensure proper operation of the equipment, use specified electrical and/ or air supply sources.
2. Do not attempt to alter the design of the equipment unless written approval is received from our factory.
3. Keep all manuals readily accessible at all times and refer to it often for the best performance from your equipment.

# Declaration of Conformity

**Equipment Type: Heavy Industrial**

**Model No.** \_\_\_\_\_

**The manufacturer of the products covered by this declaration is**

**ITW Dynatec  
31 Volunteer Dr.  
Hendersonville, TN 37075**

**The directives covered by this declaration**

89/336/EEC Electromagnetic Compatibility (EMC) directive, as amended  
73/23/EEC Low Voltage Equipment directive, as amended  
98/37/EC Machinery directive (consolidated edition)

**The basis on which conformity is declared**

The product identified above complies with the protection requirements of the EMC directive, with the principal elements of the safety objectives of the Low Voltage directive, and with the essential health and safety requirements of the Machinery directive. The manufacturer has applied one or more of the following standards:

I, the undersigned, hereby declare that the equipment specified above conforms to the following Directive(s) Standard(s).

EN 292-1 Safety of Machinery – basic terminology, methodology  
EN 563 Temperatures of Touchable Surfaces  
EN 60204-1 Electrical Equipment of Machines  
EN 50081-2 General Immunity Standard- Residential, light industrial environment  
EN 50082-2 General Immunity Standard- Industrial environment

**Signed:** .....  .....  
Judson Broome (General Manager)

**Date:** ..... 09/01/08 .....  
(dd/mm/yy)

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## Chapter 1 SAFETY PRECAUTIONS

All operators and service personnel must read and understand this manual before operating or servicing equipment.

All maintenance and service on this equipment must be performed by trained technicians.

### Electrical



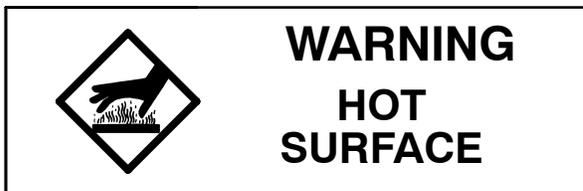
Dangerous voltages exist at several points in this equipment. To avoid personal injury, do not touch exposed connections and components while input

power is on. Disconnect, lockout and tag external electrical power before removing protective panels.

A secure connection to a reliable earth ground is essential for safe operation.

A disconnect switch with lockout capability must be provided in the line ahead of the unit. Wiring used to supply electrical power should be installed by a qualified electrician.

### High Temperatures



Severe burns can occur if unprotected skin comes in contact with molten adhesive or hot application system parts.

Safety glasses, gloves and long-sleeved clothing must be worn whenever working with or around adhesive application systems.

### High Pressure



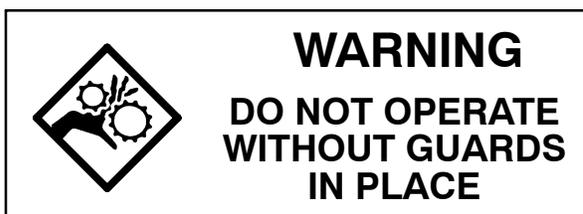
To avoid personal injury, do not operate the equipment without all covers, panels and safety guards properly installed.

To prevent serious injury from molten adhesive under

pressure when servicing the equipment, disengage the pumps and relieve the adhesive system's hydraulic pressure (e.g., trigger the heads, hand-held applicators, and/or other application devices into a waste container) before opening any hydraulic fittings or connections.

**IMPORTANT NOTE:** Even when a system's pressure gauge reads "0" psig, residual pressure and trapped air can remain within it causing hot adhesive and pressure to escape without warning when a filter cap or a hose or hydraulic connection is loosened or removed. For this reason, always wear eye protection and protective clothing.

### Protective Covers



Keep all guards in place!

To avoid personal injury, do not operate the application system without all covers, panels and safety guards properly installed.

## Eye Protection & Protective Clothing



It is very important that you PROTECT YOUR EYES when working around hot melt adhesive equipment!

Wear safety glasses with side shields which conform to ANSI Z87.1 or EN166.

Failure to wear safety glasses could result in severe eye injury.

It is important to protect yourself from potential burns when working around hot melt adhesive equipment.

Wear protective gloves and long-sleeved, protective clothing to prevent burns that could result from contact with hot material or hot components.

Always wear steel-reinforced safety shoes.

## Safe Installation and Operation

To avoid possible failure of hoses, make sure all hoses are routed to avoid kinking, tight radius turns (8" or less) and abrasive contact. Hot-melt hoses should not have prolonged contact with heat-absorbing surfaces such as cold floors or metal troughs. These heat-absorbing surfaces can alter adhesive flow and cause incorrect calibration. Hoses should never be covered with materials that prevent heat dissipation, such as insulation or sheathing.

Read this manual before applying electrical power to the equipment. Equipment may be damaged by incorrect electrical connections.

Do not use adhesive that is dirty or that may be chemically contaminated. Doing so can cause system

clogging and pump damage.

When adhesive hand-held applicators or other movable applicators are used, never point them at yourself or at any other person. Never leave a hand-held applicator's trigger unlocked when not actually in use.

Do not operate the hopper or other system components without adhesive for more than 15 minutes if the temperature is 150 degrees C (300 degrees F) or more. To do so will cause charring of the residual adhesive.

Never activate the heads, hand-held applicators and/ or other application devices until the adhesive's temperature is within the operating range. Severe damage could result to internal parts and seals.

## Treatment for Burns From Hot Melt Adhesives

Burns caused by hot melt adhesive must be treated at a burn center.

Care should be used when working with hot melt adhesives in the molten state. Because they rapidly solidify, they present a unique hazard.

Even when first solidified, they are still hot and can cause severe burns. When working near a hot melt

application system, always wear safety gloves, safety glasses and long-sleeved, protective clothing.

Always have first-aid information and supplies available.

Call a physician and/or an emergency medical technician immediately.

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## **Service**

Refer all servicing to qualified personnel only.

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## **Explosion/ Fire Hazard**

Never operate this unit in an explosive environment.

Use cleaning compounds recommended by ITW Challenger or your adhesive supplier only. Flash points

of cleaning compounds vary according to their composition, so consult with your supplier to determine the maximum heating temperatures and safety precautions.

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## **Lockout/ Tagout**

Follow OSHA 1910.147 (Lockout/ Tagout Regulation) for equipment's lockout procedures and other important lockout/ tagout guidelines.

Be familiar with all lockout sources on the equipment.

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Even after the equipment has been locked out, there may be stored energy in the application system, particularly in the capacitors within the panel box. To ensure that all stored energy is relieved, wait at least one minute before servicing electrical capacitors.

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## **Use of PUR (Polyurethane) Adhesives**

PUR adhesives emit fumes (MDI and TDI) that can be dangerous to anyone exposed to them. These fumes cannot be detected by the sense of smell. ITW Dynatec strongly recommends that an exhaust hood or system be installed over any PUR system.

Consult with your adhesive manufacturer for specifics about required ventilation.

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**CAUTION:** Because of the nature of PUR adhesives to strongly bond in the presence of moisture, care must be taken to prevent them from curing inside Dynatec equipment. If PUR adhesive solidifies in a unit, the unit must be replaced. Always purge old PUR adhesive from the system per your adhesive manufacturer's instructions and timetable. **ALLOWING PUR ADHESIVE TO CURE IN A UNIT VOIDS ITW DYNATEC'S WARRANTY.**

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## **In This Manual**

WARNINGS and CAUTIONS are found throughout this manual.

WARNINGS mean that failure to observe the specific

instructions may cause injury to personnel.

CAUTIONS mean that failure to observe the specific instructions may damage the equipment.

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## Chapter 2 DESCRIPTION AND SPECIFICATIONS

### ***Description***

The ITW Challenger C22 adhesive supply unit (ASU) is a computer-controlled hot-melt supply unit designed on metric standards. Its easy-to-use, all-icon control panel is internationally operator friendly. The standard C22 is available for either 240V or 240/400V service.

The C22 ASU uses a microprocessor temperature control to closely control the temperature of hot-melt adhesive for up to six hoses and six heads. Temperature setpoints are operator-selected for up to thirteen zones and the system automatically provides warnings and alarms for operator errors and system malfunctions.

The system provides accurate, proportionate temperature control for the hopper, hoses and applicators. Sequential start-up delays may be programmed for turn-on of the hoses and heads. A “stand-by” temperature may be programmed so that the temperature zones can be maintained at a lower temperature when the ASU is not in active use, enabling rapid return to normal operation.

The temperature control can interlock the parent machine with preselected adhesive temperatures so that production automatically begins when adhesive temperatures are correct for the application. All system temperature values can easily and quickly be programmed.

With these flexible temperature programming features, the system increases adhesive life by eliminating prolonged high adhesive temperatures. It reduces energy consumption and brings the system up to normal operating temperatures in the shortest possible time.

The standard C22 ASU uses ITW Challenger’s new, extremely dependable, constant-pressure piston pump. This air-operated pump insures a high pressure adhesive output from a low pressure, compressed air input. Piston pumps are available for either hot-melt or lotion applications.

The ASU’s teflon-coated hopper accepts adhesive in all popular forms, including pellets, slugs and blocks. The ASU can accommodate air-actuated automatic applicators (heads), electric applicators, hand-held applicators and/or special applicators. Options available include pressure gauge, an additional piston pump, a 40-mesh outlet filter, 7-day scheduler and RS-232 interface.

## Specifications

### Environmental:

Storage/ shipping temperature	-40° C to 70°C (-40° F to 158°F)
Ambient service temperature	-7° C to 50°C (20° F to 122°F)
Noise emission	< 60 dbA (at 1 meter)

### Physical:

Dimensions	see dimensional layouts on following pages
Number of heads/ hoses	up to 6 heads/ hoses
Number of hopper temperature zones	1
Number of pumps	1 or 2
Piston pump ratio	12:1
Enclosure	styled, durable metal and high temp plastic, dust and splatter resistant
Hose connections	Electrical: 12-pin Mechanical: wrench-secured fluid fittings (#06 37° SAE)
Hopper capacity	C22: 22 kg/ 48 lb C45: 45 kg/ 100 lb
Hopper construction	welded aluminum, cast-in heaters, TFE Teflon coated
Filtration	hopper bottom screen, large pleated pump outlet filter
Weight, empty	C22: 50 kg/ 110 lb C45: 54 kg/ 118 lb
Adhesive form	accepts most forms (no water-based adhesives)

### Electrical:

Supply voltage	240/400 VAC/ 3PH + N/ 50-60 Hz (Y, "WYE") 240 VAC/ 3PH/ 50-60 Hz (Δ, "DELTA")
Power consumption, system maximum	9600 watts
Power consumption, hopper	2400 watts
Hopper heater type	cast-in tubular
Temperature control	microcontroller
Temperature sensors	Ni120 standard
Electrical connectors	durable, latching connectors, Nordson-style
Maximum current available for each hose/ head combination	5 amps

**Pressurized Air:**

Air pressure supply	1.4 to 6.8 bar (20 to 100 psig)
Air consumption at 60 pump cycles per minute	90 normal liters/ minute (3.2 SCFM at 100 psig)

**Performance:**

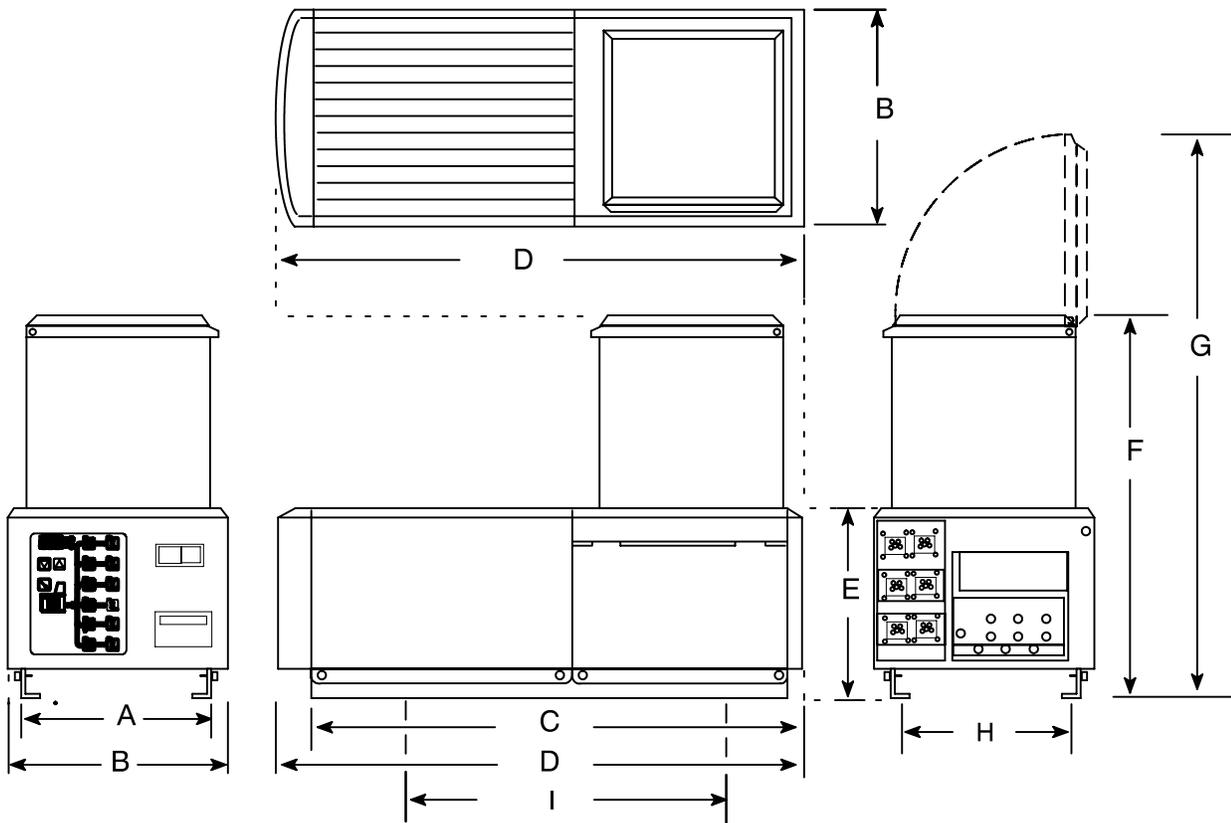
Adhesive temperature control range	40°C to 218°C (100°F to 425°F)
Adhesive temperature control accuracy	± 1°C (± 1°F)
Over-temperature cutoff for all zones	232°C (450°F)
Over-temperature cutoff for hopper thermostat	224°C (435°F)
Adhesive viscosity	500 to 50,000 centipoise
Warm-up time, full hopper	approximately 0.5 hour
Adhesive delivery rate, open line, per pump	0.91 kg/min (2 lb/min)(12:1 piston pump)
Adhesive melt rate (depends on adhesive used)	22.6 kg/hr (50 lb/hr)
Adhesive pressure	up to 68 bar (1000 psi) maximum
Maximum pump speed	60 pump cycles per minute

**Temperature Controller:**

Controller board	1 board, modular construction
Display type	long-life, bright LED
Temperature control zones	13
Fuses	all fuses are size 5mm x 20mm hose/ applicator head: 6.3 amp fast open transformer: 1 amp, fast hopper: 15 amp circuit breaker

**Other:**

Operator interface	digital display with simplified, all-icon keypad
Seven-day scheduler	option
RS232 interface	option
Temperature standby	yes
High & low temperature tolerance	yes
Ready interlock contact	yes
Sensor open alarm	yes



DIMENSION	A	B	C	D	E	F	G	H	I mounting holes*
C22 mm C22 inches	304,8 12	355,6 14	787,0 31.0	838,0 33.0	304,8 12	610,0 24.0	889,0 35.0	248,9 9.80	381 15
C45 mm C45 inches	304,8 12	355,6 14	787,0 31.0	838,0 33.0	304,8 12	1016,0 40.0	1295,0 51.0	248,9 9.80	381 15

Installation Dimensions: C22 & C45 ASUs

## Chapter 3 INSTALLATION & START-UP

### **Mounting the ASU**

The ASU can be mounted on most flat surfaces, on either an open or a solid frame (as shown below). The main electrical power and the serial communication connections come in from below the unit and connect under the keypad. Access to the underside of the ASU is not a necessary consideration in mounting the unit.

The unit's hinged hopper lid may be rotated 90 degrees in any direction.

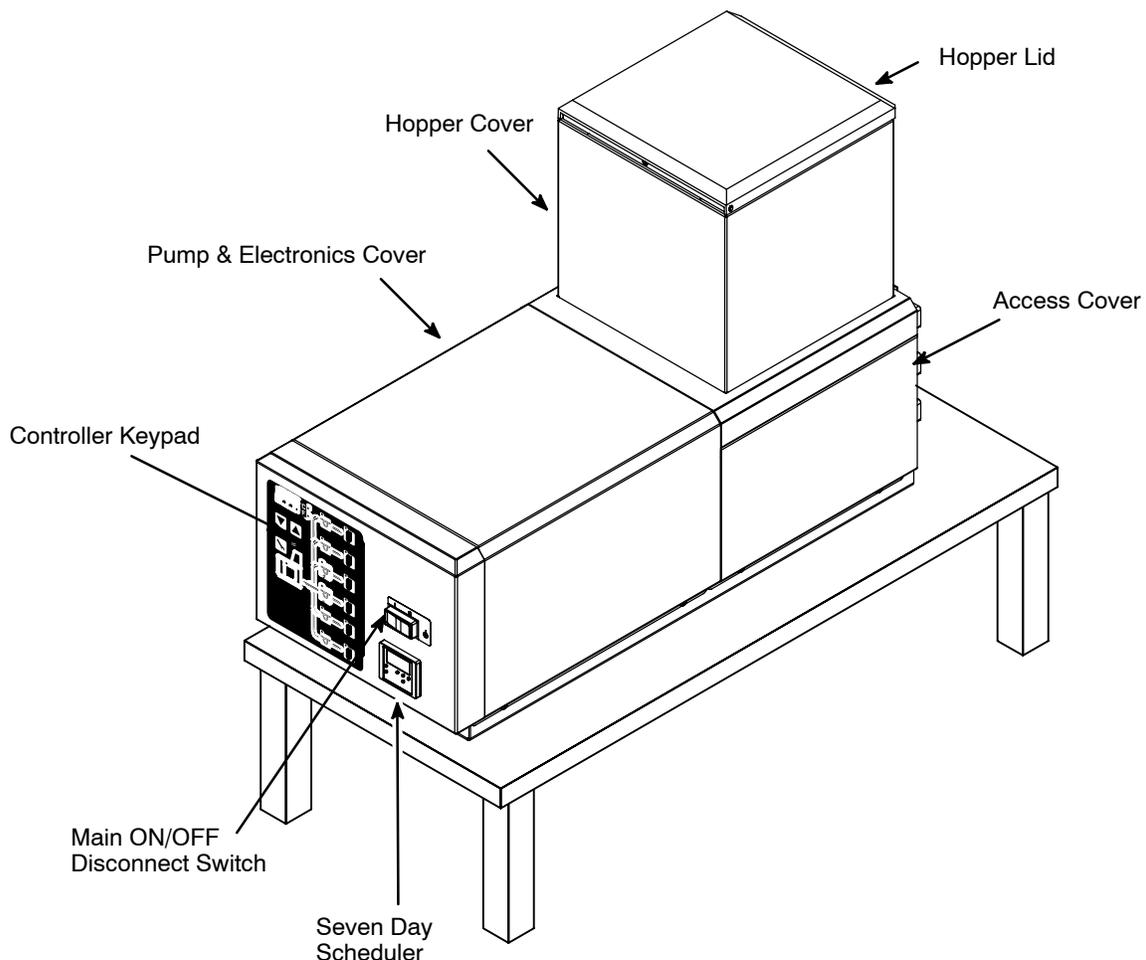
For installation dimensions, see illustration on page 2-4.

### **Lifting the ASU**



### WARNING

The unit must be lifted by two persons, using proper lifting technique, one person at either end. Securely hold it under its base plate. No belts or hooks should be used. Never allow anyone to stand on the ASU.



## Installation

**NOTE: Re-read Chapter 1 “Safety Precautions” before performing any installation procedures. All installation procedures must be performed by qualified, trained technicians.**

After the ASU has been properly mounted, the following general sequence should be followed for installation:

1. Make sure that incoming line power to the ASU and the unit’s main power switch are turned OFF.



### DANGER HIGH VOLTAGE

A lockable power disconnect switch with overload protection must be provided by the customer as part of the ASU installation. The disconnect must isolate the ASU from its power source.



### DANGER HIGH VOLTAGE

Disconnect and lockout input power to the application system before starting any installation procedures. Make sure there is no electrical power on the leads you will be connecting.

2. Your power supply should be rated for 30 Amp service and should include an earth ground conductor.



**CAUTION: Grounding conductors never carry electrical current. The use of a neutral conducting wire as earth ground is incorrect and may cause damage to the controller.**

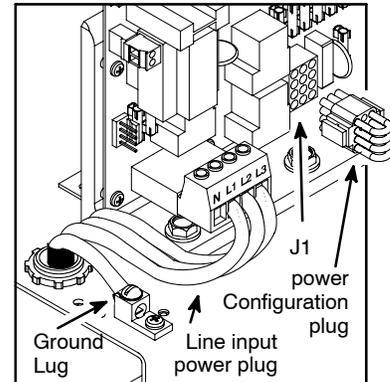
3. *Make two connections to the printed circuit board:* Loosen the 2 captive screws on the bottom of each side of the pump and electronics cover. Remove cover.

- a. Select proper power configuration plug for your system (two plugs are shipped with the unit. You must install one of these):



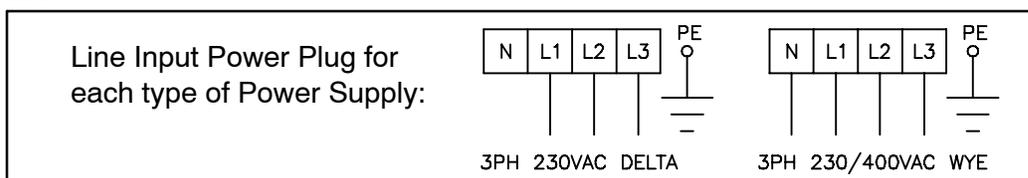
**CAUTION: Using the incorrect power configuration plug may cause serious damage to the unit.**

- for 230 VAC, 3PH, Delta = use PN 112542 white plug with violet wire
- for 230/ 400 VAC, 3PH, Wye = use PN 112543 white plug with yellow wire



- b. Insert proper power configuration plug into socket J1 at bottom, center of control printed circuit board located within the control enclosure (see illustration of PCB in Chapter 7 for location).

- c. Wire main power into Line Input Power Plug and the ground lug (to the left of board). Main power connections & the ground lug are at the bottom, left of the PCB (X1). Conduit fitting or cable grip not supplied.



- d. Remove jumper on PCB at “RTD Selection” (see illustration of PCB in Chapter 7).

cont.

4 a. Connect a compressed air supply (100 psi/ 7 bar max.) to the air regulator using a 1/4 R (BSPT) male connector fitting.



**CAUTION: The compressed air supply must be clean and dry. NEVER use lubricated oil. Use of an air line filter may be required to remove moisture and lubrication from the air supply.**

b. The air control regulator has a locking cap. Lift the cap up, then turn clockwise to increase pressure. A counter-clockwise turn decreases pressure. The recommended pressure is 1.4 to 6.8 bar (20 to 100 psi).

5. The adhesive hoses are connected at the hose end panel (see illustration on page 3-4). You must make both an electrical and an adhesive flow connection. The electrical hose connections are at the six numbered rectangular receptacles on the hose end panel.

The hose adhesive ports are located to the left of the electrical connections. They are numbered (1-6) from top to bottom. There are six ports (fittings) for the use of up to six hoses.

When making hose connections, follow the number guide label on the ASU above the hose socket; ie. when using one hose make your hookup to electrical connection #1 and adhesive port #1. When using two heads/ hoses, connect hose/ head #1 to electrical connection #1 and adhesive port #1, then hookup hose/ head #2 to electrical connection #2 and adhesive port #2. In a similar manner, connect the remainder of your hose(s)/ head(s).

Route hoses so that there is at least an eight-inch radius at any bend. Do not hang hoses without proper support. Do not crimp, clamp, squeeze or tie hoses. Refer to the hose and applicator manuals for further details on these items.

### **Adding Adhesive**



#### **WARNING HOT ADHESIVE**

**Do not overfill the melt tank since adhesive generally expands as it melts and a full tank may overflow.**

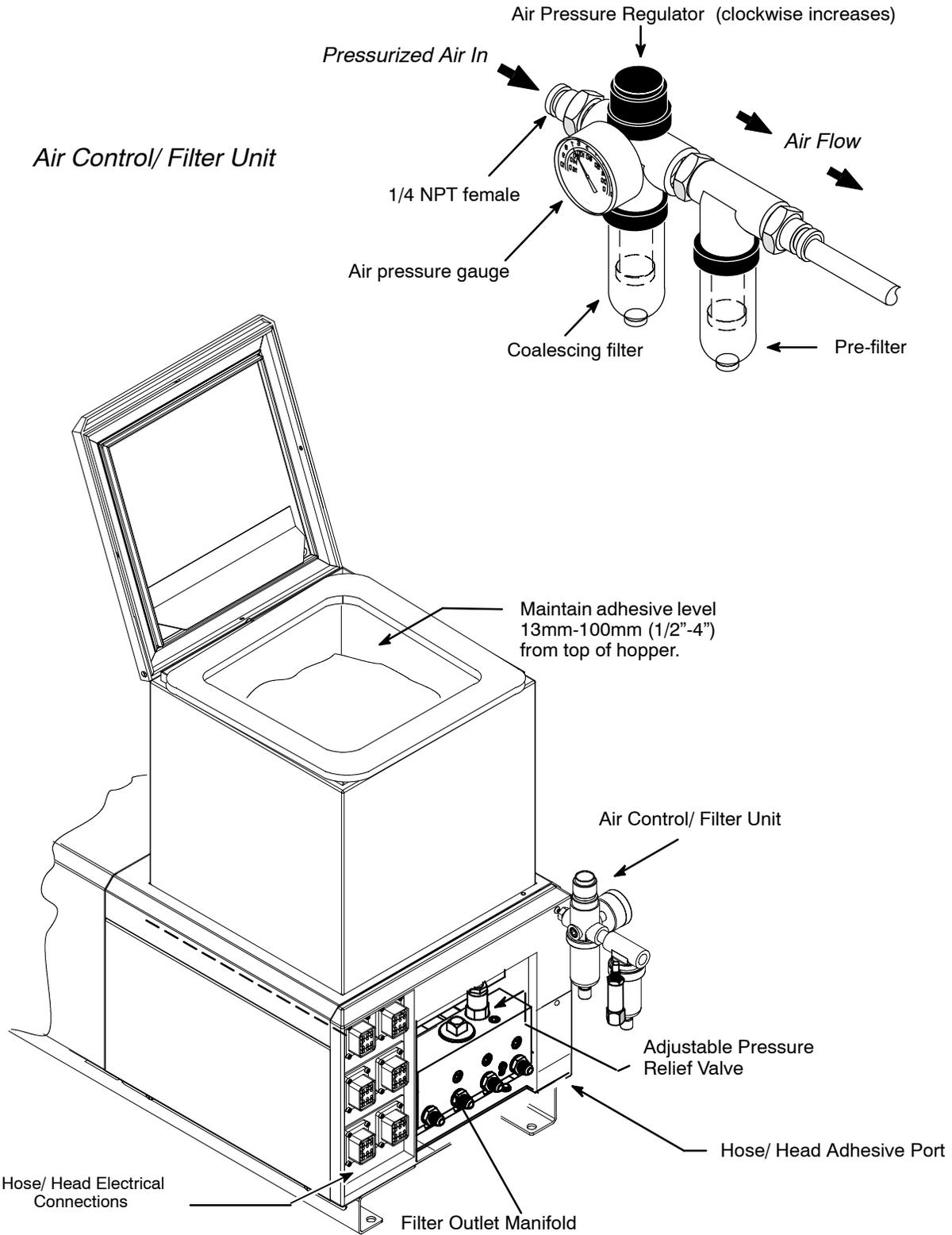


**CAUTION: Using adhesive with viscosity over 50,000 centipoise may cause the pump to stall.**

The adhesive level should be maintained at 13mm to 100mm (1/2" to 4") from the top of the hopper. Where applications demand a high output volume of adhesive, add small amounts of adhesive frequently. Adding large amounts of adhesive to an almost empty hopper will lower the temperature of the adhesive in the hopper and may cause the ASU to fall below its READY setpoint.

### **Changing the Adhesive Formula**

If a different adhesive formulation from the one being currently used is needed, the system will have to be flushed if the two formulations are incompatible. See Chapter 6 of this manual for the proper flushing procedure. When in doubt about adhesive compatibility, flush your system.



*Rear Cover: Hose and Head Electrical and Adhesive Connections*

### **Wattage Availability Chart**

<b>ASU Voltage</b>	<b>Max. System Wattage</b>	<b>Hopper Wattage</b>	<b>Wattage Available for All Hoses and Heads</b>
240/400 VAC (Y) or 240 VAC (Delta)	9600 @ 240VAC	2400 @ 240VAC	7200 @ 240VAC

Notes:

1. Assume 33 Watts per foot of hose, #6 hose at 240VAC.
2. Assume 100 Watts per inch of head width, at 240VAC.
3. The power available for any one hose/head combination is 1200 Watts at 240VAC.
4. At reduced voltage, less wattage is available. For example: 240V equipment operated on 200 volts, will develop wattage 31% lower than the wattage available at 240 volts.

### **Typical Start-Up and Shut Down of the C22 Application System**

#### **Start Up Procedures**

1. Fill the ASU's hopper with clean hot-melt adhesive as described on page 3-3. Close the hopper lid immediately to prevent contaminants from falling in. (Cover your bulk supply of adhesive to prevent contaminants also.)
2. At the control panel, turn ON the Main Power Switch. The controller will perform its initial calibration cycle. The display will read "CAL". Each of the 13 temperature zone's LEDs will flash as a lamp test.
3. Program your adhesive setpoints (see instructions on page 5-2) or use the factory settings listed below. Allow adequate time (approximately 20-30 min.) for the adhesive to melt and the temperatures of the temperature zones to stabilize.  
*Note:* When the ASU leaves the ITW Dynatec factory, it is programmed with the following factory settings (unless special factory settings were requested):
  - Hopper: 177°C (350°F)
  - Hose: 177°C (350°F)
  - Applicator: 177°C (350°F)
  - Sequential Startup: OFF
4. Once the ASU has reached temperature, the ASU will begin to pump adhesive.
5. Use the air pressure regulator, located at the rear of the ASU, to regulate adhesive output.

#### **Shut Down Procedures**

1. Turn OFF the Main Power Switch.

## **Storage and Disposal of the C22 Application System**

### **Temporary Storage of the Unit**

1. Flush the adhesive application system with flushing fluid (PN L15653), following the instructions detailed in Chapter 6 of this manual.
2. Clean or replace both the output filter and the primary filter, following instructions detailed in Chapter 6.
3. Shut OFF all pressure and power sources.
4. Release residual air pressure.
5. Remove all residual adhesive and wipe components clean.
6. Remove all air lines and all power supply cables.
7. Pack the unit in a corrosion-proof manner.
8. Store the unit in such a way that it is protected from damage.

### **Disposal of the Unit**

1. Shut OFF all pressure and power sources.
2. Release residual air pressure.
3. Remove all residual adhesive.
4. Remove all air and adhesive supply hoses and all power supply cables.
5. Dismantle all components and sort into mechanical and electrical components.
6. Arrange for all components to be recycled.

---

## Chapter 4 TEMPERATURE CONTROLLER SET-UP

### ***Temperature Control Functions in General***

The C22/ C45 temperature controller provides accurate temperature control for the hopper, hoses and applicators. Setpoints are programmed at the user-friendly, all-icon keypad. The controller will display an error message any time an open or shorted sensor condition occurs.

### ***Defining Temperature Control Terms***

#### **Adhesive Temperature Control Range**

The temperature limits within which the ASU, hoses and applicators may be programmed and maintained.

#### **Alarm Signal**

The controller provides an alarm signal if any zone has a critical situation. This signal is available on a dry contact located at connector X10 on the Control printed circuit board.

#### **CPU Module**

The central processing unit (CPU) of the microprocessor temperature control.

#### **Temperature Controller**

The built-in control system that controls, monitors and displays all system temperature values of the adhesive application system.

#### **Control PCB**

The printed circuit board (PCB) of the ASU. It provides control signals to, and monitoring signals from, the hopper, hoses and applicators. It features lighted LEDs to indicate that heater power is ON. The ASU's fuses and power configuration plug are located on this board.

#### **Keypad Locking**

The controller's keypad may be locked (or unlocked) to restrict (or allow) further programming.

#### **Mechanical High-Temperature Protection**

A mechanical, redundant thermostat located on the hopper that will turn off the system above safe temperatures

#### **RTD Sensors**

The system uses 120-ohm Nickel resistance temperature detector (RTD) sensors for all temperature controls.

#### **Ready Signal**

The controller provides a ready signal if all temperature zones are within a programmable tolerance and the system is ready for production. This signal is available on a dry contact at connector X11 on the Control printed circuit board. The ready signal also controls pump operation.

### **RS232 Remote I/O Interface**

Bi-directional data transfer to a remote computer is available for the controller via the RS232 option. The ASU's RS232 serial port connection allows remote interface up to 50 meters from the C22 controller.

### **Sequential Startup**

This feature allows the temperature zones to come on in sequence (hopper followed by hoses and heads). When activated, and the ASU is turned ON from a cold start, the hopper heats first. When the hopper is within its setpoint tolerances, the hoses and heads begin to heat.

### **Setpoint**

A programmable temperature that has been selected for hopper, hoses and applicators.

### **Setpoint Limitation**

This is a universal maximum temperature for all zones (218°C [425°F]). The programmer cannot program a temperature setpoint higher than the setpoint limitation.

### **Seven-Day Scheduler**

This option enables the controller to provide scheduling of ON and OFF operating modes for the ASU's system at the keypad. It therefore allows the operator to program ON and OFF heating cycles which coincide with his production schedule throughout the work week. The scheduler helps conserve electricity usage and functions also as an additional safety feature.

### **Standby (Setback)**

During breaks or delays in production, it is possible to reduce the temperature of all zones by a specified amount through programming of a standby. The programmed standby (also referred to as "setback") is the difference in temperature by which all zones will reduce below their setpoints when standby is activated. Standby is always OFF when the ASU is turned ON. In standby mode, the ready signal is OFF and the pump will stop.

### **Error Indication Messages**

A controller display of "EO1" indicates that the selected zone (ie, a hose, applicator or the tank) has an open sensor. A display of "EO2" indicates a shorted sensor.

If either alarm occurs, first verify that the following three connections are made correctly:

1. The ASU-to-hose connection(s) located at the back of the ASU,
2. The hose-to-applicator connection(s),
3. The RTD Input connections (X4, X5 & X6) located on the Control Printed Circuit Board.

If the problem is not with a connection, check the sensor and replace if necessary.

## **Firmware Chip and Checksum**

The firmware chip is on the Control Printed Circuit Board (see Ch. 7). Inscribed on the controller's chip is information that is required if your controller needs service, including the controller's checksum and software revision.

Chip example:



## **System Values That Are Permanently Programmed**

- Minimum setpoint value: 40°C (100°F).
- Maximum setpoint value: 218°C (425°F).

## **System Values as Programmed by the Factory**

ITW Challenger can set the controller's system values to customer's specs, if provided.

If customer's specs are not provided, the following values will be entered into the temperature controller at the factory. They may be changed by reprogramming through the keypad.

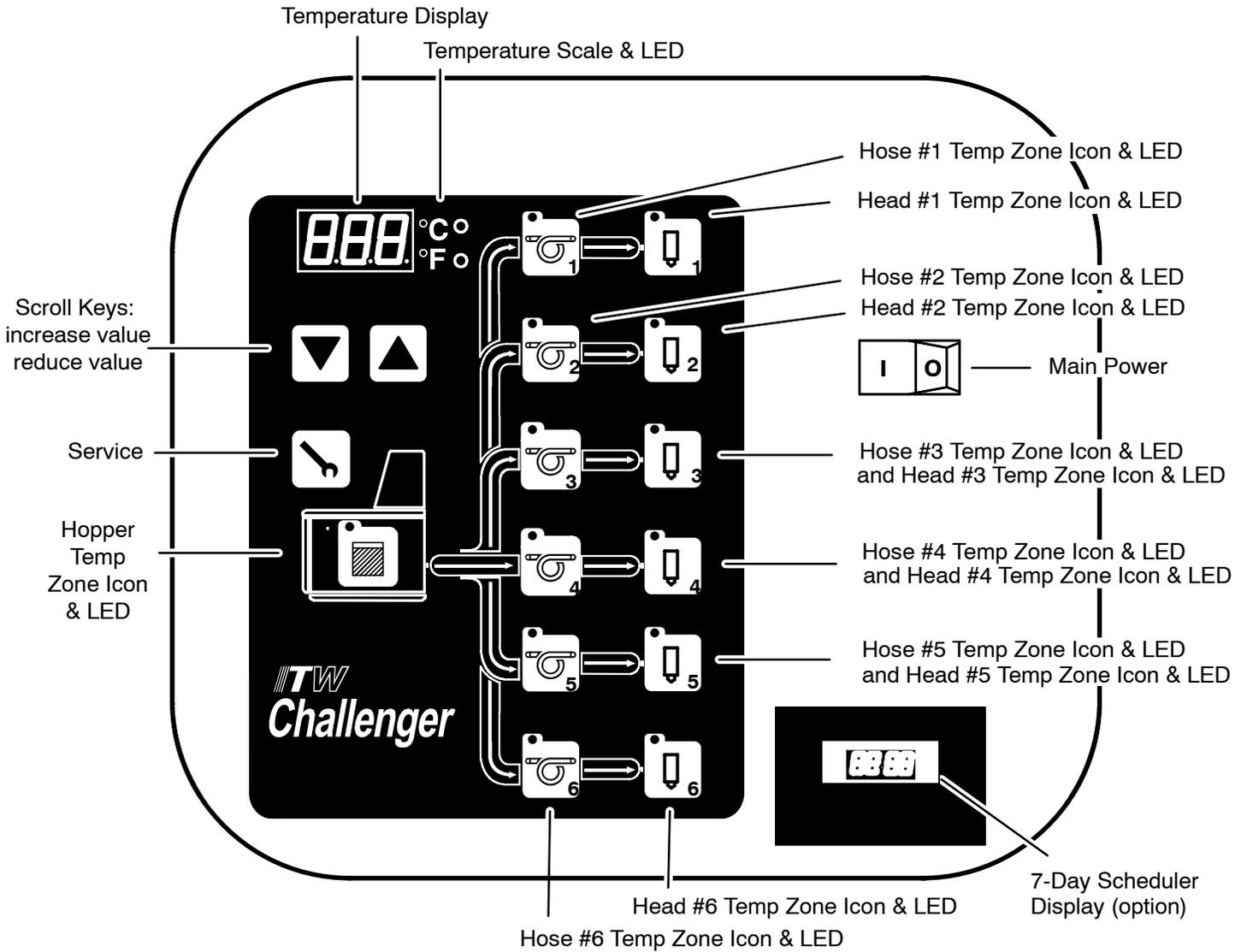
- Temperature scale: displayed in degrees Fahrenheit
- Applicator (head) and hose setpoints: OFF
- Hopper setpoint: 177°C (350°F)
- All zones are switched off, except for the hopper
- Access Code: not active
- All programmable time delays: set to zero (0)
- Tolerance range for high & low temperature limits:  $\pm 27^{\circ}\text{C}$  ( $\pm 50^{\circ}\text{F}$ )

### ***Helpful Tips for the User***

- When the ASU is turned on, all temperature setpoints and other operating parameters will be exactly where they were when the ASU was turned off.
- When the ASU is turned on, all system heaters go on unless they have previously been set below 40°C (100°F) (ie. switched OFF).
- When the ASU is turned on, the controller checks all RTDs. If a zone does not have a valid RTD, this zone will be switched off.

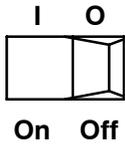
## Chapter 5 CONTROLLER PROGRAMMING INSTRUCTIONS

### Controller Keypad



## Programming

### Turn Controller ON



Turn ON the main power switch.  
System will go through its self-diagnostics (CAL).  
Controller will display "CAL".  
Temperature zone LEDs will flash.



or

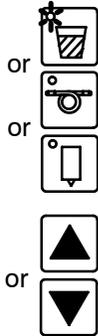


Controller will display "SS 1" (On) or "SS 0" (Off) to indicate status of the Sequential Startup feature (see info on "Sequential Startup" later in this chapter).

Controller will display firmware version, ie. VX.XX.

### Programming Temperature Setpoints

(for a shortcut method of setting setpoints, see "To Copy & Paste Setpoints" on pg. 5-9)



Choose a temperature zone.  
When flashing, the zone's setpoint is displayed, and it can be programmed.

In order to program the temperature setpoint, scroll up to increase value or down to reduce value.

After two seconds the display will read the actual temperature. The setpoint is stored.



### Turning Temperature Zones ON/ OFF



Choose a temperature zone.

Scroll to reduce value until the temperature setpoint shows " - - - ". This temperature zone is now turned OFF.

To turn ON the temperature zone, increase the setpoint.

When programming is complete, wait a few seconds and the controller will return to the ASU's actual temperature.



## Keypad Locking

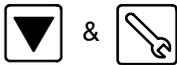
It is possible to lock or unlock the controller in order to restrict programming changes. To change the code which is necessary to over-ride or unlock the keypad lock, see Service Functions.

*Note: the ASU is shipped with de-activated keypad lock. If the keypad lock must be used, an access code must be programmed prior to locking the keypad.*

### Locking or Unlocking the Keypad

**Important Note: the controller must be in the Temperature Display mode in order to allow locking or unlocking of the keypad.**

#### Locking the Keypad

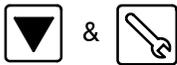


Press the Down Scroll key, then hold and press the Service icon key.

You will see "Loc" to indicate that the Keypad Lock is active.

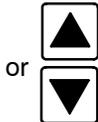


#### Unlocking the Keypad



Press the Down Scroll key, then hold and press the Service icon key.

You will see "Cod" to indicate that the access code is required.



Enter your access code by scrolling up or down.



Confirm your code input by pressing Tank key.

#### Notes:

1. Once the keypad lock is active, unauthorized programming is not possible, even after turning the ASU OFF, then back ON again.
2. Once the keypad lock is unlocked, programming is possible until the ASU is turned OFF, then back ON or the keypad is locked again.
3. If the keypad must be unlocked permanently, the access code must be de-activated in the Service Functions.

## Service Functions

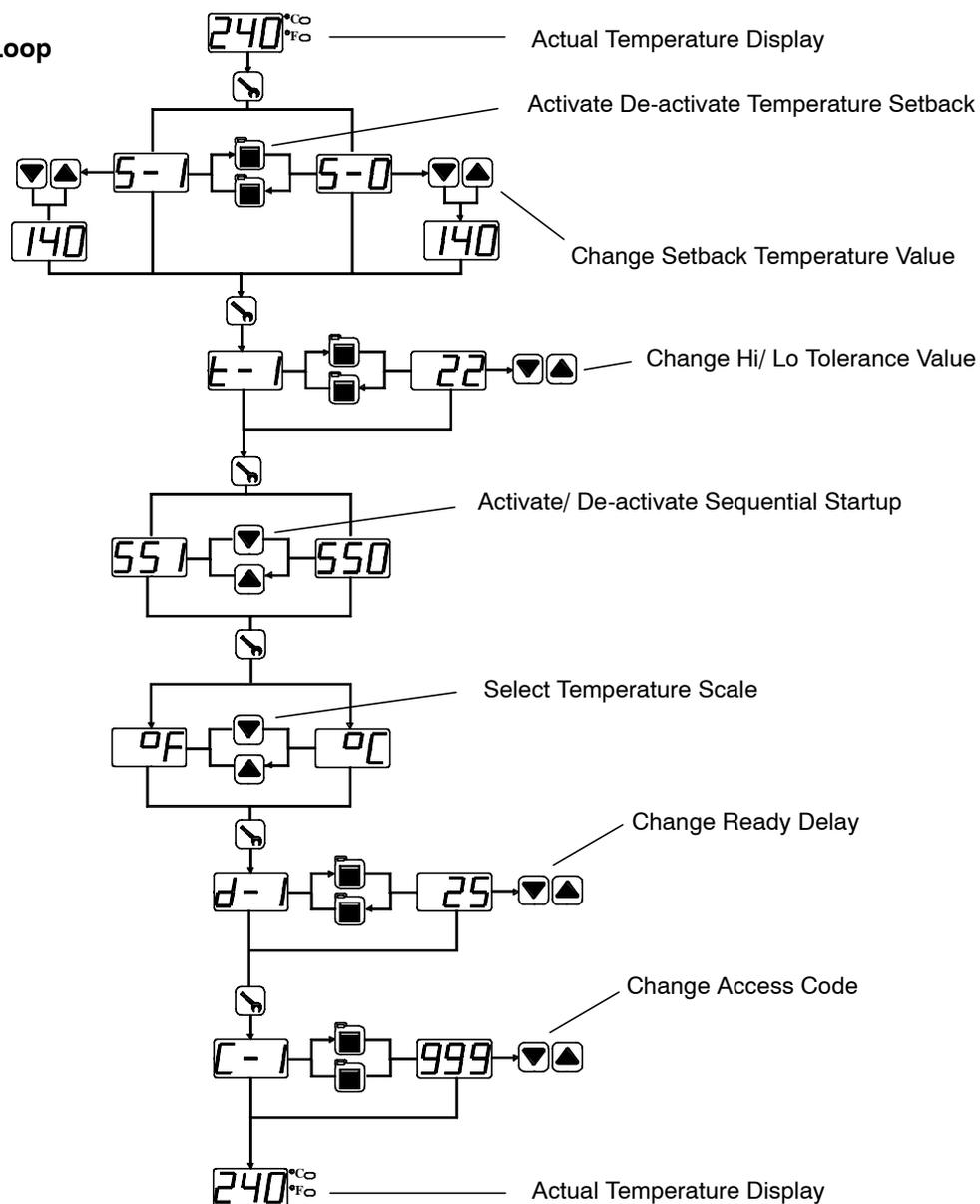
After the basic programming of Temperature Setpoints is complete, the programmer proceeds to programming of the Service Functions, if desired.

The Service Functions are a continuous loop of programming steps ("functions") which the programmer moves through by pressing the "Service" key. These steps are described in this section of the chapter. The Service Functions loop and basic programming is diagrammed below.

There are three ways to exit the Service Functions loop:

1. Just wait (approx. 10 seconds) and the controller will automatically return to the actual temperatures display,
2. Press the Service key until you are back to the actual temperatures display, or
3. Press any Hose or Head key and you will return to the actual temperatures screen.

### Diagram of the Service Functions Loop



## Service Functions, cont.

### Standby Programming

“Standby” is a temperature value by which all temperature zones will lower when Standby mode is activated. For example, if your temperature setpoints are all 300 degrees, and you program a 100 degree Standby, then the Standby temperature of all zones will be 200 degrees. Similarly, if your temperature zones setpoints vary, and you program a 100 degrees Standby, each zone’s Standby temperature will be 100 degrees lower than its setpoint.



Press Service icon to enter Service Functions.

You will see either “S-1” (standby is On) or “S-0” (standby is Off).



or



Press the Tank icon to activate/ de-activate Standby.



If desired, you may set the Standby temperature by scrolling up or down to desired temperature.



When programming is complete, wait a few seconds and the controller will return to the ASU’s actual temperature.

Note: When Standby is active, the display will alternate between the ASU’s actual temperature and S-1.

## Service Functions, cont.

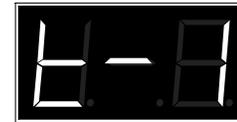
### To Set Tolerance (Hi & Low Temperature Limits)

The Tolerance (high/ low alarm) setpoint is a range (+ and - the zone's temperature setpoint) between which your ASU can safely operate. It's lower temperature represents the ASU's ready temperature. It's upper value represents the over-temperature point.

Setting the Tolerance range, for example: if the temperature setpoint is 200 degrees, and the Tolerance setpoint is 10 degrees, then the high alarm equals 210 degrees and the low alarm (ready temp) equals 190 degrees.



Press the Service icon twice to select the Tolerances of your temperature zones. An display of "t-1" indicates the Tolerance function has been selected.



Press the Tank button to display the Tolerance.



or



Use the scroll buttons to change the Tolerance range for all zones. Note: your Tolerance range must be a value between  $\pm 50$  degrees for Fahrenheit ( $\pm 27$  degrees for Celsius).

When Tolerance programming is complete, wait a few seconds and the controller will return to the ASU's actual temperature.

### Turning Sequential Startup ON/OFF

The Sequential Startup feature programs the order in which the temperature zones will come on at startup. A Sequential Startup of "SS1" (On) means the tank will begin heating first, then, when the hopper is ready, the other zones will begin heating. A Sequential Startup of "SS0" means Sequential Startup is Off and all zones will begin heating immediately.



Press the Service icon three times to set Sequential Startup.

The display will flash either "SS1" (sequential startup is ON) or "SS0" (sequential startup is OFF).



or



or



Scroll to choose between ON and OFF. When programming is complete, wait a few seconds and the controller will return to the ASU's actual temperature.

Note: Any time the ASU is switched ON, you will briefly see "SS1" or "SS0" displayed.

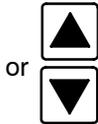
## Service Functions, cont.

### To Set Temperature Scale

The Temperature Scale may be set to display temperature either in degrees Celsius or Fahrenheit.



Press the Service icon four times to set the Temperature Scale.



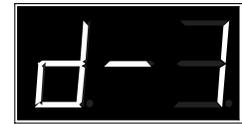
Scroll to choose between Celsius ("C") or Fahrenheit ("F") as indicated by the Temperature Scale LED. When programming is complete, wait a few seconds and the controller will return to the ASU's actual temperature.

### To Set Ready Delay

When the system is ready (all temperature zones are within tolerance), a ready delay may be programmed to delay the system's ready output signal.



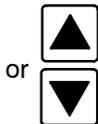
Press the Service icon five times to set a Ready Delay.



You will see "d-1" to indicate you are in Ready Delay programming mode.



Press the Hopper icon to display the Ready Delay.



To change a Ready Delay, scroll up or down to the desired length (in minutes) of delay.

0 = Default, no delay

99 minutes = maximum length of delay

When programming is complete, wait a few seconds and the controller will return to the ASU's actual temperature.

## Service Functions, cont.

### To Change Access Code (De-activate Keypad Locking)



x 6

To change the Access Code, press the Service icon six times.



You will see "C-1" to indicate you are in Access Code programming mode.



Press the Hopper icon to see the programmed Access Code. For example, "999".



or



To change the Access Code, scroll up or down to the desired numeric value.

"- - -" = no Access Code (Access code is de-activated),  
1 - 999 = possible Access Code values



When programming is complete, wait a few seconds and the controller will return to the ASU's actual temperature.

## Controller Features

### System Ready Indicator Light

When not in programming mode, a flashing temperature scale light (LED) indicates that the ASU is not “Ready” for production. This LED will cease to flash when all temperature zones are within the programmed temperature tolerance window.



### Error Indication Messages

“EO1” = the temperature sensor is open (no sensor attached) or has high resistance.

“EO2” = the temperature sensor is shorted or has low resistance.

“EO3” or “EO4” = an internal error has occurred. The printed circuit board or the ASU must be returned to Dynatec or re-calibration.

“o - t” = overtemperature on any zone. Power to all heaters is switched OFF. Recycle power (re-boot) and check which zone has caused the fault alarm.



### To Copy and Paste Setpoints

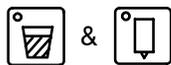
The Copy/ Paste feature of the controller copies the hopper setpoint and pastes it as the setpoint of other temperature zones. The paste will apply to only temperature zones that are switched ON.

Set your Hopper setpoint as described earlier in this chapter.



Push and hold the Hopper icon. While holding, press the #1 Hose icon. Release.

then



Push and hold the Hopper icon again. While holding, press the #1 Head icon. Release.

The manually programmed setpoint has now been pasted in to all turned on hose and head zones. When programming is complete, wait a few seconds and the controller will return to the ASU's actual temperature.

## Programming of Optional Features

### Seven-Day Scheduler

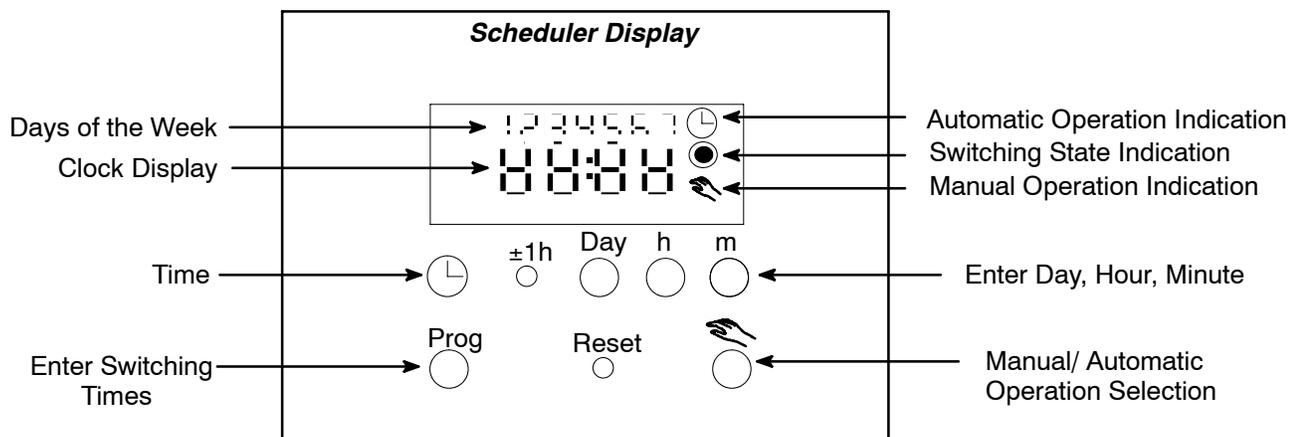
The Seven-Day Scheduler allows the operator to program main power ON and OFF times which coincide with his daily production schedule throughout the work week. Up to 20 “switching times” may be scheduled. A switching time is a specific day, time and state..

An ASU which has an active seven-day scheduler should be turned ON at the main power switch. It should never be turned off by the main power switch while the scheduler is active. To turn the ASU OFF (temporarily overriding the scheduler), use the seven-day scheduler’s manual operation key.

If the scheduler switches the ASU OFF, the controller’s main display will say “OFF”. To re-activate the ASU (over-ride the scheduler), press the scheduler’s manual operation icon (at the lower, right on the scheduler display) once or twice. Later, to return the scheduler to active, press the manual operation icon again until the the automatic operation’s clock icon (at upper, right on display) re-ap-  
pears.

For additional information on the scheduler, see the Appendix in this manual.

### Scheduler Display



### Time and Day Programming

- Press the Time key and hold throughout the following procedure.
- Set the day of the week with the Day key (1= Monday, 2= Tuesday...7= Sunday).
- Set the desired hour with the h key.
- Set the desired minutes with the m key.
- Release the Time key.
- The colon will now flash.

## Setting the Switching Commands

The programmer must set the desired days of the week, switching times and switching state.

### **Select the Free Memory Spaces**

Press the Prog key (as necessary) until the digits 1 thru 7 are visible.  
Release the Prog key.

### **Select the Desired Days of the Week**

Press the Day key to select any single day or any combination of days.  
Monday = 1, Tuesday = 2...Sunday = 3.

### **Select the Desired Switching Times**

Press the h key to select the hours.  
Press the m key to select the minutes.

### **Select the Desired Switching State**

Press the Manual Operation Selection key to toggle the switching state. The symbol will indicate the state.

Symbol:  = ON,  = OFF

Press the Prog key once to end.

### **Repeat for Further Switching Commands**

Repeat the last three steps for programming of additional switching commands.

### **End Programming of Switching Commands**

Press the Time key once. The display will show the current time.

## Select Manual ON/ OFF

Press the Manual Operation Selection key to select manual mode ON or OFF.

 = manual mode ON

 = manual mode OFF



## Chapter 6 PREVENTIVE MAINTENANCE

**Note: Re-read Chapter 1 “Safety Precautions” before performing any maintenance procedures. All maintenance procedures must be performed by qualified, trained technicians.**

### **General Cleaning**

The ASU enclosure is finished with an extremely durable polyurethane paint. The enclosure may be cleaned with a variety of industrial cleaners following manufacturers’ directions. To prevent discoloration or deterioration of the ASU’s finish, avoid prolonged contact with strong solvents.

The molded plastic lid and control and hose panels may be cleaned with mineral spirits.

### **Preventive Maintenance Schedule**

The ASU requires little maintenance. The hopper is fitted with a coarse screen to prevent large debris from entering the system. Normally this screen does not require cleaning. The ASU parts that require regular, periodic maintenance are as follows:

### **Purging the Filter Manifold of Adhesive and Pressure**

As a safety precaution, the ASU’s system should be purged of pressure and adhesive before attempting to change the output filter or before removing any of the hoses or applicators from their manifold port.

Refer to the illustration on page 6-2 while following these instructions.

<b>WARNING</b>	
	<b>HIGH PRESSURE</b> During the purging procedure, hot adhesive can come out of the manifold under high pressure. Wear a face shield, gloves and protective clothing. Stand clear of the ASU until all pressure is relieved.
	<b>HOT ADHESIVE</b> Avoid splashing hot adhesive. Position a heat-resistant container under the manifold’s purge drain before proceeding.

The ASU should be at operating temperature. Turn the ASU’s motor OFF.

1. Locate the bleed valve on the output filter manifold.
2. With a hex key screwdriver (allen wrench), slowly loosen the purge screw (do not attempt to remove it) which is in the bleed valve’s port. Allow the adhesive and pressure to escape out

*cont.*

of the manifold. The adhesive will flow into the heat-resistant container positioned below the manifold.

3. After all adhesive has run out, re-tighten the purge screw.

### Output Filter

The output (pump) filter should be replaced monthly during the first few months of operation. After you gain experience with your system, you can determine how often you need to replace it. The output filter is located on the output filter manifold on the hose connection panel of the ASU.

Use the following procedure to replace the output filter.

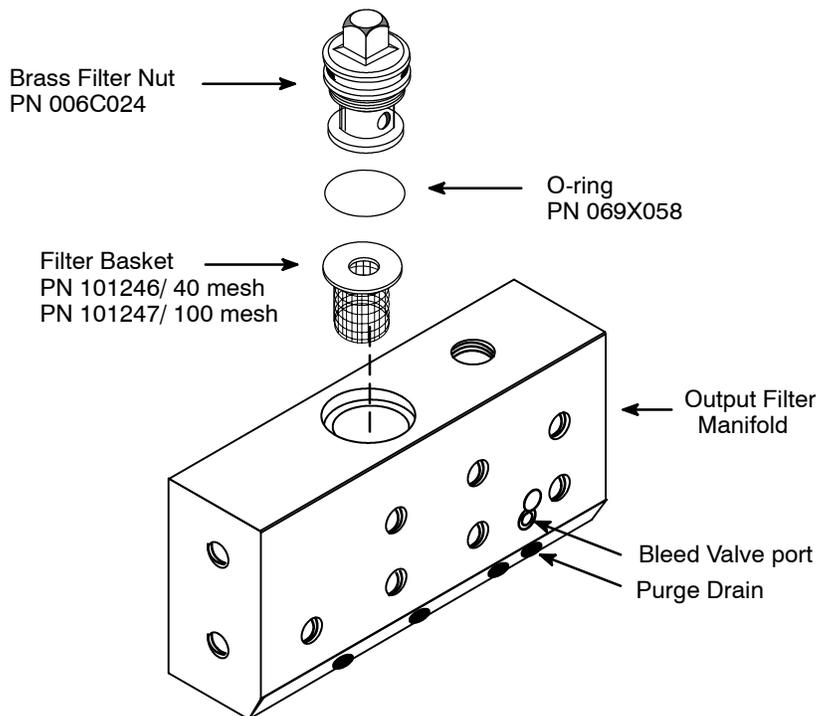
## WARNING



**HIGH PRESSURE**  
Use the output filter manifold's bleed valve to relieve adhesive pressure before performing any pump filter maintenance. See page 6-1 for detailed instructions.



**HOT ADHESIVE**  
Avoid splashing hot adhesive. The filter screen will be covered with hot adhesive and must be handled with proper tools. Position a heat-resistant container under the manifold's purge drain before proceeding.



*4-Hose Output Filter Manifold (located on the Hose Connection Panel)*

1. The system should be at operating temperature before starting this procedure.
2. Before proceeding, follow instructions to “Purge the Filter Manifold of Adhesive and Pressure” on page 6-1.
3. Unscrew and remove the brass filter nut (15.8 mm or 5/8” nut).
4. With needle nose pliers, pull the filter basket out of the manifold body.
5. The filter basket is replaced as needed. Note the char and debris inside the filter basket.
6. Before replacing the filter basket, replace the o-ring on the filter nut. Apply o-ring lubricant (PN N07588) to the new o-ring.
7. Apply a coat of anti-seize to the threads of the filter nut. Re-install the filter basket and the filter nut. Tighten the filter nut until it is seated firmly against the manifold body, taking care not to cut the o-ring as it enters the manifold.

### ***Hose Fittings***

All hose fittings should be checked for tightness after every three months of operation.

### ***Fasteners***

After the first ten hours of operation, check all set screws, socket head and cap screws for tightness. Thereafter, re-check all fasteners after every three months of operation.

### ***Pump Shaft Leak***

There is a cutout in the baseplate, directly below the pump shaft(s), which will allow adhesive from a leaking pump to exit the ASU. Inspect the area under the baseplate cutout every month for adhesive.

A leaking pump shaft indicates a worn pump seal. See instructions in Chapter 8 for replacement of this seal.

## Primary Filter Cleaning

See the illustration below for location of the primary filter.

1. Pump all the adhesive out of the hopper.
2. Lower the temperature of the application system to the adhesive's softening point.

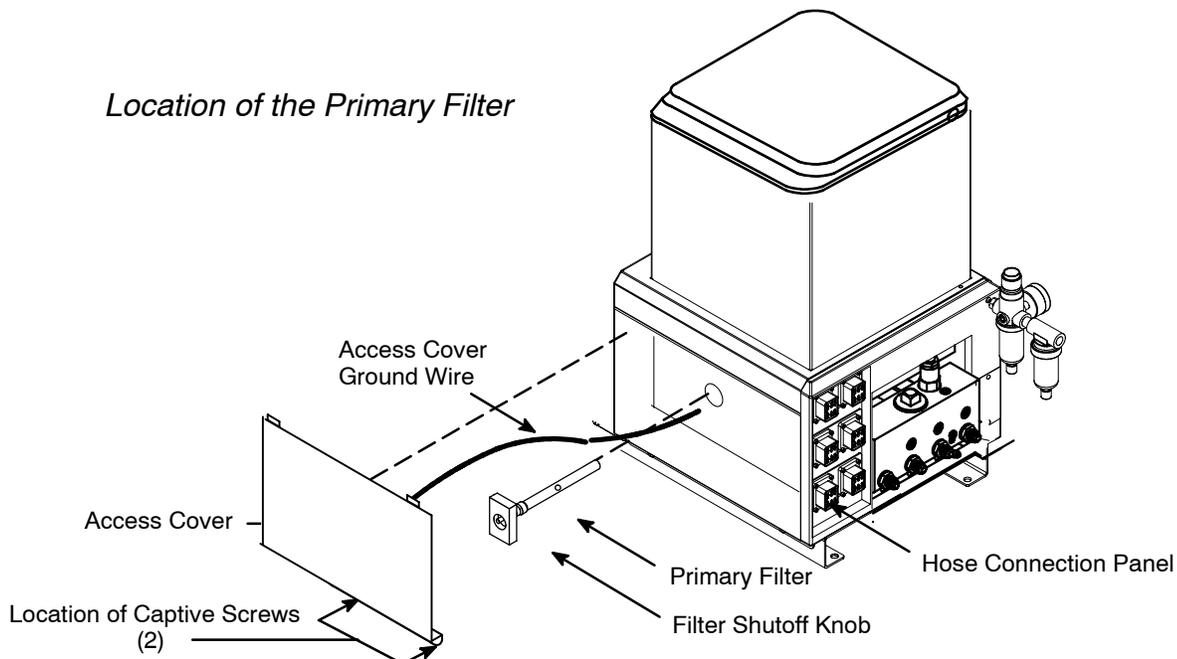


### WARNING HOT SURFACE

The ASU will still be hot when this procedure is being done. Use insulated gloves and protective clothing when removing the primary filter.

3. Remove the access cover via two captive screws. Do not pull out the ground wire attached.
4. Wearing gloves, unscrew the filter retaining nut and pull the primary filter out.
5. Emmerge the clogged filter in flushing fluid (PN L15653) to loosen contaminants. Remove filter from fluid and use a hot air gun (if necessary) and rags to clean all contaminants from the filter.
6. Apply a coat of anti-sieze compound onto the threads of the filter retaining nut before re-inserting into the ASU.
7. When re-installing the filter assembly, turn the filter's cut out hole toward the pump. Align the filter shutoff knob in its "open", vertical position (as shown in the diagram). Note: the filter shutoff knob is closed when it is positioned horizontally.
8. Replace the access cover and restore the ASU to normal operation.

*Location of the Primary Filter*



## Flushing the System

Contaminated adhesive, accumulation of residue, or changing the adhesive formulation may require the system to be flushed. At least 6 liters (1.5 gallons) of flushing fluid is required (PN L15653).



### WARNING

The flushing fluid will splash easily. Wear protective clothing, gloves and goggles to prevent severe burns.

1. Pump out as much of the molten adhesive as possible.
2. Purge the manifold, following the instructions given in “Purging the Filter Manifold of Adhesive and Pressure” on page 6-2.
3. Disconnect one of the supply hoses’ adhesive feed from its applicator head. Do not disconnect electrical power to the head. Put the hose in a secured position within a container to catch the used flushing fluid.
4. Add flushing fluid to the hopper and allow approximately fifteen minutes for it to reach hopper temperature. Carefully stir the flushing fluid to mix with any remaining adhesive.
5. Slowly turn the air pressure regulator clockwise.
6. Pump about half of the fluid into the container.
7. Turn the regulator counter-clockwise.
8. Remove the output filter and replace the basket. Install a new o-ring on the filter nut (lubricate the new o-ring with o-ring lubricant prior to installation) and tighten the brass nut.
9. Add new adhesive to the hopper and heat to application temperature.
10. Slowly turn the air pressure regulator clockwise.
11. Actuate each applicator until all flushing fluid is removed and a steady stream of new adhesive flows.
12. Re-adjust the pump air pressure for desired flow.
13. Re-fill the hopper and resume production.



Air Pressure  
Regulator



Pressure  
Relief Valve

## **Summary of Preventive Maintenance Schedule**

**Monthly** (or as experience dictates)

*Inspect output filter basket. Replace as required.*

*Check for leaking adhesive under the baseplate, caused by a worn pump seal. Replace as required.*

**Every Three Months** (or as experience dictates)

*Check all hose fittings for tightness.*

*Check all fasteners for tightness.*

*Inspect primary filter. Clean or replace as required.*

## Chapter 7 TROUBLESHOOTING

### General Troubleshooting Notes

**Note:** Re-read Chapter 1 “Safety Precautions” before performing any troubleshooting or repair procedures. All troubleshooting or repair must be performed by qualified, trained technicians.

	<b>DANGER HIGH VOLTAGE</b>		<b>WARNING HOT SURFACE</b>
<p>The ASU uses electrical power that can be life threatening and hot-melt adhesives that can cause serious burns. Only qualified persons should perform service on the ASU.</p>			

### Handling Printed Circuit Boards (PCBs)

	<b>DANGER HIGH VOLTAGE</b>
<p>Before unplugging connectors from the Control PCB, ground yourself to the ASU by touching any available unpainted cool metal surface, mounting screws, etc. This will avoid electrical discharge to the PCB assembly when you are removing and replacing connectors.</p>	



**CAUTION:** Printed circuit boards (PCB) should be handled using the following procedures:

1. Wear a wrist grounding strap. If a grounding strap is not available, frequently touch a bare metal part of the ASU (unpainted frame, mounting screw, etc.) to safely discharge any electrostatic buildup on your body.
2. Handle a PCB by its edges only. Don't grip a PCB across its surface.
3. When removed from the ASU, the PCB must be packaged inside a metallized, static drain envelope. Do not place the removed PCB on a table, counter, etc. until it has first been placed in or on a static drain envelope.
4. When handing a PCB to another person, touch the hand or wrist of that person to eliminate any electrostatic charge *before* you hand the PCB to him.
5. When unwrapping a PCB from its static drain envelope, place the envelope on a *grounded, nonmetallic* surface.
6. To cushion a PCB for shipment, use only static-drain bubble pack. Do not use foam peanuts or bubble pack not known to be static draining.

### Control Printed Circuit Board

Notes:

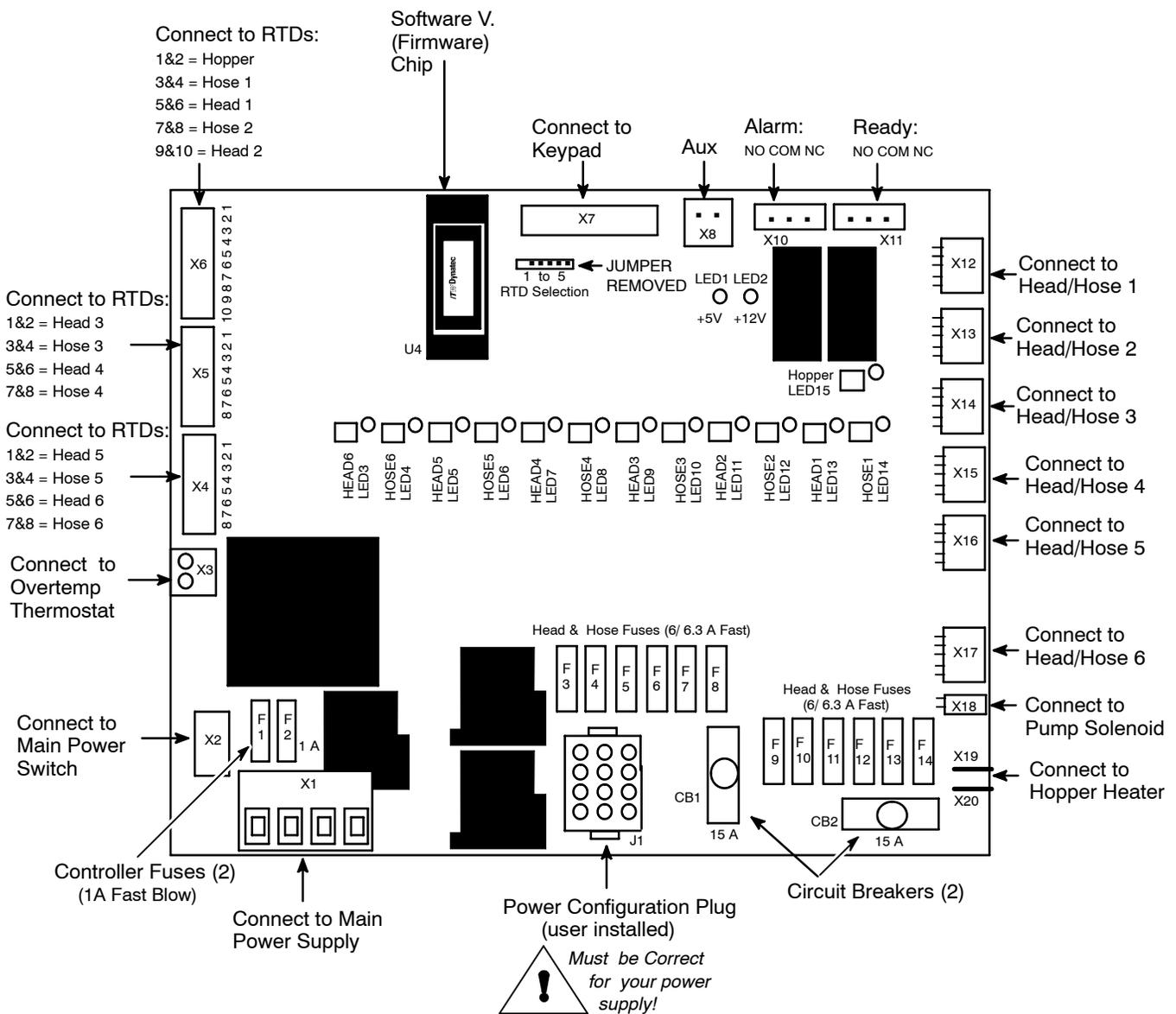
1. The green LEDs cycle on and off as each heater outputs.
2. The Power Configuration Plug (user-installed) must be correct for your application or serious ASU damage will result. See Installation Chapter 3 for details.



**CAUTION: Using the incorrect power configuration plug may cause serious damage to the unit.**

3. Fuses sizes are as shown in diagram below. The pump(s) is fused together with Head/ Hose #6 fuses.

4. At RTD Selection, remove jumper from pins #4 and #5.



### Overtemp Thermostat

The overtemp thermostat cuts off power to all temperature zones if the hopper temperature exceeds 224°C (435°F). The overtemp thermostat must be re-set manually, by opening the ASUs front panel and pressing the reset button in the center of the overtemp switch (note: the reset button is protected by a plastic insulator).

### Tank Overcurrent

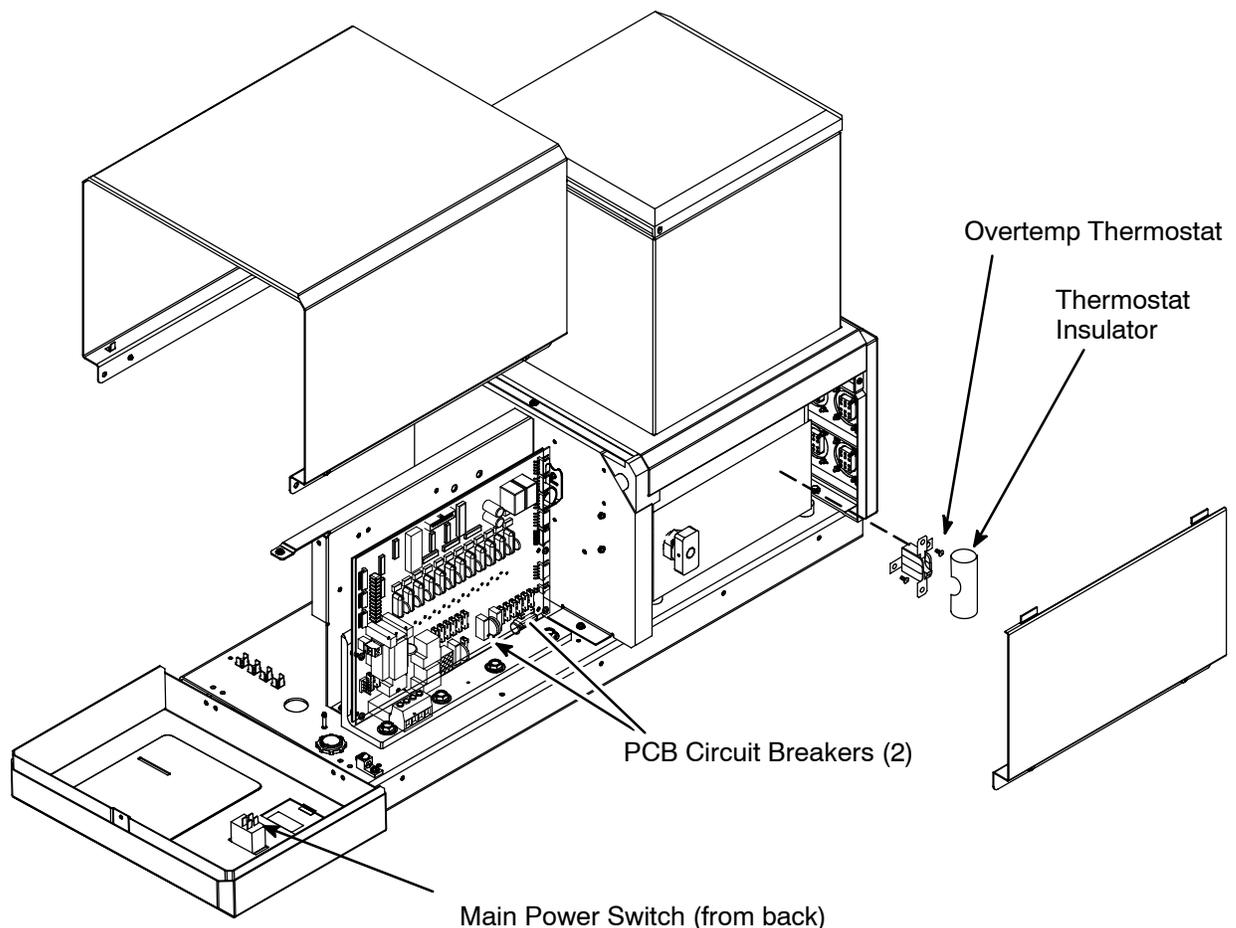
If only the power to the tank zone cuts off, the circuit breaker(s) on the printed circuit board must be reset. Either remove the control enclosure or the control panel face plate, locate the circuit breakers (see illustration below), identify the one which has popped up and push it down, back into place.

### Ready Contact to Parent Machine

A ready contact from the controller to the parent machine can enable the parent machine if it is connected on the control printed circuit board.

### Temperature Zones Not Heating

If two temperature zones simultaneously cool down, the problem could be a bad fuse on the main PCB, as these fuses relate to hose/ head combinations. If only one temperature zone cools, the problem could be a bad heater or a PCB problem such as a PCB connection.



*Location of Printed Circuit Board, Overtemp Thermostat and RTD Sensor*

**Resistance Tables**

Temperature		Resistance in Ohms
°F	°C	
32	0	120.0
50	10	127.2
68	20	134.5
86	30	142.1
104	40	149.8
122	50	157.7
140	60	165.9
158	70	174.2
176	80	182.8
194	90	191.6
212	100	200.6
230	110	209.8
248	120	219.3
268	130	229.0
284	140	238.8
302	150	249.0
320	160	259.3
338	170	269.9
356	180	280.8
374	190	292.0
392	200	303.5
410	210	315.3
428	220	327.5

*Temperature Sensor Resistance  
 for Ni120 RTD*

Hose Length		Resistance in Ohms Nominal @ 240V
Meters	Feet	
1.2	4	467
1.8	6	287
2.4	8	228
3	10	177
3.7	12	144
4.9	16	108
7.3	24	67

*Nominal Hose Heater Resistance for  
 Challenger Hoses*

Watts	Resistance in Ohms Nominal @ 240V
200	288
270	213
350	165
500	115
700	82

*Nominal Head Heater Resistance*

Nominal Voltage	Resistance in Ohms
240	22.3 - 25.7

*Hopper Heater Resistance*

Note: Resistance is measured at ambient temperature (20°C/ 68°F).

## Troubleshooting Guide

### Preliminary Checks: Verify the following before proceeding

1. The ASU is switched on.
2. The ASU is supplied with power.
3. The ASU is supplied with pneumatic air.
4. Pneumatic and electrical connections (including the power configuration plug) are correct.
5. Adhesive is in the hopper and it has had time to melt.

### Error Messages (see also Chapter 4)

- EO1 = temperature zone has an open sensor
- EO2 = temperature zone has a shorted sensor
- EO3 or E04 = internal error. ASU or pcb must be returned to ITW Dynatec.
- o - t = Overtemperature check for faulty zone

### Hose/ Applicator Troubleshooting Tip

Hose or applicator problems can be isolated by electrically connecting the applicator and hose to an alternate socket on the ASU. If the malfunction goes with the applicator and hose, the problem will usually be in the applicator or hose that was moved. If the malfunction does not move with the applicator and hose, the problem is probably in the ASU.

Problem	Possible Cause	Solution
Controller setpoints are not adjustable.	<ol style="list-style-type: none"> <li>1. Main Power switch OFF.</li> <li>2. Control PCB inoperative.</li> <li>3. Keypad is locked.</li> <li>4. 7-Day Scheduler active.</li> </ol>	<ol style="list-style-type: none"> <li>1. Switch ON.</li> <li>2. Replace Control PCB.</li> <li>3. Unlock keypad (see Ch. 5 Programming)</li> <li>4. See Ch.5 to override scheduler.</li> </ol>
All channels display error message or wrong actual temperatures.	Control PCB inoperative.	Replace Control PCB.
System is not working, display is dark.	<ol style="list-style-type: none"> <li>1. Ribbon connector X6 or harness X7 is disconnected.</li> <li>2. Board fuse (F1 or F2) on the PCB is inoperative.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check connection.</li> <li>2. Insert new fuse, if it blows, the Control PCB is inoperative.</li> </ol>

cont

Problem	Possible Cause	Solution
Actual hopper temperature is higher than set-point (overtemp).	<ol style="list-style-type: none"> <li>1. Hopper sensor not fully inserted.</li> <li>2. Hopper sensor inoperative.</li> <li>3. Inoperative PCB.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check hopper sensor.</li> <li>2. Replace hopper sensor if resistance does not comply with resistance table.</li> <li>3. Replace PCB.</li> </ol>
Display for Hopper = EO1.	<ol style="list-style-type: none"> <li>1. Plug connection X6 (1&amp;2) on PCB is loose.</li> <li>2. Temperature sensor inoperative.</li> </ol>	<ol style="list-style-type: none"> <li>1. Restore connection.</li> <li>2. Replace sensor if resistance does not comply with resistance table.</li> </ol>
Display for Hopper = EO2.	<ol style="list-style-type: none"> <li>1. Hopper sensor short circuit.</li> <li>2. Short circuit at plug connection X6 on Control PCB.</li> <li>3. Inoperative PCB.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace sensor if resistance does not comply with resistance table.</li> <li>2. Check and eliminate short circuit.</li> <li>3. Replace PCB.</li> </ol>
Hopper does not heat, but LED is ON.	<ol style="list-style-type: none"> <li>1. Breakers 15/16 have tripped on PCB.  Hopper heater element is inoperative.</li> <li>3. Disconnection in hopper heater circuit.</li> <li>4. Inoperative PCB.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reset breakers and observe ASU. If it trips again, check for a short circuit in heater.</li> <li>2. Replace hopper if element's resistance does not comply with resistance table. <i>Note: remove lead wires from heater element when measuring resistance.</i></li> <li>3. Check and repair (see wiring diagram).</li> <li>4. Replace PCB.</li> </ol>

Problem	Possible Cause	Solution
Hopper does not heat, and LED is OFF.	Inoperative PCB.	Replace PCB.
A Hose (or Head) temperature zone is not heating. Hose (or Head) LED on the PCB is ON.	<ol style="list-style-type: none"> <li>1. Loose plug connection on PCB.</li> <li>2. Heating element inoperative.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check connectors X12, X13, X14, X15, X16 and X17 and restore connection.</li> <li>2. Check resistance and compare to resistance table on page 7-4.               <ol style="list-style-type: none"> <li>a. For head: if heater cartridge is inoperative, replace heater.</li> <li>b. For hose: if heating element is inoperative, replace hose.</li> </ol> </li> </ol>
A Head & Hose temperature zone is not heating	<ol style="list-style-type: none"> <li>1. Disconnection between ASU and Hose (or between Hose and Head).</li> <li>2. Hose (or Head) fuse on the PCB is inoperative.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check plug connections.</li> <li>2. Insert new fuse. If fuse blows again, check for a short circuit in heater. Note: there are two fuses for each hose /head combination.</li> </ol>
A Hose (or Head) temperature zone is not heating. Hose (or Head) LED on the PCB is OFF.	<ol style="list-style-type: none"> <li>1. Sequential heat-up may be active.</li> <li>2. Inoperative PCB.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check controller display at start up. Re-program if necessary.</li> <li>2. Replace PCB.</li> </ol>
A Hose (or Head) temperature zone's actual temperature is much higher than setpoint.	<ol style="list-style-type: none"> <li>1. Inoperative Hose (or Head) triac on PCB (corresponding PCB LED is OFF).</li> <li>2. Inoperative Hose (or Head) temperature sensor (corresponding PCB LED is ON).</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace PCB.</li> <li>2. Check resistance and compare to resistance table.               <ol style="list-style-type: none"> <li>a. For head: if sensor is inoperative, replace sensor.</li> <li>b. For hose: if sensor is inoperative, replace hose.</li> </ol> </li> </ol>

Problem	Possible Cause	Solution
Display for Hose (or Head) = EO1	<ol style="list-style-type: none"> <li>1. No Hose (or Head) is connected.</li> <li>2. Disconnection between ASU and Hose (or between Head and Hose).</li> <li>3. Disconnection at X4, X5 or X6 on PCB.</li> <li>4. Hose (or Head) sensor is inoperative.</li> </ol>	<ol style="list-style-type: none"> <li>1. Connect Hose (or Head) if needed. If not needed, ignore display.</li> <li>2. Check plug connection.</li> <li>3. Make proper connection.</li> <li>4. Check resistance and compare to resistance table.                             <ol style="list-style-type: none"> <li>a. For head: if sensor is inoperative, replace sensor.</li> <li>b. For hose: if sensor is inoperative, replace hose.</li> </ol> </li> </ol>
Display for Hose (or Head) = EO2	<ol style="list-style-type: none"> <li>1. Hose (or Head) sensor short circuit.</li> <li>2. Short circuit in plug connection between ASU and Hose (or between Hose and Head).</li> <li>3. Inoperative PCB.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check resistance and compare to resistance table.                             <ol style="list-style-type: none"> <li>a. For head: if sensor is inoperative, replace sensor.</li> <li>b. For hose: if sensor is inoperative, replace hose.</li> </ol> </li> <li>2. Make proper connection.</li> <li>3. Replace PCB.</li> </ol>

## Piston Pump Troubleshooting Guide



### WARNING HOT SURFACE & ADHESIVE

Some of the procedures in the following Troubleshooting Guide require working near hot adhesive. Be sure to wear protective gloves, safety glasses and clothing and use proper tools for handling hot melt components.

For pump disassembly instructions, see page 8-5.

On a two-pump unit, the two pumps operate as a pair. In the event of a pump problem, the two pumps should be troubleshoot individually.

Problem	Possible Cause	Solution
Pump Will Not Stroke	<ol style="list-style-type: none"> <li>1. No air pressure.</li> <li>2. 3-way solenoid valve is closed.</li> <li>3. Fault in compressed air fitting on ASU.</li> <li>4. Adhesive not up to temperature.</li> <li>5. Inoperative air cylinder 4-way valve.</li> <li>6. Start-up time delay has not expired.</li> </ol>	<ol style="list-style-type: none"> <li>1. Verify system has been provided with at least 0.5 SCFM of air at 20-100 PSIG (.014 std. cubic meters/minute at 6.8 bar).</li> <li>2. Verify that valve is properly connected (electrically) inside ASU. Verify that valve is properly connected to Air Control/ Filter Unit. Disconnect valve electrical leads and verify that air is passed through when 240 VAC is applied to the valve terminals. Replace valve if defective.</li> <li>3. Inspect the system for improper connections, loose tubing or fittings, or kinked tubing. Repair or replace tubing or fittings as necessary.</li> <li>4. Wait for setpoint to rise or re-program setpoint lower.</li> <li>5. Remove 4-way valve. Inspect, clean and repair as necessary.</li> <li>6. Wait for time delay or re-program time delay.</li> </ol>
Pump Will Not Stroke, adhesive has melted.	Not all the system components (including hoses & heads) have attained "ready" condition.	Wait until all system components are ready, or adjust the temperature zone tolerances.

Problem	Possible Cause	Solution
Pump Quick-Strokes in Both Directions	<ol style="list-style-type: none"> <li>1. No adhesive in hopper.</li> <li>2. Adhesive too cold to flow into pump.</li> <li>3. Adhesive used is too viscous.</li> <li>4. Pump needs priming.</li> <li>5. Large opening in system downstream of pump.</li> </ol>	<ol style="list-style-type: none"> <li>1. Verify that hopper has an adequate level of hot melt adhesive.</li> <li>2. Check temperature of the thermostat to make sure there has been enough time for the adhesive to rise to the hopper setpoint temperature.</li> <li>3. Verify that adhesive selection and hopper setpoint temperature are compatible and that both are appropriate for your application.</li> <li>4. Prime the pump by first lowering the air pressure, then letting the pump cycle very slowly until primed.</li> <li>5. Inspect system for open filter drain, disconnected or ruptured hose, or disconnected head. Repair as necessary.</li> </ol>
Pump Quick-Strokes on the Forward-Stroke Only (shaft moving into pump body)	Inlet check valve blocked open.	Clean inlet check valve.
Pump Motion on the Forward Stroke (shaft moving into pump) is very slow or stopped.	Outlet check valve is blocked closed.	Clean outlet check valve.
Pump Quick-Strokes on the Reverse Stroke (shaft moving out of pump)	Outlet check valve is blocked open.	Clean outlet check valve.

Problem	Possible Cause	Solution
<p>Low or Inconsistent Adhesive Output</p>	<ol style="list-style-type: none"> <li>1. Output filter clogged.</li> <li>2. Adhesive used is too viscous.</li> <li>3. Blocked hose.</li> <li>4. Blocked applicator heads.</li> <li>5. Pressure relief valve in output block is opening.</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove and inspect filter screen. Clean or replace as necessary. See Chapter 6 “Preventive Maintenance” for procedure.</li> <li>2. Verify that system components are at proper temperature and that selected adhesive is correct for your application.</li> <li>3. Inspect hose for kinks, internal plugs of debris or char (degraded adhesive). Clean or replace hoses as required.</li> <li>4. Inspect heads for plugged nozzles, proper air valve operation or plugged filters. Clean or repair heads as needed.</li> <li>5. Verify that air supplied to pump is less than 6.8 bar (100 PSIG). If relief valve is opening with air pressure less than 6.8 bar (100 PSIG), remove pump and replace pressure relief valve.</li> </ol>
<p>Adhesive Leak at Manifold Drain</p>	<ol style="list-style-type: none"> <li>1. Manifold drain valve not tightly closed.</li> <li>2. Manifold drain valve blocked open.</li> </ol>	<ol style="list-style-type: none"> <li>1. Close and tighten manifold drain valve.</li> <li>2. Remove drain valve assembly from output manifold, clean and re-install.</li> </ol>



## Chapter 8 DISASSEMBLY & RE-ASSEMBLY PROCEDURES

### Disassembly Procedures

**Note: Re-read Chapter 1 “Safety Precautions” before performing any disassembly procedures. All disassembly procedures must be performed by qualified, trained technicians.**

*Note: Use the exploded-view drawings referenced with each procedure in conjunction with the instructions outlined in this chapter. Read the “cautions” on page 8-4 before re-assembling the ASU.*

#### To Remove the Pump & Electronics Cover

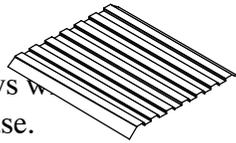
1. Loosen the four captive screws (two on each side) along the bottom of the pump and electronics cover.
2. Lift the cover straight up and off.

#### To Remove the Hopper Cover

1. Loosen the two captive screws along the bottom of the hopper cover and the screw near the top corner of the access cover.
2. Remove the screw that attaches to the heat shield.
3. Lift the hopper cover up and off.

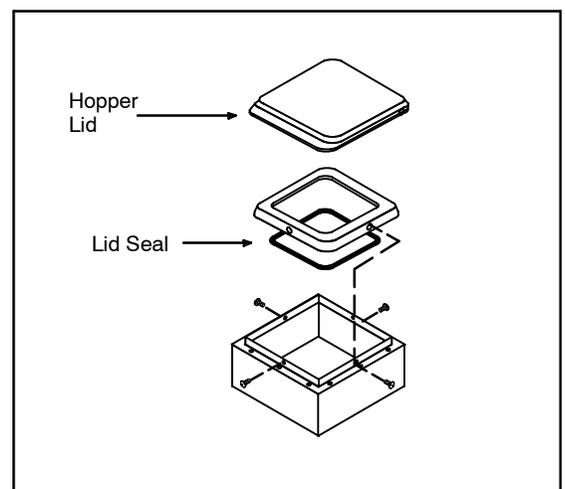
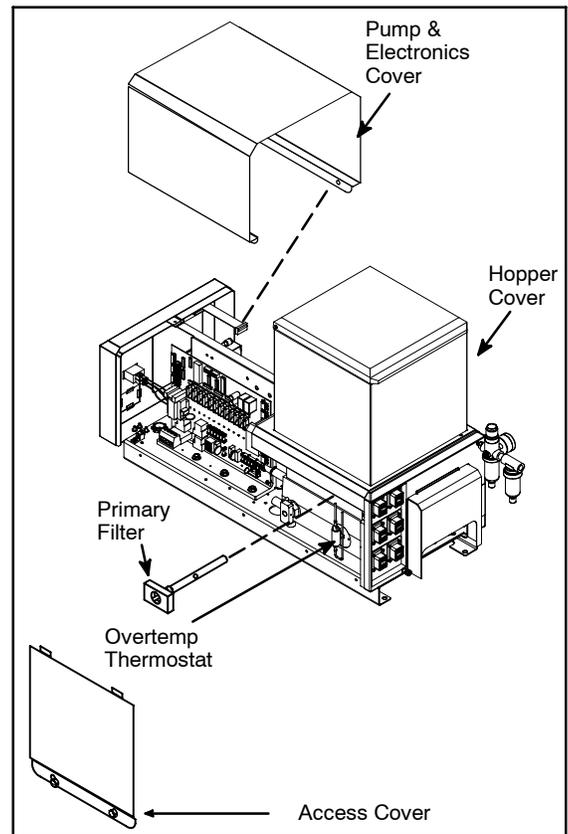
#### To Remove the Hopper Lid

1. Remove the four flat head screws indicated one on each side of the lid base.
2. Pull the lid up to remove.
  - a. **Lid Seal Replacement:** The lid seal (o-ring) is located inside the lid base. Remove the old seal, which rests against the top of the hopper. Install the new seal into the groove provided.



#### Overtemp Thermostat Replacement

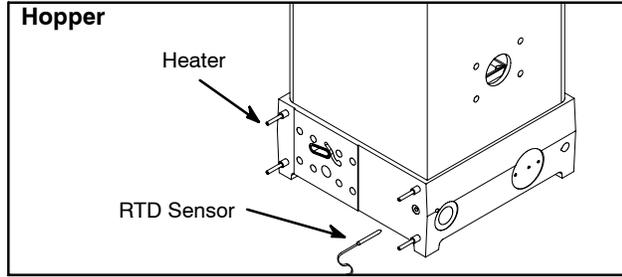
Loosen two captive screws to remove the access cover. Remove the two screws and slip the terminals and the hopper ground wire off of the thermostat before removing the thermostat from the base of the hopper.



**To Access the RTD Sensors**

Remove the pump and electronics cover.

a. **RTD for ASU:** Each ASU has one RTD located between the two cast-in heaters. This RTD slips into its adapter and is easily plugged in electrically.



**To Access the Electrical Components**

(See illustrations on pages 10-3 & 8-1)

Remove the pump and electronics cover.

a. **Main On/ Off Switch Replacement:**

Switch is located on the display panel.

1. Free the old switch via two screws from the front.
2. Remove the switch through the back.
3. Disconnect two incoming and two outgoing power leads from the old switch and connect them to new switch.

b. **Fuse Replacement:**

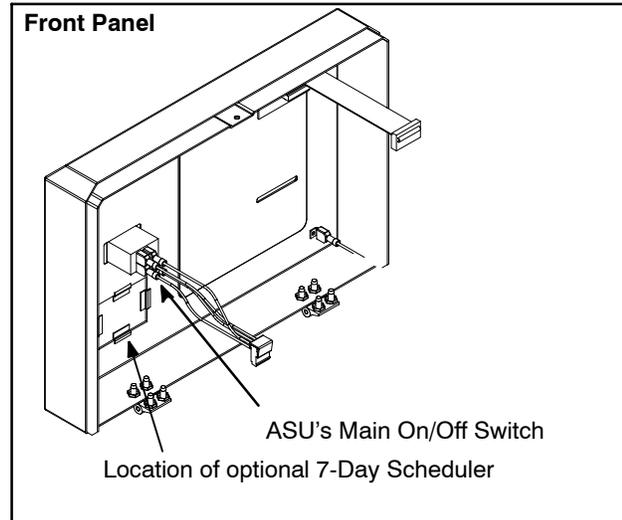
*Note: Use fuses as specified on page 7-2.*

i. **Fuses on PC Board:** (see also detailed illustration on page 7-2 for sizes and locations of fuses).

*Note on PCB fuses: each Hose #/Head # pair (ie: Hose #2/ Head #2) is fused with two fuses, either one of which can blow causing the zone to not heat.*

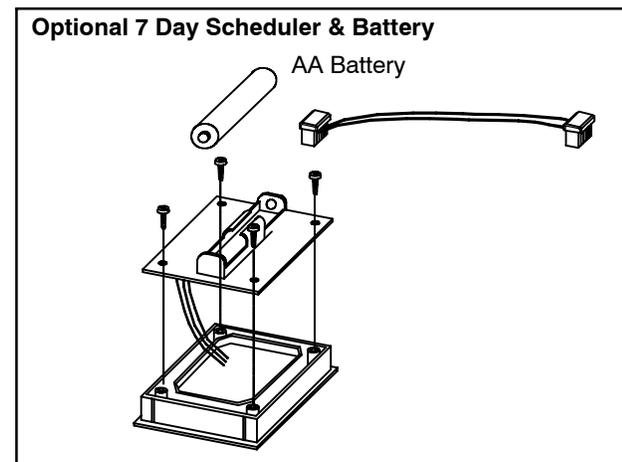
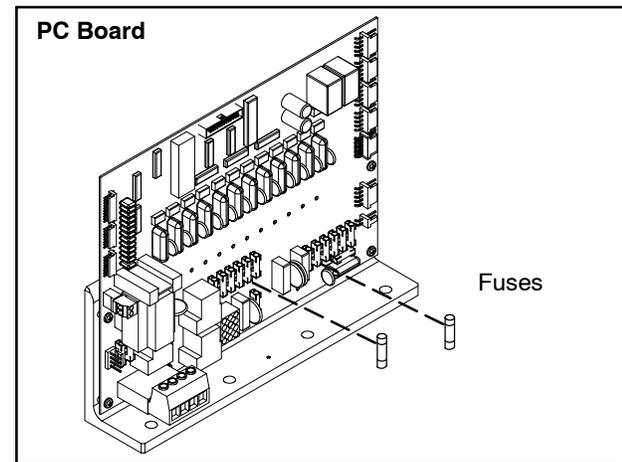
ii. **Fuses on Hopper:**

Hopper is fused with two re-settable circuit breakers. Push the knob to re-set.



c. **Optional 7-Day Scheduler Battery Replacement:**

Optional Scheduler's battery is located on the back of its display (which is located on the display panel).



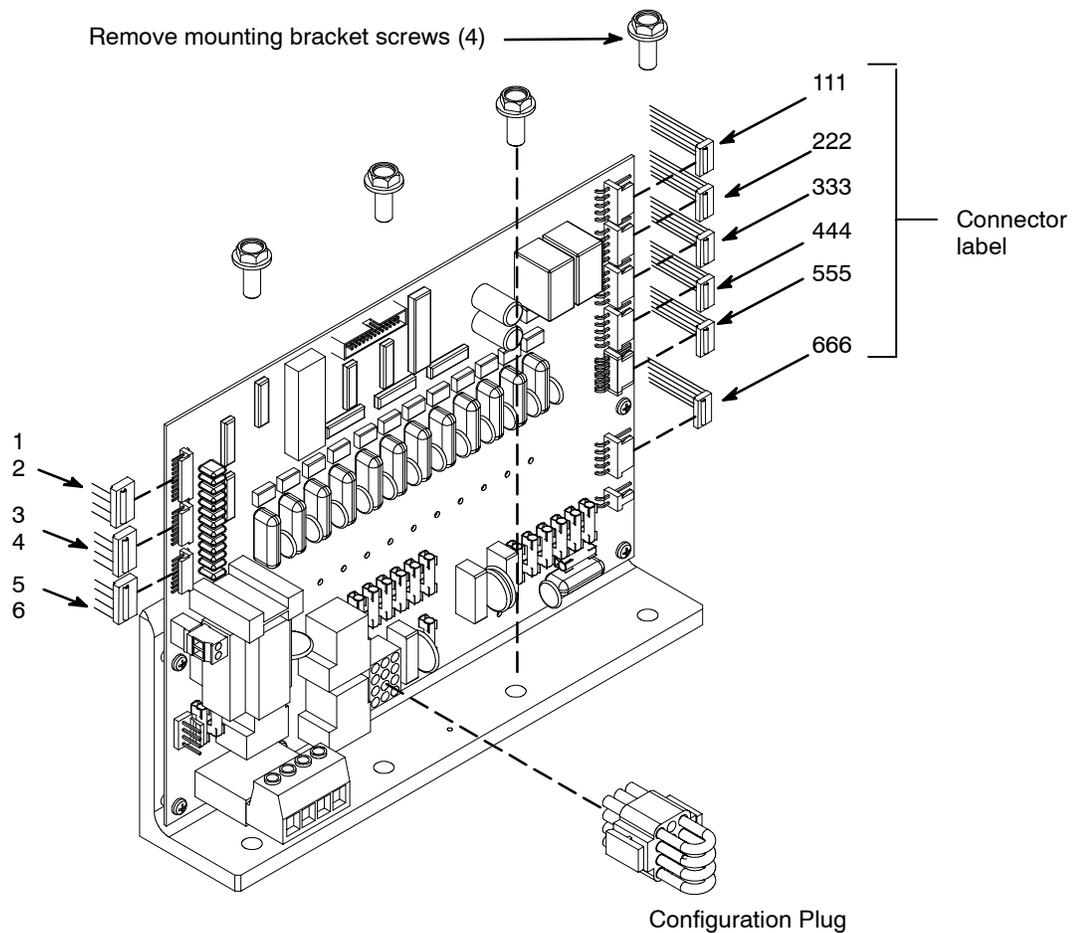
d. Printed Circuit Board Replacement:



**CAUTION:** Reference the manual section entitled “Handling Printed Circuit Boards” on page 7-1 before proceeding.

For a detailed diagram of electrical components, see Chapter 10.

1. Disconnect all electrical connections to the board.
2. Remove the four mounting bracket screws.
3. Lift the old pcb and mounting bracket/ heat sink assembly from the ASU.  
*Note:* Do not attempt to separate the pcb from its mounting bracket/ heat sink. It is all one assembly.
4. Remove the ASU configuration plug from the old pcb.
5. Place the new pcb and mounting bracket/ heat sink assembly in the ASU.
6. Re-install the four mounting bracket screws.
7. Re-install electrical connectors onto the board (refer to drawing on pg. 7-2, if necessary).
8. Re-install the ASU configuration plug onto the new pcb.



## To Access the Pump or Motor



### **DANGER HOT SURFACE/ HIGH VOLTAGE**

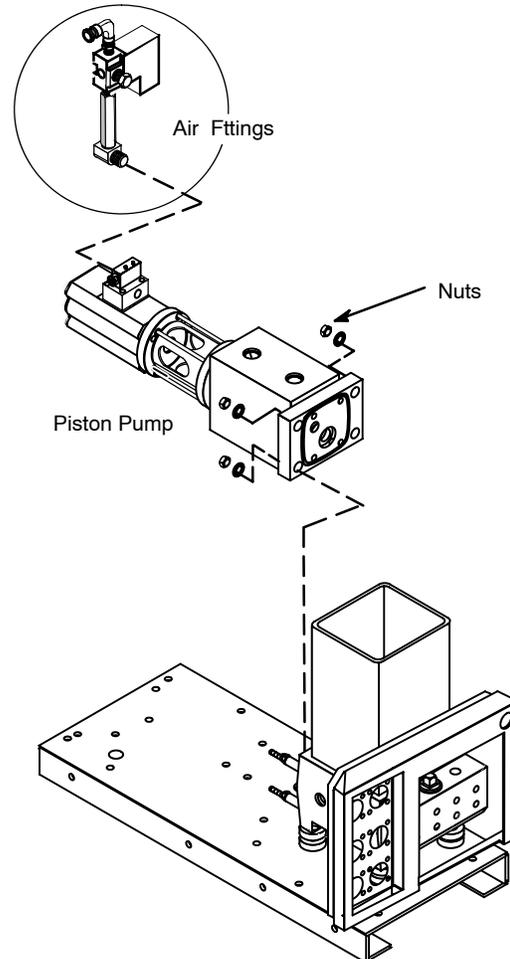
If the pump is not operable but the heating system will function, raise the temperature of the application system to the operating temperature to aid in the pump disassembly process. Otherwise, a heat gun or other controlled heating method is recommended to melt hardened hot melt material. Never use a torch or an open flame on any of the components of the application system. Once the system is up to temperature, disconnect all incoming power before proceeding.

Remove the pump and electronics cover. Remove the access cover. Remove the screw located on the top of the front end cover which allows it to fully open on its hinge. Turn off the filter shutoff valve.

#### **a. Piston Pump Removal:**

1. Turn OFF air pressure, then disconnect the air line from the solenoid valve mounted on the top of the airmotor.
2. Disconnect the harness that runs from the solenoid to the terminal strip. Disconnect the ground wire.
3. Remove the four 10mm nuts, lockwashers and flat washers that connect the pump to the hopper, using a special thin wall deep socket.
4. Remove the pump/ airmotor assembly from the end of the unit.

*To re-assemble:* tighten the pump assembly nuts and lockwashers into the hopper. Torque should be approximately 40.7 Nm (30 foot/lbs) at room temperature. With pump and hopper at 177°C (350°F), the maximum allowable torque on pump assembly nuts is 33.9 Nm (25 foot/lbs). A Piston Pump Rebuild Kit is available.



### **Note on the Cast-in Heaters**

The two cast-in heaters installed in the base of the hopper are not replaceable and will last the life of the ASU.

### **Re-Assembly Procedures**

Unless noted, the ASU's re-assembly is simply the reverse sequence of the disassembly procedures. However, the following "cautions" should be followed (whenever they apply) for proper re-assembly:



**CAUTION:** In general, all *O-RINGS AND SEALS* should be replaced whenever hot-melt equipment is re-assembled. All new o-rings should be lubricated with o-ring lube (PN N07588).

**CAUTION:** *TAPERED PIPE THREADS* are found on air line fittings used with the pump air supply and on the outlet filter manifold. Apply thread sealant (PN N02892) whenever tapered pipe threaded parts are re-assembled.

**CAUTION:** *SOME FITTINGS* used for adhesive on the ASU have straight threads and o-ring seals. Use of thread sealant is not necessary with these parts, but the o-ring seals should be clean and lubricated. Tighten straight-threaded parts and fittings until their shoulders are firmly seated against the pump body (or other surface). Excessive torque may damage straight-threaded parts and the use of power wrenches is not recommended.

**CAUTION:** *HOT-MELT RESIDUE* should be cleaned from parts before they are re-assembled, particularly from threaded parts. As a precaution against adhesive residue preventing proper re-assembly, threaded parts should always be re-tightened at operating temperature.



## Chapter 9 AVAILABLE OPTIONS & ACCESSORIES

### **Pressure Gauge Kit: PN 101175**

An optional analog pressure gauge can be mounted on the outlet filter manifold. Reading the adhesive pressure at the manifold, rather than in-line on a hose, allows for more precise monitoring of system pressure. It is also useful for troubleshooting and maintenance.

The gauge is installed at one of the adhesive ports on the manifold (see illustration on page 3-4). There is no “dedicated” port for the gauge, any one of the three ports on the manifold may be used. Fittings are included in the kit.

### **Filter Option:**

#### **40 Mesh Outlet Filter: PN 101246**

Some situations call for a coarser mesh outlet filter. A coarser filter stops large particles from entering the system while allowing fast adhesive flow. Standard equipment on Dynamini N22 is a 100 mesh filter (PN 101247).

### **Pump Options and Accessories:**

#### **Piston Pump Repair Kit: PN 105328**

The Piston Pump Repair Kit contains the following items needed to rebuild the 12:1 piston pump:

PN	Description	Qty.	PN	Description	Qty.
L16569	Bearing & Shaft Seal Kit	1	N00183	O-ring, 016	1
108772	O-ring, Adapter Plate	1	N01614	O-ring, 910	1
108700	Lube, Seal, 1/4 oz.	1	N00190	O-ring, 024	1
N01703	Fitting	3	N01702	O-ring, 904	3
N01618	Fitting	1	N00187	O-ring, 020	1
N07121	Ring, Seal, 111	1	069X270	O-ring, 025	1

#### **Piston Pump Rebuild Kit: PN 109969**

This kit contains a PN 105328 Pump Repair Kit, a PN 109968 Pump & Airmotor Seals Kit, a L16534 Piston, a L21189 Inlet Check Valve Assembly and a L21188 Outlet Check Valve Assembly.

#### **Piston Pump Bearing and Shaft Seal Kit: PN L16569**

This kit contains all items needed to replace the piston pump’s shaft seal and bearing, including seals, o-ring, pump shaft bearing and retaining ring. A seal pedestal and o-ring lubricant are also included.

#### **Dual Piston Pump/ Air Motor Assembly Model: PN 112674**

The C22 ASU can accommodate two piston pumps. When two pumps are employed, both work together as a pair to double adhesive output. The standard ASU uses one pump, therefore an additional 12:1 pump is required to complete the pair.

### **Water-Resistant Kit Assembly: PN 112212**

#### **Upgrade Kit only: PN 112212**

Existing C22 ASU's may be field-retrofitted with the installation of a water-resistant upgrade kit which uses seals and stainless steel fasteners.

<b>PN</b>	<b>Description</b>	<b>Qty.</b>	<b>PN</b>	<b>Description</b>	<b>Qty.</b>
N00198	O-ring	2	069X064	O-ring	3
018X031	Ball Bearing	5	078F017	Ring, Clip	4
069X061	Pump Shaft Seal	1	078I001	Key, Woodruff	1

### **Controller Options**

#### **Seven-Day Scheduler**

This option enables the controller to provide scheduling of ON, OFF and STAND-BY operating modes for the C22 ASU system at the keypad. Up to ten events may be scheduled. It therefore allows the operator to program ON and OFF heating cycles which coincide with his production schedule throughout the work week. The scheduler helps conserve electricity usage and functions also as an additional safety feature.

#### **Serial Communication (PC Link/ Remote I/O Interface)**

Bi-directional data transfer to a remote computer is available for the controller. The ASU's standard RS232 serial port connection allows remote interface up to 50 meters from the controller. This connection enables all system parameters to be monitored and/ or controlled from the remote station.

**Recommended Spare Parts List**

Category	Part No.	Description	Qty.
<b>Electrical:</b>	108566	Fuse, 6.3 A/ Super Fast 5x20 (temperature zones)	20
	102762	Fuse, 1 A, fast blow (pc board)	5
	110720	RTD Sensor, N120	1
	104166	Overtemp Switch Assembly	1
	112426	Printed Circuit Board & Heatsink Assy.	1
	110747	Rocker Switch (control panel on/ off)	1
	112470	Battery (for optional 7-Day Scheduler)	1
	111941	Circuit Breaker, 15a	2
<b>Filters:</b>	101246	Filter Basket, 40 mesh/ 420 micron (optional)	2
	101247	Filter Basket, 100 mesh/ 149 micron (standard)	2
	102752	Primary Filter Assembly (filter shut-off, standard)	1
	113774	Filter Shut-Off Assembly (filter shut-off, dual pump option)	1
	006C024	Filter Nut	1
<b>Misc:</b>	L15653	Kit, Flushing Fluid, 1 gallon	1
	108700	TFE Lubricant	2
	N00210	O-ring 912	1
	069X058	O-ring 028 (filter plug)	1
	N00181	O-ring 014	6
	N00192	O-ring 032 (outlet filter/ manifold)	1
	N00188	O-ring 022	1
	N00196	O-ring 111	6
	105610	Filter Regulator Asy.	1
	101840	Relief Valve	1
<b>Kits:</b>	L16569	Piston Pump Bearing & Shaft Seal Kit	1 per pump
	105328	Piston Pump Repair Kit	1 per pump
	109969	Piston Pump Rebuild Kit	1 per pump
	109982	Pressure Relief Valve Repair Kit	1 per pump



## Chapter 10 COMPONENT ILLUSTRATIONS & BILLS OF MATERIAL

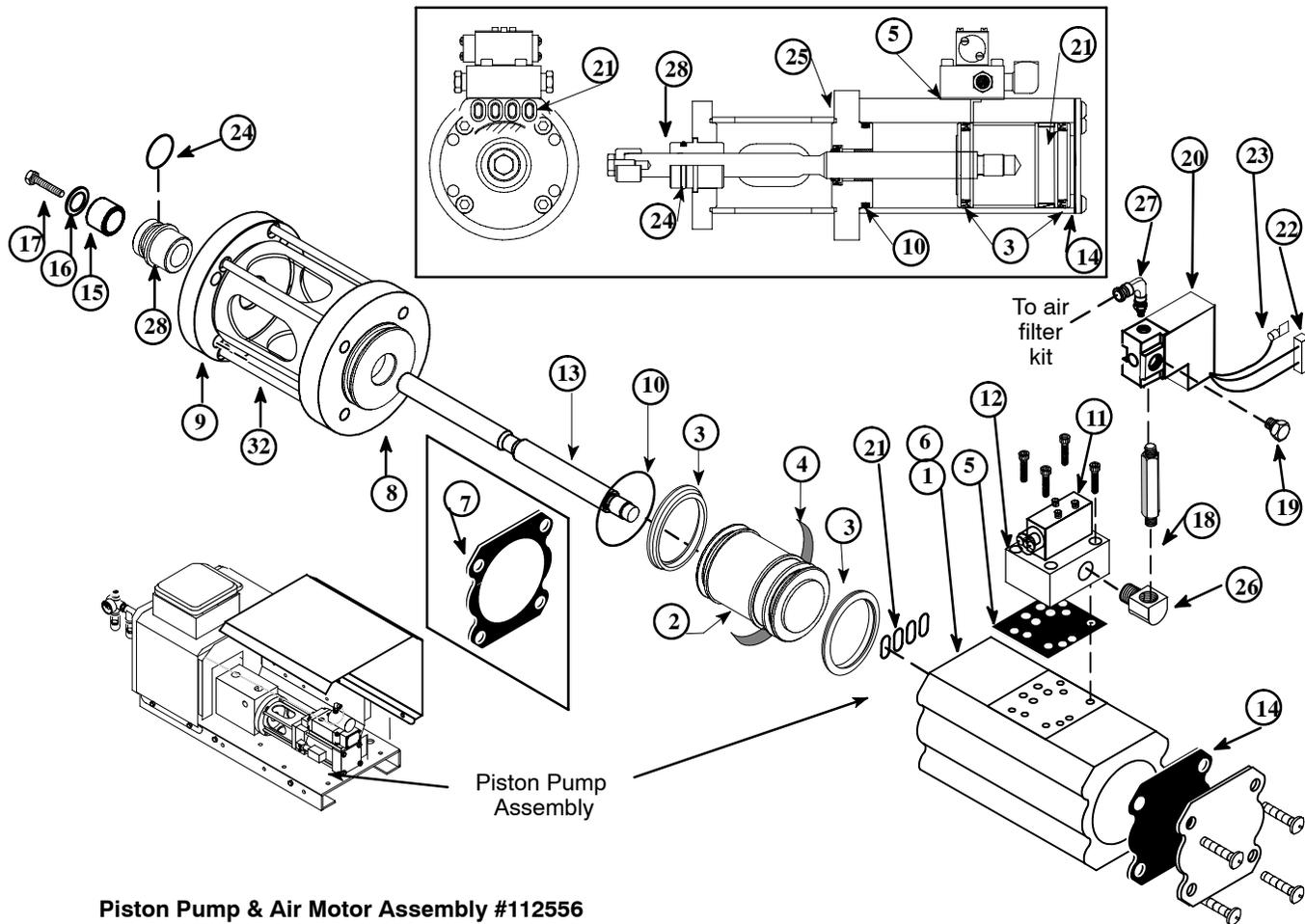


### **WARNING**

All parts must be periodically inspected and replaced if worn or broken. Failure to do this can affect equipment's operation and can result in personal injury.

### ***Chapter Format***

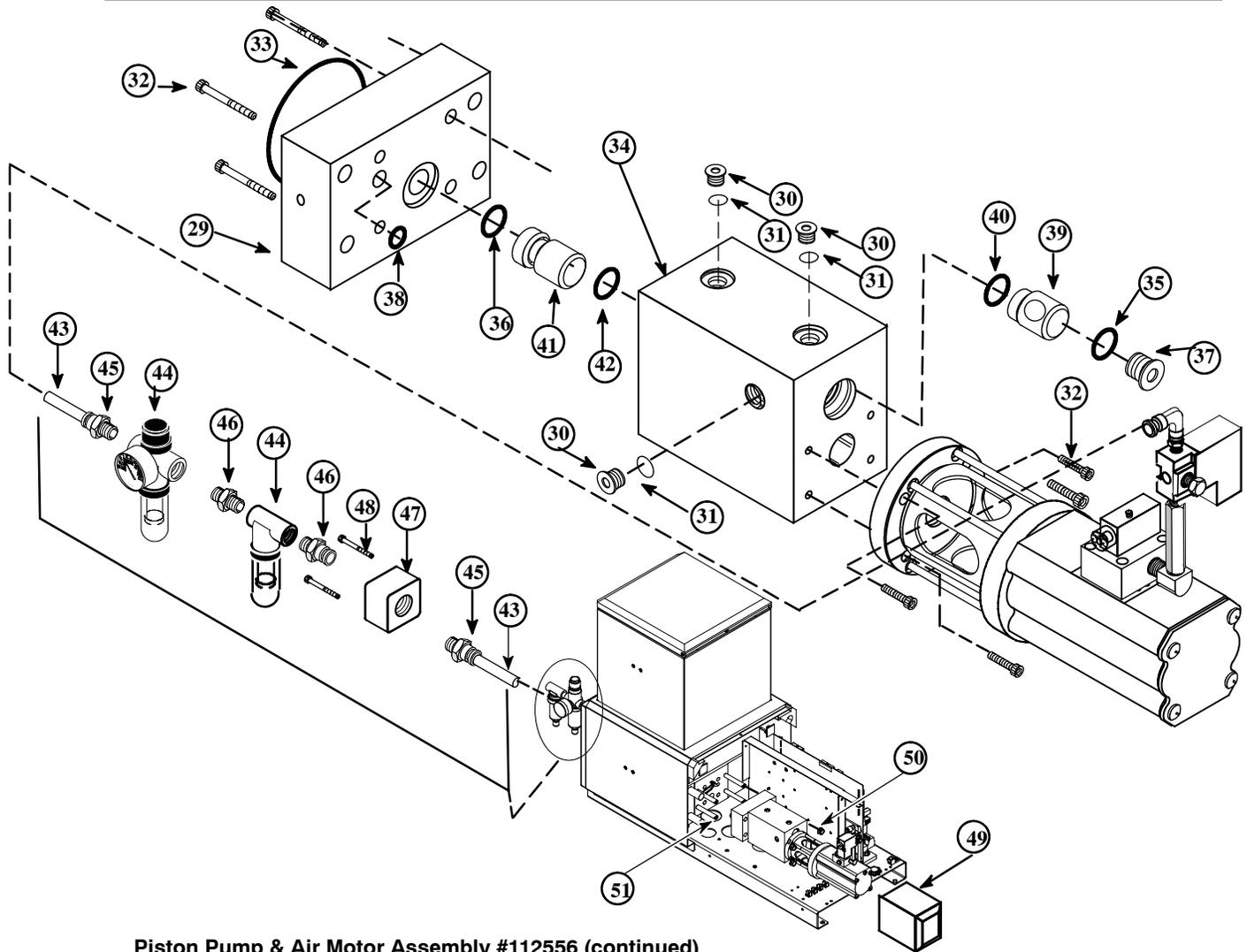
This chapter contains the component illustrations (exploded-view drawings) for each assembly of the C22/45 ASU. These drawings are useful for finding part numbers as well as for use when maintaining or repairing the unit.



**Piston Pump & Air Motor Assembly #112556**

Item	Item Number	Description	Qty
1	109970	Air Motor Assembly (replaces 105070)	1
2	NPN	2" Pump Piston	1
3*	NPN	2" Piston Seal 60030-4238	1
4*	NPN	2" Wear Strip 60624	1
5*	108379	Valve Gasket	1
6	NPN	2" Strke Pump Tube	1
7*	NPN	Pump Gasket A01046-02 (old style Pump only)	1
8	NPN	Mounting Flange A01046-11	1
9	105726	Mounting Flange with Float Seal	1
10	NPN	O-ring, -224	1
11	104437	Valve	1
12	106931	Valve Manifold	1
13	109953	Pump Shaft ( <i>Pump Shaft Old, 105070 Assembly</i> )	1
14*	NPN	Gasket Air Motor Cap	1
15	L16534	Piston, Pump Shaft	1
16*	N06918	Bellevue Washer, 1/4	1
17*	N01739	1/4-20 x .62 HHC Screw	1
18	072X254	Solenoid Nipple	1
19	030B108	Breathing Vent	1
20	112583	Solenoid Assembly, 240v	1
21		O-ring, -011	4
22	103166	2 Pole Connector	1
23	106933	Ground Wire ( included with item 20)	1
24	N06913	O-ring, -118	1
25	NPN*	Seal, Rod Wiper,. 625 Viton	1
26	072X098	Street Elbow, 1/8 NPT	1
27	N06436	Elbow, 1/4 tube, Push-in x 1/8	1
28*	L16569	Seal And Bearing Assembly	1

Note: \*These items are included in Piston Pump Rebuild Kit 109969 (replaces 105330\*\*). (cont.)

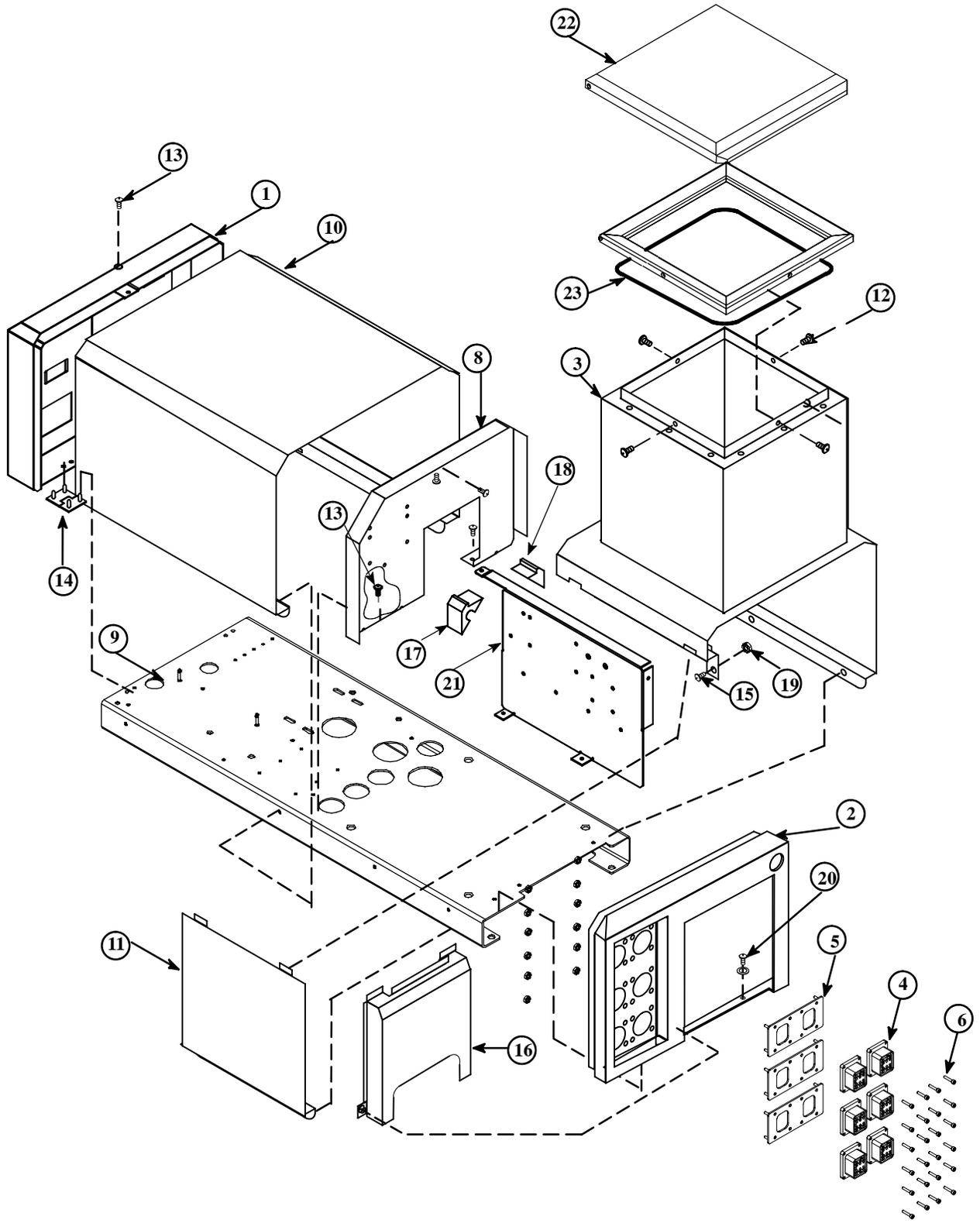


**Piston Pump & Air Motor Assembly #112556 (continued)**

Item	Part number	Discription	Qty.
29	100750	Adapter Plate	1
30 *	N01703	Plug Fitting	3
31 *	N01702	O-ring , -904	3
32	101156	M6 x 20 SHC Screw (Note: torque to 90 in/lbs (10nm))	8
33 *	108772	Pump Seal	1
34	100344	Piston Pump Body	1
35 *	N01614	O-ring, -910	1
36 *	N00190	O-ring, #-024	1
37 *	N01618	Plug Fitting	1
38*	N00183	O-ring, -016	1
<b>39 *</b>	<b>107011</b>	<b>Outlet Check Valve, Service Assembly</b> (available as an assembly only)	<b>1</b>
40	N07121	Square Seal, -111	1
<b>41 *</b>	<b>107010</b>	<b>Inlet Check Valve Assembly</b> (available as an assembly only)	<b>1</b>
42	N00187	O-ring, -020	1
		<b>Fittings For Coalesing Air Filter</b>	
43	N07677	TFE Tubing, .250 Diameter	2.5'
44	100380	Filter Assembly	1
45	N06430	Brass Male Connect Fitting	1
46	N01067	Brass Nipple	2
47	101888	Air Block	1
48	105113	M4 X 8 SHC Screw	2
	<b>Note:</b>	<b>Not included in this assembly</b>	
49	107352	Pump Cover	1
50	104158	M10 Nut	4
51	105276	M10 x 800 mm Stud (Pump Mounting)	
	<b>Note:</b>	<b>*These items are included in Piston Pump Rebuild Kit 109969 (replaces 105330).</b>	

## Bill of Materials for C22/ C45 Cabinet Assembly

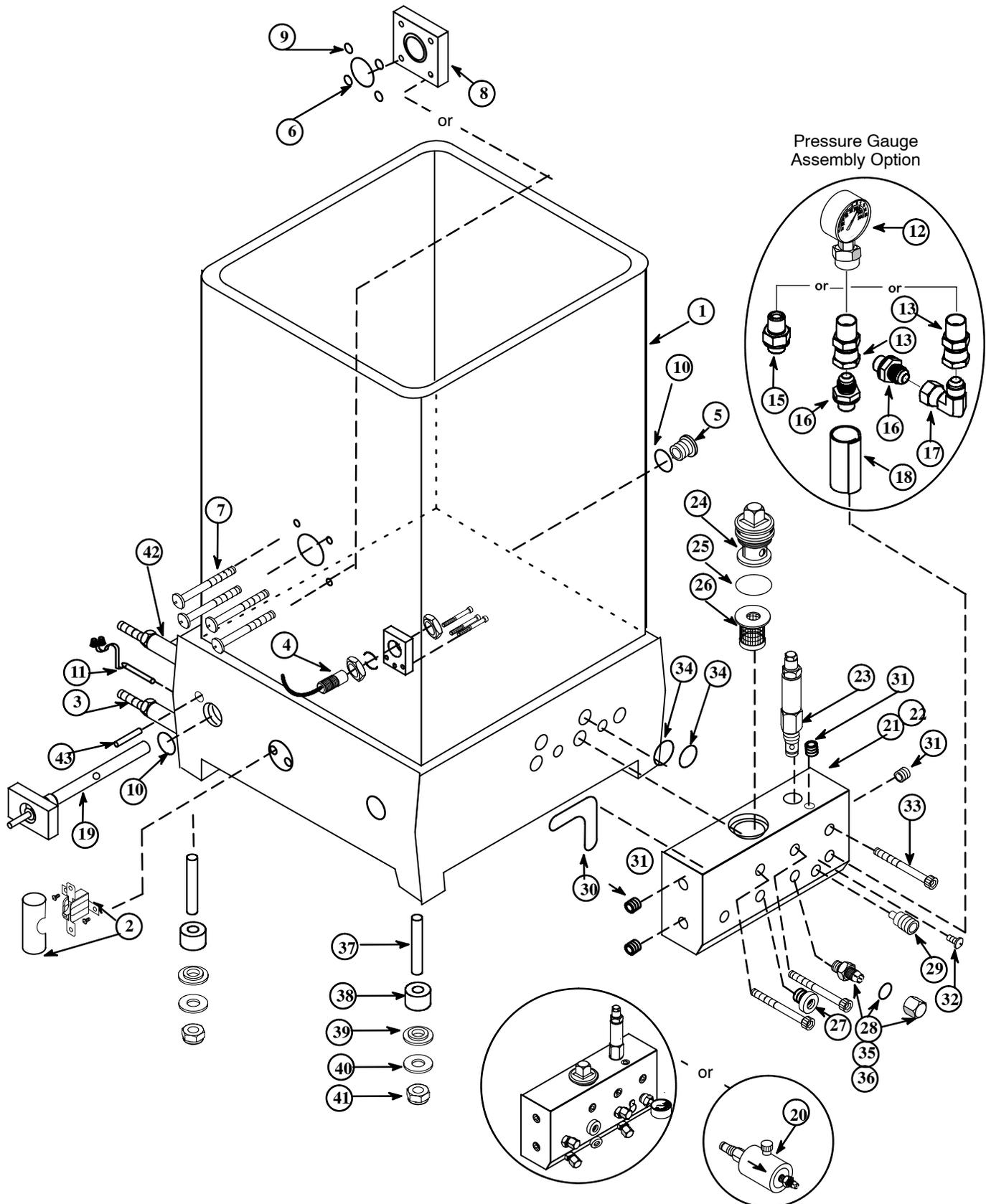
<i>Item No.</i>	<i>Part Number</i>	<i>Description</i>	<i>Qty.</i>
1	112406	Front Cover End (included in PN 112557 Front Panel Assy.)	1
2	110333	Rear Cover End (for use with Nord connectors)	1
3	100891	Hopper Cover, C22	1
	101889	Hopper Cover, C45	1
4	109721	Receptical 12-POS	6
5	110330	Receptical Mounting Plate, Nord Compatible	3
6	103537	M3 x 0, 5 x 16mm, SHCS	24
7	108500	M3-0.5 Nut, Keps	24
8	106375	Heat Shield	1
9	111422	Base C22, C45	1
10	111268	Pump and Electrical Cover	1
11	100888	Access Cover (S22, S45)	1
12	115051	M4 x 6mm Screw	4
13	107389	M4 x 8mm Pan Head Screw	4
14	100749	Hinge (included in PN 112557 Front Panel Assy.)	2
15	105115	6-32 Phillips Head Screw	1
16	109796	Cover, Hose, Single Filter	1
17	107350	Insulator	1
18	107351	Insulator	1
19	105114	6-32 Nut	1
20	105112	M4 x 0.7 x 10mm Hex Head Screw	3
21	106376	Pump and Electrical Divider Panel	1
22	<b>103290</b>	<b>Lid Assembly (available as an assembly only)</b>	<b>1</b>
23		Hopper Lid Seal (included in PN 103290 Lid Assembly)	1



Component Illustration: C22 Cabinet Assembly

## Bill of Materials for C22/ C45 Melt, Filter and Pressure Relief Section

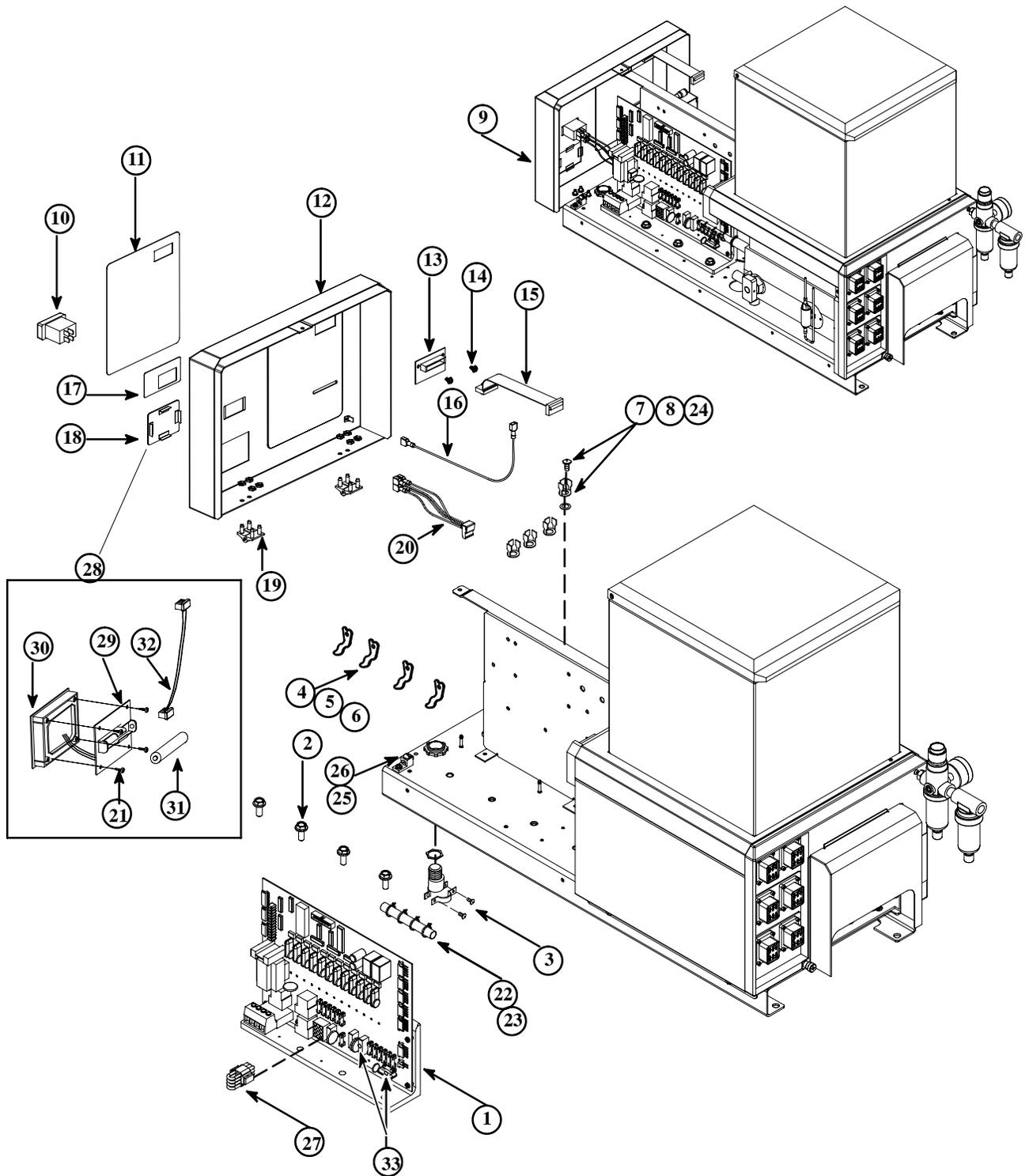
Item No.	Part Number	Description	Qty.
1	100437	Hopper, C22, 240v	1
	101891	Hopper, C45, 240v	1
2	104166	Mechanical Overtemp Thermostat Assembly	1
3	not replaceable	Cast In Heater	4
4	107193	Level Control (option)	1
5	N00094	Fitting, Plug, #12	1
6	N00192	O-ring, -032	1 or 2
7	108297	M8-1.25X20 HH Screw	4 or 8
8	105149	Block-off Plate (used in place of grid)	1 or 2
9	N00181	O-ring, -014	4 or 8
10	N00210	O-ring, -912 (included with filter shut-off)	
11	110720	Temperature Sensor	1
	<b>101175</b>	<b>Pressure Gauge Assembly (option)</b>	<b>1</b>
12	101174	Pressure Gauge (option)	1
13	104325	Fitting Adapter, #6 x 1/4 NPT (option)	1
14	not used		
15	103330	Fitting, Adapter, 1/4 BSPP x 1/4 NPT	1
16	101624	Fitting, Adapter, #6 JIC x 1/4 BSPP (includes N00196 O-ring)	1
17	N07830	Fitting, 90 deg., #6 JIC Male x #6 JIC Female	1
18	102987	Insulator Cuff	1
<b>19</b>	<b>102752</b>	<b>Filter ShutOff Assembly</b>	<b>1</b>
<b>20</b>	<b>104890</b>	<b>Flow Control Assembly (option)</b>	<b>1</b>
<b>21</b>	<b>105614</b>	<b>4-6 Hose, Single Pump, Filter Manifold Assembly (option)</b>	<b>1</b>
22	100896	Filter Manifold (for PN 105614 assembly)	1
23	101840	Pressure Relief Valve	1
24	006C024	Filter Nut	1
25	069X058	O-ring, -028	1
26	101247	Filter Basket, 100 mesh/149 micron	1
27	101625	1/4-18 BSB Plug	4
28	101624	BSB Hose Fitting	4
29	104852	Drain Plug M10 x 12mm	1
30	N00192	O-ring, #-032	1
31	N00754	1/4 Level Seal Plug	4
32	101833	10-32 x 1/2 Tamper Proof Screw	1
33	105110	8 x 55mm SHC Screw (filter block to hopper)	3
34	N00181	O-ring, -014	2
35	N08024	Cap Nut	4-6
36	N00196	O-ring, -111	4-6
37	105061	M8 x 50mm Stud	4
38	105134	Spacer	4
39	L00475	Insulation Washer	4
40	N00688	5/16 Washer	4
41	105126	M8 Nut	4
42	102411	Cap, High Temp.	4
43	105097	M6 x 30mm Set Screw	1



Component Illustration: C22 Melt, Filter and Pressure Relief Section

## Bill of Materials for Front Panel and Electrical Components Assembly

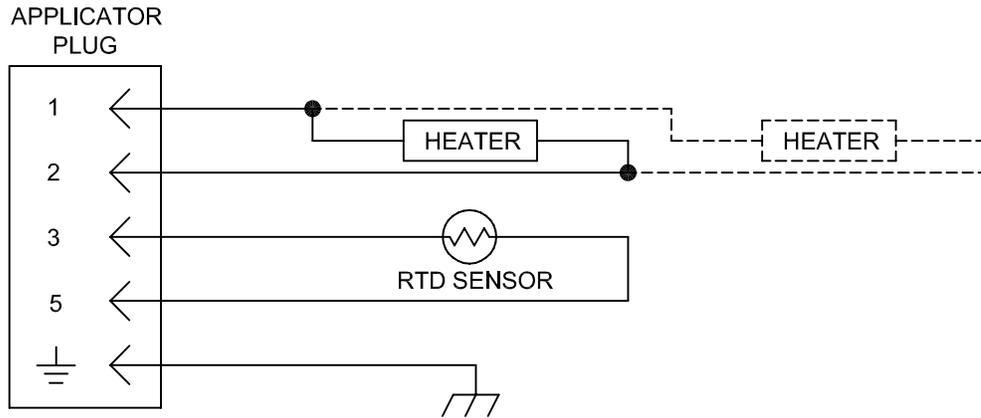
<i>Item No.</i>	<i>Part Number</i>	<i>Description</i>	<i>Qty.</i>
1	112426	Heat Sink PCB Assembly	1
2	108296	M8-1.25 x 16 Hex Head Flange Screw	4
3	105199	3/4 NPT Clamp Type Connector	1
4	106615	Cable Tie Velcro	1
5	102446	M4 x 10mm SHC Screw	2
6	105164	Washer #8	1
7	103404	M3 x 10mm SHC Screw (ground spade)	4
8	106812	Terminal ,Faston Tab, .25" (ground spade)	4
9	<b>112557</b>	<b>Front Panel Assembly</b>	<b>1</b>
10	110747	Switch, DPDT, Rocker, Sealed	1
11	112425	Switch Membrane	1
12	112406	Front Panel	1
13	112428	PBC Display Assembly	1
14	107389	M4 x 0.7 x 8, KEPS Screw	2
15	106379	Cable Assembly	1
16	110785	Wire Assembly	1
17	111985	Power Switch Label	1
18	112552	Cover Plate	1
19	100749	Hinge	2
20	110749	Power Switch Cable Assembly	1
21	078A316	Self-Tapping Screw (part of 112540)	4
22	048J109	Cable Tie	10
23	104858	Insulator	1
24	105327	Internal Tooth Lock Washer	5
25	105562	Ground Lug 84 GA	1
26	107208	M5 x 0.8 x 8 mm PH Pan Head Screw	1
27	116812	Power Configuration Plug Set	1
28	<b>112540</b>	<b>7-Day Scheduler Kit (Option)</b>	<b>1</b>
29	112468	PCB Assembly, 7-Day Scheduler	1
30	112469	7-Day Scheduler Module	1
31	112470	Battery, AA-size, Long Life	1
32	112541	Cable Assembly	1
33	111941	Circuit Breaker, 15A	2



Component Illustration: Front Panel & Electrical Components Assembly



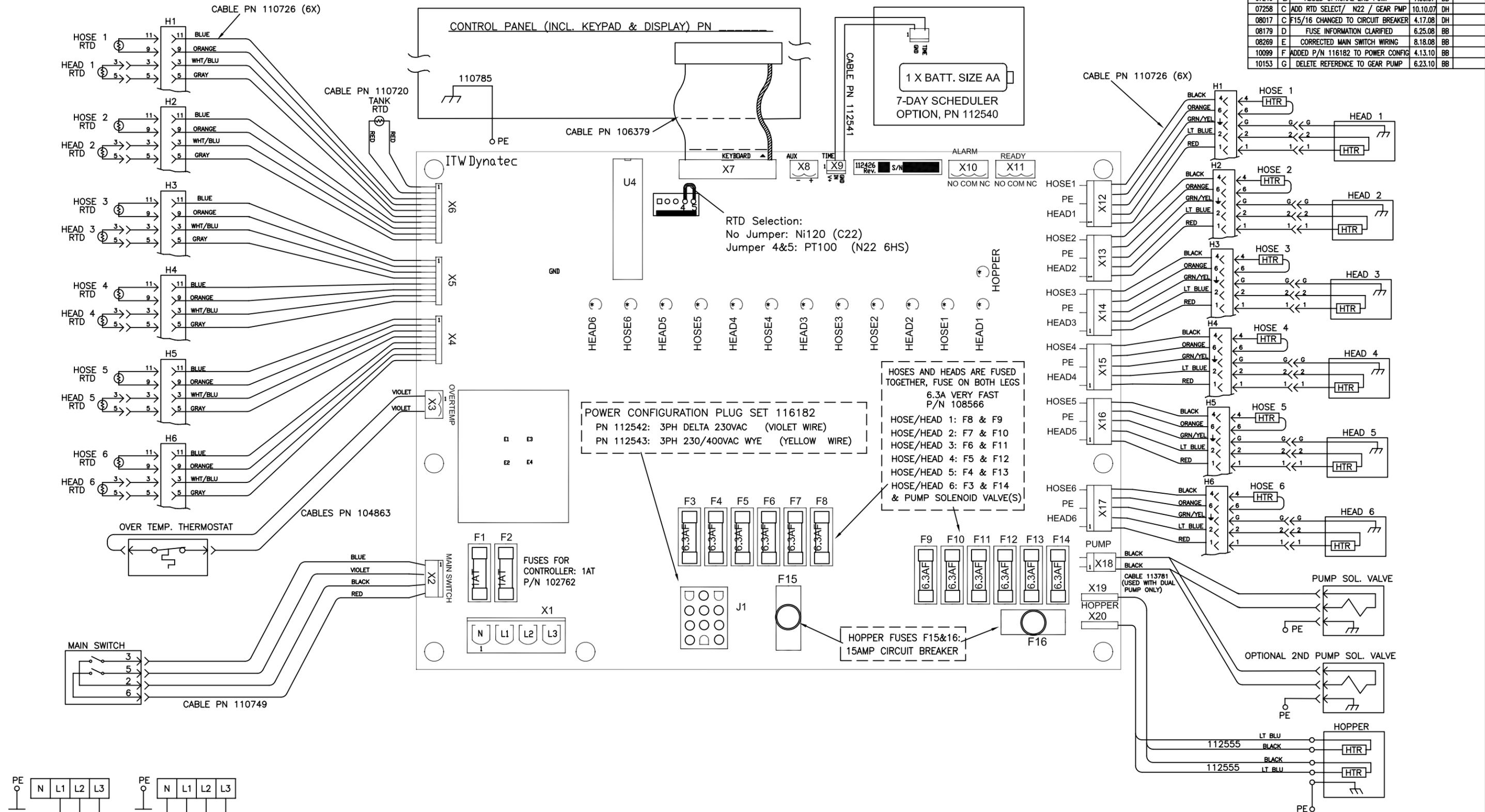




SCHEMATIC, CHALLENGER APPLICATOR  
WITH 120 OHM Ni SENSOR

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CONSENT OF ITW/DYNATEC.

REV. NO.		112544		SH	REV	G	
REL.	REV.	DESCRIPTION	DATE	BY	APPROVED		
N05086	A	ORIGINAL RELEASE	12.09.05	DH			
07240	B	ADDED OPTIONAL 2ND PUMP	7.06.07	BB			
07258	C	ADD RTD SELECT/ N22 / GEAR PMP	10.10.07	DH			
08017	C	F15/16 CHANGED TO CIRCUIT BREAKER	4.17.08	DH			
08179	D	FUSE INFORMATION CLARIFIED	6.25.08	BB			
08269	E	CORRECTED MAIN SWITCH WIRING	8.18.08	BB			
10099	F	ADDED P/N 116182 TO POWER CONFIG	4.13.10	BB			
10153	G	DELETE REFERENCE TO GEAR PUMP	6.23.10	BB			



USED ON N22, C22	APPROVALS DH	DATE 12.09.05	FOR MACHINING STANDARDS AND SYMBOLS, SEE ITW/DYNATEC SPEC. AGS800		U/M EA
CHECKED	COMPUTER DESCRIPTION(25 CHARACTERS) WIRE DIAG, C22 ASU	SCALE 1:1	WIRING DIAGRAM C22 ASU 112544 CAD DRAWING		STATUS E
DO NOT SCALE DRAWING			REV. NO. 112544	GROUP G	SHEET 1 of 1



## Optional Seven-Day Scheduler

**GB** Operating instructions EM/1 digi 20  
WA-EKf 3887/02.01/S.NMS/D.BAU/00/00335/80 10.08.59 7

### 1. Notets on safety

Installation must be performed and inspected by a specialist or under his supervision.

#### For assembly:

- Suitable for use in ambient conditions with normal contamination.

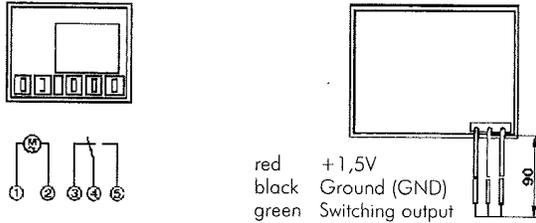
#### For operation:

- We place very exacting demands on the electromagnetic compatibility (EMC) of the electronics when developing our products. The interference immunity achieved as a result significantly exceeds the current requirements of the corresponding EN standards.
- In individual cases, check whether additional protective measures are still necessary, e. g. installation of appropriate components (varistor, suppresser diodes, RC elements).
- In extreme cases, installation of another subassemblies is recommended, e. g. isolating relay or power contractor, mains suppresser filter.

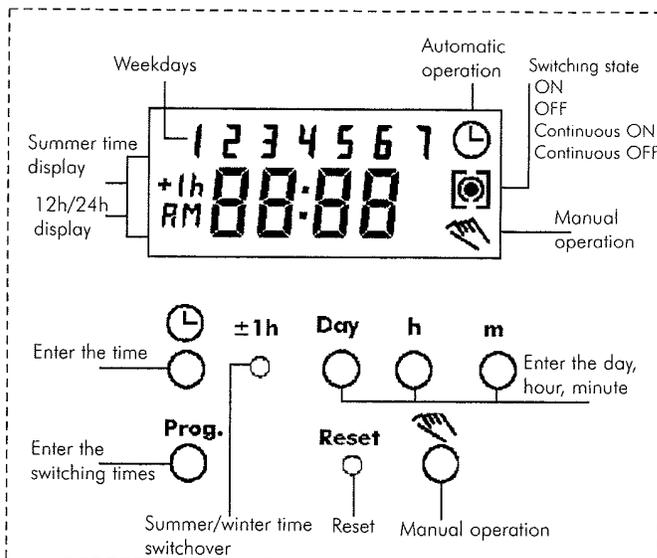
#### For operation:

- No metallic, pointed objects (e. g. needles) may be used on keys which are operated with a tool.

### 2. Connection



### 3. Display/control elements



### 4. Putting into operation



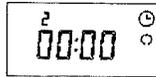
Bring the electronics into a defined state.

Press Reset 1x.

For approximately 2 seconds you see all display elements, followed by the defined state.

The digits for the weekdays flash.

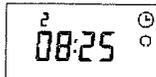
#### Setting the time and date



Press the -key and keep it pressed.

Set the weekday with the Day key.

1 = Monday, 2 = Tuesday... 7 = Sunday



with the h key hours

with the m key minutes

#### Notes:

If you press the keys h and m for more than 2 seconds, the digits are incremented more quickly.

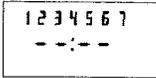
Release the -key.

The colon now flashes every second.

### 5. Entering switching commands

You define the weekdays, the switching times and the switching state.

Symbol: - ON, - OFF



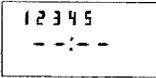
#### Selecting free memory spaces:

Press the Prog key as often as necessary until the appears (The digits 1 to 7 are visible). Release the key.

#### Setting the weekdays

with the Day key

1 = Monday, 2 = Tuesday, ... 7 = Sunday



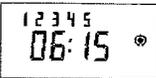
Select the defined combination of the weekdays or single days

Example: Monday ... Friday

#### Setting the switching times:

with the h key hours

with the m key minutes



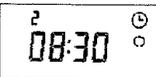
#### Setting the switching state:

with the -key

- ON or - OFF

Press the Prog key 1x

The input is ended.



Enter the next switching command (see above)

or Press the -key 1x.

The display shows the current time.

#### Note:

After programming is complete, and you return the timeswitch to the current time display by pressing the key, the timeswitch will not automatically switch to the correct state for the current time. You must select the output required with the key

= manual mode ON

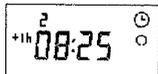
= manual mode OFF

The timeswitch will correctly follow subsequent switching commands according to the programme entered, as they occur in real time.

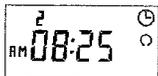
## Optional Seven-Day Scheduler, cont.

### 6. Auxiliary functions

- Summer time / winter time switchover
- 12h/24h display
- Read - Change - Delete

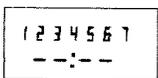


**Summer time / winter time switchover**  
Press the key +/- 1h once.  
+1h appears in the display.

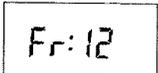


**12h/24h display**  
If you press the keys "+/-1h" and "h" simultaneously, the display is switched over. AM or PM appears in the display.

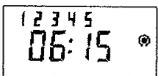
**Read - Change - Delete**  
• the switching commands



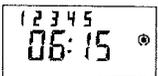
**Read**  
Press the Prog key in steps.  
Each step shows a switching command until the end of the program.



Then:  
• a free memory location  
• Number of free memory locations



**Change**  
Press the Prog key in steps until you come to the switching command you want to change - with the keys Day, h, m.



**Delete - Individual switching commands**  
Press the Pog key in steps until you reach the switching command which you want to delete.

Press the h or m key as often as necessary until ---- is displayed.

Press the Prog key and keep it pressed for approx. 3 seconds. The switching command is deleted.

### 7. Manual switch function (☞ key)

This changes the current switching state without affecting the programmed memory. During timed operation, use the ☞ key to select settings as described in the table below.

☺ = Automatic	☞ = Manual mode	☺ = Continuous operation
☺ = OFF	☞ = ON	☺☞ = Continuous ON
☺ = ON	☞ = OFF	☺☞ = Continuous OFF
The switching state corresponds to the programme entered.	The switching state is overridden, but resets with the next timed instruction in the memory.	The output will remain in the ON or OFF condition permanently, until the ☞ key is used to restore the automatic function

### 8. Technical Data

	<b>1,5 V CMOS</b>	<b>230 V</b>
Dimensions (H x W x D mm)	51 x 64 x 13,5	51 x 64 x 45
Switching panel cut-out (mm)	47 x 60	47 x 60
Installation depth (mm)	14	38
Weight	50 g	95 g
Connection	1.5 V	220-240V
Power consumption (typ.)	15 µA	4,4 VA
Can be approved in accordance with EN60730	yes	yes
Maximum switching capacity	100 mA at 1.5 V AC	10 A at 250 V AC
Minimum switching capacity		100 mA at 20 V AC
Switching output	CMOS	Floating, change-over contact
Ambient temperature	-10 ° ... + 55 °C	-10 °C ... +55 °C
Protection class (DIN40050)	User-related	User-related
Running accuracy (typ.)	+/- 2.5 s per day at 20 °C	
Running reserve	none	100 hours
Charging duration	-	140 hours
Shortest switching time	1 minutes	1 minutes
Programmable every	minutes	minutes
Display	LCD	LCD
Channels	1	1
Memory locations	20	20
Manual switch, override	yes	yes
Switching state display	yes	yes
Connection type	3 single litz wires	5 x DIN flat connectors