ITW Dynatec®

Adhesive Application Solutions | ISO 9001 Quality Management System Certified

SIMPLICITY

ADHESIVE MELT & SUPPLY UNIT

With Piston Pump and V6 LCD Controller V2.00

Technical Documentation, No. 20-77, Rev.5.26

English - Original instructions

ITW Dynatec
An Illinois Tool Works Company
www.itwdynatec.com

Information about this manual

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 Dynatec 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.

NOTICE:
Most common screws, nuts and washers called out in the manual are not for sale and they can be obtained locally at your hardware Store.
Specialty fasteners are available by contacting ITW Dynatec's Customer Service.

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Manual Revision 125

Chapter 1
Declaration of Incorporation / Conformity

EC declaration of conformity

according to the Machinery Directive 2006/42/EC, Annex II 1. A

Original

The manufacturer bears the sole responsibility for issuing this declaration of conformity

ITW Dynatec

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TN 37075 Hendersonville

Person established in the Community authorised to compile the relevant technical documentation

Andreas Pahl

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Industriestraße 28

40822 Mettmann

Description and identification of the machinery

Product / Article	Adhesive supply unit
Project number	PRJ-2016-11-23-0001
Commercial name	Dynamelt Simplicity
Model	Simplicity
Additional information	Including Transformer units.
Function	Melting and delivery of hot melt adhesives

It is expressly declared that the machinery fulfils all relevant provisions of the following EU Directives or Regulations:

2014/30/EU	Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility (recast) Published in 2014/L 96/79 of 3/29/2014
2014/35/EU	Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits Published in 2014/L 96/357 of 3/29/2014
2009/127/EC	Directive 2009/127/EC of the European Parliament and of the Council of 21 October 2009 amending Directive 2006/42/EC with regard to machinery for pesticide application Published in L 310/29 of 11/25/2009
2011/65/EU	Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment Published in 2011/L 174/88 of 7/1/2011

Reference to the harmonised standards used, as referred to in Article 7 (2):

EN ISO 13850:2015	Safety of machinery — Emergency stop function — Principles for design (ISO 13850:2015)
EN ISO 12100:2010-11	Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)
EN ISO 13854:2019	Safety of machinery - Minimum gaps to avoid crushing of parts of the human body (ISO 13854:2017)
EN 60204-1:2018	Safety of machinery - Electrical equipment of machines - Part 1: General requirements (IEC 60204-1:2016, modified)

Hendersonville, 3/7/2023

Place, Date	Signature Heidi Rushton VP/GM	Signature Michael Wallner Operations Manager EMEA & Asia

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Chapter 2
Safety Instructions

2.1 General Considerations

- **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.**

Read and adhere to the manual!

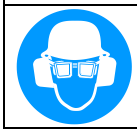
1. Read and follow these instructions.
   Failure to do this could result in severe personal injury or death.
2. Keep the binding rules for accident prevention valid for your country and the place of installation. Also, keep the approved qualified technical rules for safety-conscious and professional work.
3. Additional safety instructions and/ or symbols are located throughout this manual. They serve to warn maintenance personnel and operators about potentially hazardous situations.
4. Inspect the machine for unsafe conditions daily and replace all worn or defective parts.
5. Keep work area uncluttered and well lit. Remove all material or things not needed for the production from the workspace of the equipment!
6. All covers and guards must be in place before operating this equipment.
7. Subject to technical modifications without notice!
8. To ensure proper operation of the equipment, use specified electrical and/ or air supply sources.
9. Do not attempt to alter the design of the equipment unless written approval is received from ITW Dynatec.
10. Keep all manuals readily accessible at all times and refer to it often for the best performance from your equipment.

2.2 Warning Labels

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 from ITW Dynatec.

2.3 Safety Symbols in this Manual

Mandatory signs

	General mandatory sign
	Read and adhere to the documentation!
	Switch the unit voltage-free before working! Main switch OFF!
	Wear headgear, protective goggles and ear protection!

	Wear foot guard!
	Wear protective gloves!
	Wear protective clothing!

Warning signs

NOTE: The dangers and risks exist if the corresponding instructions are not heeded and the precautionary measures are not taken!

	**Caution, danger spot!** This sign points to possible dangers for life and physical condition or to possible risks for machine and material or to possible risks for environment. The word **"DANGER"** in addition with this points to possible dangers of life The words **"WARNING" and "CAUTION"** in addition with this sign point to possible risks of injury. The word **"ADVICE"** in addition with this sign points to possible risks for machine, material or environment.

	**Danger, high voltage!** This sign points to possible dangers for life and physical condition caused by electricity. **Risk of injury, mortal danger!**
	**Caution, hot surface!** This sign points to possible risks of burns. **Risk of Burns!**
	**Caution, high pressure!** This sign points to possible risks of injury caused by high pressure. **Risk of injury!**
	**Caution, rotating rolls!** This sign points to possible risks of injury caused by inrunning nip (at rolls). **Risk of injury!**

Prohibition signs

	**Fire danger!** **Smoking prohibited!**

	**Fire danger!** **Fire and open flames prohibited!**

2.4 Safe Installation and Operation

Read and adhere to the manual!

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

2. 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. Hoses should be spaced apart from each other, not making direct contact.

3. Do not use adhesive that is dirty or that may be chemically contaminated. Doing so can cause system clogging and pump damage.

4. 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.

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

6. 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.

7. Never attempt to lift or move the unit when there is molten adhesive in the system.

8. In case of an emergency or exceptional incident, press the power button to the melter in order to stop the unit.

9. Use the unit only as it is intended to.

10. Never let the unit run unattended.

11. Operate the unit only in a faultless and fully functional condition. Check and make sure that all safety devices work in proper form!

	**Smoking, fire and open flames prohibited! Fire danger!** Make absolutely sure that there is no smoking and no fire being lit in the work area!

2.5 Explosion/ Fire Hazard

1. Never operate this unit in an explosive environment.

2. Use cleaning compounds recommended by ITW Dynatec or your adhesive supplier only.

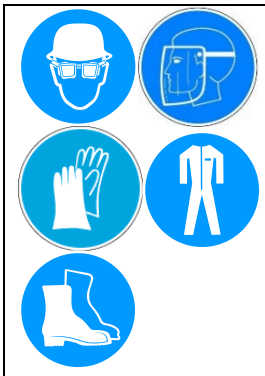
3. Flash points of cleaning compounds vary according to their composition, so consult with your supplier to determine the maximum heating temperatures and safety precautions.

2.6 Choice of Adhesive

DANGER! HARMFUL FUMES!

Substance(s) being processed (e.g., melted, pumped, applied) by ITW equipment is at the discretion of the user and beyond ITW Dynatec's control. Any health effects or other safety-related concerns arising from the melting of those particular substances (e.g., hazardous fumes) is the responsibility of the user to identify and mitigate.

2.7 Eye Protection & Protective Clothing



WARNING
EYE PROTECTION & PROTECTIVE CLOTHING REQUIRED

1. It is very important that you PROTECT YOUR EYES when working around hot melt adhesive equipment!
2. Wear a face shield conforming to ANSI Z87.1 or safety glasses with side shields which conform to ANSI Z87.1 or EN166.
3. Failure to wear a face shield or safety glasses could result in severe eye injury.
4. It is important to protect yourself from potential burns when working around hot melt adhesive equipment.
5. Wear heat-resistant protective gloves and long sleeved, protective clothing to prevent burns that could result from contact with hot material or hot components.
6. Always wear steel reinforced safety shoes.

2.8 Electrical

DANGER HIGH VOLTAGE

1. 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.
2. Disconnect, lockout and tag external electrical power before removing protective panels.
3. A secure connection to a reliable earth ground is essential for safe operation.
4. An electrical 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.
5. Notify the maintenance personnel immediately, if cables are damaged. Provide for exchanging the defective components immediately.

2.9 Lockout/ Tagout

Switch the unit voltage-free before working!
Main switch OFF!

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

2. Be familiar with all lockout sources on the equipment.

3. 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 after removing power before servicing electrical capacitors.

2.10 High Temperatures

WARNING HOT SURFACE

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

2. Face shields (preferred) or safety glasses (for minimum protection), heat-resistant protective gloves and long-sleeved clothing must be worn whenever working with or around adhesive application systems.

2.11 High Pressure

WARNING HIGH PRESSURE PRESENT

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

2. To prevent serious injury from molten adhesive under pressure when servicing the equipment, disengage the pumps and relieve the adhesive system's hydraulic pressure (i.e., trigger the heads, hand-held applicators, and/or other application devices into a waste container) before opening any hydraulic fittings or connections.

3. IMPORTANT NOTE: Even when a system's pressure gauge reads “0” psi, 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.

4. Either of the two High Pressure symbols shown may be used on ITW Dynatec equipment.

5. Keep the given operating pressure.

6. Notify the maintenance personnel immediately, if hoses or components are damaged. Provide for exchanging the defective components immediately.

2.12 Protective Covers

WARNING
DO NOT OPERATE WITHOUT GUARDS IN PLACE

1. Keep all guards in place!
2. To avoid personal injury, do not operate the application system without all covers, panels and safety guards properly installed.
3. Never get your extremities and/or objects into the danger area of the unit. Keep your hands away from running parts of the unit (pumps, motors, rolls or others).

2.13 Servicing, maintenance

1. Only trained and qualified personnel are to operate and service this equipment.
2. Before any service work disconnect the external power supply and the pressure air supply!
3. Never service or clean equipment while it is in motion. Shut off the equipment and lock out all input power at the source before attempting any maintenance.
4. Follow the maintenance and service instructions in the manual.
5. Keep the maintenance rates given in this documentation!
6. Any defects in the equipment that impact safe operation must be repaired immediately.
7. Check screws that have been loosened during the repair or maintenance, if they are tight again.
8. Replace the air hoses in preventive maintenance regularly, even if they have got no viewable damages! Adhere to the manufacturers` instructions!
9. Never clean control cabinets or other houses of electrical equipment with a jet of water!
10. Adhere to the current safety data sheet of the manufacturer when using hazardous materials (cleaning agents, etc.)!

2.14 Secure transport

1. Examine the entire unit immediately after receipt, if it has been delivered in perfect condition.
2. Let damages in transit certify by the carrier and announce them immediately to the ITW Dynatec.
3. Use only lifting devices that are suitable for the weight and the dimensions of the equipment (see drawing of the equipment).
4. The unit has to be transported upright and horizontally!
5. The unit has to cool down to room temperature before packaged and transported.

2.15 Treatment for Burns from Hot Melt Adhesives

Measures after being burned:

1. Burns caused by hot melt adhesive must be treated at a burn center. Provide the burn center's staff a copy of the adhesive's M.S.D.S. to expedite treatment.

2. Cool burnt parts immediately!

3. Do not remove adhesive forcibly from the skin!

4. 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.

5. When working near a hot melt application system, always wear safety shoes, heat-resistant protective gloves, safety goggles and protective clothes that cover all vulnerable parts of the body.

6. Always have first-aid information and supplies available.

7. Call a physician and/or a medical professional immediately.

2.16 Measures in case of fire

1. Please heed that uncovered hot parts of the assembly and molten hot melt may cause heavy burns. Risk of burns!

2. Work very carefully with molten hot melt. Keep in mind that already jelled hot melt can be very hot, too.

3. When working near a hot melt application system, always wear safety shoes, heat-resistant protective gloves, safety goggles and protective clothes that cover all vulnerable parts of the body!

Measures in case of fire:

Wear safety shoes, heat-resistant protective gloves, safety goggles and protective clothes that cover all vulnerable parts of the body.

Firefighting - burning hot melt:

Please keep attention to the safety data sheet given by the adhesive manufacturer.

EXTINGUISH FIRE

Appropriate extinguishing agents:
Foam extinguisher, Dry powder, Spray, Carbon dioxide (CO2), Dry sand.

For safety reasons not appropriate extinguishing agents: None.

Firefighting - burning electrical equipment:
Appropriate extinguishing agents:
Carbon dioxide (CO2), Dry powder.

2.17 Keep attention to environmental protection standards

1. When working on or with the unit, the legal obligations for waste avoidance and the duly recycling / disposals have to be fulfilled.

2. Keep attention, that during installations, repairs or maintenance operations can be hazardous to water, like adhesive / adhesive scrap, lubricating grease or oil, hydraulic oil, coolant and cleaner containing solvent do not pollute the ground or get into the water system!

3. These matters must be caught, kept, transported and disposed in appropriate reservoirs!

4. Dispose these matters according to the international, national and regional regulations.

Chapter 3
Description and Technical Specs

3.1 Applicable Safety Regulations

3.1.1 Intended Use

The Simplicity Adhesive Supply Unit (ASU) may be used only to melt and supply suitable materials, e.g., adhesives. When in doubt, seek permission from ITW Dynatec.

If the unit is not used in accordance with this regulation, a safe operation cannot be guaranteed.

The operator - and not ITW Dynatec - is liable for all personal injury or property damages resulting from unintended use!

Intended use includes, that you
- read this documentation,
- heed all given warnings and safety instructions, and
- do all maintenance within the given maintenance rates.

Any other use is considered to be unintended.

3.1.2 Unintended Use, Examples

The Simplicity ASU may not be used under the following conditions:
- In defective condition.
- In a potentially explosive atmosphere.
- With unsuitable operating/processing materials.
- When the values stated under Specifications are not complied with.

The Simplicity ASU may not be used to process the following materials:
- Toxic, explosive and easily flammable materials.
- Erosive and corrosive materials.
- Food products.

3.1.3 Residual Risks

In the design of the Simplicity ASU, every measure was taken to protect personnel from potential danger. However, some residual risks cannot be avoided.

Personnel should be aware of the following:

- Risk of burns from hot material.
- Risk of burns from hot ASU's components.
- Risk of burns when conducting maintenance and repair work for which the system must be heated up.
- Risk of burns when attaching and removing heated hoses.
- Material fumes can be hazardous. Avoid inhalation. If necessary, exhaust material vapors and/or provide sufficient ventilation of the location of the system.
- Risk of pinching parts of the body at running parts of the unit (pumps, motors, rolls or others).
- The safety valves may malfunction due to hardened or charred material.

3.1.4 Technical changes

Any kind of technical changes having impact to the security or the operational liability of the system should only be done by written agreement of ITW Dynatec. Suchlike changes made without given a corresponding written agreement will lead to immediate exclusion of liability granted by ITW Dynatec for all direct and indirect subsequent damages.

3.1.5 Using foreign components

ITW Dynatec takes no responsibility for consequential damages caused by using foreign components or controllers that have not been provided or installed by ITW Dynatec.

ITW Dynatec does not guarantee that foreign components or controllers used by the operating company are compatible to the ITW Dynatec-system.

3.1.6 Start-up

We recommend asking for an ITW Dynatec-service technician for the start-up to ensure a functioning system. Let yourself and the people working with or working on the system be introduced to the system on this occasion.
ITW Dynatec takes no responsibility for damages or faults caused by any untrained personal.

3.2 Description SIMPLICITY

3.2.1 Description

The Simplicity Adhesive Supply Unit (ASU) is designed to melt and supply suitable materials, e.g., adhesives.

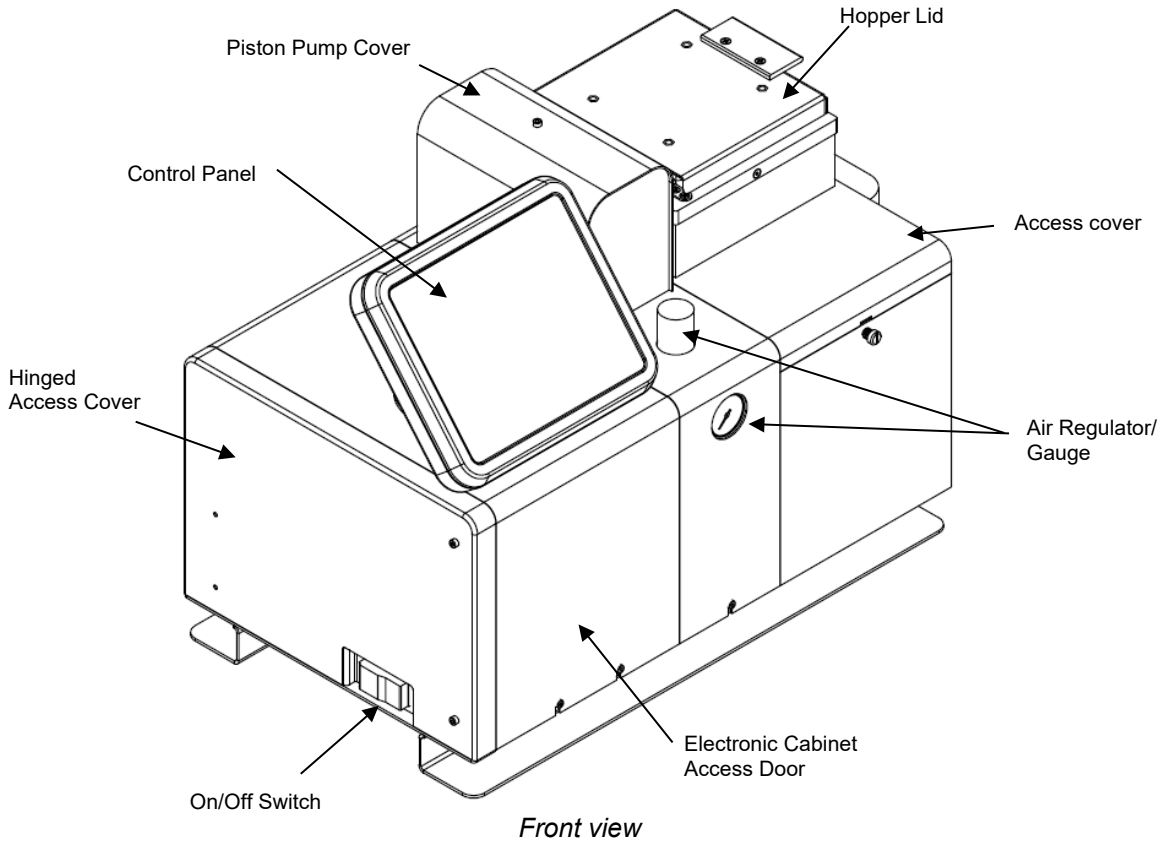
The Simplicity ASU is a computer-controlled hot-melt supply unit designed on metric standards. Its “all-icon" control panel, with choice of display languages, is internationally operator friendly. It is available for 240V (1Ph), 240V (3Ph Delta) or 400V (3Ph Wye) service. A transformer kit is available for 400V (3Ph Delta) and 480V (3Ph Delta).

The ASU provides accurate, proportionate temperature control for the hopper, hoses and applicators. A “standby" 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. A seven-day scheduler is available in the controller by default. An adhesive level sensor is available optionally.

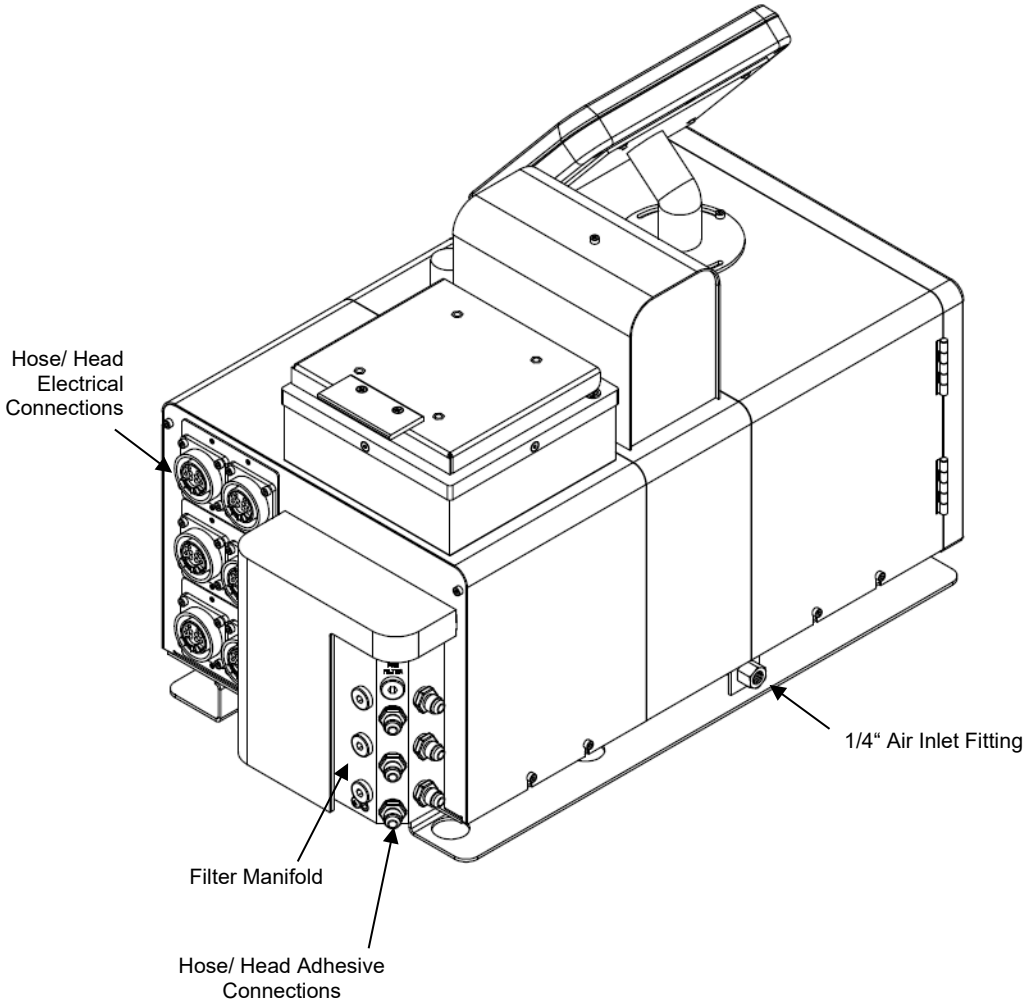
Digital readout of system conditions is provided. Optional external audible signals or lights which alert the operator to alarm conditions may be wired in. The CPU monitors the electronic circuitry and provides alarms for error conditions.

The Simplicity ASU uses a dependable, constant-pressure piston pump 12:1. This air-operated pump ensures a high-pressure adhesive output from a low pressure, compressed air input. Two piston pumps can optionally be mounted at the 16 kg hopper (only) to double the delivery rate.

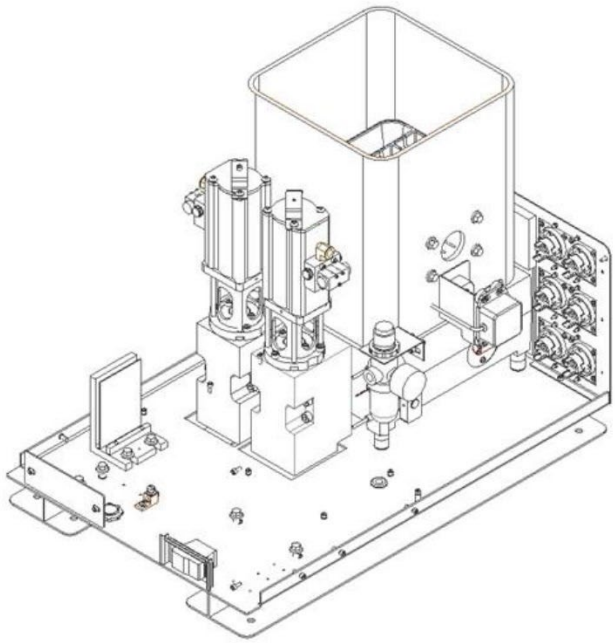
The Simplicity's hopper (4, 8 or 16 kg) accepts adhesive in all popular forms, including pellets, slugs and blocks. A pre-melt grid can optionally be mounted at the 16 kg hopper to increase the adhesive melt rate. The ASU can accommodate air-actuated automatic applicators (heads), electric applicators, hand-held applicators and/or special applicators.



Front view



Back view



Two piston pumps option

3.2.2 Specifications

Environmental:

Storage/ shipping temperature ..... -40°C to 70°C (-40°F to 158°F)
Ambient service temperature ..... -7°C to 45°C (20°F to 113°F)
Noise emission ..... < 60 dbA (at 1 meter)

Physical:

Dimensions ..... see dimensional layouts on following pages
Number of hoses/ applicators ..... 2, 4 or 6 hoses/ applicators
Number of hopper temperature zones ..... 1 or 2
Number of pumps ..... 1 / only 16 kg = 2 piston pumps (optional)
Piston pump ratio 12:1
Enclosure ..... styled, durable metal and high temp polymer, dust and splatter resistant
Hose connections ..... standard = universal 15-pin Amphenol connectors at ASU
wrench-secured fluid fittings (#6 JIC)
optional NDSN = 12-pin rectangular electrical connectors
Hopper (tank) capacity ..... 4 kg (9 lbs.)
8 kg (18 lbs.)
16 kg (35 lbs.)
Hopper lid openings ..... Simplicity 4/8 kg = 136 mm x 136 mm
Simplicity 16 kg = 237 mm x 237 mm
Hopper construction ..... welded aluminum, cast-in heaters
Hopper coating ..... ceramic nano-composite
Filtration ..... hopper: filter and shutoff assembly
filter manifold: large pleated pump outlet filter
Adhesive form ..... accepts most forms

Electrical:

Service requirements ..... 230VAC Single Phase, see also Wattage Chart
240VAC, 3Phase (DELTA), see also Wattage Chart
230/400VAC, 3Phase + N + PE (WYE,STAR), see also Wattage Chart
400/480VAC, 3Phase (DELTA), with optional transformer kit
Power consumption, system maximum ..... Simplicity 4/8 = 12600 watts
Simplicity 16 = 16100 watts
See Wattage Chart for details
Hopper heater type ..... cast-in tubular
Temperature control ..... microprocessor-based proportional integral derivative (PID)
Temperature sensors ..... 100 Ohm Platinum RTD standard
120 Ohm Nickel RTD optional
Electrical connectors ..... durable, latching connectors
Maximum power available for each hose or head ..... see Wattage chart

Pressurized Air (Piston Pumps Models):

Air pressure supply (optional pneumatic pressure relief valve) ..... 0.7 to 7.0 bar (10 to 100 psi)
Maximum recommended pump speed ..... 60 pump cycles per minute
Air consumption at 60 pump cycles per minute .... 90 normal liters/ minute (3.2 SCFM at 100 psi)

Performance:

Maximum operating temperatures ..... 218°C (425°F)
Over-temperature cutoff (thermostat) for hopper ..... 232°C (450°F)
Adhesive temperature control range ..... 10°C to 232°C (50°F to 450°F)
Adhesive temperature control accuracy ..... ±1°C (1°F)
Standby adhesive temperature range ..... up to 80°C (150°F) lower than setpoint
Hopper ready adhesive temperature deviation (factory set/ field adjustable) ... + 20°C (36°F) from setpoint
Adhesive viscosity ..... 500 to 50.000 centipoise
Warm-up time, full hopper ..... approximately 40 minutes
Adhesive delivery rate (piston pump 12:1) * .....4 / 8 / 16 kg = up to 0.91 kg/min (2 lbs./min)
16 kg w. dual piston pump = up to 1.81 kg/min (4 lbs./min)
Adhesive pressure maximum ..... up to 68 bar (1000 psi)
Adhesive melt rate * .....4kg / 8 kg = up to 10 kg/h (22 lbs./h)
16 kg = up to 23 kg/h (50 lbs./h)
Optional drop-in grid (16kg only) = up to 41 kg/h (91 lbs./h)

* depends on adhesive used.

DynaControl V6 LCD Temperature Controller:

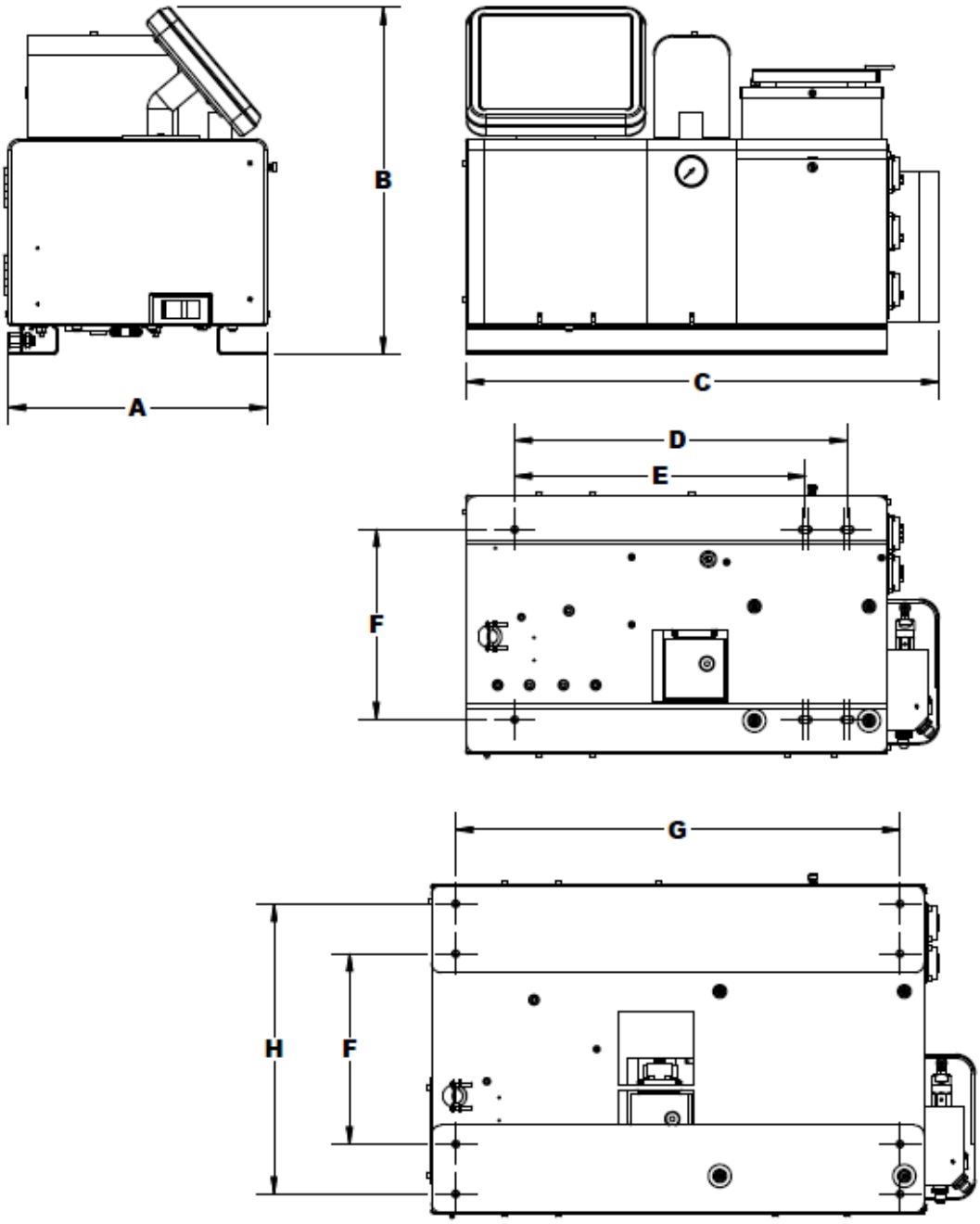
Main board ..... 5 zones per board
Auxiliary board .....5 zones per board, modular construction
Display type ..... liquid crystal (LCD)
Temperature control zones ..... 5-15 triac-output
Fuses ..... 9 on main power board, 6 on each auxiliary power board: 10 AF/2AT

Other

Display languages ..... English, German, Spanish, French, Japanese, Chinese
Operator interface .....LCD graphic display with icon membrane switches
Temperature stand-by ..... yes
High and low temperature alarms ..... yes
Sequential heating..... yes (hopper, hose, head staged heating)
Sensor open alarm ..... yes
Seven-day scheduler ..... yes
Adhesive level sensor ..... yes
CE approval ..... yes

3.2.3 Dimensions

Dimensions are expressed as "mm."



Unit Comparison Tabulation									
Unit	A	B	C	D	E	F	G	H	Hole Diameter
4 kg	339	454.5	619.5	436	381	249	-	-	9.5
8 kg	339	541.5	619.5	436	381	249	-	-	9.5
16 kg	431.2	510.6	712.9	-	-	249	582	380	9.5

Installation & Clearance Dimensions: DM Simplicity 4kg, 8kg, 16kg

3.2.4 Amperage Calculation

The Amperage Calculation chart assumes standard ITW Dynatec equipment. Applicator head/ air heater width is typically equal to the applicator's service block width. For non-standard equipment, read the amperage from the equipment's data tag or consult with ITW Dynatec's Customer Service Dept. Wire gauge calculation assumes wire rating of 75°C.

CAUTION

The customer is responsible for providing appropriate over-current protection and main power disconnect. The On/Off-switch does **not** completely de-energize the ASU and does **not** provide overcurrent protection for the supply power cord.

Amperage Calculation Chart DM-Simplicity

PN 150xxx Rev. A

ASU Size

Model	Simplicity 4 / 8	Simplicity 16	Simplicity 16 with Premelt Grid
Amp	6.5	10.9	21.8

Amps

STEP 1 Select ASU type Enter Amps

Total Length of All Hoses +

Feet	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180
m	3.7	7.3	11	14.6	18.3	22	25.6	29.3	33	36.6	40.3	43.9	47.6	51.2	54.9
Amp	1.5	3	4.5	6	7.5	9	10.5	12	13.5	15	16.5	18	19.5	21	22.5

STEP 2 Add up all hoses Enter Amps

Total Width of All Applicator Heads +

Inches	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60
mm	**102**	**203**	**305**	**406**	**508**	**610**	**711**	**813**	**914**	**1016**	**1118**	**1219**	**1320**	**1422**	**1524**
Amp	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30

STEP 3 Add up all applicators Enter Amps

Total Width of All Air Heaters +

Inches	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28
mm	0	51	102	152	203	256	305	356	406	457	508	559	610	660	711
Amp	0	2.5	5	7.5	10	12.5	15	17.5	20	22.5	25	27.5	30	32.5	35

STEP 4 Add up all air heaters Enter Amps

Total Current for SINGLE PHASE AC Input Voltage =

STEP 5 Add up total Amps

Recommended Wire Gauge and Over-Current Protection for Your Power Source

SINGLE PHASE AC INPUT VOLTAGE SPECIFICATIONS

Amp	20	23	26	29	32	35	38	41	44	47	50	53	56	59	62
AWG	10	10	8	8	8	8	8	8							
mm²	2.5	2.5	4	4	4	6	6	10							

Amp @ Single PH 240V

Wire Gauge

STEP 6 Find the column with your total single phase amperage in chart at left

STEP 7 Select your AC in Voltage

3- PHASE, 240VAC INPUT VOLTAGE SPECIFICATIONS

Amp	12	13	15	17	18	20	22	24	25	27	29	31	32	34	36
AWG	12	12	12	10	10	10	10	10	10	8	8	8	8	8	8
mm²	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	4	4	4	4	6	6

Amp @ 3PH 240V

Wire Gauge

3- PHASE, 400VAC INPUT VOLTAGE SPECIFICATIONS

Amp	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
AWG	12	12	12	12	12	12	12	12	12	12	10	10	10	10	10
mm²	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5

Amp @ 3PH 400V

Wire Gauge

Find the corresponding maximum amperage and wire gauge

3.2.5 Wattage Chart

The Wattage Chart shows the maximum current of the power service. Use it to determine the adequate power service for your ASU.

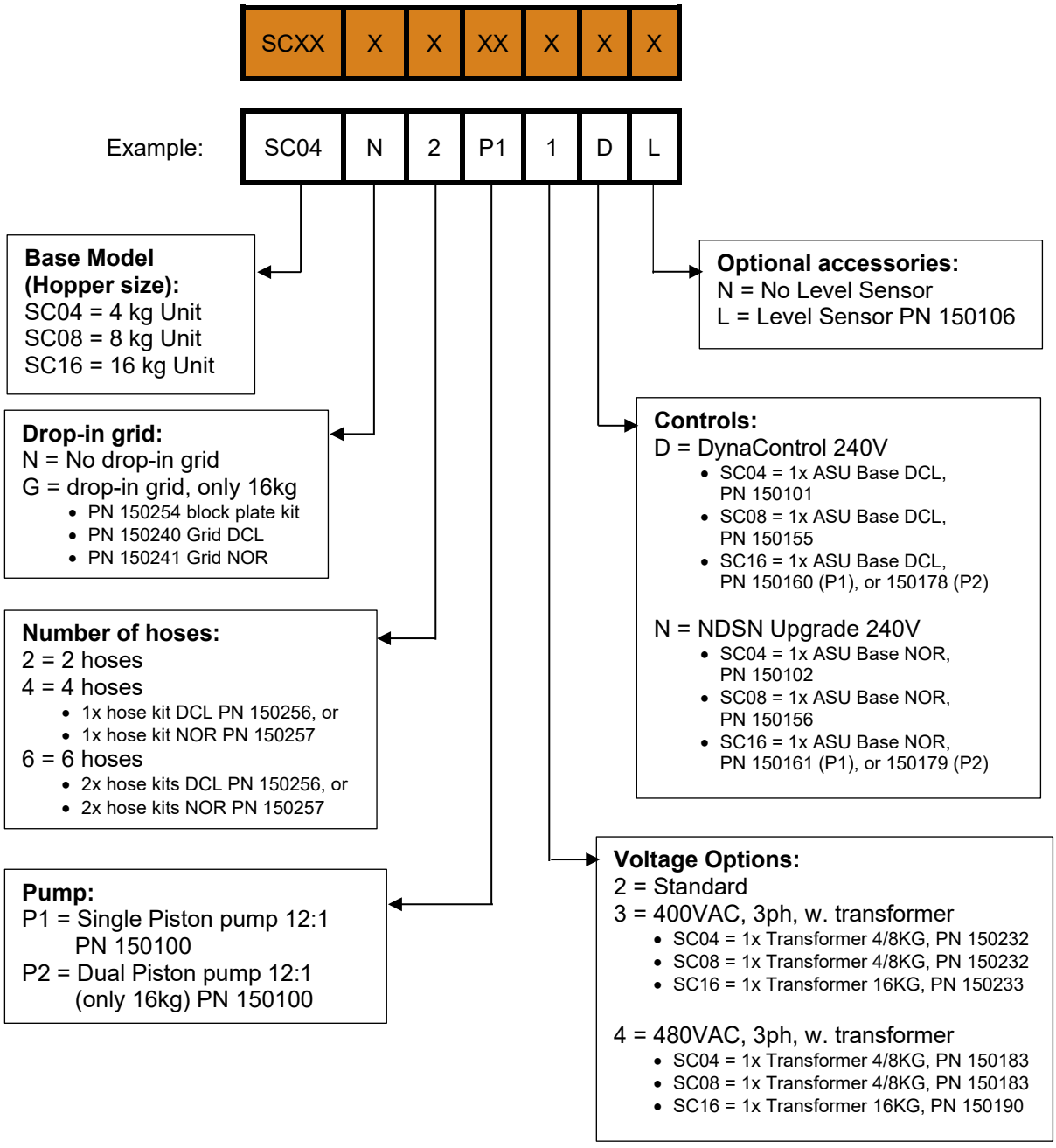
Maximum Wattage and Amperage for fully loaded machines			230/240 VAC Single Phase			230/400 VAC 3-Phase +N		
Model	Hopper Wattage	Number of Hoses	Max. Wattage	Max. Amp.	Max. Watt for Hoses	Max. Wattage	Max. Amp.	Max. Watt for Hoses
Simplicity 4	1500W	2	5200	23	3700	5200	16	3700
		4	8900	39	3700 x 2	8900	16	3700 x 2
		6	8900	39	7400	12600	21	3700 x 3
Simplicity 8	1500W	2	5200	23	3700	5200	16	3700
		4	8900	39	3700 x 2	8900	16	3700 x 2
		6	8900	39	7400	12600	21	3700 x 3
Simplicity 16	2500W	2	6200	27	3700	6200	16	3700
		4	9200	40	3700 x 2	9900	16	3700 x 2
		6	9200	40	7400	13600	27	3700 x 3
Simplicity 16 with Premelt Grid	2500W + 2500W	2	8700	38	3700	8700	27	3700
		4	9200	40	4200	12400	27	3700 x 2
		6	9200	40	4200	16100	27	3700 x 3

Maximum Wattage and Amperage for fully loaded machines			240 VAC 3-Phase (Delta)			480 VAC * 3-Phase (Delta)		
Model	Hopper Wattage	Number of Hoses	Max. Wattage	Max. Amp.	Max. Watt for Hoses	Max. Wattage	Max. Amp.	Max. Watt for Hoses
Simplicity 4	1500W	2	5200	20	3700	5200	10	3700
		4	8900	27	3700 x 2	7500	14	6000
		6	12600	34	3700 x 3	7500	14	6000
Simplicity 8	1500W	2	5200	20	3700	5200	10	3700
		4	8900	27	3700 x 2	7500	14	6000
		6	12600	34	3700 x 3	7500	14	6000
Simplicity 16	2500W	2	6200	23	3700	6200	11.5	3700
		4	9900	28	3700 x 2	8500	16	6000
		6	13600	37	3700 x 3	8500	16	6000
Simplicity 16 with Premelt Grid	2500W + 2500W	2	8700	24	3700	n/a	n/a	n/a
		4	12400	37	3700 x 2	n/a	n/a	n/a
		6	16100	40	3700 x 3	n/a	n/a	n/a

n/a = not available // * Optional transformer kit required.

Wattage Limitations:		
Each individual Hose/ Head zone	6A	1400W
Each Hose + Head combination	9A	2100W
Hose/ Head 1&2 combined	16A	3700W
Hose/ Head 3&4 combined	16A	3700W
Hose/ Head 5&6 combined	16A	3700W

3.2.6 Model Designation Matrix



EXAMPLE: SC04N2P11DL = DynaMelt Simplicity with 4 kg hopper, no drop-in grid, 2 hoses, 1 piston pump, standard voltage, DynaControl 240V and with level sensor

Chapter 4
Installation & Start-Up

4.1 Installation

CAUTION

- Before installation and start-up, please read this documentation carefully.
- Pay attention to all the installation and connecting advices.
- Heed all safety instructions mentioned in Chapter 2.
- Refer to illustrations under chapter 3.2 Description SIMPLICITY.
- All installation and start-up work must be carried out by qualified and trained technical personnel.

4.1.1 Conditions for installation and mounting

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.

Place requirement

Install the ASU so that the operator is able to work on it from all sides, for e.g., for adjusting, preparing, maintaining, repairing, cleaning, etc. See drawing of the unit for admeasurements.

Mounting and alignment

- The complete unit has to be set up on solid, stable and flat ground.
- The alignment in height of the complete system has to be considered.
- The alignment of the machine has to be considered.

Electrical connection

- Necessary electrical connection must be provided. See electrical schematics.
- Never connect or disconnect plug-and-socket connections under load!

Pneumatic connection

- In any case the air must be clean and dry! See advice in chapter “Quality of compressed air”.
- Please heed that units with high air demand may not be used at the same time with the same air supply.

Advices:

- Check all screw connections at the unit and retighten if necessary.
- Lay the cables and heated hoses so that no risk or least possible risk of stumbling occurs.

4.1.2 Mounting the SIMPLICITY ASU

The SIMPLICITY SERIES ASU can be mounted on most flat surfaces, on either an open or a solid frame. Four mounting thru-holes have been provided in the base of the unit.

Electrical power and serial communications may be routed through the back or under the unit.

For installation dimensions and required clearances, see illustrations in Chapter 3.

4.1.3 Pre-Installation

CAUTION

An appropriate power cord and overload protection must be provided by the customer as part of the ASU installation.

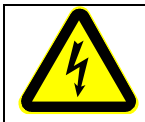
To determine if your electrical system has the correct circuit breaker size and wire gauge for the installation of this hot-melt system, including the ASU, hoses, applicator heads and air heaters, see the Amperage Calculation chart in Chapter 3 before proceeding.

4.1.4 Installation, in general

NOTE: Re-read Chapter 2 “Safety Precautions" before performing any installation procedures. All installation procedures must be performed by qualified, trained technicians.

After the SIMPLICITY SERIES ASU has been properly mounted, the following general sequence should be followed for installation. Refer to the component drawings on previous pages for orientation and location of described items.

1. Make sure that incoming line power to the ASU is disconnected and the unit's On/Off-Switch is turned OFF.



DANGER HIGH VOLTAGE

Disconnect and lock out 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. Loosen the latch screws on the top and bottom of the electrical cabinet access door. Select a power cord sized correctly for your ASU's amperage. Run the power cord through the wire way to the hole in the bottom of the base plate. Attach the power cord at the main switch's connectors. Secure the cord with a strain relief. Attach a ground wire to the ground lug provided in the base plate.

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 ASU’s controller.

3. The Melter has 4 configuration plugs. Please choose and install the appropriate voltage configuration plug according to the type of voltage supply you’re using.

CAUTION

Using the incorrect power configuration connector may cause serious damage to the unit.

The voltage configuration connector is installed on the DynaControl V6 LCD Main Board (see board illustration below).

There are four different voltage configuration connectors available:

- for 240 VAC, 1ph (and 400/480VAC 3ph Δ) system, use P/N 150127* plug with blue wires.
- for 230 VAC, 1ph + N, use P/N 150127* plug with black wire.
- for 240 VAC, 3ph, Delta, use P/N 150127* plug with violet wires.
- for 230/400 VAC, 3ph + N, Wye, use P/N 150127* plug with yellow wires.

* The four configuration plugs come as a kit with one p/n. They can be distinguished by color and have corresponding voltage printed on them.

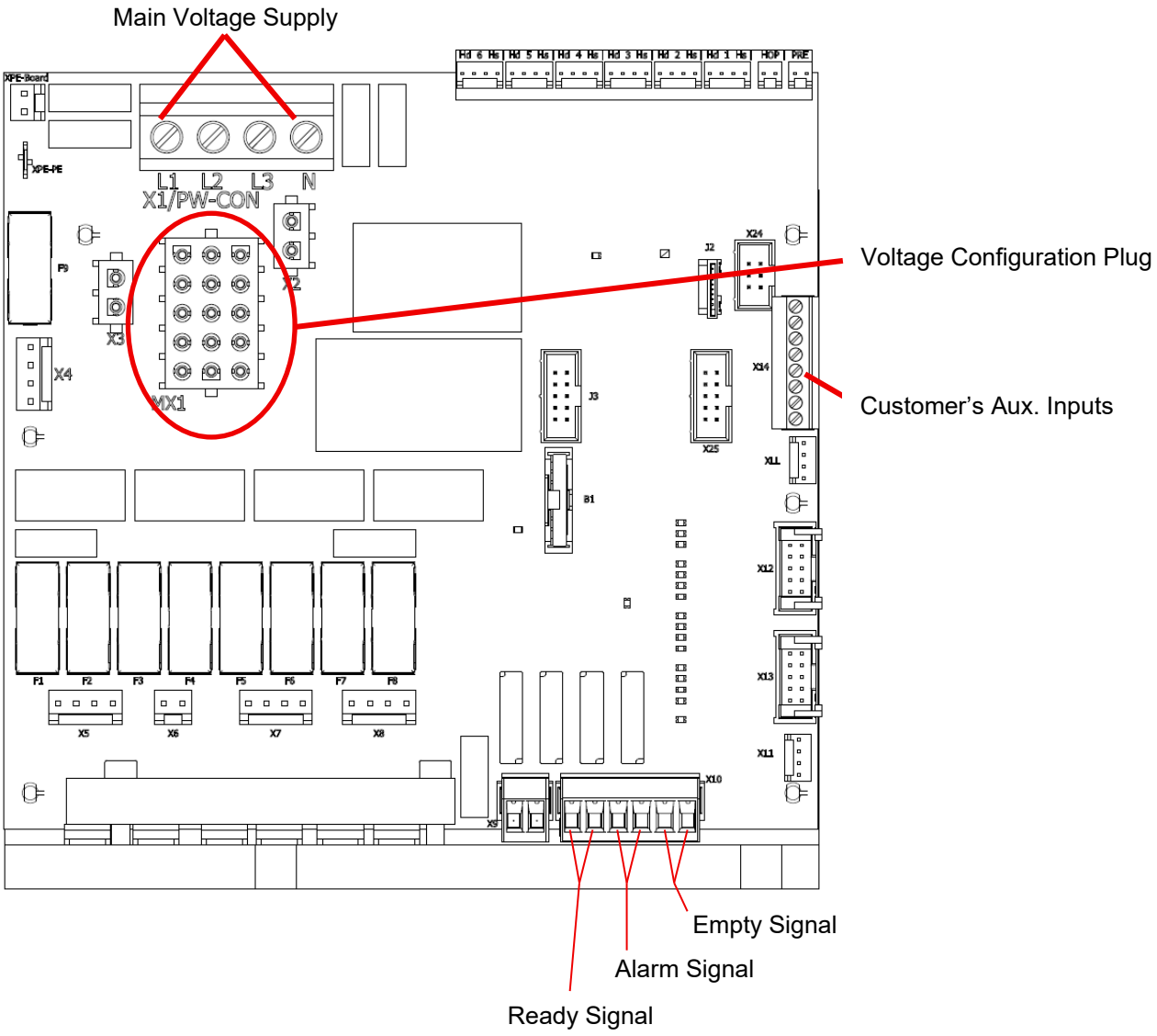
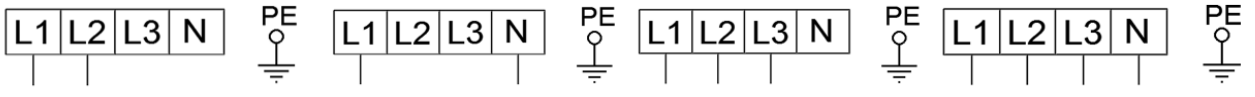


Illustration: DynaControl V6 LCD Main Board

Line input power wiring for each type power supply:



1PH PE 200-240VAC 1PH N/PE 200-240VAC 3PH Δ PE200-240VAC 3PH Y N/PE 230/400VAC

4. At installation, the customer must make the following terminal connections into the ASU's main power (ON/OFF) switch and modules.

Terminal	Circuit	Location
L 1, L 2, L 3, N	Input Power from Main Power	Base Frame Main Terminals
PE	Ground	Ground Lug
Non-essential connections; connect if feature is installed:		
RELAY OUTPUT 1	Ready Output Signal (contact closes when ready)	V6 Main Board, see drawing above
RELAY OUTPUT 2	Alarm Output Signal (contact opens when alarm)	
RELAY OUTPUT 3	Hopper Low Level Signal (contact closes when glue level is low)	
ST.BY PU.ST. IN-C.	Standby Input External Pump Start/Stop (activate to start pump) Common for Inputs	See chapter 7.2 and schematics for details

5. The air pressure regulator, gauge and solenoid valve assembly (located in the base frame on the front of the unit) are pre-installed.

   Connect a one-quarter inch (1/4") airline to the female 1/4 NPT fitting on the bottom of the unit, located in the base frame. Air supplied to the unit must be regulated, clean and dry (see advices under point "Quality of compressed Air" on next page). Recommended supply pressure is 10 to 100 psi (0.7 to 6.8 bar).

   To increase pressure, use a flat tip screw driver to turn the regulator valve clockwise. To decrease pressure, turn the regulator counter-clockwise. The recommended pressure is 0.7 to 6.8 bar (10 to 100 psi).

6. Nine hydraulic hose connection ports are located on the filter manifold. These ports are positioned to allow for up to six hoses to be routed either from the back of the unit, or from the right-hand side. It is recommended that you use a 45° fitting (available from ITW Dynatec) when using the three ports located on the corner of the filter manifold. ITW Dynatec recommends that hoses be connected to the bottom ports first, then the middle ports, and finally the top ports.

7. The hydraulic pressure gauge can be installed either in one of the hose ports or gauge port labeled "PRE PSI" indicating pressure before the filter.

WARNING HOT ADHESIVE

Do not remove the manifold cover. This cover should remain in place during operation in order to prevent burns and maintain the temperature of the filter manifold. Replace the foam cover if it becomes damaged or dirty.

4.1.5 Quality of compressed Air

CAUTION

- **In any case, the air must be clean and dry!**
- **The min. requirement for compressed air supply to solenoids to control automatic Applicators is ISO 8573-1:2010 class 2:4:3.**
- **The min. requirement for compressed air supply to solenoids to control Adhesive Supply Unit is ISO 8573-1:2010 class 7:4:3.**

Compressed air quality classes per ISO 8573-1:2010 class 7:4:3:

ISO 8573-1: 2010	Solid particles				Water		Oil
Class	Maximum number of particles per m³			Mass concentration	Vapor pressure dew point	Liquid	Total oil content (liquid, aerosol and mist)
	0.1-0.5 µm	0.5-1 µm	1-5 µm	mg/m³	°C	g/m³	mg/m³
0	As stipulated by the equipment user, stricter requirements than class 1.						
1	≤ 20,000	≤ 400	≤ 10	-	≤ -70	-	0.01
2	**≤ 400,000**	**≤ 6,000**	**≤ 100**	**-**	≤ -40	-	0.1
3	-	≤ 90,000	≤ 1,000	-	≤ -20	-	**1**
4	-	-	≤ 10,000	-	**≤ +3**	-	5
5	-	-	≤ 100,000	-	≤ +7	-	-
6	-	-	-	≤ 5	≤ +10	-	-
7	-	-	-	5-10	-	≤ 0.5	-
8	-	-	-	-	-	0.5 - 5	-
9	-	-	-	-	-	5 - 10	-
X	-	-	-	> 10	-	> 10	> 10

4.2 Start-Up

4.2.1 Advices for the start-up operation

WARNING

Start with start-up not until
- the functioning of the unit is known, and
- the unit installation has been done according to the details given in the previous chapter. That means all unit components are operable.

Read the documentation thoroughly to avoid breakdowns caused by faulty handling.

We recommend asking for an ITW Dynatec-service technician for the start-up, to ensure a functioning unit. Let yourself and the people working with or working on the unit be introduced to the unit on this occasion.

ITW Dynatec takes no responsibility for damages or faults caused by any untrained personal.

Allow only skilled expert staff to do the start-up!

Always wear safety shoes, heat-resistant protective gloves, safety goggles and protective clothing when working on or with the unit. Risk of burns and risk of injury!

Risk of electric shocks! Risk of injury, Mortal danger!

The unit components are getting very hot during operation! Risk of burns!

The adhesive is very hot and pressurized! Risk of burns and risk of injury! At working temperature, molten adhesive could cause heavy burns. Let spilled out adhesive cool down first, before removing it!

CAUTION

During operation of the unit, heed the following:
- Heed all safety instructions mentioned in chapter 2.
- Install an appropriate protection device to avoid unintended contact with heated parts and with spilling out hot adhesive. The protection device must prevent also the operator against not reaching into the adhesive application and against injuring.
- Set the working temperatures strictly within the temperature range given by the adhesive manufacturer. Do not exceed this temperature range.
- Switch the unit off during longer production breaks.
- Switch the unit to standby during shorter production breaks.
- Avoid voltage fluctuation.
- The air supply must be clean and dry.
- In case of an emergency or exceptional incident, press the power-button in order to stop the unit quickly.

CAUTION

The unit is ready for operation, when
- all temperatures are within the tolerances,
- all motors are switched on.

Risk of stumbling on cables and heated hoses!

Keep your hands away from running parts of the unit (pumps, motors, rolls or others).

4.2.2 Start-up, in general

This is a generic start-up:

1. Check the complete unit and the traverse paths for safety. Fix visible damages immediately.
2. Before switching the unit on, make sure that the starting unit could hurt no one!
3. Remove all material or other things not needed for the production from the workspace of the unit!
4. Check and make sure that all safety devices are working in proper form!
5. Fill the ASU's hopper with clean hot-melt adhesive.

WARNING HOT ADHESIVE

The adhesive and unit components are getting very hot during operation! Risk of burns!

Always wear safety shoes, heat-resistant protective gloves, safety goggles and protective clothing when working on or with the unit. Risk of burns and risk of injury!

CAUTION

Using adhesive with viscosity over 50.000 centipoise could cause motor stall and/ or pump failure.

NOTES:

- Do not overfill the hopper (melt tank) since adhesive generally expands as it melts and a full hopper will overflow.
- The adhesive level should be maintained at 25mm to 100mm (1" 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 for the proper flushing procedure. When in doubt about adhesive compatibility, flush your system.

6. Close the hopper lid immediately to prevent contaminants from falling in. (Cover your bulk supply of adhesive to prevent contaminants also.)
   The consequences of dirt would be:
   - breakdowns
   - higher contamination of the adhesive filter,
   - the adhesive application and/or adhesive film formation will be disabled, contain those dirt particles, tend to tear open.

7. Switch the Main Power Switch ON at the ASU.
   The controller will perform its initial calibration cycle.

8. Program your adhesive setpoints (see instructions in Chapter 5) 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.

CAUTION

The unit is ready for operation, when
- all temperatures are within the tolerances, and
- the adhesive in the ASU hopper is molten completely.

NOTE: When the ASU leaves the ITW Dynatec factory, it is programmed with the following factory settings (unless special factory settings were requested):
- Hopper: 150°C (300°F)
- Hose: 177°C (350°F)
- Applicator: 177°C (350°F)
- Sequential Startup: ON

9. Once the ASU has reached temperature, the ASU will automatically begin to pump adhesive.

10. Use the air pressure regulator, located at the center of the ASU, to regulate pump speed and adhesive output.

CAUTION! RISK OF BURNS AND INJURY!
- The unit operates with very high temperatures and high adhesive pressure.
- Hot adhesive comes out of the Hose/Applicator!
- Always wear heat-resistant protective gloves and safety goggles! Molten adhesives at operating temperature could cause heavy burns.
- Do not touch the hot surfaces or parts without wearing heat-resistant protective gloves!

11. Put a heat-resistant adhesive container (e.g., paperboard) under the Application Head to catch the adhesive.

12. Start the ASU pump.

13. Adhesive will be pumped through the hose/head, thereby the hose/head will be filled and flushed with adhesive.

14. Stop ASU pump.

15. Clean the Application Head from adhesive residuals.

16. Remove the heat resistant container/paperboard.

17. The equipment is ready for operation.

4.2.3 Operation and Calibration of Level Sensor

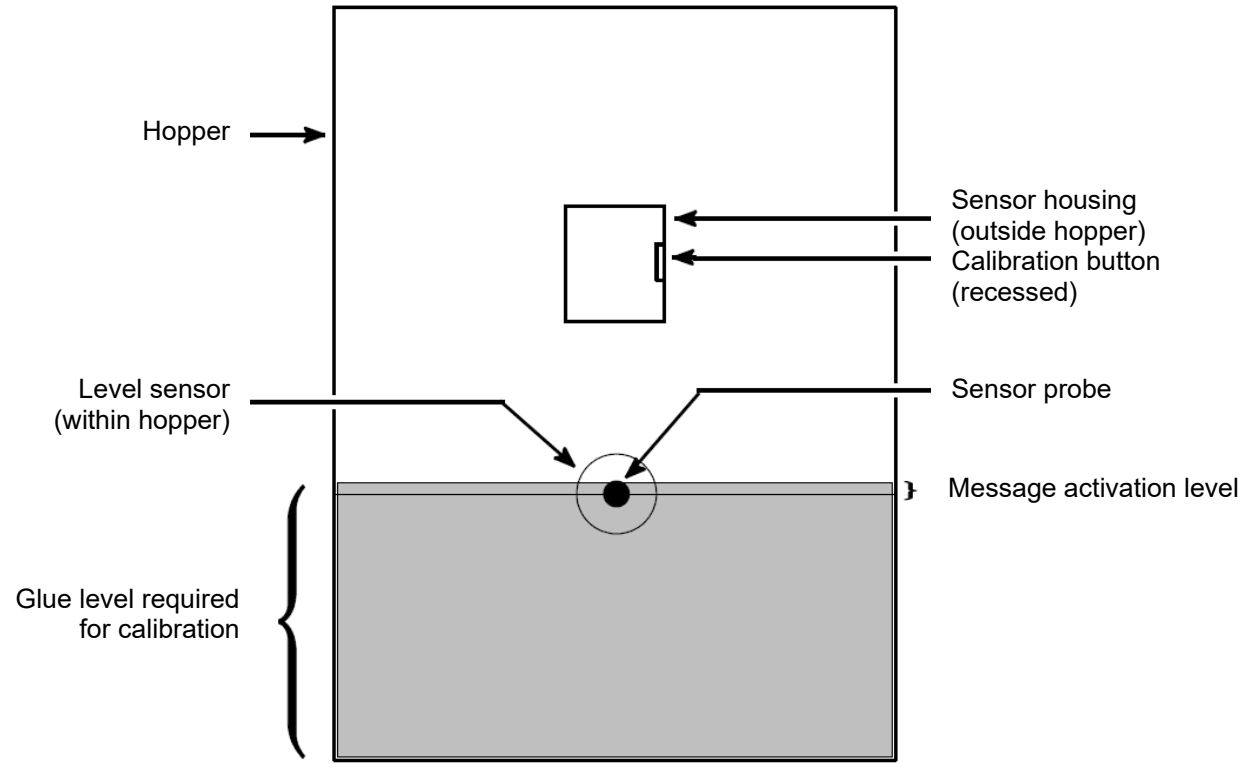
The level of adhesive in the hopper is monitored by a sensor, mounted in the wall of the hopper and accessed from within the electronics cabinet, which informs the operator of a low adhesive level via a system status message (illustrated below) on the controller's Overview Screen.

After a Hopper Empty message is displayed, the operator must replenish the glue in the hopper and the message will disappear.

Calibration

The level sensor must be re-calibrated for each application.
Follow this sequence:

1. Open the access cover. Locate the level sensor housing with its calibration button on the side of the hopper.
2. Fill the hopper with adhesive and turn the unit On. Allow the adhesive to become molten.
3. Pump adhesive out of the hopper until the molten adhesive reaches a level between the top and the center of the sensor probe. This is the level that will activate the Hopper Empty message.
4. On the level sensor housing, press and hold the calibration button for five seconds.
5. Turn Off the ASU, close the cabinet and re-fill the hopper. Allow sufficient time for the sensor to recognize the level of the adhesive.



4.2.4 Field Installation of Controller Options

Customers who choose to modify their adhesive supply unit with ITW Dynatec manufactured options should assure that only qualified technicians perform such installations. The installation of options that require specific procedures and/ or calibration are outlined in this chapter.

Before controller options are installed, always turn the controller's main power switch OFF. In most cases, turning the controller OFF will assure that the controller will retain its programmed parameters and configuration. Re-booting is not necessary.

4.2.5 Pneumatic Pressure Relief Valve Operation

For location of the pneumatic pressure relief valve, see the exploded-view drawing in Chapter 10.

Valve Operation

The Simplicity ASU is equipped with a pneumatic pressure relief valve that has two functions. It controls output adhesive pressure during pump operation and lowers adhesive pressure when the pump is switched off, when adhesive is molten.

The pneumatic pressure relief valve regulates adhesive pressure proportional to air pressure supplied to the pump. The relief valve operates at a 14:1 adhesive to air pressure ratio. Ten psi (0,68 bar) of air pressure will regulate the adhesive pressure to a maximum of 140 psi (9,7 bar). The valve is designed to deliver a maximum adhesive pressure of 1000 psi (68 bar).

When air pressure is cut off from the relief valve, the valve will open and dump adhesive pressure by relieving adhesive back to the hopper when adhesive is molten. Air pressure may be cut off from the relief valve by performing any or all of the following actions:

- Turning Off the pump at the ASU's control panel,
- Switching the ASU's main power Off, or
- Shutting Off air supply to the ASU.

Adjustment

Air pressure supplied to the pneumatic relief valve is adjusted by turning the pressure regulator built into the front of the ASU with clockwise (to increase pressure) or counter-clockwise (to decrease pressure).

Maximum adhesive pressure can be determined by reading the air pressure from the built-in gauge and multiplying by 14. For example, if the air pressure gauge reads 25 psi (1,7 bar), then adhesive pressure will be limited to 350 psi (24 bar).

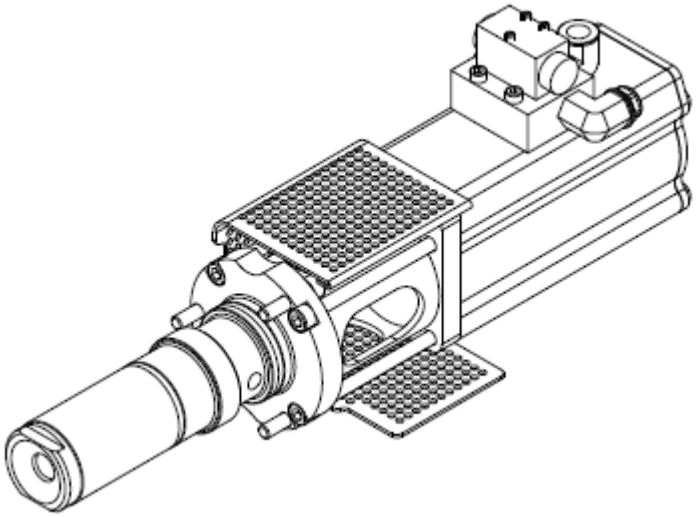
4.2.6 Operation of the ASU's Piston Pump

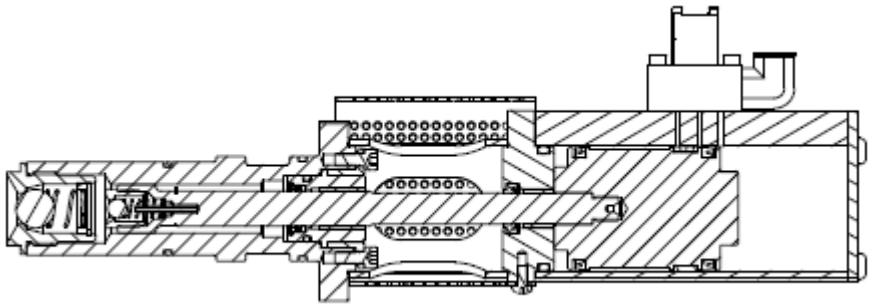
The pump is double-acting and provides constant pressure. However, the pump does not provide the same volume of adhesive with each piston stroke. When operating, the pump shaft will move more slowly during the forward stroke (into the pump body) and more quickly during the reverse stroke out of the pump body.

During the forward stroke of the pump, the piston's movement forces the input check valve to close. The pressure generated by the piston opens the output check valve. During the forward stroke, the adhesive pressure is uniform within the pump and in the output.

During the reverse stroke, the piston moves to the left and low-pressure adhesive pushes the input check valve open and fills the cylinder. At the same time, the higher back-pressure from the pump output holds the output check valve closed.

See piston pump drawing under chapter 10.

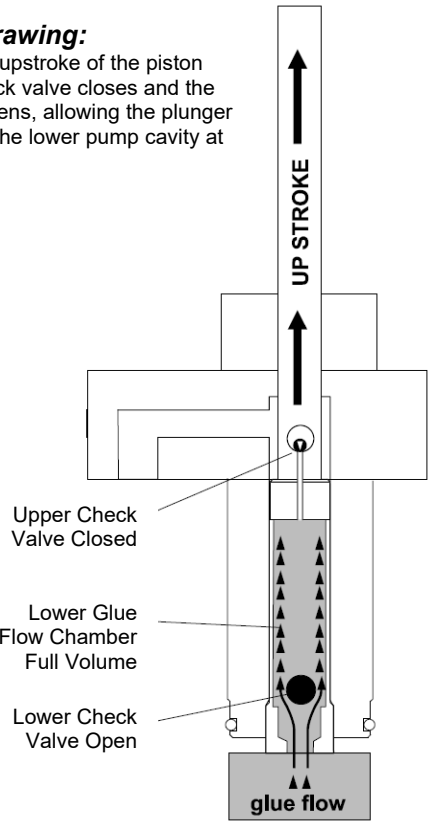




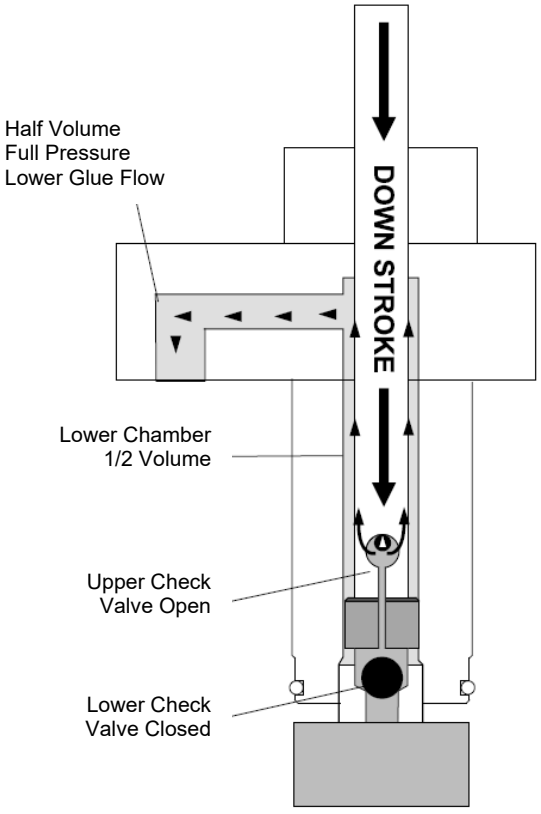
4.2.7 Piston Pump Flow Diagram

The illustrations below demonstrate how adhesive flows through the piston pump.

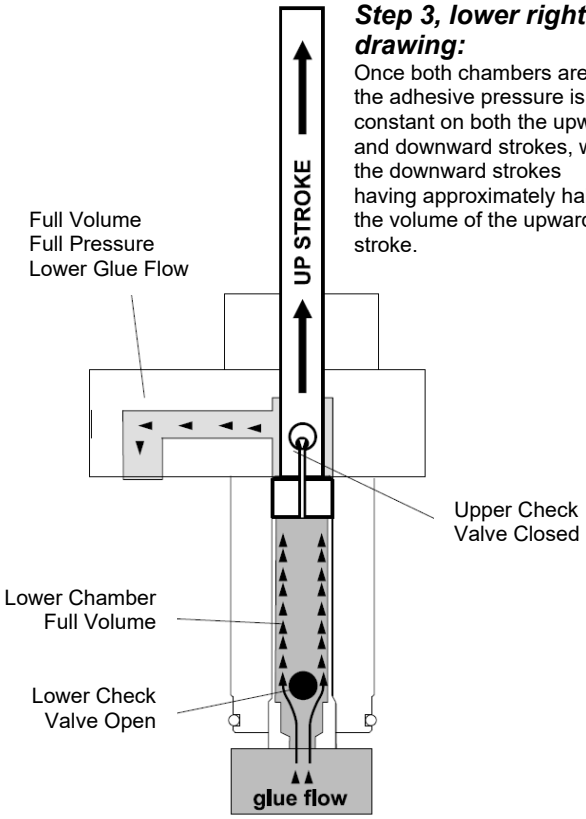
Step 1, upper drawing:
On the first (priming) upstroke of the piston pump, the upper check valve closes and the lower check valve opens, allowing the plunger to pull adhesive into the lower pump cavity at full volume.



Step 2, lower left drawing:
On the down stroke of the piston pump, the upper check valve opens and the lower check valve closes, forcing adhesive up into the shaft cavity and causing it to escape through the outlet in the shaft. The adhesive then spills into the upper pump chamber at half volume.



Step 3, lower right drawing:
Once both chambers are full, the adhesive pressure is constant on both the upward and downward strokes, with the downward strokes having approximately half the volume of the upward stroke.



4.3 Shut Down Procedure

CAUTION! RISK OF BURNS AND INJURY!

- Parts of the unit can be hot long after switching off.
- Always wear heat-resistant protective gloves and safety goggles! Molten adhesives at operating temperature could cause heavy burns.
- Do not touch the hot surfaces or parts without wearing heat-resistant protective gloves!

Effect following steps for switching the unit off:

1. Switch the Main Power Switch OFF!

Removing dirt:

Remove dirt from all unit components immediately.

Wooden scrapers, lint-free cloth with thinner or cleaner may only be used for cleaning.

Metallic scrapers or other tools made from steel, like knife or blades, may not be used under any circumstances.

4.4 Storage and Disposal of the SIMPLICITY 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. Relieve residual adhesive pressure.
3. Clean or replace both the outlet filter and the filter and shutoff assembly, following the instructions detailed in Chapter 6.
4. Shut OFF all pressure and power sources.
5. Release residual air pressure.
6. Remove all residual adhesive and wipe components clean.
7. Remove all air lines and all power supply cables.
8. Pack the unit in a corrosion-proof manner.
9. 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. Relieve residual adhesive pressure.
3. Release residual air pressure.
4. Remove all residual adhesive.
5. Remove all air and adhesive supply hoses and all power supply cables.
6. Dismantle all components and sort into mechanical and electrical components.
7. Arrange for all components to be recycled.

Chapter 5
DynaControl V6 Controller

5.1 Controller Set-Up

5.1.1 Security Advice

CAUTION

- Do not damage the display with sharp edged tools or similar!
- Do not besprinkle the display with liquids!
- Keep the display always clean!

5.1 2 Temperature Control Functions in General

The DynaControl microprocessor-based proportional temperature control in the ASU performs several functions that help to maintain adhesive setpoints in all temperature zones of the adhesive application system. It maintains permanent system values such as the maximum temperature setpoint. It enables the user to program temperature settings and heater on/off sequencing that are appropriate to a specific application. It displays all programmed values, and it includes self-diagnostic malfunction alerts and failure alarms.
Note: Some DynaControl functions are direct temperature conversions between degrees Celsius and Fahrenheit. Other parameters are independently selected values.

5.1.3 Defining DynaControl Temperature Control Terms

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

Default Settings
The factory-set programmable system values that will be in effect if the user does not enter new values. See Chapter 5 for the controller's defaults.

Error Indication Alarms
Controller alarms which indicate that the programmed over-temperature values have been exceeded for one or more hopper, hose or head zones or that a zone temperature has fallen beneath its hi-lo tolerance. Alarms may also indicate an open or short-circuited sensor.

Main Power & Aux Power PCBs
The Power printed circuit board (PCB) and Auxiliary PCBs provide power to all the temperature zones in the ASU's system. The standard unit's hopper, hoses and applicators are controlled by the Power PCB. Additional hoses and applicators are controlled by the Aux PCB(s).

Mechanical High-Temperature Protection
A mechanical, redundant thermostat located on the hopper which turns OFF the system at 232°C (450°F).

Microprocessor-based Proportional Temperature Control

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

Over-Temperature Setpoint

The programmable temperatures that will cause alarms to occur when those temperatures are exceeded (over-temp icon is shown at right).

Power is not disconnected; the READY contact opens and the alarm contact opens. If an external alarm has been connected, it will activate. The over-temp setpoint is the upper limit of the ready temperature range of each zone.

RTD Sensors

The standard ITW Dynatec's system uses 100-ohm platinum resistance temperature detector sensors for all temperature controls.

Ready Temperature

The programmable temperature which allows the ASU pump to turn ON. The default ready temperature range is a deviation of + 20°C (+ 36°F) from the setpoint. The setpoint minus the deviation is the low limit of the range, and the setpoint plus the deviation is the high limit of the range.

Sequential Heating

The heating sequence which allows the slower-heating hopper to reach operating temperature without unnecessary use of electricity for faster-heating hoses and applicators. Sequential heating is the time period during which the hoses and applicators remain OFF while the hopper (and optional drop-in grid) heats up. Hoses and applicators may be independently programmed. If hopper temperature is above ready temperature when the ASU is turned ON, the hose and applicator sequence is bypassed and they will be turned ON. Sequential heating is restored after Standby is turned from ON to OFF Sequential heating is not needed for most applications and can delay total system warm-up time.

Setpoints

The temperatures that you have selected and programmed for each of the temperature zones.

Setpoint Limitation

This is a universal maximum temperature for all zones. The programmer cannot program a temperature setpoint higher than the setpoint limitation. If the actual temperature of any zone climbs higher than the setpoint limitation, all heaters will shut down.

Standby Condition

The system condition where the ASU, hose and head temperatures are maintained at predetermined reduced temperature values. Standby temperatures are set lower than setpoint temperatures in order to reduce adhesive degradation and energy consumption when the system is temporarily inactive, and to permit rapid system warm-up when run condition is selected. When standby mode is activated, the controller will display STANDBY.

Temperature Zone Enable

The temperature zone enable allows the operator to disable unused temperature zones in such a way that they do not appear on the controller's display and heating is switched OFF.

5.1.4 Error Indication Alarms

The conditions that will trigger an alarm are:

- When a hopper, hose or head has exceeded its selected over-temperature setpoint, which is the setpoint plus its Hi/Lo alarm setting, or when it is below its selected under-temperature setpoint, which is the setpoint minus its Hi/Lo alarm setting.

- When a hopper, hose or head sensor has an open circuit.

When an alarm condition occurs, the current display will be interrupted only if a sensor failure occurs. If more than one alarm condition occurs simultaneously, all alarm conditions will be displayed sequentially.

5.1.5 Operator Response to Error Indication Alarms

If an alarm occurs during operation, the controller will switch off the internal power to the heaters and an appropriate error indication display will appear.

Pressing the RETURN button resets the error. If several zones display alarms, each must be acknowledged by pressing RETURN. The alarm display is switched off. The operator must either switch OFF the indicated temperature zone(s) (via the DynaControl keypad) or troubleshoot to correct the problem.

Low temperature alarms will not open the main contactor and are only indicated on the bar-graph display and auxiliary alarm output contacts.

A sensor failure is displayed as a “**?**” on the bar-graph and power is switched off to the zone.

When the actual temperature exceeds the setpoint limitation plus a tolerance of a few degrees, a “**!**” is displayed on the bar-graph and heater power is switched off.

5.1.6 Settings for a Typical Operation

Note: The values given here are approximate settings for a typical packaging application. The values you choose will be based on the type of equipment and adhesive you are using and the nature of your particular operation.

If Application Temperature is 177°C (350°F):

- Hose and head temperature: 177°C (350°F).
- Hopper setpoint temperature: 163°C (325°F).
- Hi/ Lo limit deviation: 12°C (20°F).
- ASU operating range: 149°C to 177°C (300°F to 350°F).
- Standby condition temperature (deviation): 30°C (50°F).
- Hopper over-temperature setpoint: 177°C (350°F)
- Mechanical thermostat (for the hopper) over-temperature: 219°C (425°F)

For most operations, temperature fluctuations will be very small and of short duration. For these reasons, the settings above are recommended.

System Values That Are Factory Programmed (not customer programmable)

- Minimum setpoint value: 10°C (50°F).
- Maximum setpoint value (setpoint limitation): 218°C (425°F).
- Maximum alarm deviation: 50° (C or F).
- Minimum alarm deviation: 5° (C or F).
- Maximum standby temperature: 150° (C or F) less than setpoint.
- Minimum standby temperature: 30° (C or F) less than setpoint.
- “Actual" temperature indication range: 0°C to 260°C (32°F to 500°F).

Default Settings of the DynaControl V6 Controller

- Language: English
- Standby temperature for all zones: 66°C (150°F) lower than programmed setpoints.
- Hi/ lo limit deviation for all temperature zones: + 20°C (36°F).
- Setpoint limitation: 218°C (425°F).
- Sequential heat-up: Off.
- Global setpoints: No.

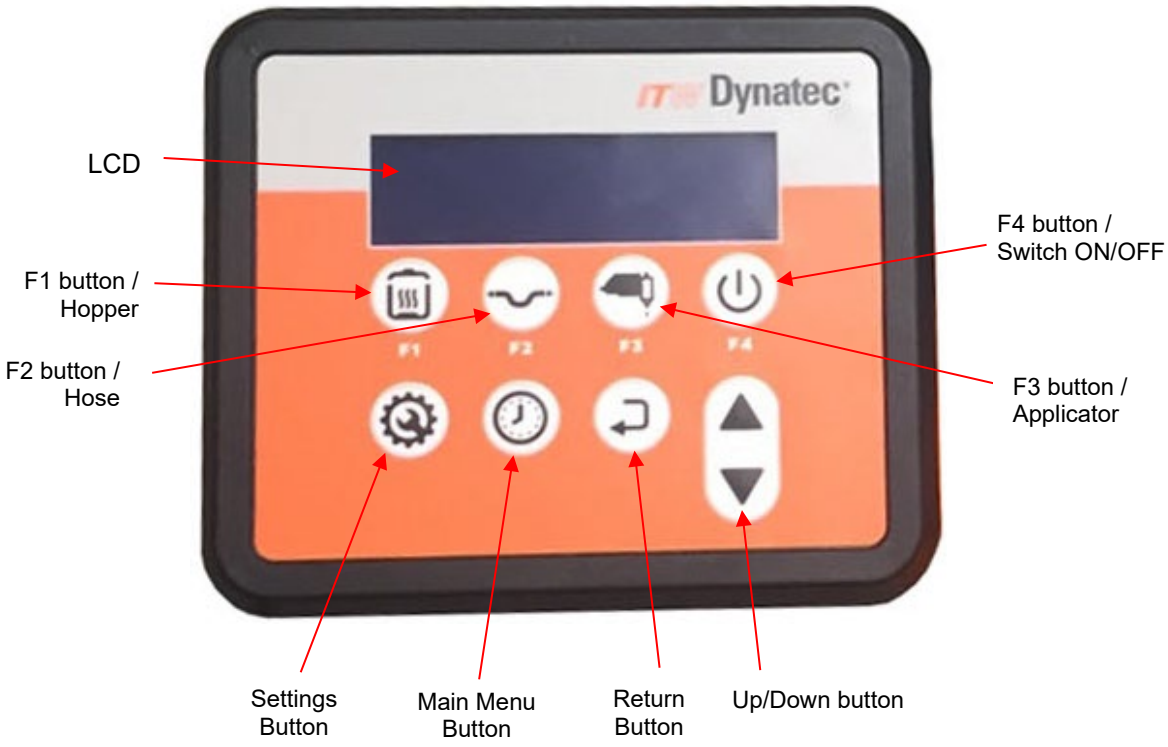
5.1.7 Helpful Tips for the User

- 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 de-activated (in which case they will be turned OFF) or if sequential heatups have been set. However, if hopper temperature is above ready temperature when the ASU is turned on, all hose and head sequential heatups will be bypassed and hoses and heads will be turned ON.

5.2 Controller Programming Instructions

5.2 1 DynaControl (DCL) V6 LC Interface

DynaControl V6 controller technology is available as a liquid crystal display (LCD), which allows an instant overview of temperature zone and pump status.



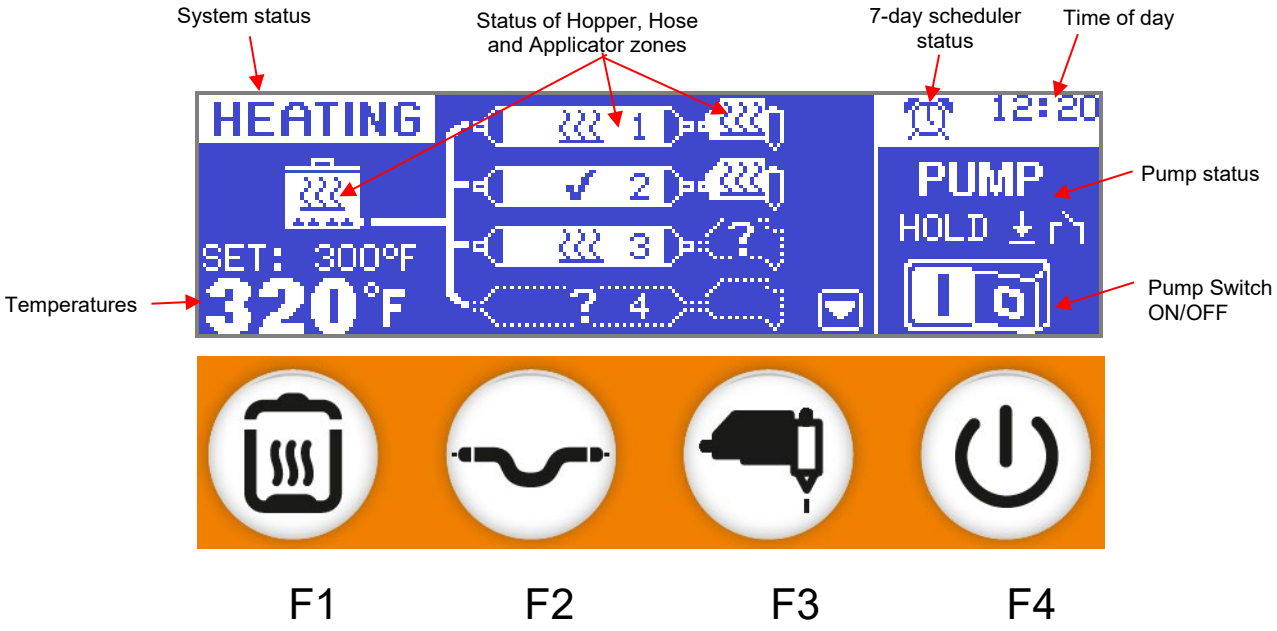
5.2.2 In General

- Press the Return button to return to the Main Screen.
- When there is no operator activity on a screen for approximately 20 seconds, the controller will automatically return to the Main Screen.

5.2.3 Main Screen

The main screen shows:

- System Status
- Hopper actual temperature and setpoint temperature.
- Status of hopper, hoses and heads zones.
- 7-day scheduler status and time of day.
- Pump status.



5.2.3.1 System status

Depending on the situation the following the status line can show following system messages:

HEATING	Zones are heating normally but at least one zone has not reached the ready window.
READY	All zones are within the ready window, no alarms present, hopper is not empty.
WARNING!	At least one zone is showing over or under temp condition, ready output is turned off.
ALARM	At least one zone is in over temp condition or has a sensor fault. Alarm output is activated. All zones are shut off.
EMPTY!	The level probe indicates a low adhesive level in the hopper.
STANDBY	The system is in standby mode. All setpoints are lowered by a programmed value.
HOPPER OVER TEMP!	Over temp thermostat has tripped. The hopper is in over temperature condition, all power circuits are shut off.

Pressing the Settings button  will turn the setpoint display on/off.

5.2.3.2 Zones status

Every zone of the system is shown with its pictogram. Each pictogram shows the current status of that zone.
Examples:

Zone is switched on and heating

Zone is switched on and has reached the ready window

Zone is switched on but in low temperature condition

Zone is switched on but in high temperature condition

Zone is switched on but there's a sensor fault

Zone is switched on but currently doesn't heat because of sequential heat-up ('Wait' position)

Zone is switched on but is in Stand-by mode (temperature setback)

Zone is switched off and there's no sensor present

Zone is switched off but there's a sensor present

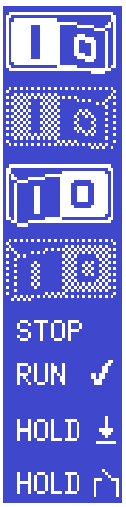
If the zone's pictogram is outlined, that zone is temporarily switched off.

On units with 6 hoses/heads only 4 hoses/heads can be shown at a time.

Via Up/Down button it is possible to switch from hose/head 1-4 to hose/head 3-6 and vice versa. Even those zones that are currently not on the screen are monitored.

5.2.3.3 Pump Status and Control

The status of the adhesive pump is listed as one of the following:



Pump is manually switched on and all temperatures are ready.

Pump is manually switched on but actually not running (HOLD condition).

Pump is manually switched off but could be started.

Pump is manually switched off in HOLD condition.

Additionally, the pump condition is shown:
STOP = Pump is in Stop mode.
RUN = Pump has start signal and is running.
HOLD = Pump is in Run mode but it is on Hold, due to one of following reasons:

Pump is on Hold due to low temperature condition.

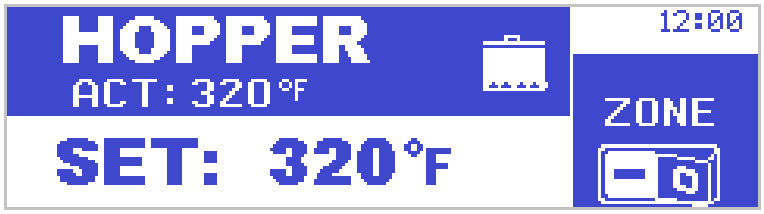
Pump is on Hold because external pump enable is not activated (Input IN2).

Use the pump ON/OFF button (F4) to switch the pump on/off.
If the system is in low temp condition or standby, the pump will not run but will come on automatically when the system gets ready.

5.2.4 Changing Temperature Setpoints

- In order to change a setpoint the zone has to be selected.
- Use the buttons F1, F2, F3 to select the corresponding zone. Pressing the Up/Down button multiple times switches to the next zone in that group (hose/head).

- This will bring up the *Edit Screen* showing the selected zone:



- The setpoint is flashing (if setpoint change is allowed).
- This screen shows also the actual temperature of the selected zone.
  

  indicates that there's no valid RTD temperature sensor reading.
- If a hose or head is selected it is possible to select the next hose/head by pressing the corresponding Up/Down button again. If the hopper has more than one zone (Filter block or premelt grid) then those can be selected the same way.
- On the Edit Screen the setpoint is flashing and can immediately be changed using the Up/Down button.
- Any setpoint change is automatically confirmed when a different zone is activated or the Edit Screen is left.
- If a zone is deactivated, its setpoint is placed in parenthesis 

  .
- Via button F4  the selected zone can be switched on/off.
- The rocker switch on the right side of the display shows the zone condition 

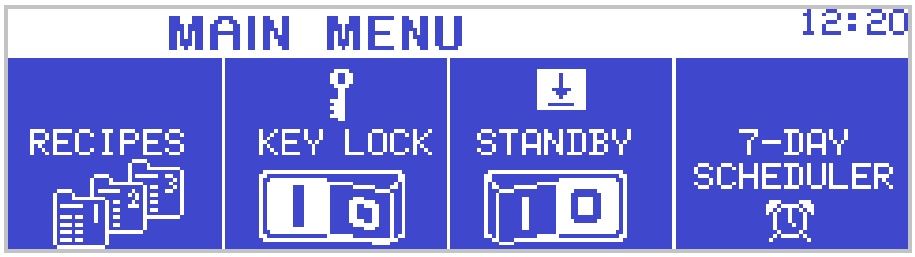
  / 

  .
- A zone that doesn't have a valid RTD temperature sensor reading cannot be switched on.
- Pressing the button BACK  will switch back to the Main Screen (Overview screen).
- If the keypad is locked it's not possible to change setpoints, indicated by the key symbol 

  .
- If no button is pressed on the Edit Screen for 20 seconds, the display will switch back to Main Screen.

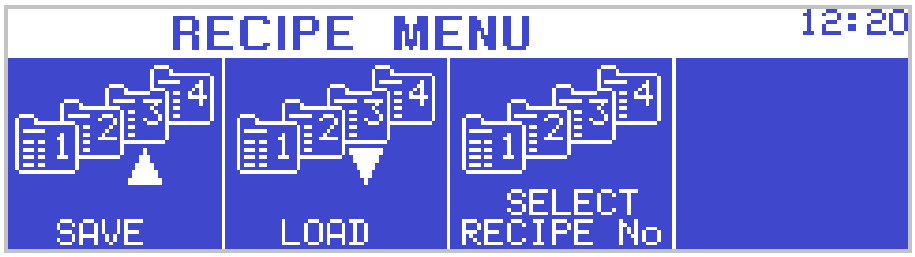
5.2.5 Main Menu

Pressing the button  opens the *Main Menu*. There are four functions available:



5.2.5.1 F1 - Recipe Menu

Press F1 for Recipe Management (‘Temperature Programs’)



On the Recipe Menu, it’s possible to save all setpoints into a program slot or recall (load) a previously saved set of parameters.

1. Select the Recipe Number (1-4) to be loaded/saved with button F3.
2. Save (F1) or Load (F2) selected recipe.
3. Return to the main screen by pressing the return button  .

A recipe contains all setpoints and the modes (used or not used) of all temperature zones.

5.2.5.2 F2 - Keypad Lock

On the MAIN MENU, press F2 KEY LOCK to lock or unlock the keypad lock.

Once the keypad lock is active, it is no longer possible to change setpoints or system parameters. The controller's access code must be entered to unlock setpoints or system parameters.

The closed padlock indicates the locked status, the opened padlock indicates the unlocked status.

The Dynamelt Simplicity is shipped from ITW Dynatec with a default access code of **11111** (5-digit). This default code can be changed by entering the numbers 1 to 4 only, using the F-keys, F1 (for 1), F2 (for 2), F3 (for 3), F4 (for 4).

To unlock:

1. On the MAIN MENU screen, press F2 button (KEY LOCK).

2. On the KEYPAD LOCK screen, enter the access code using the F1 - F4 buttons.

3. If the code is correct, the KEY LOCK is unlocked, and you go back to the MAIN MENU screen.

To lock:

1. On the MAIN MENU screen, press F2 button (KEY LOCK).

NOTE: On the KEYPAD LOCK screen, you have the choice to CHANGE ACCESS CODE or just to CONFIRM KEY LOCK.

2. On the KEYPAD LOCK screen, press F2 button (CONFIRM KEY LOCK).

The keypad lock will be locked (with the existing access code), and you go back to the Main Menu screen.

To change ACCESS CODE:

1. On the MAIN MENU screen, press F2 button (KEY LOCK).

2. On the KEYPAD LOCK screen, press F1 button (CHANGE ACCESS CODE).

3. On the next KEYPAD LOCK screen, enter your new 5-digit access code with the numbers 1 – 4 only, using the F-keys F1 (for 1), F2 (for 2), F3 (for 3), F4 (for 4).

4. Press F4 button (CONFIRM).

Your new access code will be changed, and you go back to the MAIN MENU screen.

5.2.5.3 F3 - Standby

Press F3 to activate the Standby ('Temperature Setback'). The corresponding symbol indicates the status. In standby mode, the pump will stop and the ready signal will be removed.

5.2.5.4 F4 - 7-Day Scheduler

Press F4 to go to the 7-Day scheduler screen.

The 7-Day Scheduler has two programs; each program can have up to 4 events.
Each program can be assigned to individual days or group of days.

Use buttons F1 and F2 to select a field and use Up/Down button to change a field.

Pressing F3 will immediately bring the system in sleep mode.
With button F3 the 7-Day Scheduler can be activated/deactivated.

If the system is in sleep mode, button F4 (ON/OFF) will "wake up" (activate) the controller.

Pressing the Settings button  will open the Set Day/Time screen:

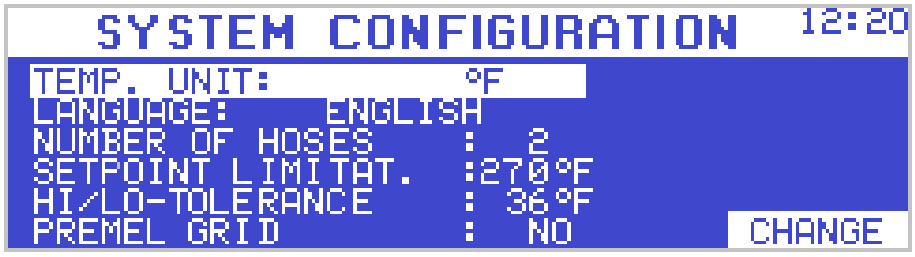
Use button F1, F2, F3 to select and Up/Down button to change actual day/time.

Pressing button F4 will turn Day-Light-Saving on/off (turning forward/backward one hour).

Use return button  to return to Main Screen.

5.2.6 System Configuration

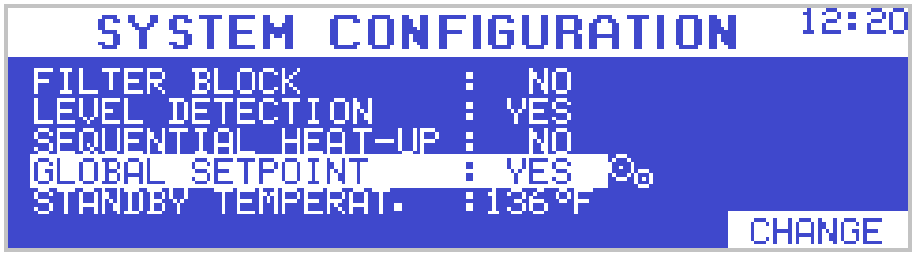
Pressing the Settings button  circa 5 seconds will open the configuration menu:



- Temperature Unit (°C/°F)
- Language Selection: English, German, French, Spanish, Japanese, Chinese
- Number of Hoses: 2-4-6
- Hi/Lo Tolerance: Ready Window (5-50F)
- Premelt Grid: YES/NO

Select the desired function using the Up/Down button.
Press button F4 to change selected parameter.

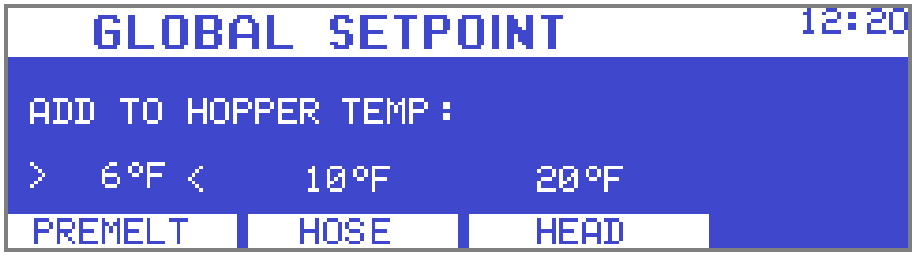
Pressing the Settings button  will lead to the second configuration screen:



- Filter Block, YES if there's a heated filter block
- Level Detection: YES/NO
- Sequential Heat-Up: YES/NO (YES: Hopper zones first, then hoses/heads)
- Global Setpoints: YES/NO (YES: Hopper setpoint is leading all other zones)
- Standby Temperat: Setback difference for all zones

5.2.7 Global Setpoints

Pressing the button  while the global setpoints are selected will open its configuration screen:



On this screen for premelt grid, hoses and heads a certain ‘add-on’ can be programmed in order to have staggered temperatures in the whole system.

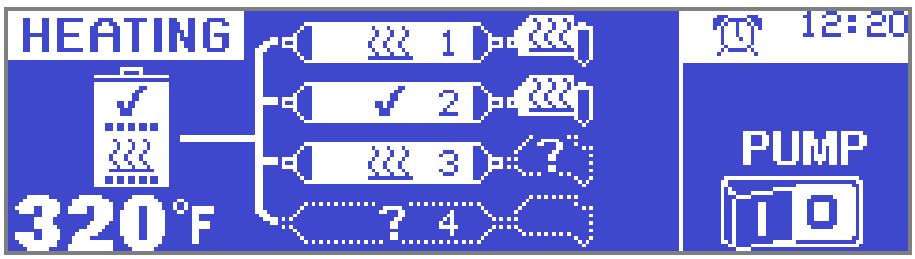
When Global Setpoints are enabled and a hose or head zone is selected, it is not possible to change the zones setpoint. The screen will show:

Picture above shows heads are set to 320°F (hopper setpoint) plus 20°F add-on for heads.

5.2.8 ASU with premelt grid

An ASU equipped with a premelt grid will show both heater zones on the screen. Both will have individual status symbols. The actual temperature on the main screen is the hopper’s temperature.

Pressing the Hopper button (F1) will first select the premelt grid and second time the hopper.



5.2.9 Loading Factory Defaults

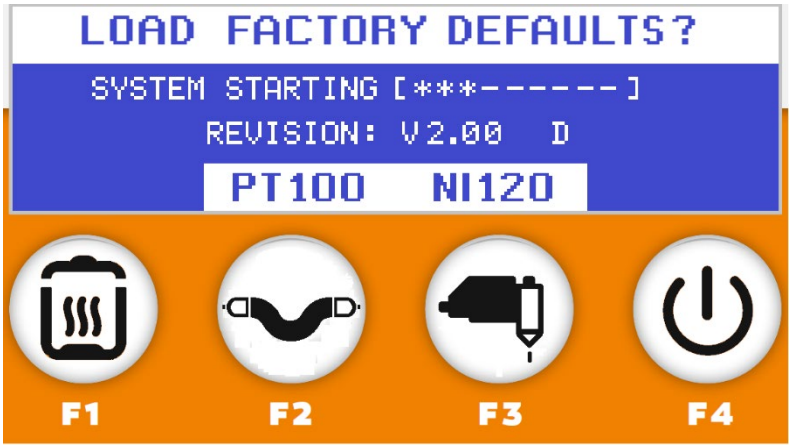
In rare occasions, it might be necessary to reload all settings to factory default. This will reset the parameters to following values:

- Language: English
- Temperature Unit: °Fahrenheit
- Number of Hoses: 2
- Setpoint Limitation: 425°F
- Temperature Tolerance:35°F
- Setback Difference: 150°F
- Hopper Setpoint: 350°F (zone on)
- Hose/Head Setpoints: 200°F (zones off)

Additionally, all 7-day scheduler settings and temperature programs will be reset.

Reload Procedure:

Immediately after switching on the unit, press and hold button F4 until the Load Screen appears:



While the progress bar is running press either button F2 (PT100) or F3 (NI120). This will load corresponding settings and the controller will automatically restart.

Make sure to select the proper RTD setting:
- PT100: DynaControl hoses (circular hose connectors)
- NI120: NDSN compatible hoses (rectangular hose connectors)

Note:
The start-up screen shows the firmware revision and a letter indicating which RTD temperature sensor has been selected:
- D: DynaControl (PT100)
- N: NDSN compatible (NI120)

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Chapter 6
Maintenance and Repair Notes

6.1 Security advices for maintenance and repair

Heed all security advices given in Chapter 2.

Use only original parts from ITW Dynatec, otherwise ITW Dynatec's warranty is void!

Maintenance and repair work is only permitted for skilled personnel!

Always wear safety shoes, heat-resistant protective gloves, safety goggles and protective clothing that cover all vulnerable parts of the body while working on the heated unit! Risk of injury or heavy burns!

High Voltage! Risk of injury and mortal danger!

- All electrical connections must be made by qualified electrical personnel.
- Care must be taken to assure proper grounding prior to any disassembly.
- Lockout and tag the electrical sources as required.
- Make sure there is no electrical power on the leads you will be connecting.
- When covers are removed, high voltage sources create an electrocution hazard.
- Wear appropriate safety equipment when working with high voltage sources.

Parts and surfaces of the unit get very hot. High temperatures! Risk of heavy burns!

High adhesive temperature and adhesive pressure! Risk of injury or heavy burns!
Always assume that the system is under pressure, proceed with caution.

Keep a cool-pack, or bucket of clean water near the work area.

Place a heat-resistant catchment container/underlay under the components. Hot adhesive may come out.

CAUTION: At working temperature, molten adhesive could cause heavy burns. Let spilled out adhesive cool down first, before removing it!

CAUTION: Use only lint-free cleaning cloth and suitable cleaner for cleaning! Do not damage surfaces! Do not scratch above them with sharp-edged tools, otherwise the components will get leaky and inoperable!

All maintenance and repair work has to be done at working temperature, except as noted otherwise. Else there is a risk of damaging the unit components!

Before any service work disconnect the external power supply and switch the unit voltage-free:

1. Switch off the main switch and the controller.
2. Disconnect the power supply respectively remove the plug / cable.
3. Guard the unit against unauthorized restarting!

Before any service work the adhesive pressure must be relieved throughout the system. Depressurize the system:

1. Disconnect the pressure air supply.
2. Turn the pressure regulator to zero bar, if necessary. Wait approximately 1 minute until the pressure is relieved.
3. Release the adhesive pressure from filter manifold. See Ch.6.4.
4. Open the applicators purge valve or open the modules by activating the solenoids to relieve any adhesive pressure.

6.1.1 Equipment Preparation for Maintenance & Repair

- Adhesive processing equipment must be worked on while hot enough to soften any material residue within the assembly. This depends on the type of adhesive used with the equipment. This may require the system to be up to operating temperature before disassembled, to prevent damage to fasteners and components.
- Once disassembled, the individual parts may be cleaned by immersion in approved solvent. Surface deposits may be removed by lightly brushing with a brass device. Care must be taken not to damage sealing surfaces with sharp objects or sand paper.
- Components such as O-rings, fasteners and relief valves should be discarded and replaced by certified ITW Dynatec replacement parts.

6.1.2 Re-Assembly Procedures and General Cautions

Unless noted, the 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 must be replaced whenever hot-melt equipment is re-assembled. All new O-rings must be lubricated with O-ring lube (PN 001U002).

TAPERED PIPE THREADS are found on air pipe 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.

SOME FITTINGS used for adhesive on hot melt equipment 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. Excessive torque may damage straight-threaded parts and the use of power wrenches is not recommended.

HOT-MELT RESIDUE must 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 must always be re-tightened at operating temperature.

6.2 Maintenance plan

CAUTION

Heed all security advices given in Chapter 6.1.

Use only original parts from ITW Dynatec, otherwise ITW Dynatec's warranty is void!

Please use only the indicated lubricants and keep the prescribed maintenance intervals. Consider in addition the enclosed regulations of manufactures.

Punctual and consistent maintenance of the unit secures not only a trouble-free function, but also prevents expensive repair costs.

Remove all materials and tools used during the repair or maintenance from the workspace of the unit.

Place a heat-resistant catchment container/underlay under the components. Hot adhesive may come out.

Use only lint-free cleaning cloth and suitable cleaner for cleaning! Do not damage surfaces! Do not scratch above them with sharp-edged tools, otherwise the components will get leaky and inoperable!

Maintenance plan:

Operating time/ frequency	Inspection point / maintenance notes
Continuous	• Remove leaked out adhesive and scrap adhesive and search for the cause of leak, eliminate the cause. • Listen for abnormal sounds of the unit, e. g. from the motors, pumps, etc.
Once a day	• Clean the ASU and components from dirt.
Once a week	• Check pump and their seals for wearing and leaks and replace if necessary. • Check output filter for clogging and replace if necessary. • Check pressure relief valves for function and replace if necessary. • Check air supply connections for leaks and tighten if loose or replace if necessary. • Check the solenoid valves for proper function and replace it if necessary.
Every 3 months	• Inspect the filter and shutoff assembly. Clean or replace it as required. • Check pump mounting screws for tightness and tighten if necessary. • Check all hose fittings for tightness and tighten if necessary. • Due to temperature differences a loosening of threads (threaded connections) is possible. Check all parts with threads, all screw fittings and fasteners for tightness and tighten them if necessary.
Once a year	• Clean the ASU. • Complete check-up for wear.
Every two years	• Complete maintenance.

6.3 General Cleaning

Follow the manufacturer's directions when using industrial cleaners on the enclosure.

The enclosure is comprised of both injection-molded nylon and epoxy powder-coated steel panels. The painted steel panels may be cleaned with a variety of industrial cleaners following manufacturers' directions. The polymer panels may be cleaned with mineral spirits.

6.4 Purging the Filter Manifold of Adhesive and Pressure

As a safety precaution, purge the filter manifold of pressure and adhesive before changing the output filter or before removing any of the hoses or applicators from their manifold port.

WARNING

Heed all security advices given in Chapter 6.1.

Maintenance and repair work is only permitted for skilled personnel!

Always wear safety shoes, heat-resistant protective gloves, safety goggles and protective clothing that cover all vulnerable parts of the body while working on the heated unit! Risk of injury or severe burns!

During the purging procedure, hot adhesive can come out of the manifold under high pressure. Avoid splashing hot adhesive. Stand clear of the ASU until all pressure is relieved.

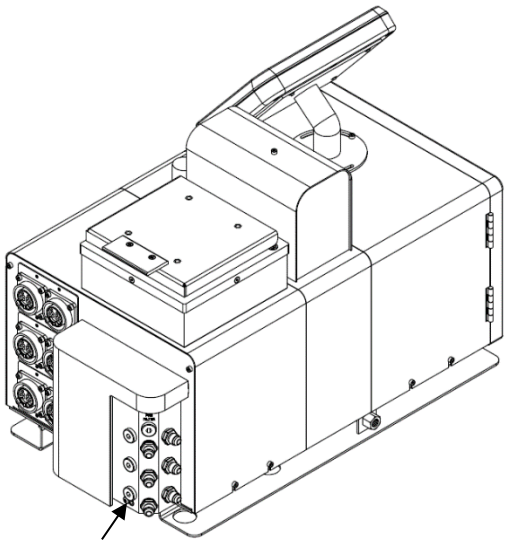
Components and adhesive are hot. Take every precaution to prevent the material and hot surfaces from contacting the skin.

Purging Adhesive Pressure from a Piston Pump Unit

The piston pump-equipped ASU uses an air-controlled pressure relief valve that dumps adhesive pressure back into the unit's hopper whenever the pump or the ASU is turned OFF.

To ensure operator safety, ITW Dynatec recommends that the following procedure for relieving adhesive pressure be utilized in conjunction with the air-controlled relief valve.

1. The system should be at operating temperature.
2. Turn the pump/ motor OFF.
3. Switch the unit voltage-free and depressurize.
4. Guard the unit against unauthorized restarting.
5. Place a heat-resistant catchment container/underlay under the manifold's purge drain. Hot adhesive may come out!
6. Locate the purge valve (screw) on the side of the filter manifold. The purge valve is the bottom-most port on the manifold.



7. With a 5mm Allen wrench, slowly loosen the purge screw. Do not attempt to remove the purge screw. Allow the adhesive and pressure to drain. All the adhesive will flow into the heat-resistant container.
8. After adhesive pressure has been relieved, re-tighten the purge screw.

After finishing the maintenance or repair works:

- Remove all materials and tools used during the repair or maintenance from the workspace of the unit.
- Connect the voltage supply and the compressed air supply. Heat the unit up. Wait until all temperatures are within the tolerances and the adhesive in the hopper is molten completely.
- Continue production.

6.5 Preventive Maintenance

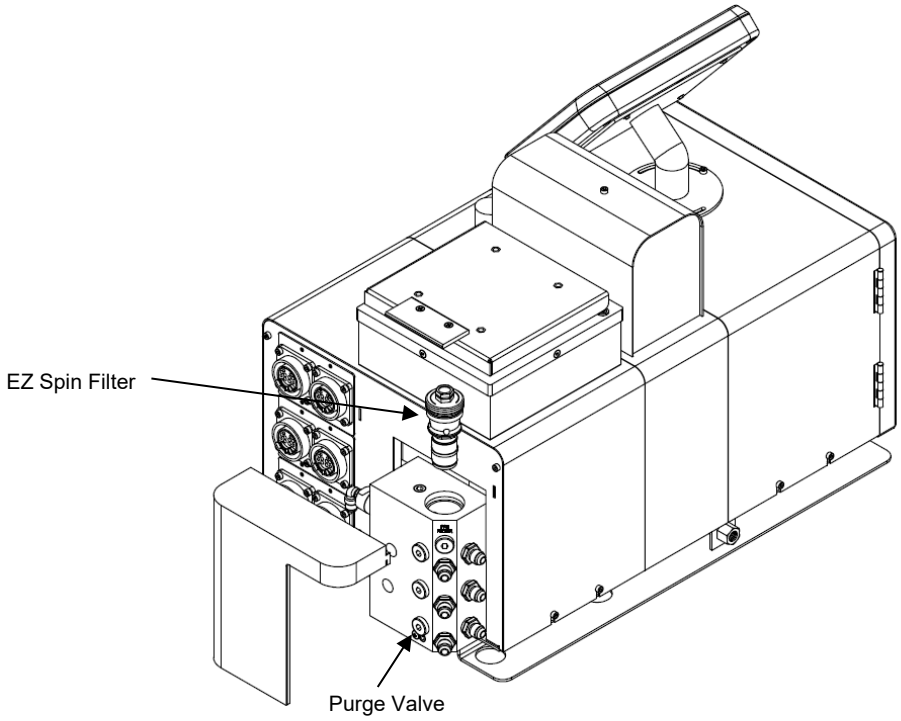
6.5.1 Preventive Maintenance Schedule

The Simplicity requires periodic maintenance to function reliably.
The ASU parts that require regular, periodic maintenance are as follows:

6.5.2 Output Filter

The output (pump) filter cartridge 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. See illustration.

Use the following procedure to replace the output filter:



WARNING

Heed all security advices given in Chapter 6.1.

Maintenance and repair work is only permitted for skilled personnel!

Always wear safety shoes, heat-resistant protective gloves, safety goggles and protective clothing that cover all vulnerable parts of the body while working on the heated unit! Risk of injury or severe burns!

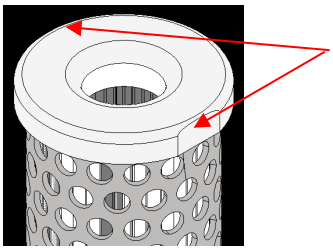
Use the output filter manifold's purge valve to relieve adhesive pressure before performing any pump filter maintenance. See Ch.6.4 "Purging the Filter Manifold of Adhesive and Pressure" for detailed instructions.

During the purging procedure, hot adhesive can come out of the manifold under high pressure. Avoid splashing hot adhesive. Stand clear of the ASU until all pressure is relieved.

The filter cartridge will be covered with hot adhesive and must be handled with proper tools. Components and adhesive are hot. Take every precaution to prevent the material and hot surfaces from contacting the skin.

To replace the Output Filter:

1. The system should be at operating temperature.
2. Turn the pump OFF.
3. Switch the unit voltage-free and depressurize.
4. Guard the unit against unauthorized restarting.
5. Place a heat-resistant catchment container/underlay under the purge valve drip tray. Hot adhesive may come out!
6. Wearing insulated gloves, arm guards and a face shield, use a flat-tip screwdriver (or a 5mm Allen wrench) to open the purge screw within the purge valve. A small amount of adhesive will pop out of the drain valve, relieving stored pressure in the manifold. Allow the adhesive to drain into the container. Close the drain valve purge screw after pressure has been relieved.
7. After all pressure has been drained from the manifold, remove the filter nut and the attached filter cartridge with a 25mm (1") wrench.
8. All the O-rings and the filter cartridge are attached to the filter nut. Loosen and remove the filter cartridge from the filter nut.
9. Inspect the filter nut and O-rings for damage and replace as necessary. When replacing O-rings, lubricate the new O-ring with O-ring lubricant prior to installation.
10. Install a new filter cartridge onto the filter nut. Holding the filter cartridge by the two flats on the end cap in a vise and using a torque wrench, tighten the filter to 72 in-lb (8.1 Nm).



11. Re-install the filter assembly into the manifold. Tighten the filter nut to 15-20 ft.-lbs. (20-27 Nm) being careful not to damage the O-ring seal.
    Note: when correctly installed, the filter nut sits below the top surface of the manifold.

After finishing the maintenance or repair works:

- Remove all materials and tools used during the repair or maintenance from the workspace of the unit.
- Connect the voltage supply and the compressed air supply. Heat the unit up. Wait until all temperatures are within the tolerances and the adhesive in the hopper is molten completely.
- Continue production.

6.5.3 Hose Fittings

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

6.5.4 Fasteners

Check that all fasteners are tight after the first ten hours of operation. Re-check all fasteners after every three months of operation.

6.5.5 Filter and Shutoff Assembly, Cleaning and Replacement

WARNING

Heed all security advices given in Chapter 6.1.

Maintenance and repair work is only permitted for skilled personnel!

Always wear safety shoes, heat-resistant protective gloves, safety goggles and protective clothing that cover all vulnerable parts of the body while working on the heated unit! Risk of injury or severe burns!

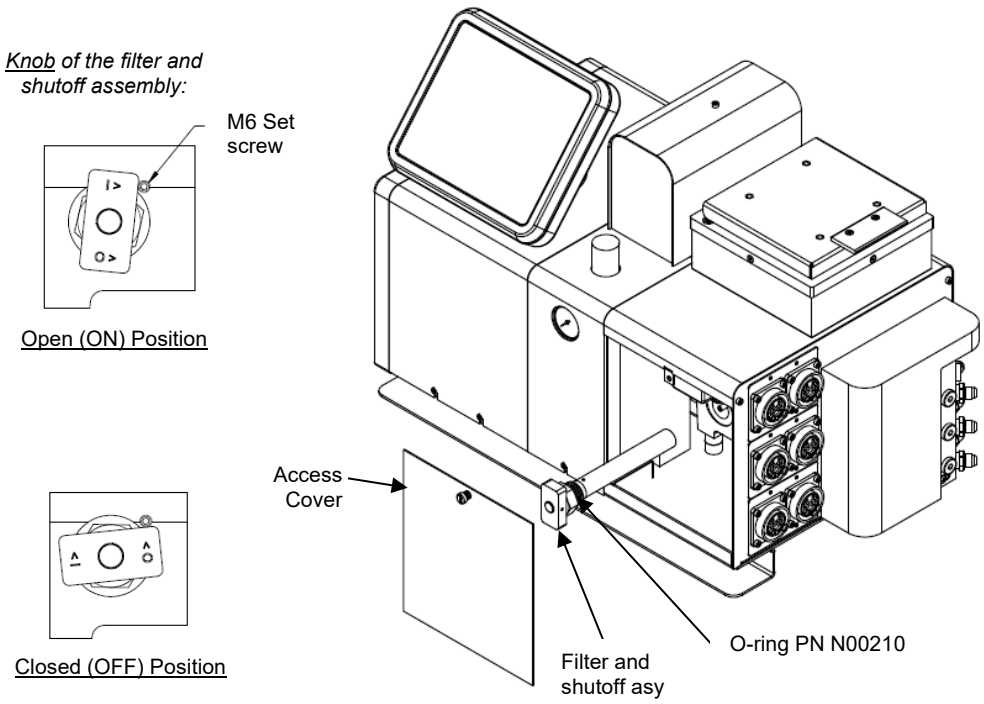
Use the output filter manifold's purge valve to relieve adhesive pressure before performing any pump filter maintenance. See Ch.6.4 "Purging the Filter Manifold of Adhesive and Pressure" for detailed instructions.

During the purging procedure, hot adhesive can come out of the manifold under high pressure. Avoid splashing hot adhesive. Stand clear of the ASU until all pressure is relieved.

The filter cartridge will be covered with hot adhesive and must be handled with proper tools. Components and adhesive are hot. Take every precaution to prevent the material and hot surfaces from contacting the skin.

NOTE on Function:

- This assembly is installed in the hopper (tank) in the adhesive channel to the pump. It functions as a pre-filter and filters debris and it prevents them from entering into the adhesive system. During production it must always be open (vertical position).
- Close this assembly (horizontal position), for example during pump replacement, to prevent that the adhesive flows out of the tank (shutting-off the adhesive flow).



1. Pump all adhesive out of the hopper.
2. Turn the pump OFF.
3. Depressurize the system (see Ch.6.4).

4. Lower the temperature of the application system to the adhesive's softening point.

WARNING HOT SURFACE

The ASU will still be hot during this procedure.
Use insulated gloves and protective clothing when removing the filter and shutoff assembly.

5. Remove the access cover by loosening the captive screw and lifting the panel off of the base rail.

6. Remove the M6 set screw.
   Wearing gloves, unscrew the filter retaining nut and pull the filter and shutoff assembly from the hopper.

7. Immerse 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.
   NOTE: If the filter cannot be cleaned, replace the entire assembly.

8. Install a new O-ring PN N00210 on the filter and shutoff assembly. Apply a coat of anti-seize compound onto the threads of the filter retaining nut and re-install the filter and shutoff assembly into the hopper.

9. Position the filter knob in the OPEN position (see illustration) and install the M6 set screw until it bottoms. Do not overtighten!

10. Replace the access cover and restore the ASU to normal operation.

After finishing the maintenance or repair works:

- Remove all materials and tools used during the repair or maintenance from the workspace of the unit.
- Connect the voltage supply and the compressed air supply. Heat the unit up. Wait until all temperatures are within the tolerances and the adhesive in the hopper is molten completely.
- Continue production.

6.5.6 Flushing the System

Contaminated adhesive, accumulation of residue in the system and hopper, or changing the adhesive formulation may require the system to be flushed. To flush the system, have at least 6 liters (1.5 gallons) of flushing fluid on hand (PN L15653).

WARNING

Heed all security advices given in Chapter 6.1.

Maintenance and repair work is only permitted for skilled personnel!

The flushing fluid will splash easily.

Always wear safety shoes, heat-resistant protective gloves, safety goggles and protective clothing that cover all vulnerable parts of the body while working on the heated unit! Risk of injury or severe burns!

Components and adhesive are hot. Take every precaution to prevent the material and hot surfaces from contacting the skin.

1. Pump out as much of the molten adhesive as possible.
2. Reduce the pump pressure to zero.

   Note: the hose used in the following process is merely for the convenience of depositing flushing fluid. This procedure does not have to be repeated for each hose in the system.
3. Disconnect one of the supply hose's adhesive feed from its applicator head. Do not disconnect the electrical power to the head (since that would disable the pump). Put the hose in a secured position within a heat-resistant container, which will 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 adhesive remaining in the hopper.
5. Slowly increase the pump pressure. Pump as much of the flushing fluid through the hopper, pump and adhesive supply hose into the flushing container.

WARNING HOT ADHESIVE

Avoid splashing the flushing fluid from the end of the hose.

6. Reduce the pump speed to zero.
7. Add new adhesive to the hopper and allow it to reach application temperature.
8. Slowly increase air pressure to the pump.
9. Actuate each of the heads until all the flushing fluid is removed and a steady stream of new adhesive flows.
10. Remove the output filter and replace the filter cartridge. Install a new O-ring on the filter nut (lubricate the new O-ring with O-ring lubricant prior to installation) and tighten the filter nut.
11. Re-adjust the pump air pressure for the desired flow.
12. Re-fill the hopper with adhesive. The system is now ready for production.

Chapter 7
Troubleshooting

7.1 General Troubleshooting Notes

NOTE: Please re-read all security advices given in Chapter 2 before performing any troubleshooting or repair procedures.

All troubleshooting or repair procedures must be performed by qualified, trained technicians.

DANGER HIGH VOLTAGE

The Simplicity 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.

WARNING HOT SURFACE

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

Some of the procedures in the following Troubleshooting Guide require working near hot adhesive.

Face shields (preferred) or safety glasses (for minimum protection), heat-resistant protective gloves and long-sleeved clothing must be worn whenever working with or around adhesive application systems.

Use proper tools for handling hot melt components.

CAUTION

Printed circuit boards (PCBs) are prone to damage from static electrical charges during handling. Read the section on "Handling Printed Circuit Boards" before handling or attempting service on ASU's PCBs.

The ASU's DynaControl includes malfunction self-diagnostics, alerts and error indication alarms. The error indication alarms (the alarms displayed on the DynaControl readout) are triggered whenever there is a sensor failure and whenever there is an over-temperature condition. The operation of the error indication alarms is described in Chapter 5 of this manual.

7.1.1 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 are correct.
5. Adhesive is in the hopper.
6. The temperature controller is in operation. The setpoints are correct for the Melter, Heated Hoses and Applicators. All components are heating properly.

7.1.2 Error Messages

The controller indicates an error by displaying the word WARNING or ALARM in the System Status fields of the HMI.

See examples of controller error messages in the Troubleshooting Guides section of this chapter.

7.1.3 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.

Before disconnecting a hose or Applicator, always turn its temperature zone OFF at the controller. This will avoid controller alarms and possible system shutdown.

7.1.4 High-Temperature Redundant Overtemp Thermostat

The Simplicity Series ASU includes a mechanical (redundant) overtemp thermostat that acts as a safety backup. If the ASU's hopper temperature should exceed 232°C (450°F), the thermostat will cause the ASU's power relays to open and power to the hopper and all hoses and heads will be cut off. The mechanical thermostat must be manually re-set after the hopper temperature falls below 204°C (400°F).

The overtemp thermostat is located on the front side of the hopper, behind the access cover (see illustration on previous page). To reset: turn OFF the ASU's main power switch; loosen the captive screw to remove the access cover; push the center of the thermostat's insulator to re-set; restart the ASU.

7.1.5 Lithium Battery on Operator's Panel Printed Circuit Board

The operator display panel's printed circuit board contains a lithium battery (PN 121594) which powers the seven-day scheduler's clock. The normal life of this battery is about ten years. When the battery needs replacement, the scheduler's clock does not function, but other controller features remain intact.

Refer to the drawing of Main PCB asy 150146 for battery location under Ch.7.2 and Ch.10.

Battery Installation:
WARNING: Extra care must be taken during the battery installation!

- Do not over-bend the battery contact tab. Over-bending the tab may cause loss of tab tension! Loss of tab tension might cause loss of electrical current flow for the battery.
- Only bend the tab so far (open enough) that the battery can be slid in.

7.1.6 Handling Printed Circuit Boards (PCBs)

The ASU and DynaControl controller utilize several modules and printed circuit boards (PCBs). These boards are extremely sensitive to electrostatic charges. When working near or with these components, the following procedures must be followed to avoid damage to them.

DANGER HIGH VOLTAGE

Before unplugging connectors from the modules or I/O PCBs, ground yourself to the ASU by touching any available unpainted cool metal surface, mounting screws, etc. This will avoid electrical discharge to the assembly when you are removing and replacing connectors.

CAUTION

Modules and printed circuit boards (PCBs) 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.

5. When removed from the ASU, each PCB must be individually packaged inside a metalized, 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.

6. 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 the other person.

7. When unwrapping a PCB from its static drain envelope, place the envelope on a *grounded, nonmetallic* surface.

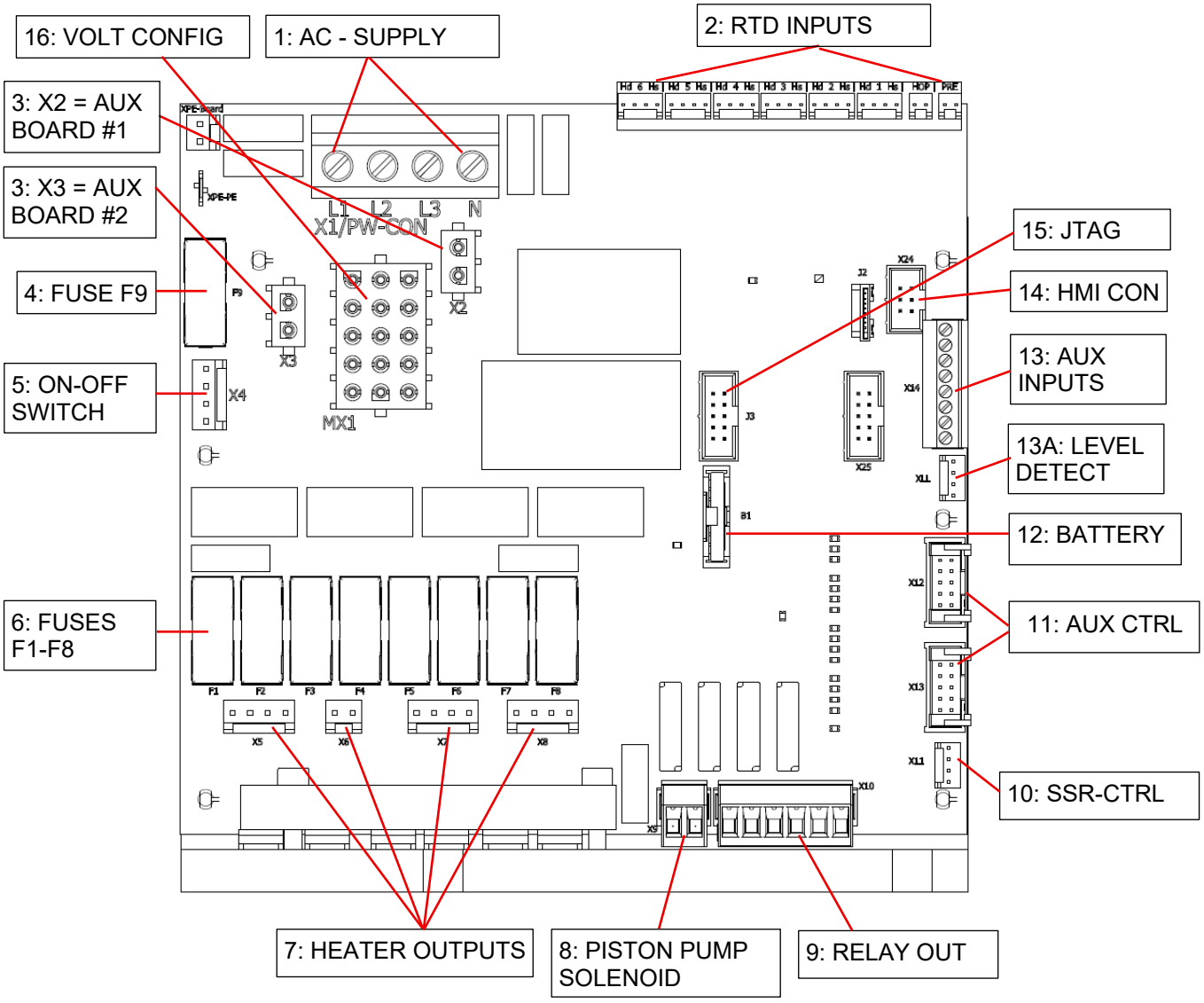
8. To cushion modules or PCBs for shipment, use only static-drain bubble pack. Do not use foam peanuts or bubble pack not known to be static draining.

The following pages detail the Simplicity PCBs.

7.2 V6 Main PCB PN 150146

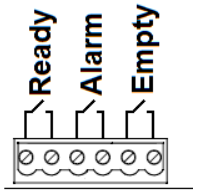
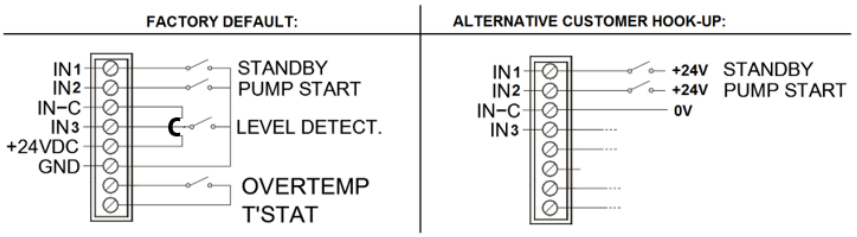
The V6 Main PCB is the main control board of the DynaControl V6 controller. Most of the internal and external components are connected to this PCB.

ITW Dynatec recommends using dry contacts for connecting to DynaControl V6!



The following items are referenced to the illustration above:

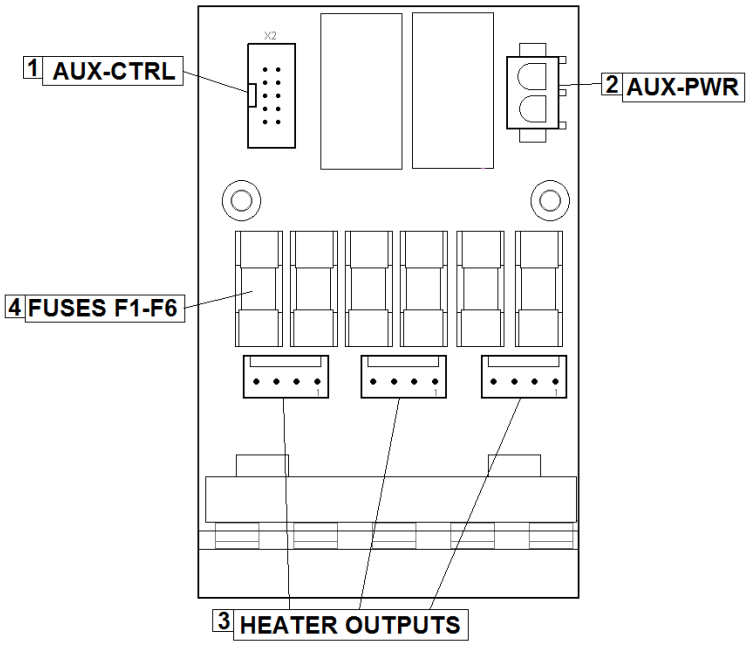
Component	Description
1: AC SUPPLY:	AC input connected to the main supply terminal on the unit's base frame.
2: RTD-INPUTS:	RTD (Temperature sensor) inputs for all zones. Depending on configuration either PT100 or NI120 RTDs are used.
3: X2 = AUX BOARD #1: **X2 = AUX BOARD #2:**	Power connections to the AUX-power boards. Depending on configuration those might not be used.
4: FUSE F9:	This fuse protects the electronic board. Fuse rating: 2AT (2-amp slow blow).

5: ON-OFF SWITCH:	Connection to On/Off switch. Keep in mind that this switch does not completely disconnect voltage.
6: FUSES F1-F8:	Heater Fuses. Those fuses protect the individual heater circuits. Fuse rating: 10AF (10-amp fast). Replace only with appropriate spare fuses.
7: HEATER OUTPUTS:	Connect to the heaters of the individual zones.
8: PISTON PUMP SOLENOID:	Connection for Pump Solenoid. This 230VAC output gets energized when the pump is turned on and system is in ready condition.
9: RELAY OUT:	Auxiliary Output Relays. • ***Ready:*** *T*his contact closes once the system is in ready condition (ready condition = all active temperature zones are within their tolerances and there is no other alarm message pending). Normally open. • ***Alarm:*** *This contact is normally closed. In case of an Alarm (over temp, RTD fault etc.) the contact will open.* • ***Empty:*** *This contact will close when the adhesive level is below a certain minimum. (optional)* 
10: SSR-CTRL:	SSR connection. In case heater circuits use additional Solid State Relays, those are connected here.
11: AUX CTRL:	It is not used.
12: BATTERY:	This battery is required to keep the internal clock for the 7-day scheduler running. If you notice the unit is losing the time/day setting it needs to be replaced. The battery type is CR2032.
13: AUX-INPUTS:	Auxiliary Inputs. This connector accepts external signals that can be used to control the ASU. The inputs require 24VDC signals. Although the internal 24VDC can be used to provide voltage for the inputs, it is recommended to use external 24VDC. For this purpose, the common of the signal inputs is available on terminal IN-C. and is isolated from the internal 24VDC. Inputs IN1 and IN2 are not polarity sensitive. That means the common (IN-C.) can either be positive or negative.  **WARNING:** The ASU's internal 24VDC is grounded. It is not recommended to connect external 24VDC with the internal. If this cannot be avoided, it is important that the ground potential of the external and that of the ASU is equal. If this is not the case, damage to the V6 control board is possible.

13A: LEVEL DETEC:	Connection to level detection.
14: HMI-CON:	This is an internal connection to the operator panel.
15: **JTAG:**	This is a Dynatec only connection.
16: VOLT-CONF:	This is a configuration plug that is determined by the power supply voltage the unit is connected to. The appropriate voltage configuration plug must be installed for the machine to operate properly. Four different connectors (plugs) are available: 1. PN 150127-1 - 240V single phase L1 / L2 (blue) 2. PN 150127-2 – 230V single phase L1 / N (black) 3. PN 150127-2 - 240V three phase, Delta (violet) 4. PN 150127-3 - 400V three phase, Wye (yellow) **WARNING:** Using the wrong configuration plug can damage the unit and create a hazardous situation.

7.3 V6 Auxiliary PCB PN 150149

The V6 AUX PCB provides heating circuits for additional zones. An ASU with 4 hose capability requires one of those; a 6-hose unit requires two AUX PCBs.

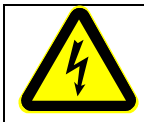


Description of Components

The following items are referenced to the illustration above:

- **Item #1** Control connection from the main PCB.
- **Item #2** AC-Power connection from the main PCB.
- **Item #3** Heater outputs. Connect to the heaters of the individual zones.
- **Item #4** Heater Fuses. Those fuses protect the individual heater circuits. Fuse rating: 10AF (10-amp fast). Replace only with appropriate spare fuses.

7.4 Heater and Sensor Resistance Values



DANGER HIGH VOLTAGE

Before unplugging connectors from the PCBs, 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.

The resistance values given in the four tables on this page will aid in troubleshooting when a sensor or heater malfunction is suspected.

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

- The "**Temperature Sensor Resistance**" table gives values for various temperatures. If you know the approximate temperature of the suspected sensor, you can check to see if the sensor resistance approximates the value given in the table by unplugging the affected head or hose connection and measuring resistance across the affected pins (see wiring diagram in Chapter 11 for pin numbers).

Temperature sensor PT 100 Ohms
Control option: DCL

Temperature °F	Temperature °C	Resistance in Ohms
32	0	100
50	10	104
68	20	108
86	30	112
104	40	116
122	50	119
140	60	123
158	70	127
176	80	131
194	90	135
212	100	139
230	110	142
248	120	146
268	130	150
284	140	154
302	150	157
320	160	161
338	170	164
356	180	168
374	190	172
392	200	176
410	210	180
428	220	183

Temperature sensor Ni 120 Ohms
Control option: NOR

Temperature °F	Temperature °C	Resistance in Ohms
32	0	120
50	10	127
68	20	135
86	30	142
104	40	150
122	50	158
140	60	166
158	70	174
176	80	183
194	90	192
212	100	201
230	110	210
248	120	219
268	130	229
284	140	239
302	150	249
320	160	259
338	170	270
356	180	284
374	190	292
392	200	303
410	210	315
428	220	328

- The "**Nominal Hose Heater Resistance**" table gives the heater resistance for hoses. A suspected hose heater problem can be quickly isolated by measuring hose heater resistance and comparing it to the correct resistance for your hose length and voltage as shown.

  Nominal Hose Heater Resistance (for #6 DynaFlex-Hoses):

Hose Length Meter	Hose Length Feet	Resistance in Ohms (240V)
1.2	4	466-544
1.8	6	279-326
2.4	8	236-275
3	10	189-221
3.7	12	155-181
4.9	16	118-137
7.3	24	77-90

- The "**Nominal Head Heater Resistance**" table gives values for several different head wattages. A suspected head heater problem can be isolated by measuring head heater resistance and comparing it to the resistance for the appropriate wattage of your system.

  Nominal Head Heater Resistance:

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

- The "**Nominal Hopper Heater Resistance**" table gives heater resistance for the hopper heaters of each Simplicity Series model and for the (optional) drop-in grids.

  Nominal Hopper Heater Resistance:

ASU's Heaters	Hopper
Quantity Heaters	2
Resistance in Ohms for each Heater	**4kg/8kg** = 71.96 – 80.65
	16kg = 41.5 – 48.2

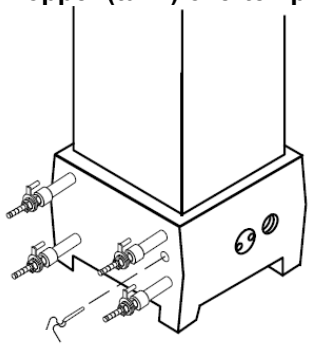
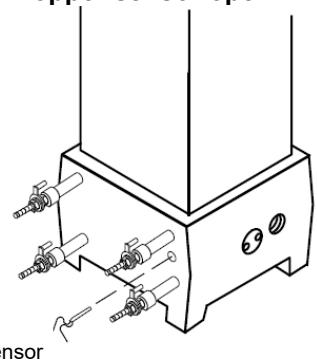
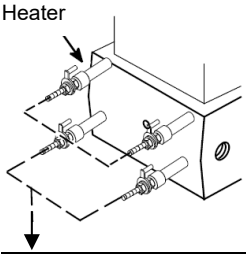
7.5 Error Indication Alarm Troubleshooting Guide

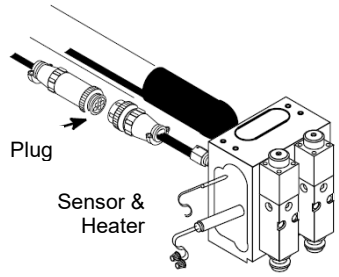
The operation of error indication alarms is described in Chapter 5. When checking for correct equipment operation in the following guide, be aware that all heaters will go off immediately after an error indication alarm occurs if the operator takes no action. With the exception of the fuses, there are no user-replaceable parts on the printed circuit boards. If there is a non-fuse failure on any of the PCBs, the PCB must be replaced.

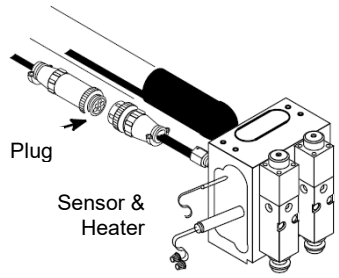
NOTE: The temperatures measured on the outer surface may deviate significantly from the temperatures set and displayed. This can lead to a false conclusion (e.g., defective heating). Such a difference is normal and depends also largely on the materials used.

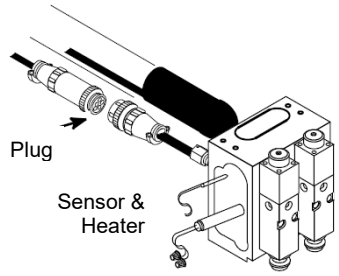
DANGER HIGH VOLTAGE

Some of the procedures in the following Troubleshooting Guide require potentially dangerous electricity to be present. Only qualified service personnel should perform these procedures.

Problem	Possible Cause	Solution
1. Hopper (tank) overtemp  Sensor	1. Setpoints have been programmed without enough deviation. 2. Hopper sensor inoperative. 3. Hopper control triac on V6 PCB is inoperative.	1. Re-program setpoints, allowing a larger deviation between the high and low limits. 2. Replace hopper sensor if resistance does not comply with the resistance table in this manual. 3. The PCB must be replaced.
2. Hopper sensor open  Sensor	1. Sensor cable has become unplugged from V6 PCB. 2. Hopper sensor inoperative.	1. Verify that hopper sensor cable is properly connected at PCB. 2. Replace hopper sensor if resistance does not match resistance table.
3. Hopper heater open Heater  Hopper heater resistance 4kg/ 8kg: 71.96 – 80.65 Ohms 16kg: 41.5 – 48.2 Ohms	1. Disconnection in hopper heater circuit. 2. Open hopper heater element.	1. Inspect hopper heater wiring for proper connections. 2. Remove all lead wires from hopper heater elements. Use an ohm meter to measure resistance across each element. Infinitely high resistance values indicate an open heating element which must be replaced.

Problem	Possible Cause	Solution
4. Hose/ Head (no.) * overtemp	1. Hose/ Head setpoints (bandwidths) incorrectly programmed.	1. Re-program setpoint (bandwidths) to allow a larger deviation.
5. Hose/ Head (no.) * not heating  ** Check each Hose/ Head circuit on the system.*	1. Disconnection between Main and Aux Power PCB. 2. Hose/ Head sensor circuit inoperative.	1. Verify that Main and Aux Power PCB are properly connected (Power and Control connections) 2. a. Visually examine hose/ head socket connections. Verify that pins are properly seated. If pins or plug housings are damaged, repair or replace hose. If socket is damaged, repair or replace harness. b. If hose-to-ASU plug and socket are okay, hose may have intermittent short or open circuit. Repair or replace hose, hose harness, Power PCB or Aux Power PCB as appropriate. Alternately, problem can be isolated by connecting the affected hose to a different ASU hose socket to determine if the problem is in the hose or in the Main or Aux Power PCB. c. If head-to-hose and hose-to-ASU plugs and sockets are okay, head sensor may have an intermittent short or open circuit. Examine connections inside the service block area of the head and monitor head sensor resistance with an ohmmeter while flexing sensor leads. Repair or replace an inoperative sensor.

Problem	Possible Cause	Solution
6. Hose/ Head (no.)* not heating (sensor circuit open)  	1. Disconnection between hose and ASU. 2. Hose sensor harness unplugged from Main PCB. 3. Hose/ Head sensor circuit inoperative.	1. Visually examine connector for proper contact and seating. If pins or housings are damaged, repair or replace hose or hose harness (in ASU). 2. Verify that affected hose is properly connected to Main PCB. Replace or repair damaged hose harness, as necessary. 3. Replace head sensor if resistance does not comply with resistance table. Use hose schematic to check hose sensor resistance at ASU socket, repair or replace hose, hose harness, Power or Aux Power PCB as appropriate.
7. Hose/ Head (no.)* not heating (sensor circuit shorted) ** Check each Hose/ Head circuit on the system.*	1. Debris at connection between hose/ head and ASU. 2. Debris at connection between hose/ head harness and Main PCB 3. Hose/ Head sensor circuit inoperative.	1. Visually inspect hose connector and ASU socket for cleanliness and proper contact and seating of pins. 2. Visually inspect that the affected hose connector at Main PCB is clean and properly installed. 3. Using the hose schematic, check hose sensor resistance at ASU socket. An ohmmeter can also be used to isolate a pinched wire in the hose harness. When cause is isolated, repair or replace sensor, hose, hose harness, Main PCB as appropriate.

Problem	Possible Cause	Solution
8. Hose/ Head (no.) * not heating (heater circuit open)  ** Check each Hose/ Head circuit on the system.*	1. Disconnection between hose/ head and ASU.	1. Visually examine affected hose/ head plug and ASU socket for cleanliness and proper contact and seating. Refer to wiring diagram for pin identification. The problem can be isolated by plugging the affected hose/ head into another ASU socket. If the new hose number is then displayed as malfunctioning, the problem is in the hose or head that was moved. Repair or replace hose or head or ASU hose/ head harness as appropriate.
	2. Disconnection between hose/ head harness and Main PCB or Aux Power PCB.	2. Verify that the hose harness plug is properly inserted into its Main PCB or Aux Power PCB plug. Check for loose leads, debris and proper contact.
	3. Disconnection between cartridge heater and cable assembly inside head.	3. Visually inspect wiring inside head. Verify that cartridge heater leads are properly connected in the service block area.
	4. Open head heater element.	4. Use an ohmmeter to measure resistance of head cartridge heater. Refer to resistance table for resistance values. Infinitely high resistance indicates an open heater. Replace cartridge heater as appropriate.
	5. Head fuse on Main PCB or Aux Power PCB inoperative.	5. If a fuse is found to be blown, do not replace it without first finding cause. Look for a short circuit to ground in the head heater circuit, particularly inside the head at the connections in the service block area. If replaced fuse also blows, Main PCB or Aux Power PCB may be the cause. However, fuse failure is usually due to a problem in the head heater circuit, not the Main PCB or Aux Power Module.
	6. Open wiring inside ASU.	6. Visually inspect ASU wiring and use an ohmmeter and the wiring diagram to locate an open wire in head heater circuit. Repair or replace ASU hose harness or other ASU wiring, as necessary.

7.6 Troubleshooting the ASU Pump

No special tools are needed for working on the ASU pump. See Chapter 8 of this manual for disassembly/ assembly procedures for the ASU pump, and Chapter 10 for locating pump parts on the component illustrations (exploded-view drawings).

7.6.1 Piston Pump Priming/ Start-Up

WARNING HIGH PRESSURE

To avoid accidental splashing of hot melt adhesive, always relieve pressure by turning pump off, disconnect air and opening the filter drain on the pump manifold before working on the pump.

WARNING

Observe manufacturer's procedures for selecting and using cleaning solvents. Be sure to read and comply with the safety procedures outlined in Chapter 2 of this manual before proceeding, particularly the section entitled, “Preventing Explosions and Fire".

WARNING HOT ADHESIVE

Use a stable, deep container to collect hot-melt adhesive while priming the pump.

- The pump is self-priming. Before starting the pump, make sure a hose is attached with an open line.
- Begin with ASU electrical power OFF and the Air Control/ Filter Unit adjusted to zero air pressure.
- Turn the ASU power switch ON, after system is heated and in ready condition, slowly increase air pressure to the pump and the Air Control/ Filter Unit.
- Increase air pressure until the pump begins to stroke very slowly. By allowing the pump to stroke very slowly it will gradually purge itself of air. As the pump begins to run smoothly, gradually increase the air pressure to normal operating pressure (1.4 to 5.4 bar or 20 to 80 psi).

7.6.2 Piston Pump Troubleshooting Guide

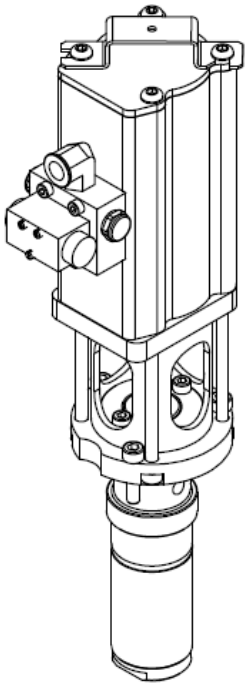
WARNING HOT SURFACE & HOT ADHESIVE

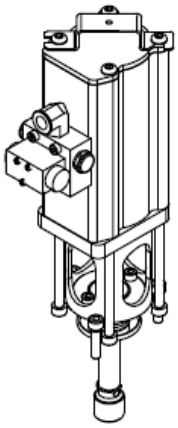
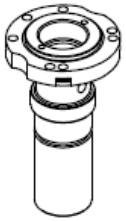
Severe burns can occur if unprotected skin comes in contact with molten adhesive or hot application system parts.

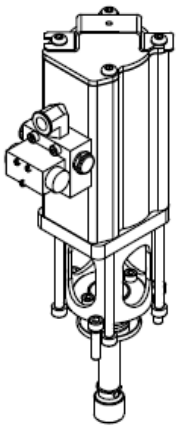
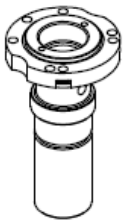
Some of the procedures in the following Troubleshooting Guide require working near hot adhesive.

Face shields (preferred) or safety glasses (for minimum protection), heat-resistant protective gloves and long-sleeved clothing must be worn whenever working with or around adhesive application systems.

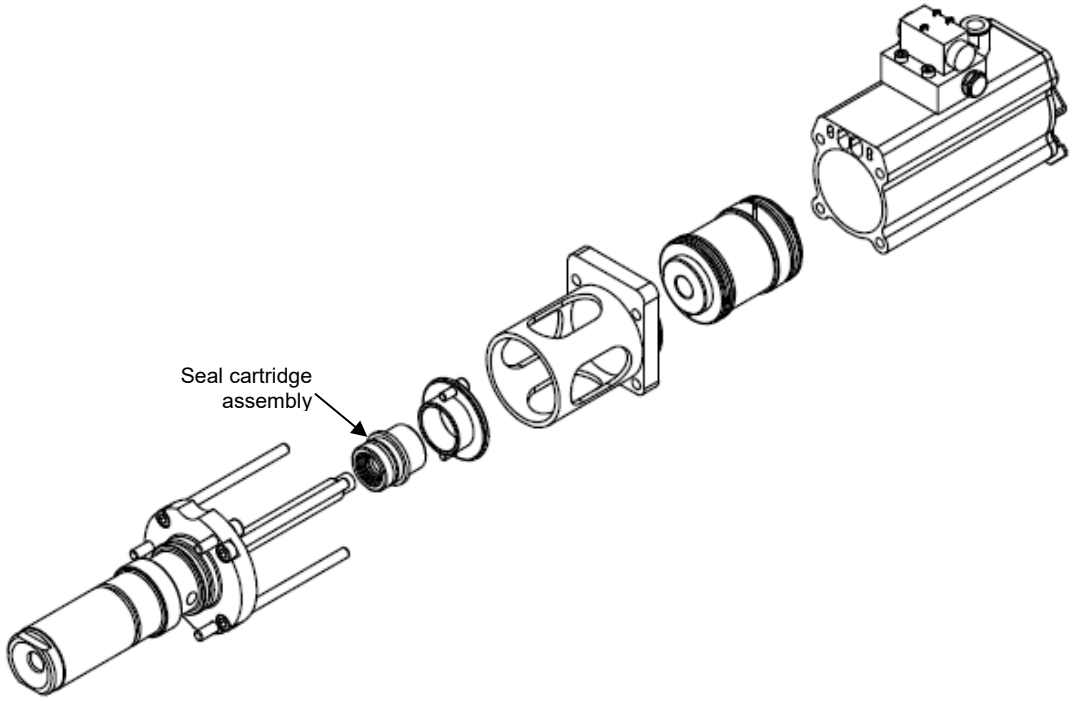
Use proper tools for handling hot melt components.

Problem	Possible Cause	Solution
1. Pump will not stroke 	1. No air pressure.	1. Verify system has been provided with at least 0.5 SCFM of air at 10-100 psi (.014 std. cubic meters/minute at 6.8 bar).
	2. 2-way solenoid valve is closed.	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 24VDC is applied to the valve terminals. Replace valve if defective.
	3. Fault in compressed air fitting on ASU.	3. Inspect the system for improper connections, loose tubing or fittings, or kinked tubing. Repair or replace tubing or fittings, as necessary.
	4. Pump is switched Off at the control panel.	4. If pump status shows STOP, the pump is switched off. Go to the Pump Screen to switch the pump on.
	5. ASU has not reached setpoint temperature.	5. Wait for the ASU to reach setpoint temperature or increase temperature tolerance.
	6. External Pump Start not activated	6. Install Jumper wire or external contact to activate pump start input.

2. Pump quick-strokes in both directions  Outlet check valve   Inlet check valve	1. No adhesive in hopper. 2. Adhesive is too cold to flow into pump. 3. Adhesive used is too viscous. 4. Problem with pump shaft piston. 5. There is a large opening in the system downstream of the pump.	1. Verify that hopper has an adequate level of hot melt adhesive. 2. Check ready temperature of the pump enable to make sure there has been enough time for the adhesive to rise to the hopper setpoint temperature. 3. Verify that adhesive selection and hopper setpoint temperature are compatible and that both are appropriate for your application. 4. Remove the shaft and piston from the pump. See Chapter 8 for disassembly/ assembly procedures. Verify that piston diameter is correct: 19.63mm to19.66mm (0.773" to 0.774") and that piston is tightly assembled to end of shaft. 5. Inspect system for open filter drain, disconnected or ruptured hose, or disconnected head. Repair, as necessary.
3. Pump quick-strokes on the forward-stroke only (shaft moving into pump body)	1. Inlet check valve is blocked open.	1. Clean inlet check valve. This may be possible without removing the pump by cleaning debris through the pump inlet hole at bottom of hopper.
4. Pump motion on the forward stroke (shaft moving into pump) is very slow or stopped.	1. Outlet check valve is blocked closed.	1. Clean outlet check valve.
5. Pump quick-strokes on the reverse stroke (shaft moving out of pump)	1. Outlet check valve is blocked open.	1. Clean outlet check valve.

Problem	Possible Cause	Solution
6. Low or inconsistent adhesive output.  Outlet check valve   Inlet check valve	1. Outlet filter is clogged. 2. Adhesive used is too viscous. 3. Blocked hose. 4. Blocked applicator heads. 5. Pressure relief valve in outlet block is opening.	1. Remove and inspect outlet filter. Clean or replace, as necessary. See Chapter 6 “Preventive Maintenance" for procedure. 2. Verify that system components are at proper temperature and that selected adhesive is correct for your application. 3. Inspect hose for kinks, internal plugs of debris or char (degraded adhesive). Clean or replace hoses as required. 4. Inspect heads for plugged nozzles, proper air valve operation or plugged filters. Clean or repair heads as needed. 5. Verify that air supplied to pump is less than 6.8 bar (100 psi). If relief valve is opening with air pressure less than 6.8 bar (100 psi), adjust or replace pressure relief valve.
7. Adhesive leak at filter drain	1. Filter drain valve not tightly closed. 2. Filter drain valve blocked open.	1. Close and tighten filter drain valve. 2. Remove filter plug assembly from pump. Disassemble plug assembly, clean and re-install.

Problem	Possible Cause	Solution
8. Adhesive leak at pump shaft seal.	1. Pump seal out of proper Shaft Seal position inside seal and bearing assembly.	1. Remove seal and bearing assembly from pump. Verify that all components are correctly assembled.
	2. Seal inoperative.	2. Remove seal from pump and inspect it. Replace worn or damaged seal. Be sure there are no burrs or other sharp edges on pump shaft or on installation tools that could damage the new seal.



Chapter 8
Disassembly & Re-assembly Procedures

8.1 Precautions for Disassembly Procedures

NOTE: Please re-read all security advices given in Chapter 2 before performing any troubleshooting or repair procedures.

All Disassembly & Re-assembly Procedures must be performed by qualified, trained technicians.

DANGER HIGH VOLTAGE

Once the system is up to temperature, disconnect and lockout all incoming power before proceeding.

ITW Dynatec's systems use 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.

WARNING HOT SURFACE

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

Some of the procedures in this chapter require working near hot adhesive.

Face shields (preferred) or safety glasses (for minimum protection), heat-resistant protective gloves and long-sleeved clothing must be worn whenever working with or around adhesive application systems.

Use proper tools for handling hot melt components.

When needed, cross-reference the exploded-view component drawings in Chapter 10 with each procedure in addition to the instructions and illustrations given in this chapter. Read the "Cautions" under point Re-Assembly Procedures before re-assembling the ASU.

8.2 Precautions for Re-Assembly Procedures

Unless noted, the Simplicity Series 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* must be replaced whenever hot-melt equipment is re-assembled. All new O-rings must be lubricated with O-ring lube (PN 001U002).

CAUTION: *TAPERED PIPE THREADS* are found on airline 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 another surface). Excessive torque may damage straight-threaded parts and the use of power wrenches is not recommended.

CAUTION: *HOT-MELT RESIDUE* must 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 must be re-tightened at operating temperature.

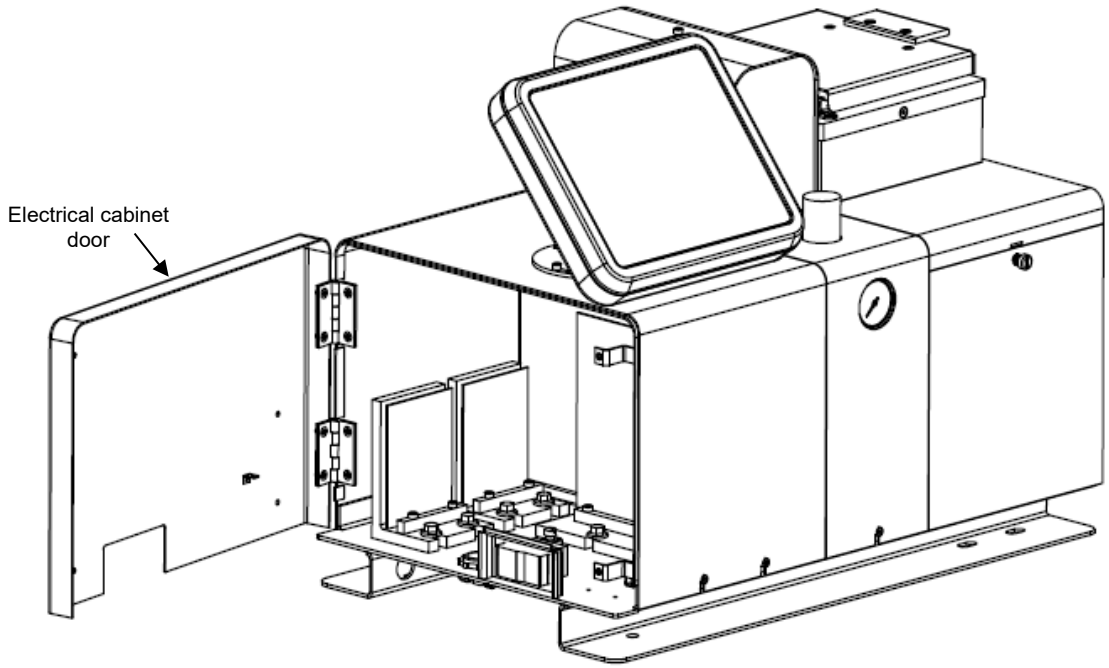
8.3 To Open the Electronics Cabinet Door

CAUTION

Heed all advices given in Ch. 8.1 Precautions for Disassembly Procedures and Ch.8.2 Precautions for Re-Assembly Procedures.

1. Turn the unit off. Remove the two upper and lower electrical cabinet door screws, located to the right of the door.

2. Open the door.



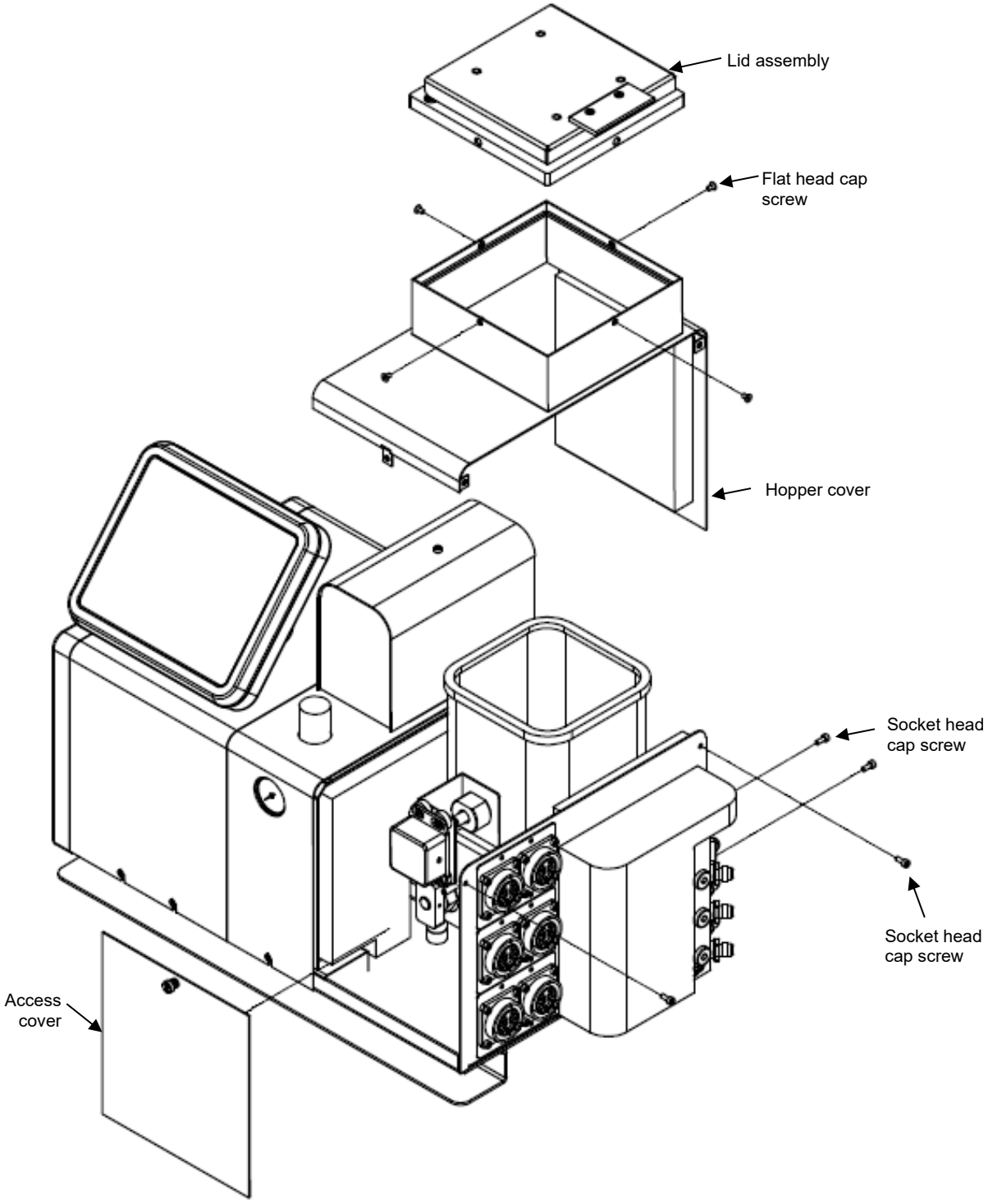
8.4 To Remove the Hopper Lid Assembly

CAUTION

Heed all advices given in Ch. 8.1 Precautions for Disassembly Procedures and Ch.8.2 Precautions for Re-Assembly Procedures.

1. Using an Allen wrench, remove the four flat head cap screws located on the four sides of the lid assembly.

2. Lift the lid assembly up and off of the hopper cover.



8.5 To Remove the Hopper Cover

CAUTION

Heed all advices given in Ch. 8.1 Precautions for Disassembly Procedures and Ch.8.2 Precautions for Re-Assembly Procedures.

1. Remove the access cover, located on the front of the unit.
2. Using an Allen wrench, loosen the four socket-head cap screws which secure the hose connector plate to the hopper cover and which secure the baseplate to the hopper cover.
3. Gently pull the hopper cover up and off the ASU.

8.6 Overtemp Thermostat Replacement

CAUTION

Heed all advices given in Ch. 8.1 Precautions for Disassembly Procedures and Ch.8.2 Precautions for Re-Assembly Procedures.

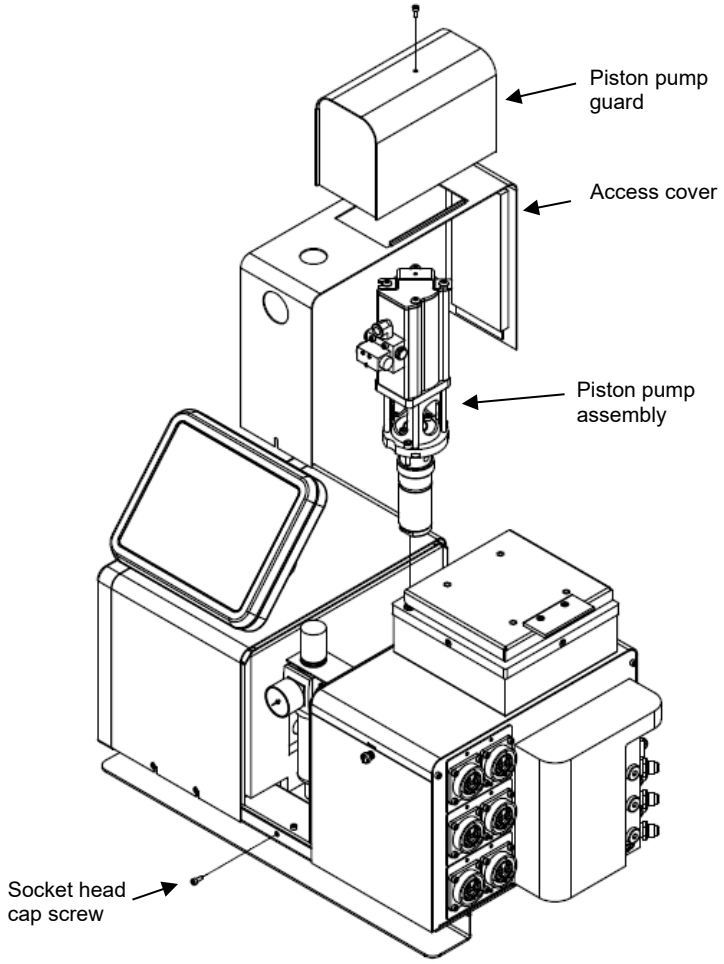
1. Remove the orange access cover of the filter and shutoff assembly, located on the front of the unit.
2. Remove the two screws and slip the terminals off of the thermostat.
3. Remove the old thermostat.
4. Apply thermal paste to the back side of the new thermostat.
5. Install the new thermostat. Tighten the screws and re-attach the terminals.
6. Attach the orange access cover of the filter and shutoff assembly.

8.7 To Remove the Piston Pump

CAUTION

Heed all advices given in Ch. 8.1 Precautions for Disassembly Procedures and Ch.8.2 Precautions for Re-Assembly Procedures.

1. The pump must be at operation temperature.
2. Turn off the pump. Remove all air pressure lines to the unit.
3. Using the drain valve on the filter manifold, release all adhesive pressure (see Ch.6.4).
4. Turn the unit off.
5. Remove the piston pump guard.
6. Remove the orange access cover.
7. Close the filter and shutoff assembly (horizontal position) to prevent that the adhesive flows out of the tank (shutting-off the adhesive flow) (see Ch.6.5.5).
8. Remove three M6 socket-head cap screws that secure the piston pump to the manifold.
9. Lift the pump straight up and out of the manifold.



8.8 Piston Pump Seal Replacement

CAUTION

Heed all advices given in Ch. 8.1 Precautions for Disassembly Procedures and Ch.8.2 Precautions for Re-Assembly Procedures.

A piston pump seal kit is available from ITW Dynatec. See details in Chapter 9.
Remove the upper and lower O-rings from the piston pump's snout and replace.

8.9 Hopper Sensor Replacement

CAUTION

Heed all advices given in Ch. 8.1 Precautions for Disassembly Procedures and Ch.8.2 Precautions for Re-Assembly Procedures.

A Hopper Sensor Repair Kit is available from ITW Dynatec. See details in Chapter 9.

1. Remove the orange pneumatic access cover. The sensor is located in the hopper casting.
2. Pull the sensor out and disconnect it from the main PCB in the electrical panel.
3. Apply a thin coat of thermal paste to the RTD, ensuring that none gets on the potting of the RTD.
4. Install new sensor into the hopper casting hole and connect into the main PCB.
5. Re-assemble the orange pneumatic access cover.

8.10 Note on the Cast-in Heaters

CAUTION

Heed all advices given in Ch. 8.1 Precautions for Disassembly Procedures and Ch.8.2 Precautions for Re-Assembly Procedures.

The two cast-in heaters installed in the base of the hopper are not replaceable.

8.11 To Access Electrical Components

CAUTION

Heed all advices given in Ch. 8.1 Precautions for Disassembly Procedures and Ch.8.2 Precautions for Re-Assembly Procedures.

1. Turn the unit Off.
2. Open the electrical cabinet door.

8.12 Main ON/OFF (Power) Switch

CAUTION

Heed all advices given in Ch. 8.1 Precautions for Disassembly Procedures and Ch.8.2 Precautions for Re-Assembly Procedures.

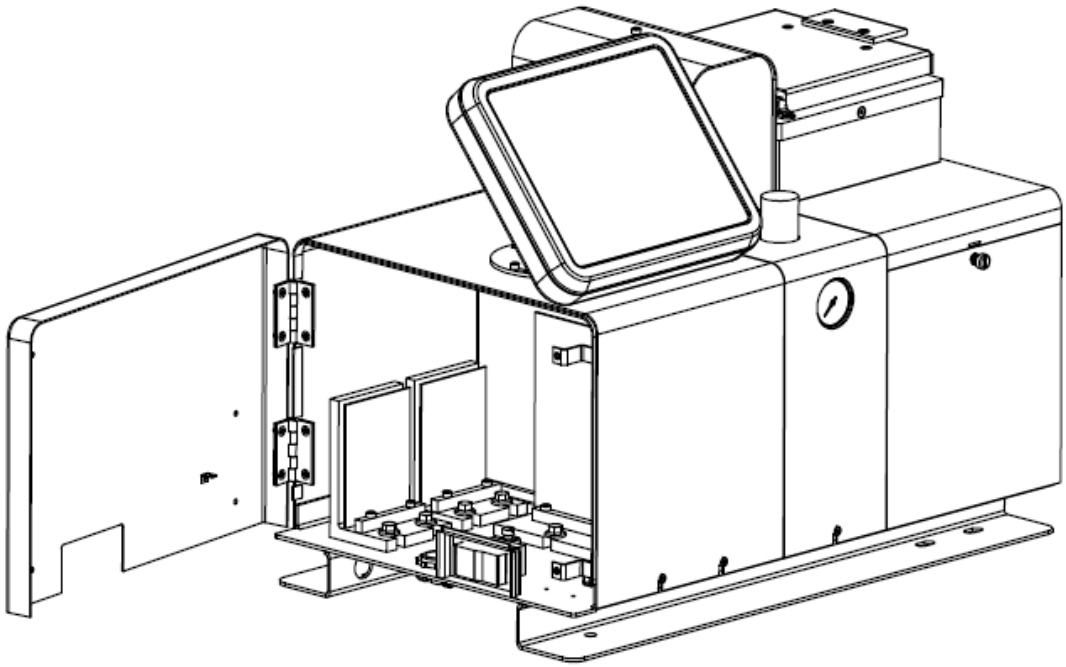
The switch body is mounted to the baseplate.

8.13 Fuse Replacement

CAUTION

Heed all advices given in Ch. 8.1 Precautions for Disassembly Procedures and Ch.8.2 Precautions for Re-Assembly Procedures.

There are several fuses on both the Main Power PCB and the Auxiliary Power PCB. To access the fuses, open the electrical cabinet door to access the PCB's.



8.14 Printed Circuit Board or Module Replacement

CAUTION

Heed all advices given in Ch. 8.1 Precautions for Disassembly Procedures and Ch.8.2 Precautions for Re-Assembly Procedures.

When removing the unit's PCBs or modules, all connectors must be removed, therefore it is important to label or use the illustrations in Chapter 7 to note the re-connection points.

Note: the only replaceable components on the PCBs are the fuses. For any other failure, the PCB or module must be replaced.

8.15 Main or Auxiliary Power Board Replacement

CAUTION

Heed all advices given in Ch. 8.1 Precautions for Disassembly Procedures and Ch.8.2 Precautions for Re-Assembly Procedures.

To Remove:

1. Unplug all connectors on the PCB, noting re-connection points.

2. Loosen the two screws at the front of the heatsink.

3. Tilt the board up approximately 5 degrees and pull it straight back out of the unit.

To Replace:

1. Engage the lip on the heat sink with the two mounting screws.

2. Tighten the two screws.

3. Plug in all connectors.

8.16 Control Panel Replacement

CAUTION

Heed all advices given in Ch. 8.1 Precautions for Disassembly Procedures and Ch.8.2 Precautions for Re-Assembly Procedures.

The entire control panel and shell is replaced as a unit. To remove the control panel, loosen the two socket-head socket screws and unplug the ribbon cable from the V6 Main PCB.

Chapter 9
Available Options & Accessories

9.1 Service Kits

Filter Kits

M12 spin-on Filter Kits:

- **PN 150230** Filter Kit containing:
  1x PN 150229 Filter 100-mesh M12 Spin-On
  1x PN N03812 O-ring 125
  1x PN 826384 Seal washer 1/2”
  1x PN 150243 Filter cap M12 spin-on

- **PN 150231** Filter Kit containing:
  1x PN 150229 Filter 100-mesh M12 Spin-On
  1x PN N03812 O-ring 125
  1x PN 826384 Seal washer 1/2”

Master Repair Kit PN 150043 (for Piston Pump 150039) containing:

1x PN 124325 Seal and gasket kit for piston pump air motor
1x PN 117257 Repair kit for piston pump

Pressure Relief Valve Repair Kit: PN 109982

Contains the following three external seals for the PN 115540 Pneumatic Pressure Relief Valve:
1x PN N00179 O-ring 012
1x PN N01601 O-ring 908
1x PN N05733 Backup Ring, 012

9.2 Extension kits for additional hose connections

The kits include PCB AUX, cables and screws to extension the unit to additional hose connections.
PN 150234 KIT,4-HOSE, DCL
PN 150235 KIT,6-HOSE, DCL
PN 150236 KIT,4-HOSE, NOR
PN 150237 KIT,6-HOSE, NOR

Note: The hose fitting G1/4X06, PN 101624 is not included in the kits.

9.3 Analog Pressure Gauge Kit: PN 101175

An optional analog pressure gauge can be mounted on the outlet filter manifold, either pre or post filter. 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.

9.4 NDSN Compatible ASU

This adhesive supply unit is a drop-in replacement for NDSN units. It is built with NDSN hose and head-compatible harnesses and utilizes Nickel Iron RTD sensors in the hopper and manifold.

9.5 480V Step Down Transformer Kits: PN 150183 (4kg, 8kg), PN 150190 (16kg)

The kits convert incoming power from 480V Delta (without neutral) to 240V and can be configured for two, four or six hose/ head zones.

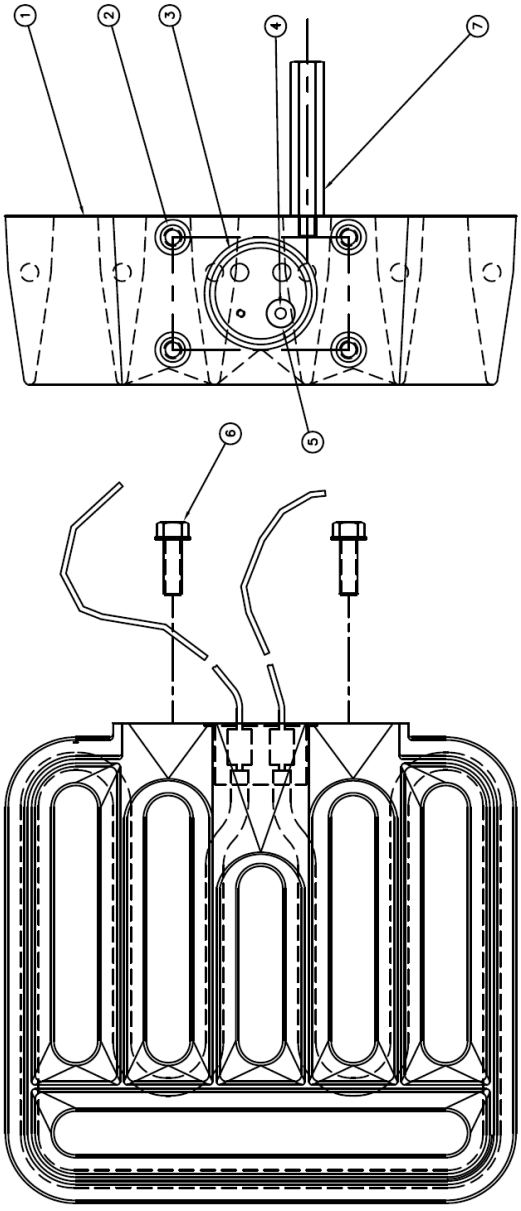
9.6 400V Step Down Transformer Kits: PN 150232 (4KG, 8KG), PN 150233 (16KG)

9.7 Level Sensor Kit, PN 150106

An optional level sensor kit can be mounted to monitor the adhesive level in the hopper. This kit includes the Probe Assy (PN 117476) and the Sensor Control Assy (PN 117477).

9.8 Grid Group, Simplicity DCL PN 150240 & NOR PN 150241

Item	Part Number	Description	Quantity
1	104802	Grid	1
2	N00181	O-ring 014	4
3	N00192	O-ring 032	1
4	106174	Sensor adaptor	1
5	150217	Sensor RTD – included in PN 150240 (DCL)	1
	150218	Sensor RTD – included in PN 150241 (NOR)	1
6	108297	Screw M8x20mm	4
7	107525	Support, lower grid	1
8	150124	Cable asy, V6-LC CTRL-AUX	1
9	150123	Cable asy, V6-LC PWR-AUX	1
10	150149	PCB asy, Aux Power	1



9.9 Recommended Service Parts List

Category	Part Number	Description	Quantity
Mechanical and others:	001U002	Silicone Lubricant, O-ring, Dow 112, 0.25	1
	N02937	Thread Sealant	1
	L15653	Kit, Flushing Fluid, 1 gallon	1
	150197	Filter/regulator 0.5 – 8 bar (7-125 psi) with prefilter and coalescing filter, with gauge 1/4 NPTF	1
	N00181	O-ring 014	3
	N00190	O-ring 024	1
	A69X133	O-ring 124	1
	N01010	O-ring 021	2
	N00175	O-ring 008	2
	N00187	O-ring 020	2
	150043	Piston pump master repair kit	1
	114852	Hopper gasket (4kg/8kg)	1
	114858	Hopper gasket 16kg	1
	109982	Pressure relief valve repair kit	1
	150231	Filter kit, 100-mesh filter, M12 Spin-On	1
	104101	Solenoid valve 3W, 240V, high-temp	1
Electrical:	150217	Hopper Sensor RTD (DCL)	1
	150218	Hopper Sensor RTD (NOR)	1
	104166	Over-Temp Thermostat & Insulator	1
	150196	ON/OFF-Switch, Sealed Rocker Switch, DPDT, 10A	1
	112568	Fuse, 10AF, fast-acting (Power and Aux Power PCBs)	20
	811899	Fuse, 2AT, time-delay (Power PCB)	5
Printed Circuit Boards & Modules:	150146	Main PCB	1
	121594	Battery, coin cell, CR2032 (for 150146)	1
	150149	Aux PCB	1
Filter Replacements:	150231	Filter kit, 100-mesh filter, M12 Spin-On	1
	102751	Filter and shutoff assembly, Simplicity 4/8kg	1
	102752	Filter and shutoff assembly, Simplicity 16kg	1

Chapter 10
Component Illustrations and Bill of Materials

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.

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

Note: Most common screws, nuts and washers called out in the manual are not for sale and they can be obtained locally at your hardware Store. Specialty fasteners are available by contacting ITW Dynatec's Customer Service.

10.1 Sheet Metal Assembly, 4kg and 8kg

Item	Part Number	Description	Quantity
1	150132	Lid assembly	1
2	150114	Manifold cover	1
3	150113	Rear panel	1
4	150115	Access panel	1
5	150120	Pneumatic access cover	1
6	150111	Baseplate, 4kg/8kg	1
7	150119	Electrical enclosure, 4kg	1
	150224	Electrical enclosure, 8kg	1
8	150125	Front door	1
9	150143	Control panel assembly	1
10	150136	Hopper cover 4kg	1
	150154	Hopper cover 8kg	1
11	150118	Piston pump cover	1
12	150137	Filter/regulator bracket	1
13	150133	Wireway cover	1
14	150117	Heat shield #1	1
15	150116	Heat shield #2	1

10.2 Sheet Metal Assembly, 16kg

Item	Part Number	Description	Quantity
1	150174	Lid assembly	1
2	150114	Manifold cover	1
3	150163	Rear panel	1
4	150165	Access panel	1
5	150180	Pneumatic access cover	1
6	150162	Baseplate, 16kg	1
7	150168	Electrical enclosure	1
8	150169	Front door	1
9	150143	Control panel assembly	1
10	150170	Hopper cover	1
11	150177	Piston pump cover	1
12	150137	Filter/regulator bracket	1
13	150133	Wireway cover	1
14	150164	Heat shield #1	1
15	150167	Heat shield #2	1

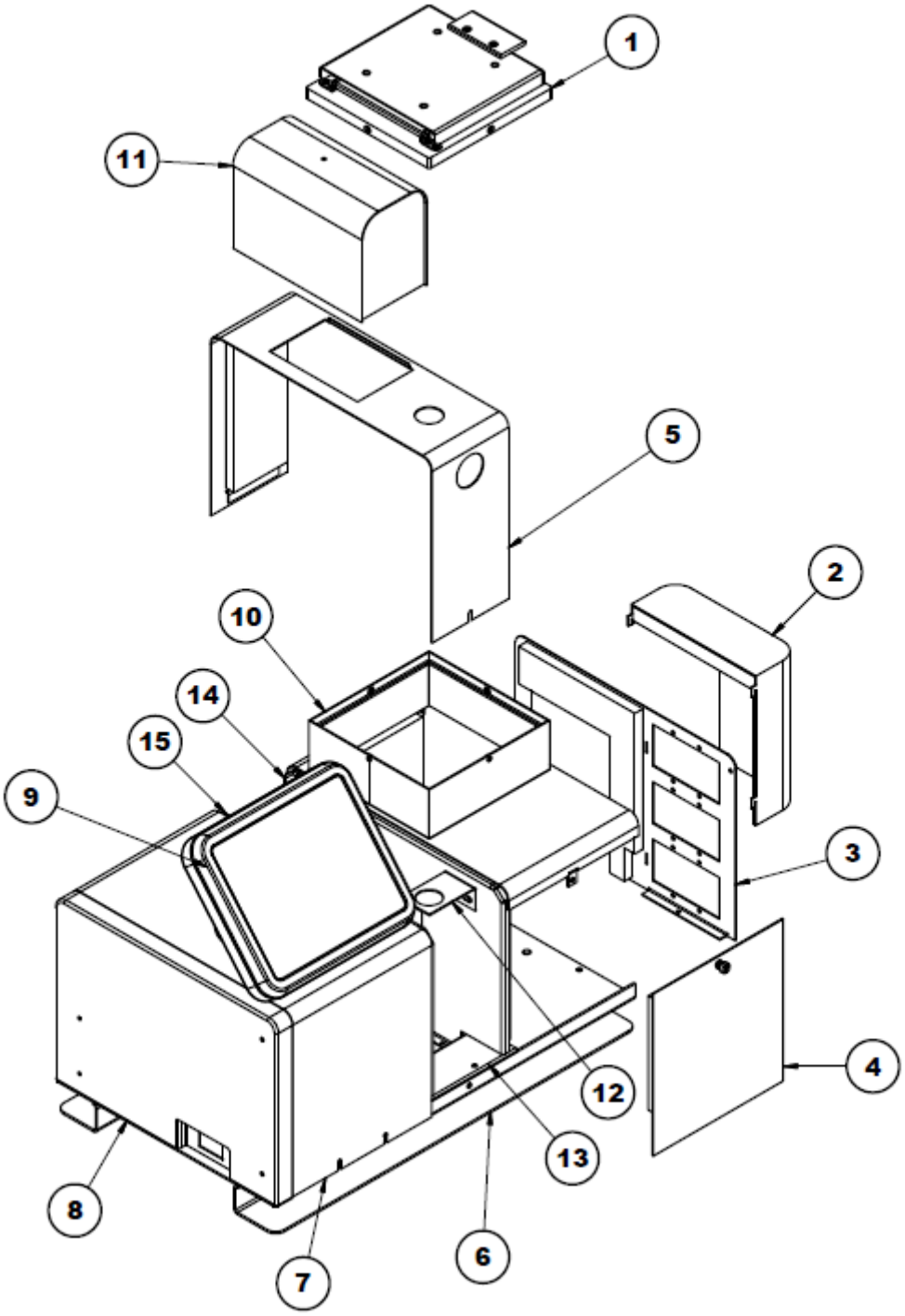


Illustration: Sheet Metal Assembly, 4kg and 8kg

10.3 Electronical Assembly

Item	Part Number	Description	Quantity
1	150135	Wire harness kit, DCL	A/R*
	150151	Wire harness kit, NOR	A/R*
	150153	Wire harness kit, BLOCKOFF	A/R*
2	150106 *	Level sensor kit (option)	1
3	150217	Hopper Sensor RTD (DCL)	1
	150218	Hopper Sensor RTD (NOR)	1
4	104166	Overtemp switch	1
5	150146	Main PCB assembly	1
6	111677	Terminal, blade	2
7	105562	Ground lug	1
8	150196	ON/OFF-Switch, Sealed Rocker Switch, DPDT, 10A	1
9	105199	Cable connector	1
10	150149	Aux PCB assembly (option)	1
11	150143	Control panel assembly	1
12	104101	Solenoid valve 3W, 240V, high-temp (not shown) (The solenoid valve is located on the backside of one of the divider panels.)	1
13	150213	4 position terminal block (not shown)	1

* See separate spare part list and drawing.
A/R* = As required.

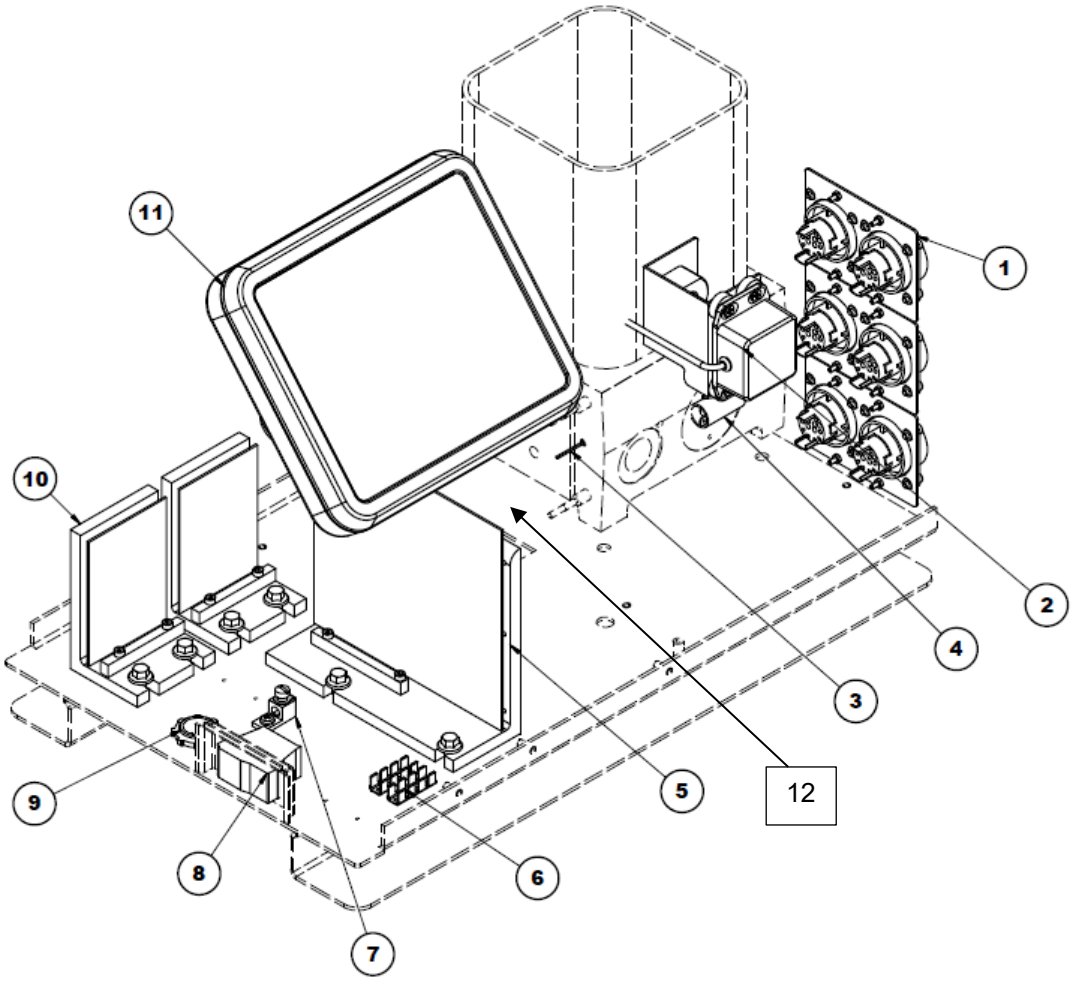
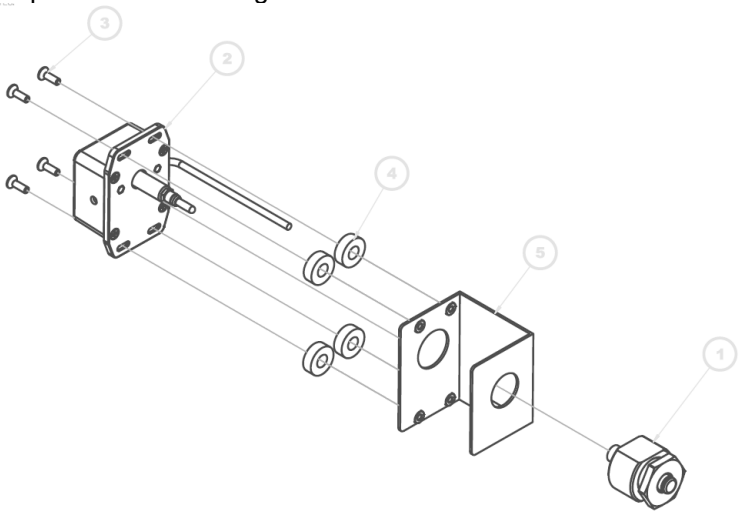


Illustration: Electronical Assembly

10.4 Level sensor kit (option), PN 150106

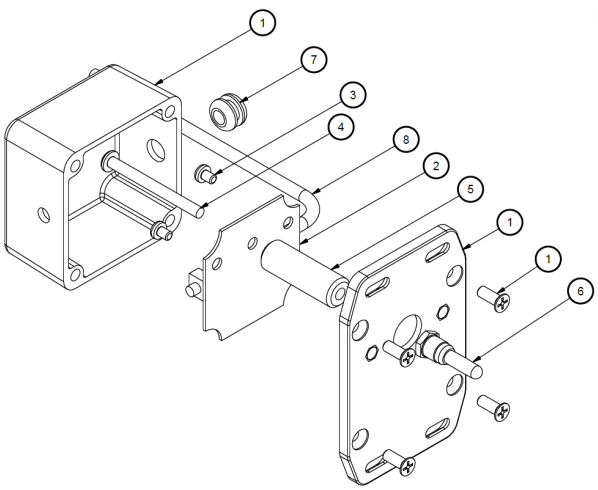
Item	Part Number	Description	Quantity
1	117476	Level sensor (probe) asy	1
2	117477*	Level sensor control asy	1
3	109813	Screw M4x12mm	4
4	L00006	Insulating spacer .25	4
5	150105	Level sensor bracket	1

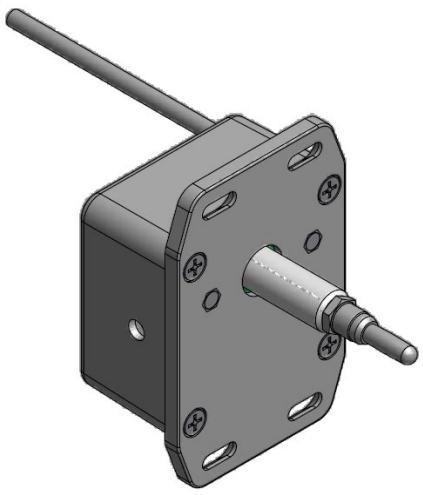
* See separate spare part list and drawing.



10.5 Level sensor control assembly, PN 117477

Item	Part Number	Description	Quantity
1	115843	Enclosure	1
2	117486	PCB level sensor	1
3	111372	Screw M3x4mm	2
4	118016	Screw 6-32x1.5	1
5	115815	Spacer	1
6	115800	Plug	1
7	118070	Grom	1
8	117808	Harness	1





10.6 Hopper (Tank) Assemblies

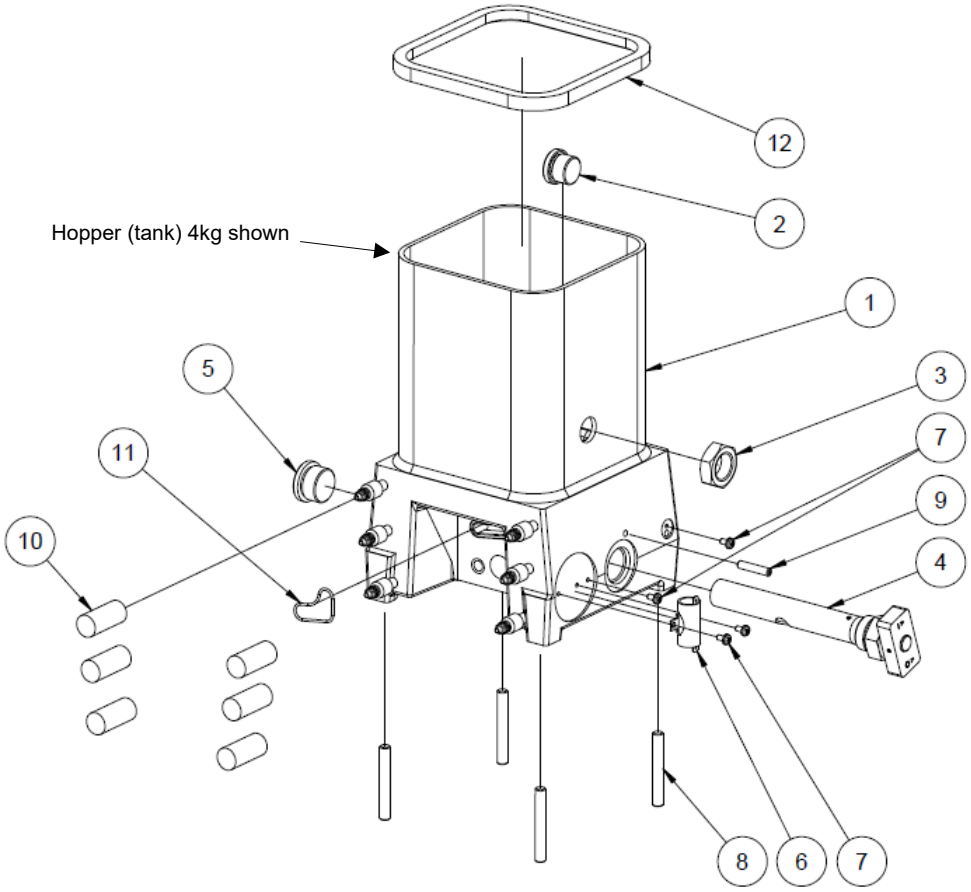
10.6.1 Hopper (Tank) Assembly, 4 kg, PN 124285

Item	Part Number	Description	Quantity
1	124280	Hopper, Simplicity, 4 KG, 120/240V	1
2	817985	Plug, socket, M22-1.5 mm	1
3	817984	Nut, Hex Jam, M22-1.5 mm	1
4	102751 *	Filter and shutoff assembly, Simplicity 4/8kg	1
5	N00094	Plug, socket	1
6	104166	Overtemperature Thermostat	1
7	107389	Screw, Phillips pan head, M4-0.7 X 8 mm	4
8	150112	Screw, Socket set, M8-1.25 X 60 mm	4
9	105097	Screw, Socket set, M6-1 X 30 mm	1
10	102411	Terminal boot, silicone	6
11	124455	O-ring, hopper, pump outlet, Simplicity 4/8	1
12	114852	Seal, hopper collar	1

* see separate drawing/BOM.

NOTES:

- Apply 001V061 heat transfer compound to back side of Overtemperature Thermostat.
- Lube O-rings with silicone lube PN 001U002
- Apply anti-seize to threads.
- Apply heat transfer compound to RTD sensor.
- Torque all M4 fasteners to .5 - .7 ft-lbs (0.7-0.9 Nm).



10.6.2 Hopper (Tank) Assembly, 8 kg and 16 kg

Item	Part Number	Description	Quantity
1	114852	Gasket, hopper collar	1
	114858	Gasket, 16kg, hopper collar	1
2	817984	Nut M22 (not shown)	1
3	817985	Fitting plug M22 (not shown)	1
4	150098	Hopper Weldment 8kg	1
	150176	Hopper Weldment 16kg	1
5	104166	Overtemp T'stat	1
6	107389	Phillips head screw	3
7	102751 *	Filter and shutoff assembly, Simplicity 4/8kg	1
	102752 *	Filter and shutoff assembly, Simplicity 16kg	1
8	105097	Set screw	1
9	105134	Spacer	8
10	N00688	Washer	4
11	105126	Lock nut	4
12	150217	Hopper Sensor RTD (DCL)	1
	150218	Hopper Sensor RTD (NOR)	1
13	N00094	Plug, socket	1
14	150112	Screw, Socket set, M8-1.25 X 60 mm	4
15 #	L00475	Washer, insulation, .328 X .750 in	2
	001V061	Heat Transfer Compound	A/R*
	150240	Optional Grid Group, 16kg, DCL (not shown)	1
	150241	Optional Grid Group, 16kg, NOR (not shown)	1

* See separate drawing/BOM.
# Item 15: The washer L00475 is used only for the 8kg units.
A/R* = As required.

NOTES:
- Apply 001V061 thermal-cote to back side of O/T thermostat.
- Lube O-rings with 001U002
- Apply anti-seize to threads.
- Apply thermal-cote to RTD sensor.
- Torque all M4 fasteners to .5 - .7 ft-lbs (0.7-0.9 Nm).

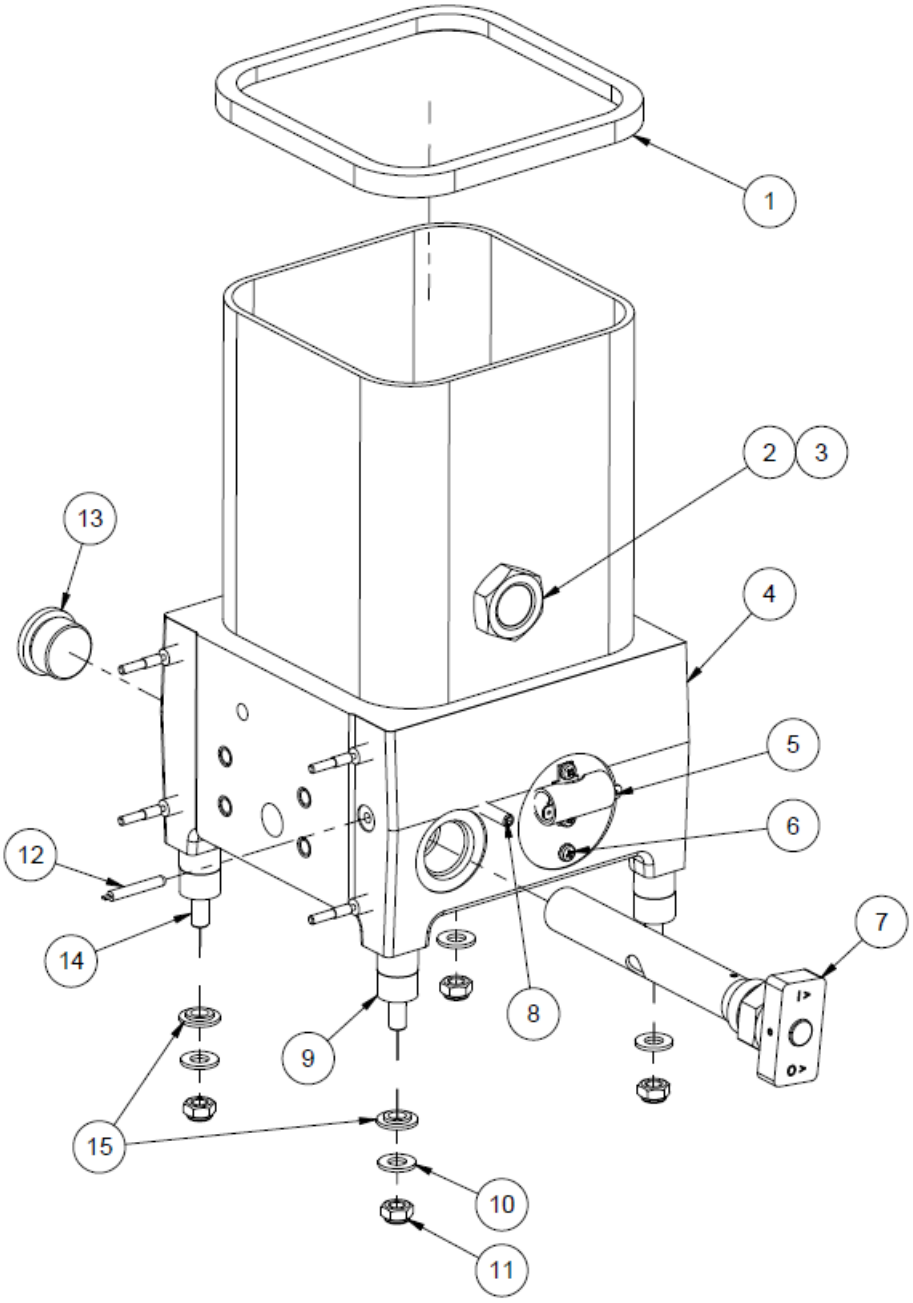


Illustration: Hopper Assembly

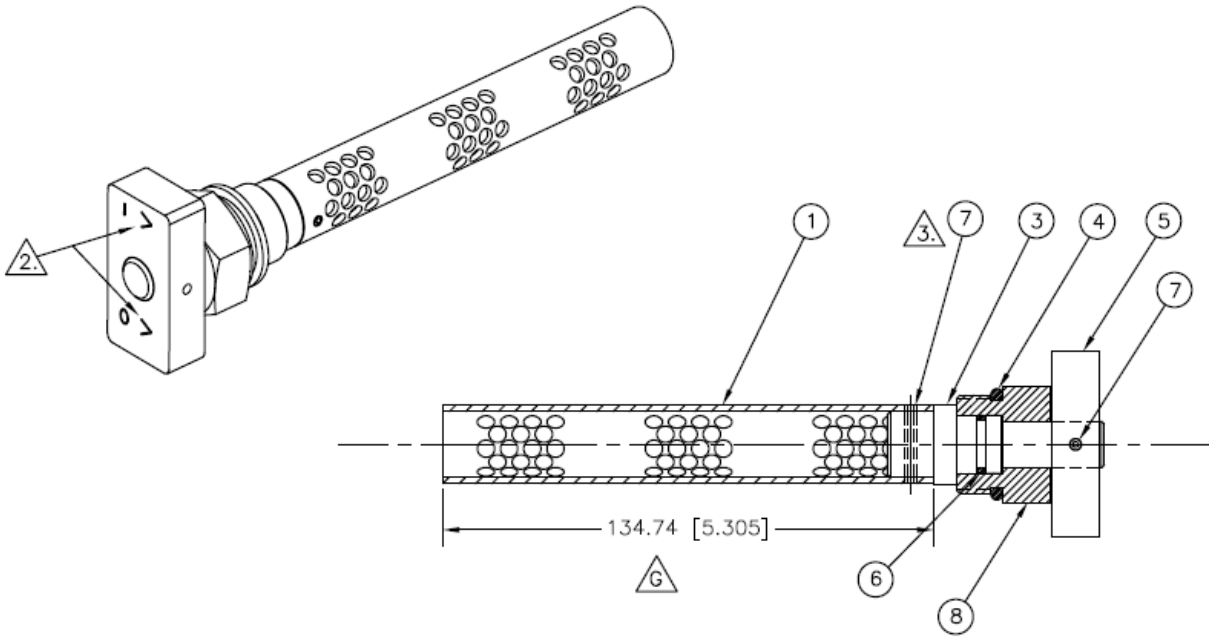
10.6.3 Filter and Shutoff Asy, PN 102751

(for Simplicity 4/8 kg)

NOTE: This assembly drawing is shown for reference only! The filter and shutoff assembly must be ordered as entire assembly. Only the O-rings and the lube can be ordered separately.

Item	Part Number	Description	Quantity
1	-	Filter cartridge (tube)	1
3	-	Stem	1
4	N00210	O-ring 912	1
5	-	Knob	1
6	N00181	O-ring 014	1
7	-	Roll pin 1/8x1	2
8	-	Nut	1
9	001V078	High-temp lube, TFE, Krytox GPL206 (not shown)	A/R*

A/R* = As required.



NOTES:
1. Coat O-rings (items 4 and 6) with high-temp lubricant (item 9) prior to assembly.
2. Knob (item 5) must be positioned with arrows in the orientation shown at assembly.
3. Grind ends of roll pin (item 7) flush with outside diameter of filter cartridge (tube) (item 1).

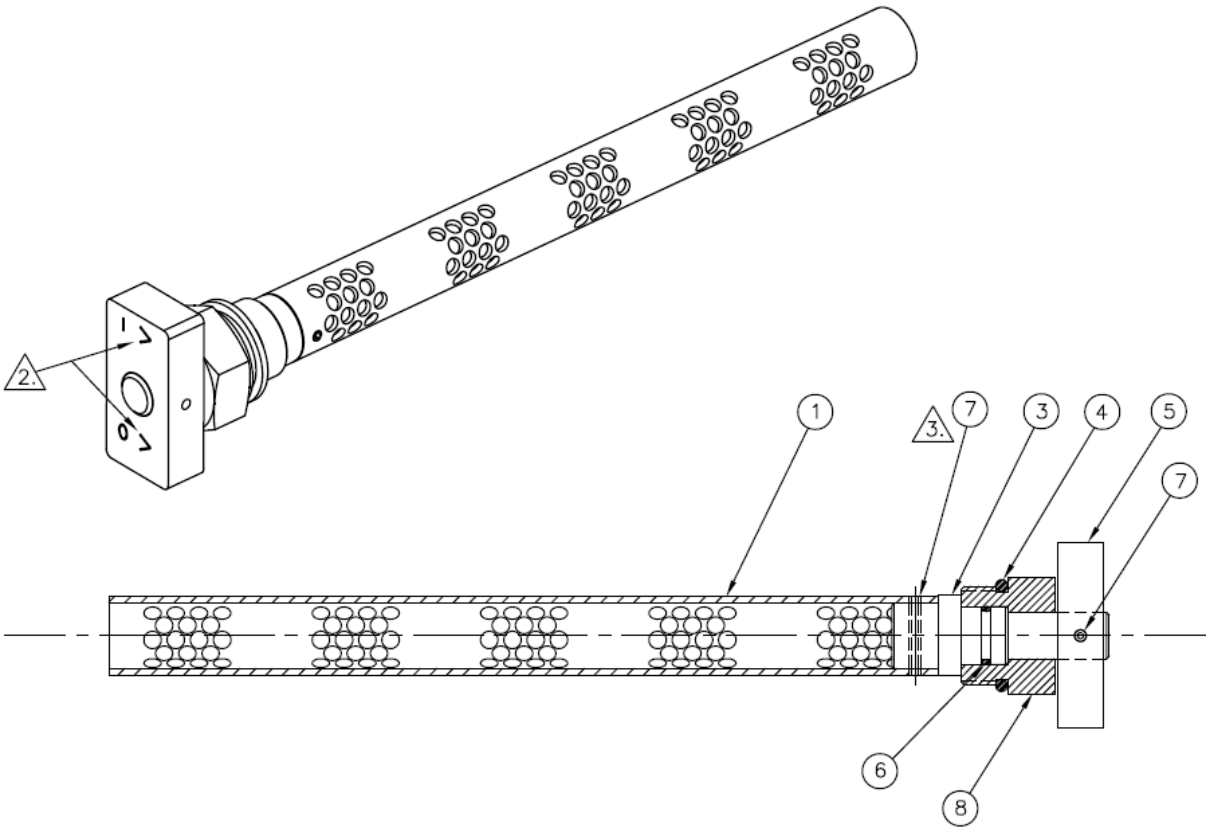
10.6.4 Filter and Shutoff Asy, PN 102752

(for Simplicity 16kg)

NOTE: This assembly drawing is shown for reference only! The filter and shutoff assembly must be ordered as entire assembly. Only the O-rings and the lube can be ordered separately.

Item	Part Number	Description	Quantity
1	-	Filter cartridge (tube)	1
3	-	Stem	1
4	N00210	O-ring 912	1
5	-	Knob	1
6	N00181	O-ring 014	1
7	-	Roll pin 1/8x1	2
8	-	Nut	1
9	001V078	High-temp lube, TFE, Krytox GPL206 (not shown)	A/R*

A/R* = As required.

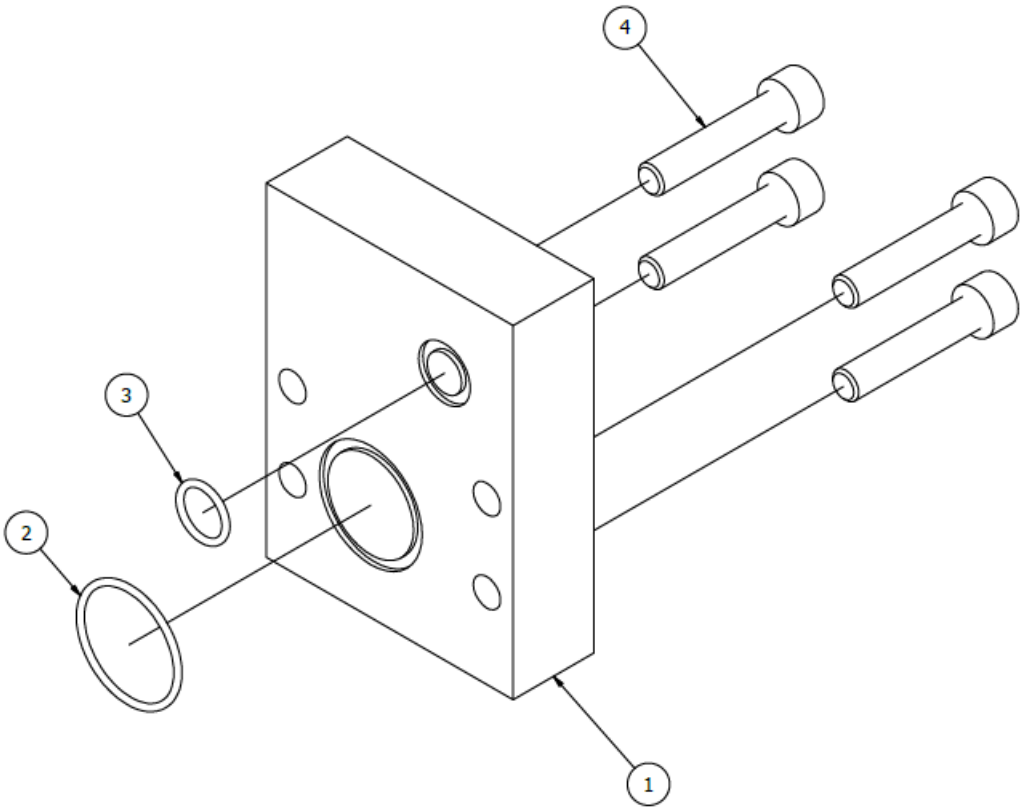


NOTES:
1. Coat O-rings (items 4 and 6) with high-temp lubricant (item 9) prior to assembly.
2. Knob (item 5) must be positioned with arrows in the orientation shown at assembly.
3. Grind ends of roll pin (item 7) flush with outside diameter of filter cartridge (tube) (item 1).

10.7 Plate Assembly for Pump Block-Off, PN 827744

The plate is used if only one pump is in use to block off the second pump port.

Item	Part Number	Description	Quantity
1	827740	Plate for pump block-off	1
2	815372	Screw M8x40mm	4
3	N00190	O-ring 024	1
4	N00181	O-ring 014	1



10.8 Filter Manifold Assembly, PN 150104

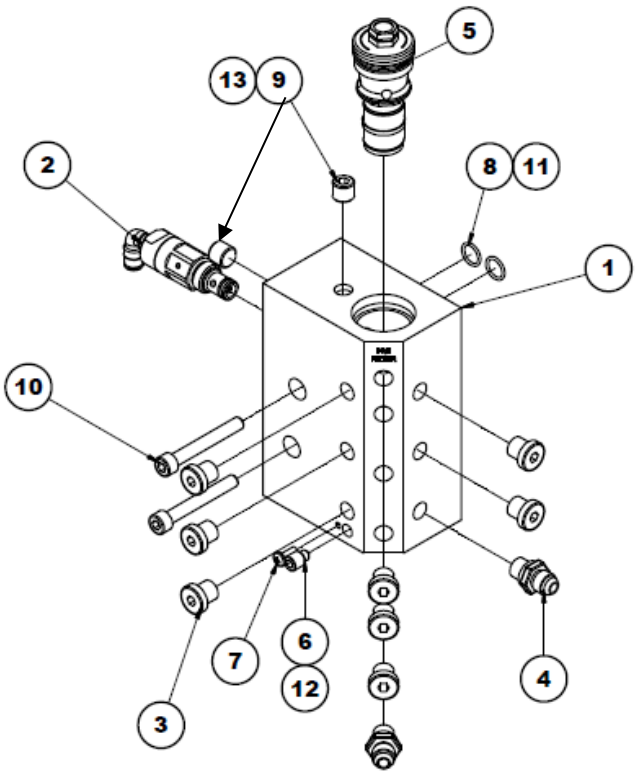
Item	Part Number	Description	Quantity
1	150103	Manifold	1
2	115540	Pneum. Pressure valve assembly	1
3	101625	Fitting, skt plug, G1/4	See tabulation
4	101624	Fitting, adapter, G1/4	See tabulation
5	150230	Filter Kit, filter + cap, 100 mesh	1
6	104852	Screw M10x12 cone	1
7	101833	Screw 10-32	1
8	N00181	O-ring 014	2
9	N00754	Fitting, flush plug, 1/4 NPTF	2
10	816169	Screw M8x60mm	2
11	001U002	Lubricant silicone DOW 112	A/R*
12	107324	Anti-seize compound, high-temp	A/R*
13	N02937	Thread sealant	A/R*

* See separate spare part list and drawing.
A/R* = As required.

Filter Manifold assembly tabulation:

# Hoses	Qty Item 3 PN 101625	Qty Item 4 PN 101624
2	8	2
4	6	4
6	4	6

NOTES:
1. Apply item 11 to all O-rings.
2. Apply item 12 to item 6.
3. Apply item 13 to all NPT flush plugs.



10.9 Piston Pump Drives

10.9.1 Piston Pump Drive for 4 kg unit

Item	Part Number	Description	Quantity
1	124801 *	Piston Pump and Manifold Assembly, 4 kg	1
2	124295 *	Adapter assembly for piston pump manifold, 4 kg	1
3	150137	Filter/regulator bracket	1
4	150197	Filter/regulator 0.5 – 8 bar (7-125 psi) with prefilter and coalescing filter, with gauge 1/4 NPTF	1
5	104101	Solenoid valve 3-way, 240V, MAC111, FLY LDS	1
6	117376	Bulkhead fitting, 1/4" tube X 1/4NPT FEM	1

* See separate spare part list and drawing.

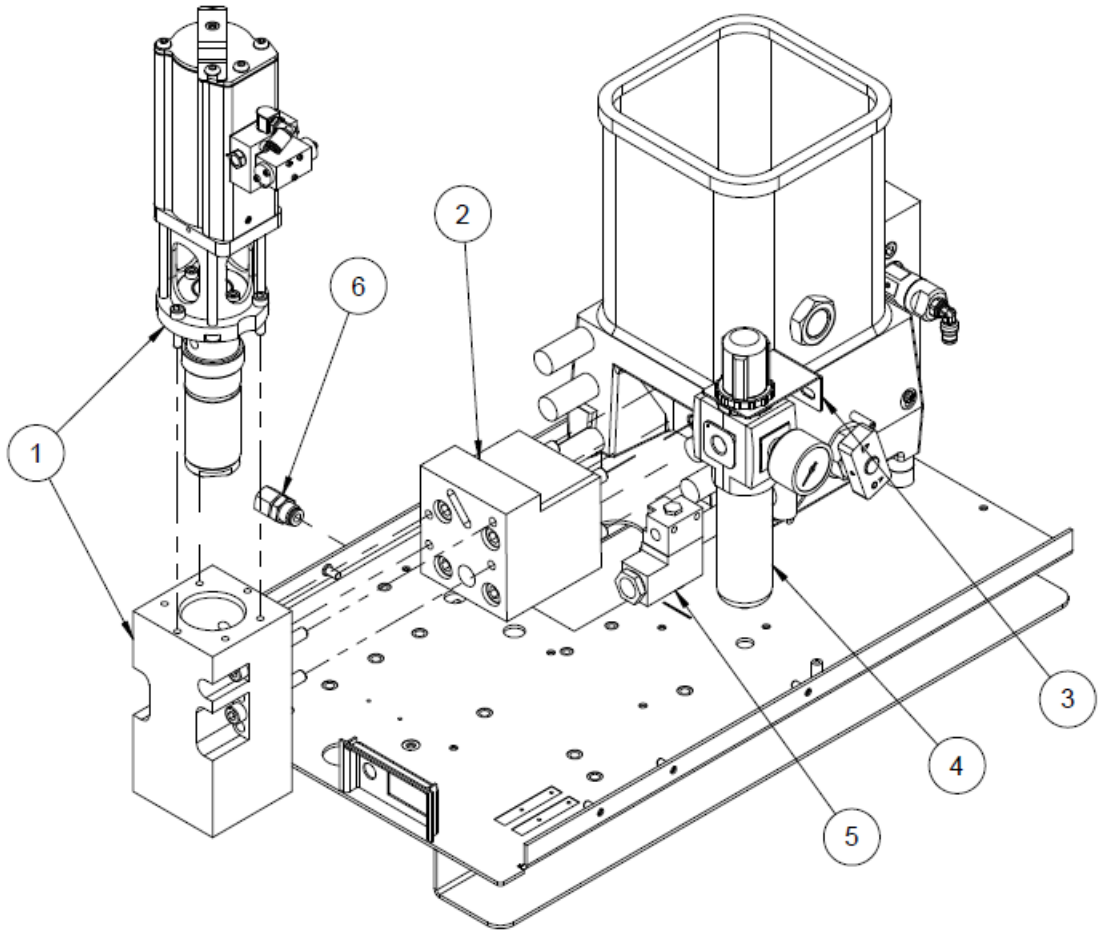
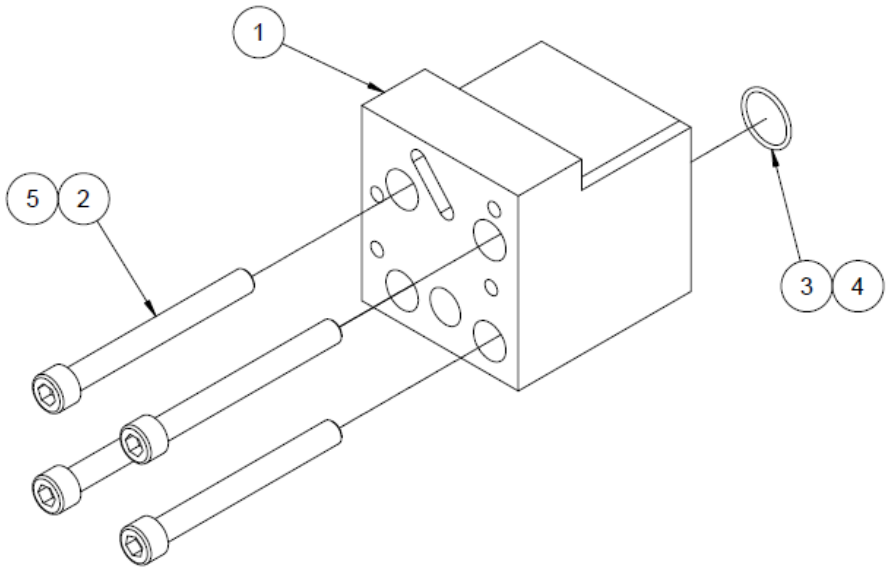


Illustration: Piston Pump Drive

10.9.1.1 Adapter assembly for piston pump manifold 4 kg, PN 124295

Item	Part Number	Description	Quantity
1	124288	Adapter	1
2	117155	Screw M10-1.5x95mm	4
3	N00187	O-ring -020	1
4	001U002	Lubricant, silicone	A/R*
5	107324	Anti-seize compound, high-temp	A/R*

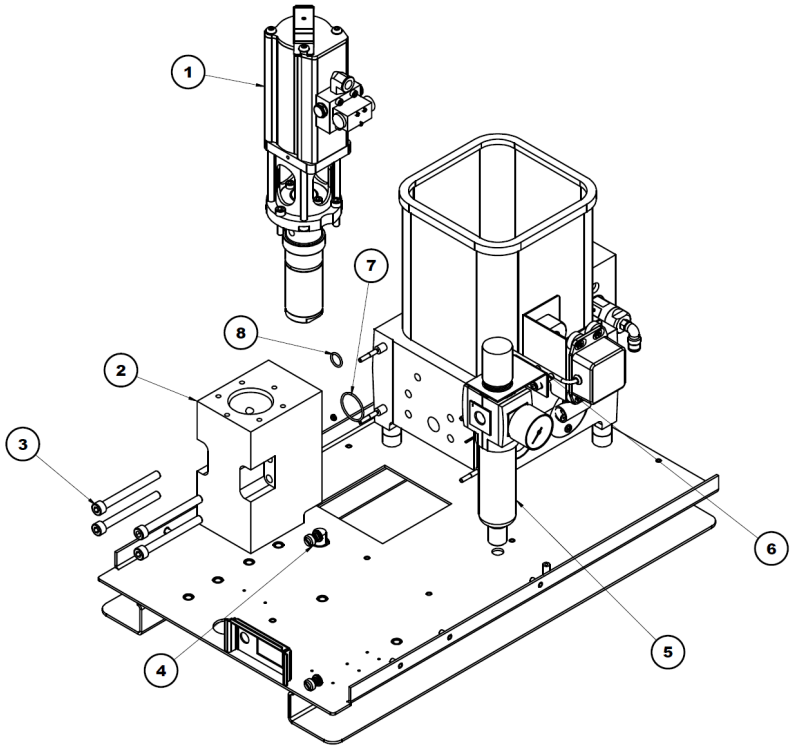
* See separate spare part list and drawing.
A/R* = As required.

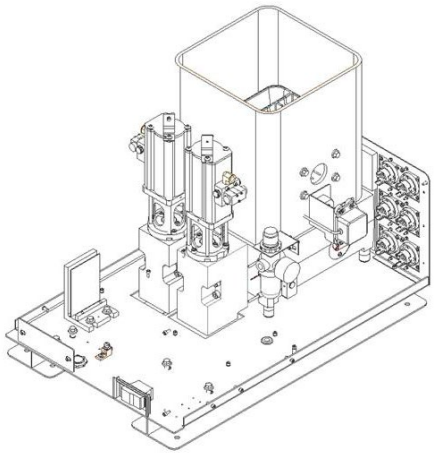


10.9.2 Piston Pump Drive for 8 & 16 kg units

Item	Part Number	Description	Quantity
1	150039 *	Pneumatic piston pump assembly 12:1	1
2	150099 *	Piston pump manifold	1
3	811147 *	Screw M8x80mm	4
4	101625 *	Plug fitting	1
5	150197	Filter/regulator 0.5 – 8 bar (7-125 psi) with prefilter and coalescing filter, with gauge 1/4 NPTF	1
6	150137	Filter/regulator bracket	1
7	N00190 *	O-ring 024	1
8	N00181 *	O-ring 014	1

* See separate spare part list and drawing PN 150100.





When two pumps are mounted, the same spare parts are then twice.

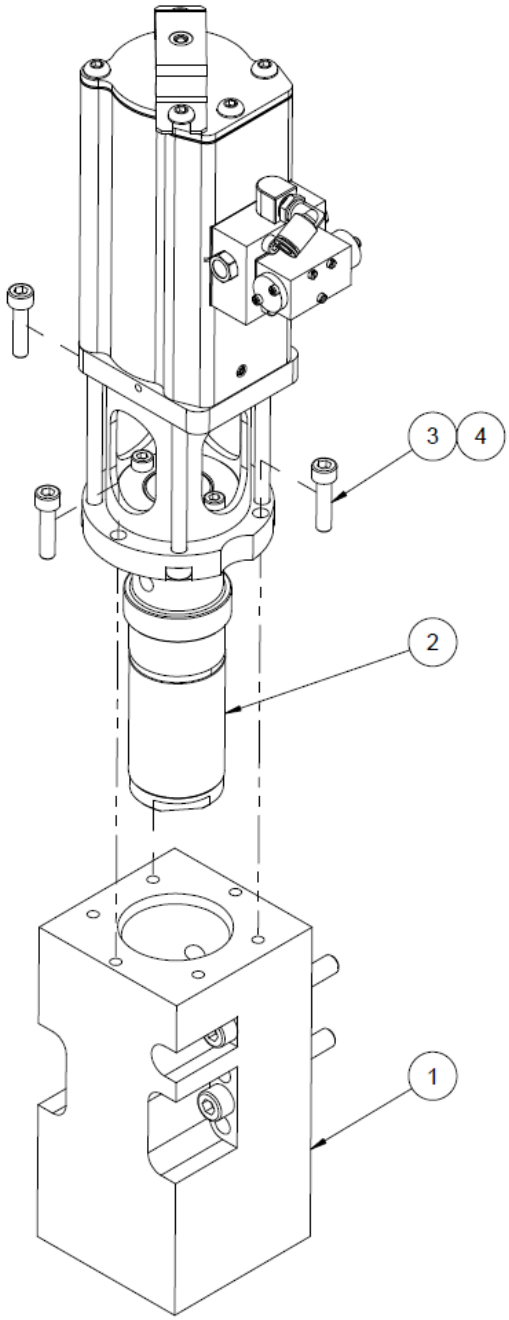
Illustration: Piston Pump Drive

10.10 Piston Pump and Manifold Assemblies

10.10.1 Piston Pump and Manifold Assembly, 4 kg, PN 124801

Item	Part Number	Description	Quantity
1	124296 *	Manifold assembly 4 kg, for piston pump	1
2	150039 *	Pneumatic piston pump assembly 12:1	1
3	117173	Screw M6x25mm	3
4	107324	Anti-seize compound, high-temp	A/R*

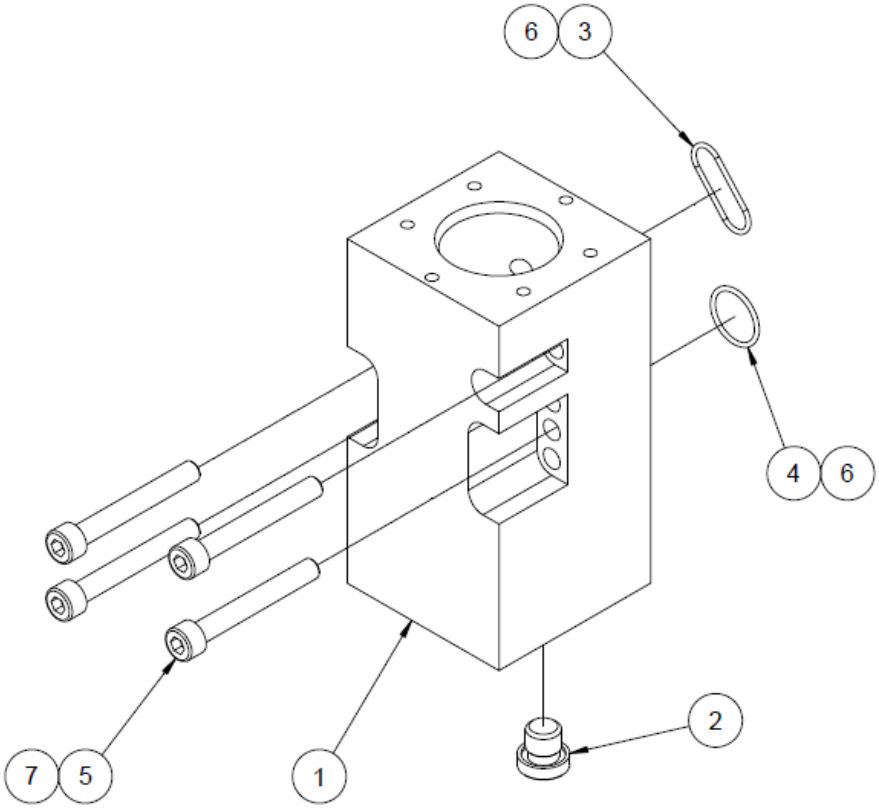
* See separate spare part list and drawing.
A/R* = As required.



10.10.1.1 Manifold assembly 4 kg, for piston pump, PN 124296

Item	Part Number	Description	Quantity
1	124294	Manifold 4 kg	1
2	101625	Plug, G1/4 BSPP, Viton	1
3	N00188	O-ring -022	1
4	N00186	O-ring -019	1
5	816169	Screw M8-1.25x60mm	4
6	001U002	Lubricant, silicone	A/R*
7	107324	Anti-seize compound, high-temp	A/R*

* See separate spare part list and drawing.
A/R* = As required.



10.10.2 Piston Pump and Manifold Assembly, for 8 & 16 kg, PN 150100

Item	Part Number	Description	Quantity
1	150099	Piston pump manifold	1
2	101625	Plug fitting G1/4	1
3	N00190	O-ring 024	1
4	N00181	O-ring 014	1
5	811147	Screw M8x80mm	4
6	150039 *	Pneumatic piston pump assembly 12:1	1
7	001U002	Lubricant, silicone, DOW112	A/R*
8	117173	Screw M6x25mm	3

* See separate spare part list and drawing.
A/R* = As required.

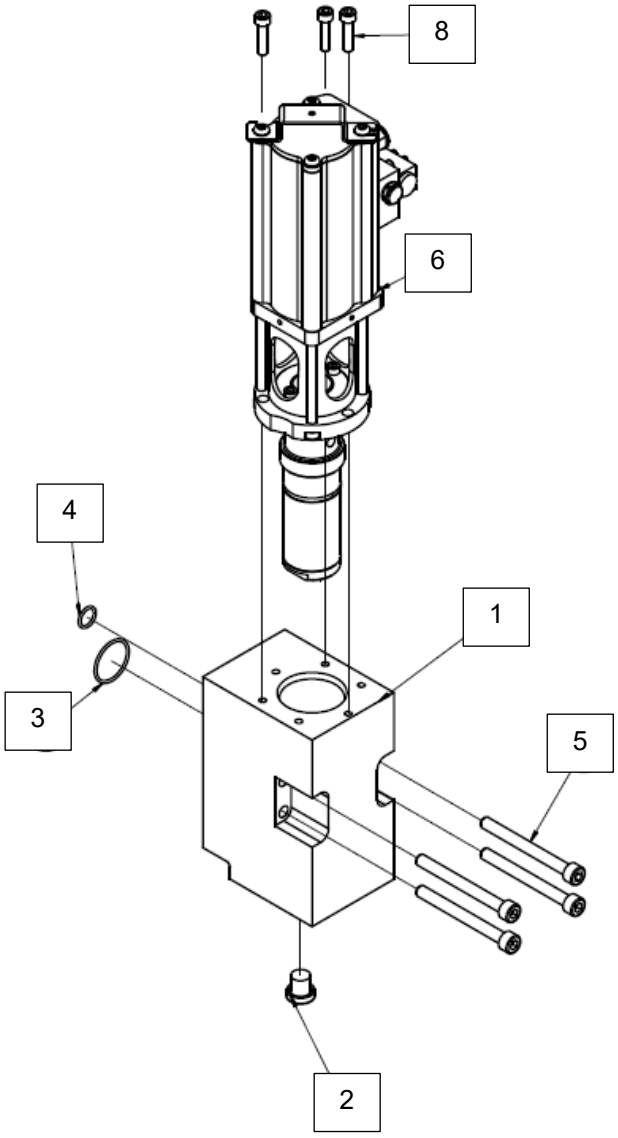


Illustration: Piston and Pump Manifold Assembly, PN 150100

10.11 Pneumatic Piston Pump Assembly 12:1, PN 150039

Item	Part Number	Description	Quantity
1	150033	Body, Piston Pump	1
2	116033	Inlet Check Valve Asy	1
2a	116032	Seat, Inlet Check Valve	1
2b	N00004	Ball, Bearing, 5/8” Dia.	1
2c	N04483	Spring, Compression	1
2d	L16532	Retainer, Spring	1
2e	N06967	Retaining Ring, Int, Inv Lug, .813” Bore	1
3	116025	Shaft Asy	1
3a	116875	Shaft/Pin Asy, Pump	1
3b	111339	Ball, Bearing, 5/16” Dia.	1
3c	116023	Spring, Compression	1
3d	116024	Seat, Outlet Check Vlv	1
3e	116877	Retaining Ring, Ext, #5103-56	1
4	L16569	Seal Cartridge Asy	1
5	116855	Retainer, Seal Cart Asy	1
6	116876	Screw, SHC, M5-0.8 X 12	2
7	150038	Screw, SHC, M6-1X90,ZP	4
8	116028	Spacer Tube	1
9	150035	Lower Cyl Head Asy	1
9a	150034	Cylinder Head, Lower	1
9b	116068	Seal, Rod	1
9c	N06006	O-ring, -224, Viton	1
10	150037	Piston Asy	1
10a	150036	Piston, Air, 2” Dia	1
10b	116072	Seal, Piston	2
10c	116073	Wear Ring, Piston	1
11	111718	Cylinder & Valve Assy	1
11a	104437	Shifting valve	1
11b	106931	Valve Manifold	1
11c	108379	Valve Gasket	1
12	N06436	Fitting, Elbow, 1/4 Tube x 1/8NPT	1
14	A69X134	O-ring, -128, Viton	1
15	N03812	O-ring, -125, Viton	1
17	108700	Lube, TFE Pre-pack .25 oz	A/R*
	001V078	Lube TFE KRYTOX GPL206	A/R*
18	108669	Thread locker, Hi-temp	A/R*
19	116619	Lube, Piston Seal, Magnalube-G, 3/4 oz tube	A/R*
22	111746	Pump cover retainer	1
23	N00178	O-ring 011	2

A/R* = As required.

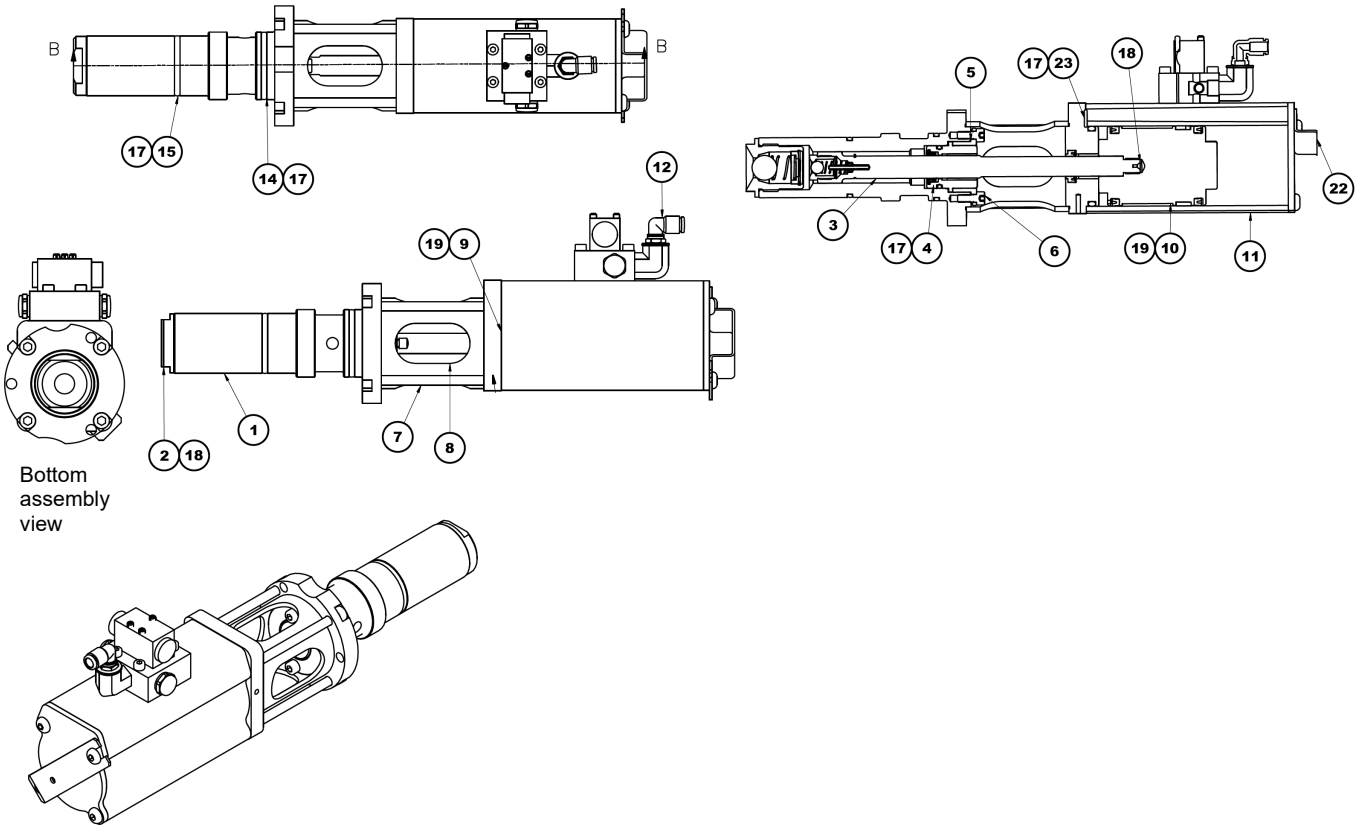


Illustration 1: Pneumatic Piston Pump Assembly, PN 150039

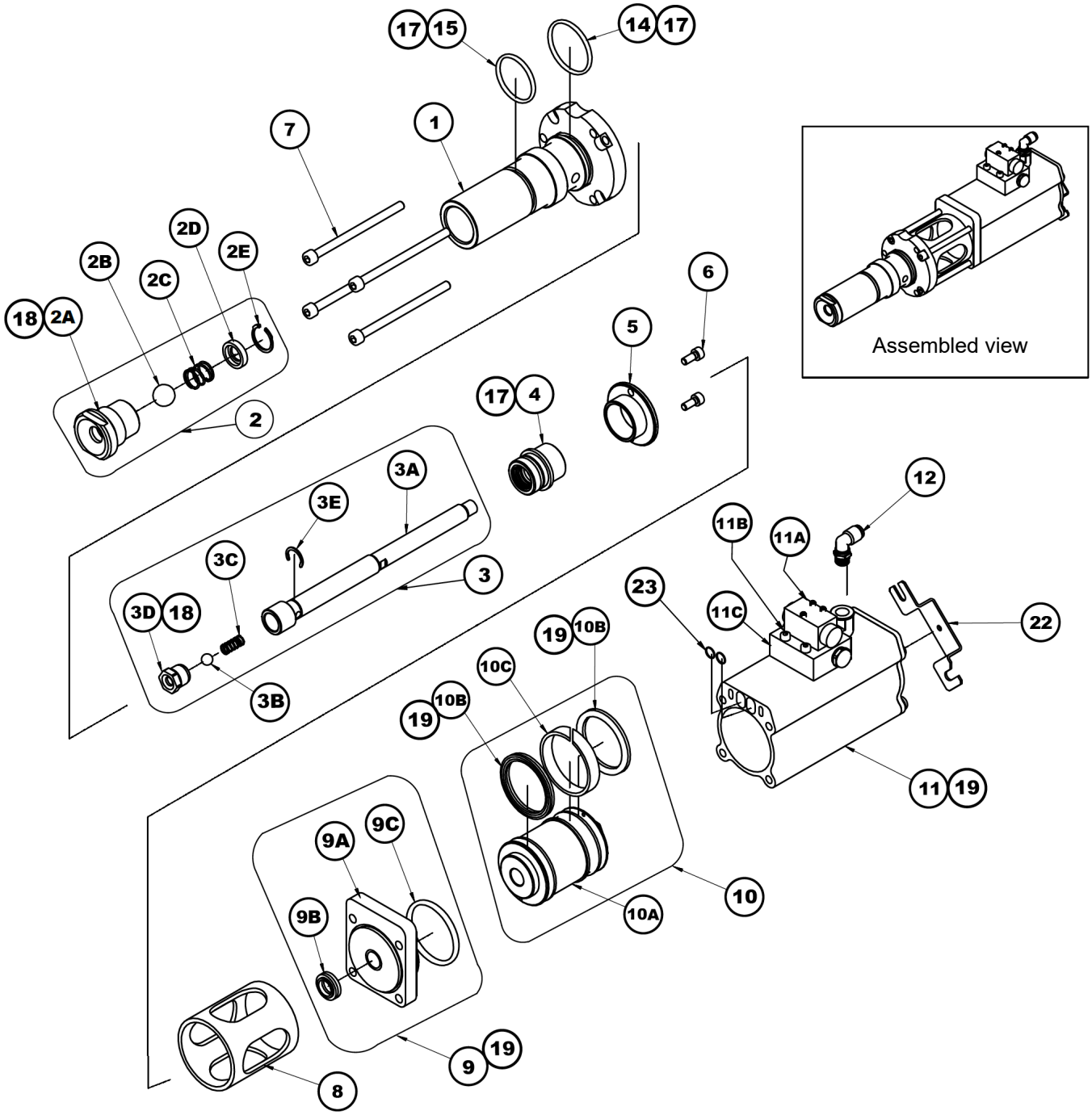
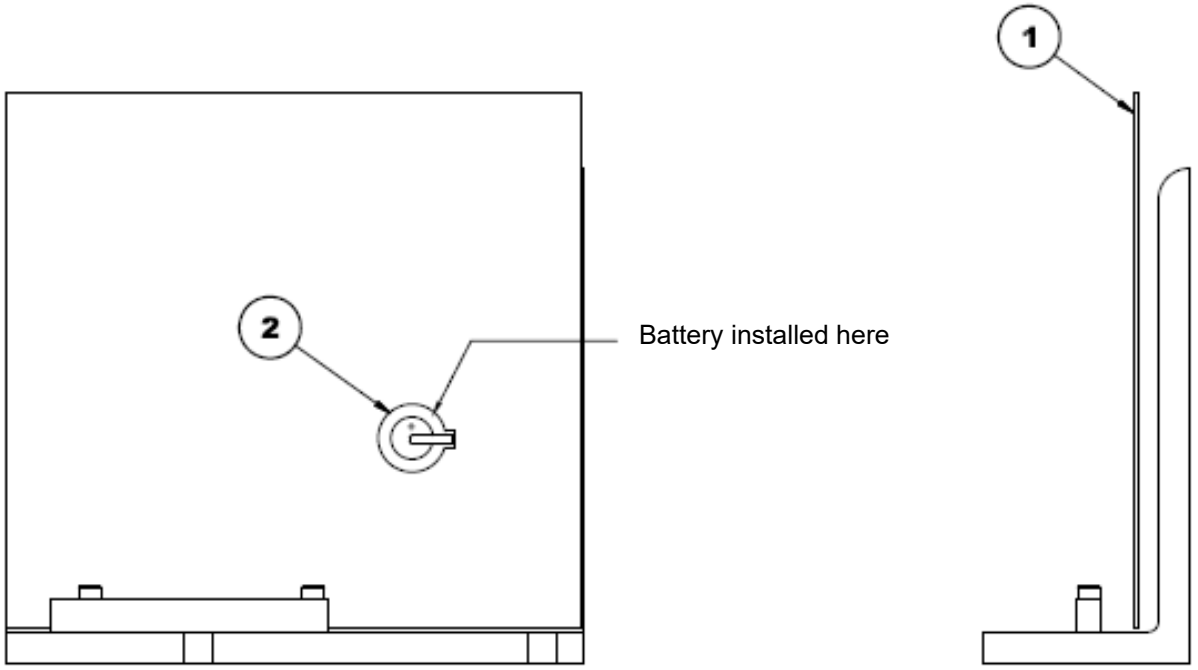


Illustration 2: Pneumatic Piston Pump Assembly, PN 150039

10.12 V6 Main PCB, full assembly, PN 150146

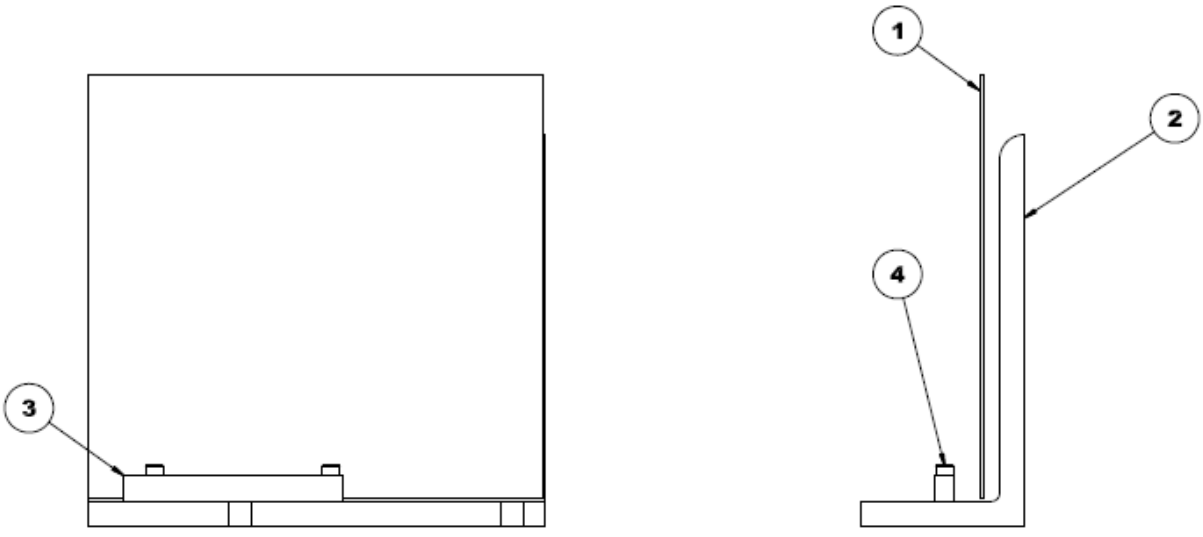
Item	Part Number	Description	Quantity
1	123571 *	V6 Main PCB, sub-assembly	1
2	121594	Battery, coin cell, CR2032	1

* see below.



10.13 V6 Main PCB, sub-assembly, PN 123571

Item	Part Number	Description	Quantity
1	150121	V6-LC Main PCB asy	1
2	150144	Heatsink plate	1
3	150145	Mounting, triac	
4	-	Screw M4x16mm	2
5	-	Keystone 9048, PCB mounting (not shown)	



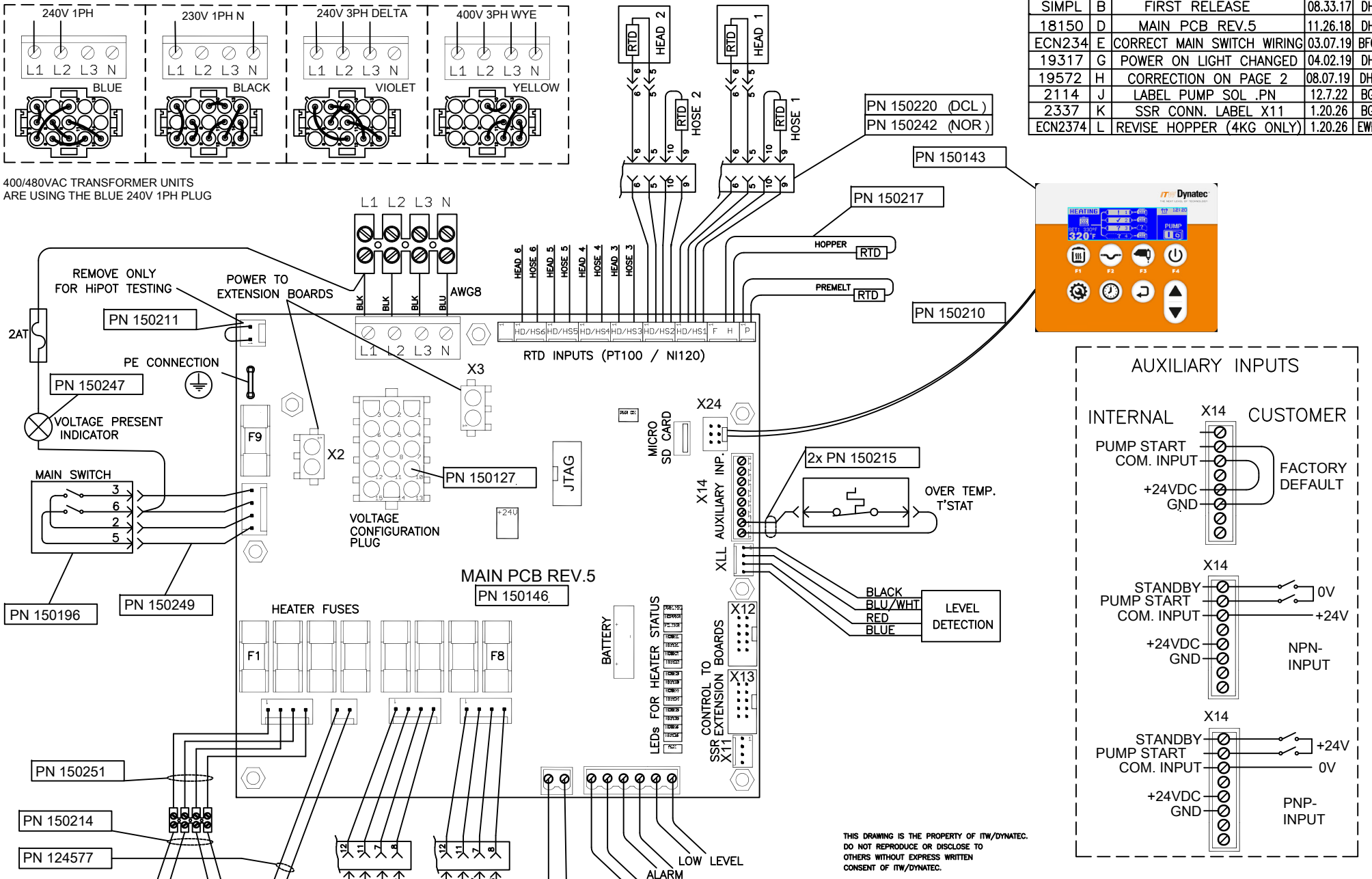
Chapter 11
Schematics & Engineering Drawings

11.1 Simplicity Schematics, PN 150212 L

INPUT VOLTAGE CONFIGURATIONS

400/480VAC TRANSFORMER UNITS
ARE USING THE BLUE 240V 1PH PLUG

REVISIONS					
REL.	REV.	DESCRIPTION	DATE	BY	APPROVED
SIMPL	B	FIRST RELEASE	08.33.17	DH	
18150	D	MAIN PCB REV.5	11.26.18	DH	
ECN234	E	CORRECT MAIN SWITCH WIRING	03.07.19	BFQ	
19317	G	POWER ON LIGHT CHANGED	04.02.19	DH	
19572	H	CORRECTION ON PAGE 2	08.07.19	DH	
2114	J	LABEL PUMP SOL .PN	12.7.22	BG	
2337	K	SSR CONN. LABEL X11	1.20.26	BG	
ECN2374	L	REVISE HOPPER (4KG ONLY)	1.20.26	EWB	



AUXILIARY INPUTS

ITEM	PART NUMBER	QTY.	U/M	DESCRIPTION

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX±.03 .XXX±.010 ANGLES ±.5°

FOR MACHINING STANDARDS AND SYMBOLS, SEE ITW/DYNATEC SPEC. A05800

USED ON

NEXT ASSY.

DO NOT SCALE DRAWING

APPROVALS	DATE
DRAWN DH	
CHECKED	

COMPUTER DESCRIPTION(25 CHARACTERS)

ITW Dynatec HENDERSONVILLE, TN

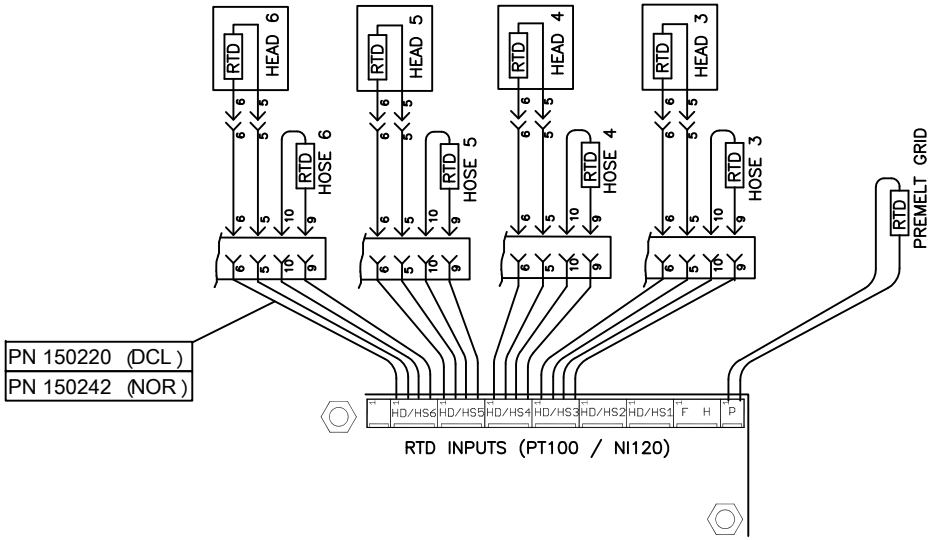
SIMPLICITY SCHEMATICS

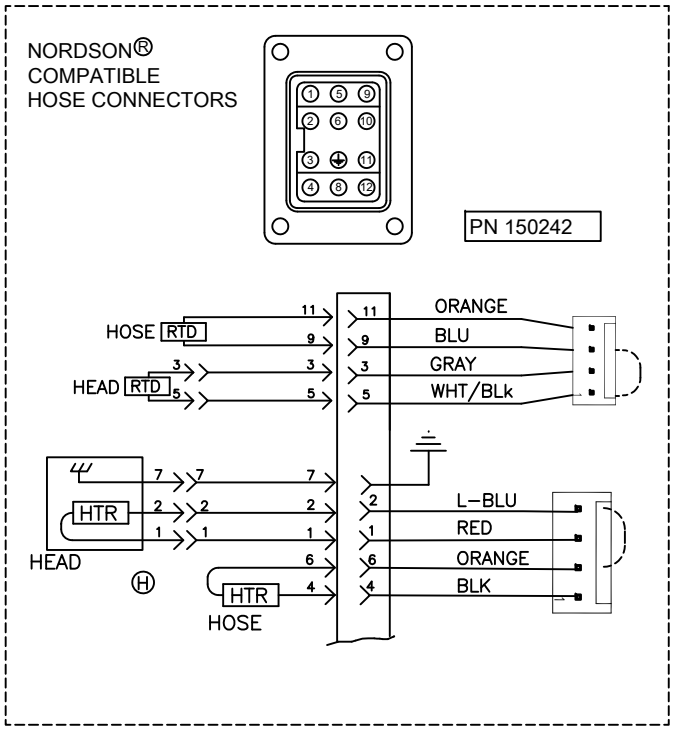
U/M EA | STATUS | SOURCE A | GROUP

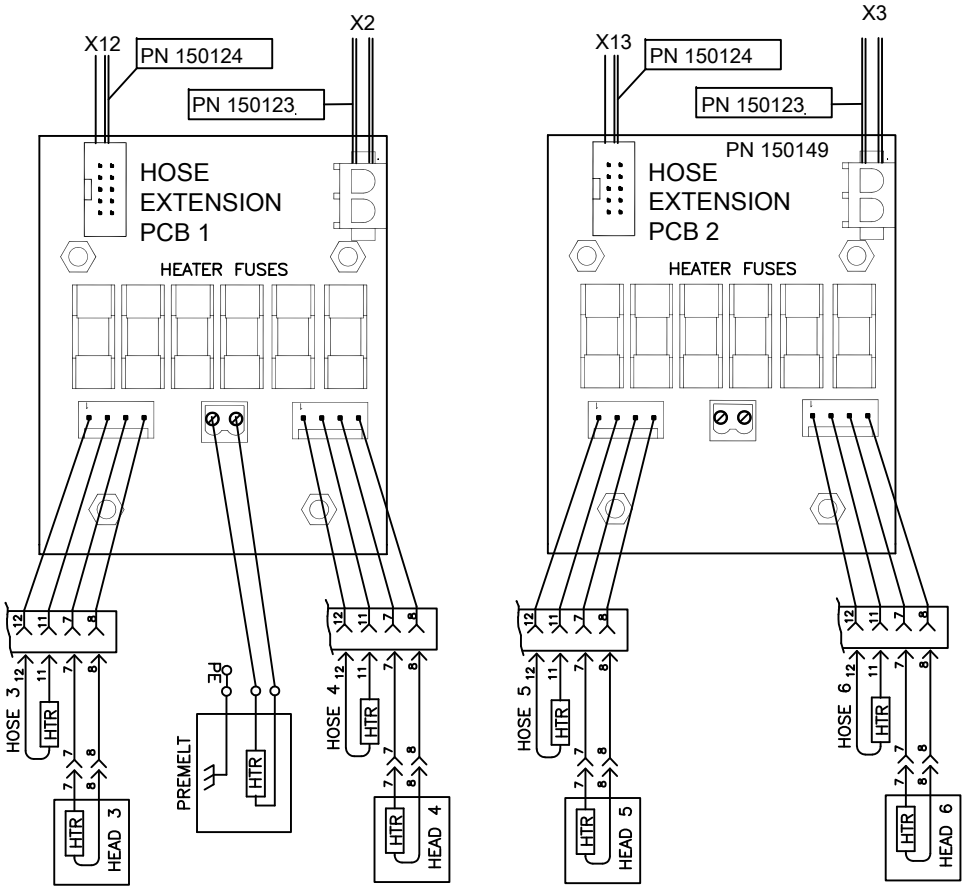
SIZE B | DWG. NO. 150212 | REV. L

SCALE 1:1 | CAD DRAWING | SHEET 1 of 2

REVISIONS					
REL.	REV.	DESCRIPTION	DATE	BY	APPROVED
–	–	SEE PAGE 1	–	–	







ITEM	PART NUMBER	QTY.	U/M	DESCRIPTION

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX±.03 .XXX±.010 ANGLES ±.5°

FOR MACHINING STANDARDS AND SYMBOLS, SEE ITW/DYNATEC SPEC. A05800

USED ON

NEXT ASSY.

DO NOT SCALE DRAWING

APPROVALS	DATE
DRAWN DH	
CHECKED	

COMPUTER DESCRIPTION(25 CHARACTERS)

ITW Dynatec
HENDERSONVILLE, TN

SIMPLICITY
SCHEMATICS

U/M EA
STATUS
SOURCE A
GROUP

SIZE B | DWG. NO. 150212 | REV. K

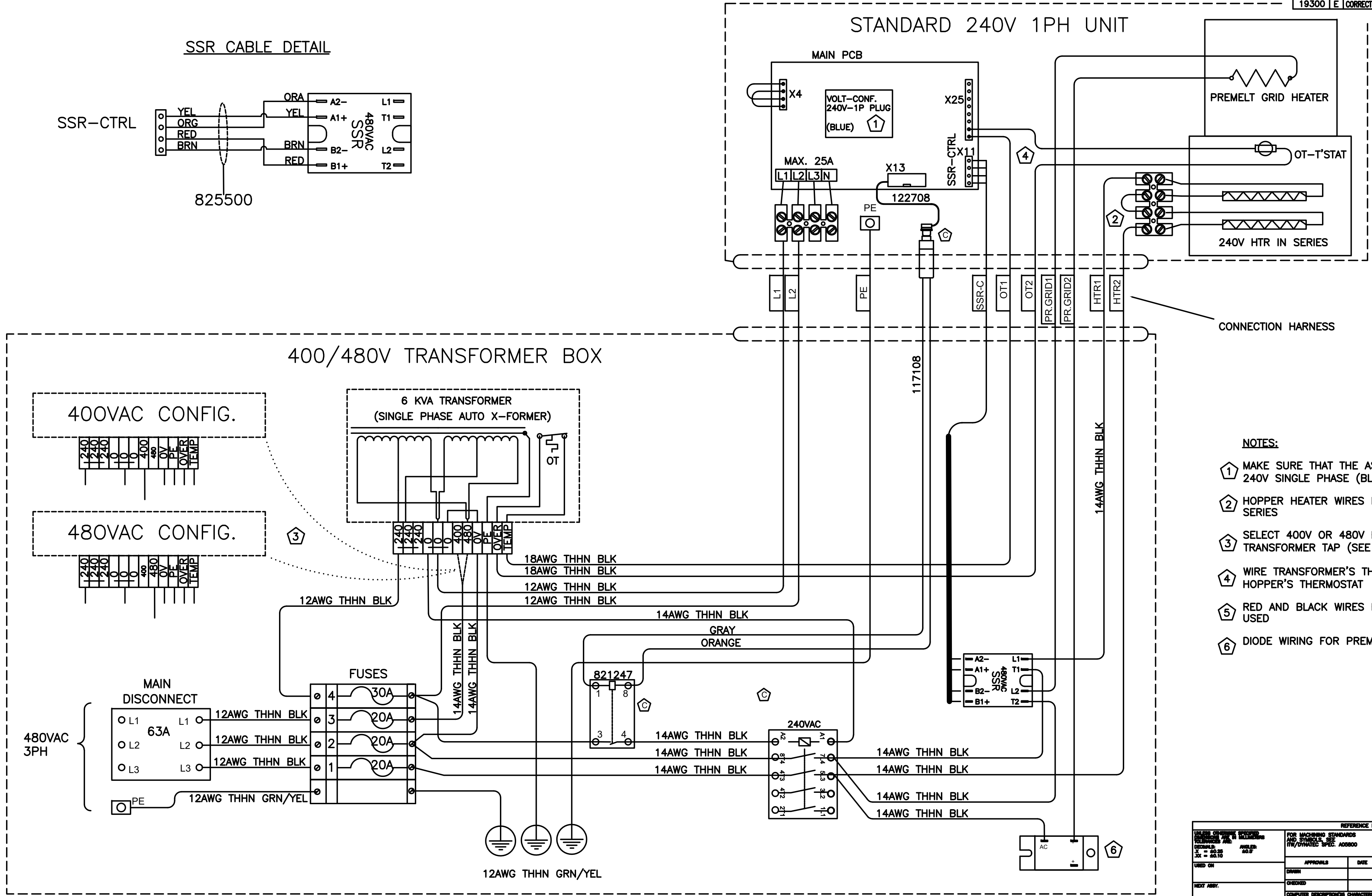
SCALE 1:1 | CAD DRAWING | SHEET 2 of 2

11.2 Transformer 400/480V Schematics, PN 150238 J

1103	F	REVISED CONTACTOR	10.15.20	JJB
23-2859	G	REVISED SSR WHIP AND SSR	11.26.24	BG
ECN2182	H	REVISED SSR WIRING	3.4.25	BG
ECN2312	I	ADDED PRE-MELT GRID WIRING	11.12.25	BG
ECN2337	J	SSR CONN. LABEL X11	11.12.25	BG

REVISIONS

REL.	REV.	DESCRIPTION	DATE	BY	APPROVED
SIMPLI	A	INITIAL RELEASE.	3.13.17	DH	
–	B	PRERELEASE UPDATE	09.20.17	BFQ	
18117	C	ADDED 24VDC AND 240VAC CONTACTORS	09.28.18	JJB	
18141	D	CHANGE 15A FUSES TO 20A, WIRES TO 14AWG	11.06.18	BFQ	
19300	E	CORRECT SSR CONNECTION P/N	03.26.08	DH	



NOTES:

1. MAKE SURE THAT THE ASU IS CONFIGURED FOR 240V SINGLE PHASE (BLUE PLUG)
2. HOPPER HEATER WIRES NEED TO BE REWIRED IN SERIES
3. SELECT 400V OR 480V BY CHANGING THE TRANSFORMER TAP (SEE DIAGRAM LEFT SIDE)
4. WIRE TRANSFORMER'S THERMOSTAT IN SERIES WITH HOPPER'S THERMOSTAT
5. RED AND BLACK WIRES FROM 117108 ARE NOT USED
6. DIODE WIRING FOR PREMELT GRID OPTION ONLY

REFERENCE PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMALS: .X = ±0.25 .XX = ±0.10 ANGLES: ±0.5°

FOR MACHINING STANDARDS AND SYMBOLS, SEE ITW/DYNATEC SPEC. A05800

ITW Dynatec HENDERSONVILLE, TN

U/M EA

STATUS R

SOURCE

WIRING DIAGRAM, XFMR ASSY,SIMPLICITY

USED ON

NEXT ASSY.

APPROVALS	DATE
DRAWN	
CHECKED	

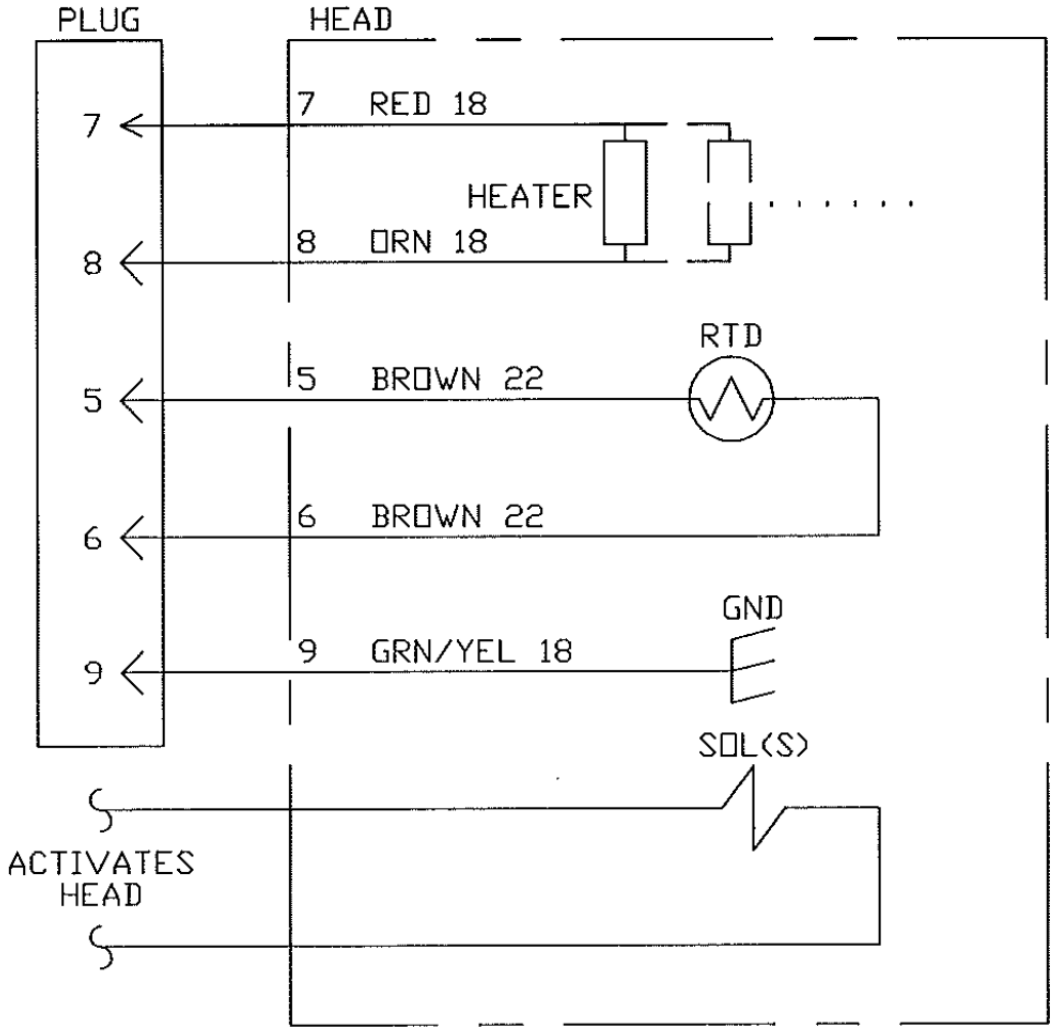
COMPUTER DESCRIPTION(25 CHARACTERS): WIRE DIAG,XFMR,SIMPLICITY

SIZE D | DWG. NO. 150238 | REV. J | GROUP

DO NOT SCALE DRAWING

SCALE 1:1 | CAD DRAWING | SHEET 1 of 1

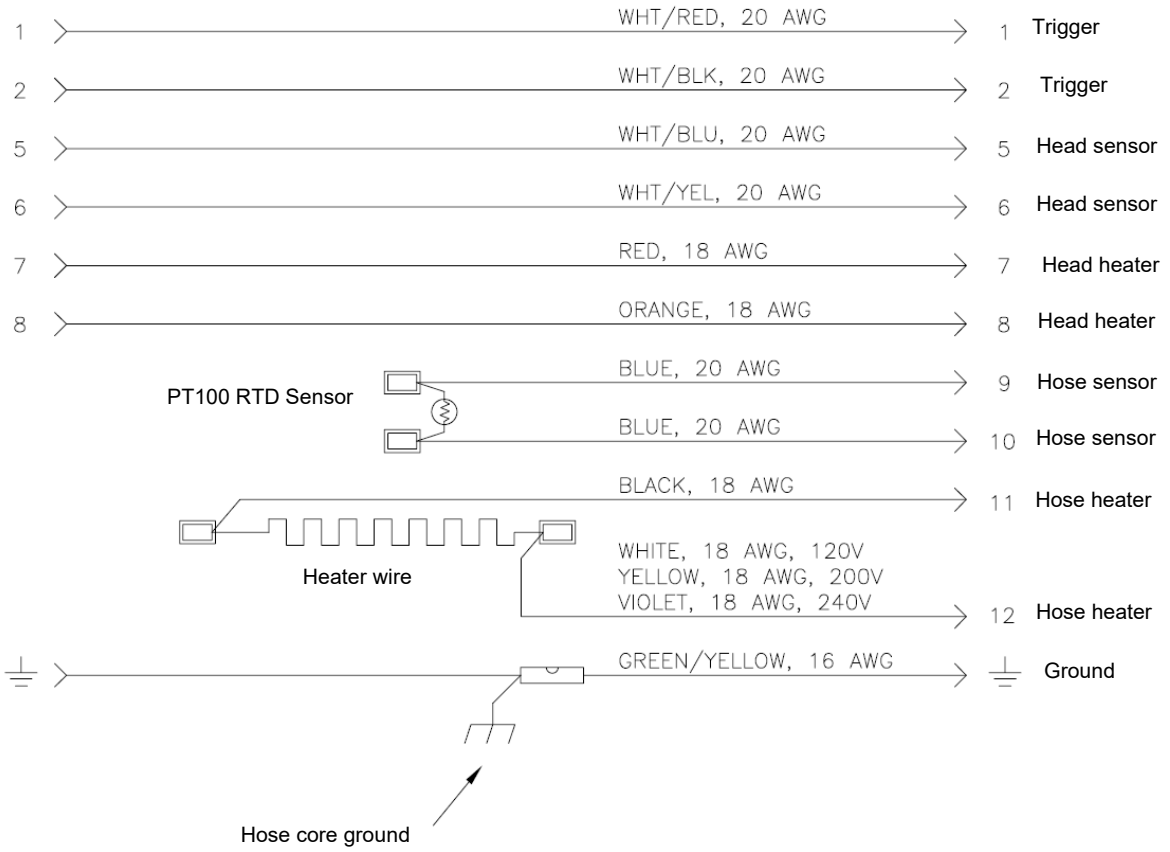
11.3 Head Schematic, PN 103117, Rev.B, DynaControl



NOTES:
1. All wire MIL-W-22759/10 or 12, minimum 600 Volts, 260 °C.
2. Solenoid(s) voltage and timing method depends on application.
3. RTD will be platinum 100 Ohm.

11.4 Hose Schematic 101082, Rev. G, Circular connector, for Standard Hoses with Temperature Sensor PT100 for DynaControl

Applicator end **Melter end**

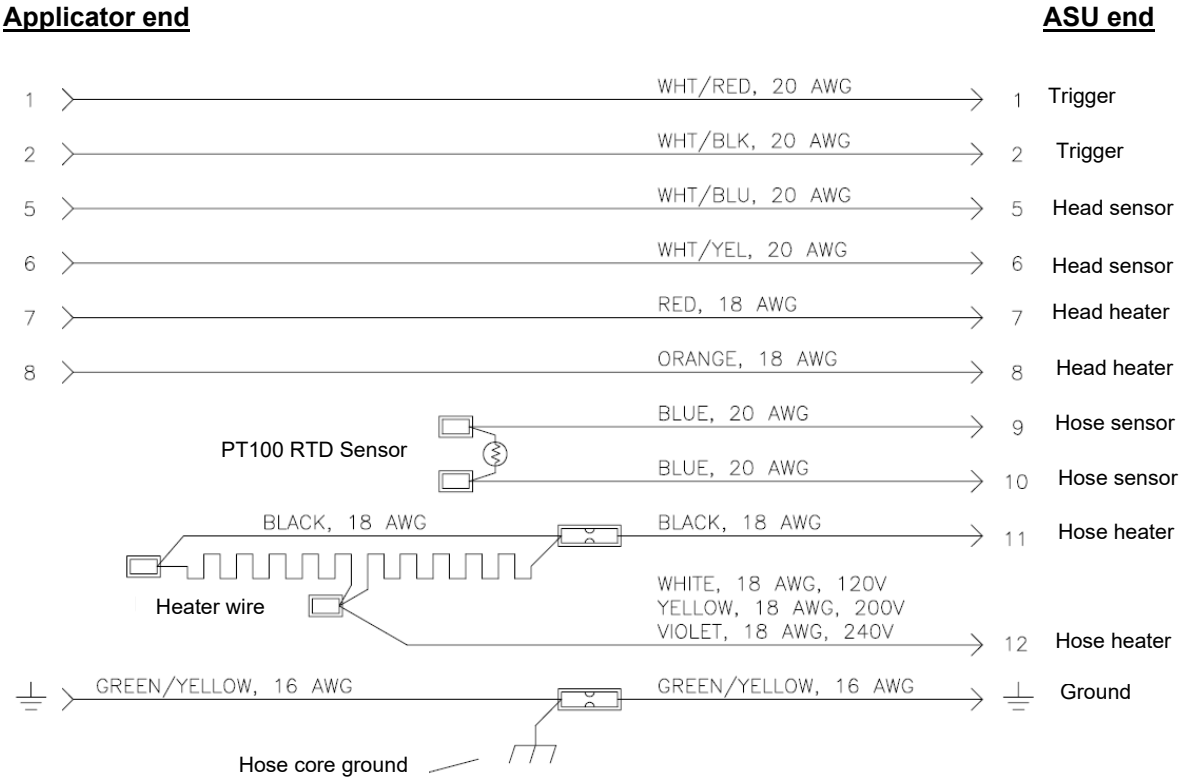


NOTES:

1. All wiring is routed through the hose.
2. Wire sizes shown are for no. 6 and no. 8 hoses up to 24 ft (730 cm) in length. For larger diameter and longer hoses, heater lead wires are 16 AWG. Other wire sizes and colors may be changed in special hoses per customer request.

11.5 Hose Schematic 112633, Rev.A, Circular connector, for Hoses with a heater wire circuit divided in 2 separate segments, with Temperature Sensor PT100 for DynaControl

NOTE: *This schematic is used on longer hoses (over 45 feet / 13.7 m) and on the #8, 8 ft. (2.4 m) hose.*



NOTES:

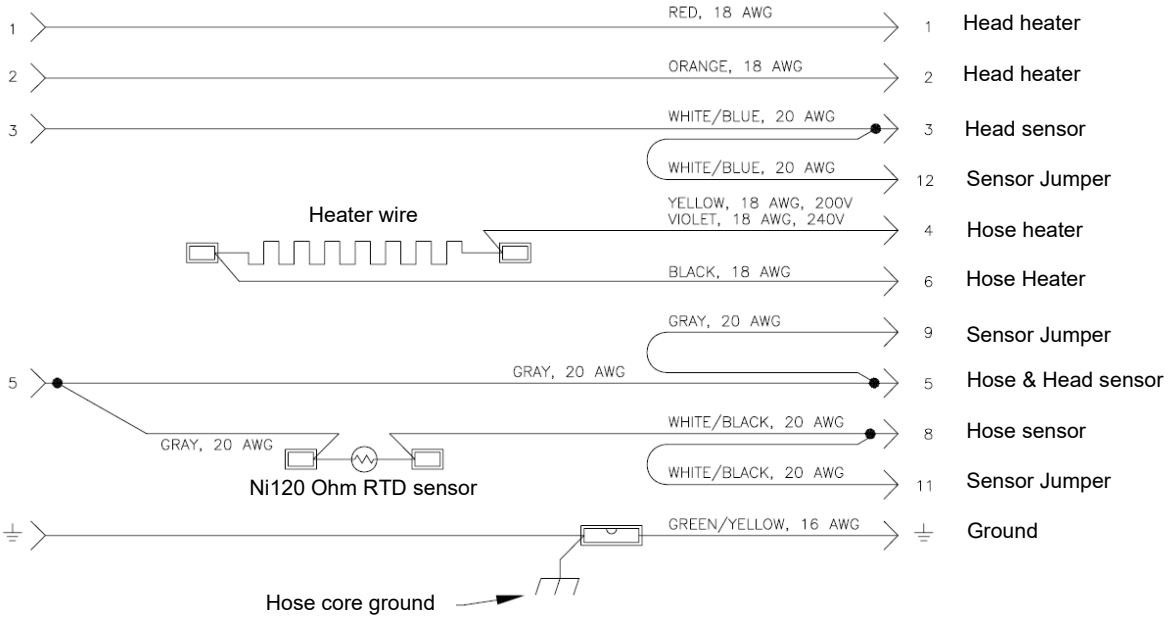
1. All wiring is routed through the hose.

2. The heater wire circuit is divided into two separate segments, each segment wound over half the hose length and wired in parallel connection to the hose supply voltage.

3. Wire sizes shown are for no. 8 hoses up to 24 ft (730 cm) in length. For larger diameter and longer hoses, heater lead wires are 16 AWG. Other wire sizes and colors may be changed in special hoses per customer request.

11.6 Hose Schematic 100951, Rev. B, Rectangular connector, for Hoses with Temperature Sensor Ni120 for NDSN-Control

Applicator end **ASU end**



NOTES:

1. All wiring is routed through the hose.

2. Jumpers at ASU end pins 9, 11 and 12 are to be contained within the ASU end connector body.

3. Wire sizes shown are for no. 6 and no. 8 hoses up to 24 ft (730 cm) in length. For larger diameter and longer hoses, heater lead wires are 16 AWG. Other wire sizes and colors may be changed in special hoses per customer request.

Manual Revision

Rev.	Page/ Chapter	Update description
Rev.2.18	19	• Update = A seven-day scheduler is available in the controller by default. An adhesive level sensor is available optionally. • Remove = A security code can restrict access to system programming and parameters.
	22	Remove = Ready interlock...yes Password protection...yes
	39	Remove = [or 246°C (475°F) for optional high temperature units]
	50	Update = New screen HEAD 1
	51	Completely new page = Loading Factory Defaults
	76	Update = See piston pump drawing under chapter 10.
	91	Update = Service Kits, Filter Kits, Master Repair Kit PN 150043 (for Piston Pump 150039), Pressure Relief Valve Repair Kit: PN 109982)
	102	Update = Filter Manifold Assembly, PN 150104 Filter Manifold assembly tabulation:
	103	Update = Illustration: Filter Manifold Assembly, PN 150104
	104	Update = * see separate spare part list and drawing PN 150100
	105	Completely new page = Piston Pump Manifold Assembly, PN 150100
	106	Update = Items 12, 17, 22, 23 (in BOM Pneumatic Piston Pump Assembly 12:1, PN 150039)
	111	Update = Schematics 2.page (PN 150212)
	112	New sub-chapter = Transformer 400/480V Schematics, PN 150238
	113	New sub-chapter = Revision update
Rev.3.18	29	Voltage configuration update.
	111	New Schematics, PN 150212C
Rev.4.18	26	Model Designation Matrix added.
	93	Grid Group, Simplicity DCL PN 150240 & NOR PN 150241 added.
Rev.12.18	7	New CE declaration.
	70	NI120 RTD resistance table added.
	111	New Schematics, 150212D.
Rev.3.19	111	New schematics, 150212F.
Rev.4.19	111	New schematics, 150212G.
	Ch.9	Extension kits for additional hose connections added.
Rev.5.19	25	Update Wattage Chart.
Rev.8.19	Ch.5	F2-Keypad lock updated.
Rev.9.19	Ch.7.2	Main PCB/ 13A updated.
Rev.6.20	Ch.7.1	Battery (PN121594) Installation added.
	Ch.10	Main PCB 150146 drawings added.
Rev.7.20	Ch.9	Grid Group PN 150240 & NOR PN 150241 updated.
Rev.10.20	Ch.6.5	Filter replacement updated.
	Ch.9	Filter kits updated.
Rev.1.21	Ch.4	Operation and Calibration of Level Sensor updated.
Rev.11.22	Ch.3.2	Specifications: Maximum operating temperatures of 218°C (425°F) added.
	Ch.10	Hopper 16kg PN 150159 removed.
	Ch.10	Plate Assembly for Pump Block-Off, PN 827744 added.
Rev.12.22	Ch.11	Schematics, 150212J updated.
Rev.6.23	P.1	Manual language added.
	Ch.1	Declaration of Conformity updated.
	Ch.10.6	10.6.1 Filter and Shutoff Asy, PN 102751, and 10.6.2 Filter and Shutoff Asy, PN 102752, added.
Rev.4.24	Ch.3.2.2	Specifications / Lid opening dimensions added.
Rev.7.24	Ch.9.1	Master Repair Kit 150043 updated.
Rev.11.24	Ch.9.4	Reference to pressure transducer kit PN 116878 removed.
Rev.1.26	Ch.11	Simplicity Schematics, 150212K updated. Transformer 400/480V Schematics 150238J updated.
Rev.3.26	Ch.11	Hose schematics added.
Rev.4.26	Ch.10.6	Washer L00475 added (only for the 4kg and 8kg units).
Rev.5.26	Ch.10.6.1 Ch.10.9.1 Ch.10.10.1	New Hopper asy 124285 for 4kg unit. New Piston Pump Drive asy for 4kg unit. New Piston Pump and Manifold asy for 4kg unit.
	Ch.11.1	Simplicity Schematics, 150212L updated.

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