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ITW Dynatec

Adhesive Application Solutions • ISO 9001 Certified

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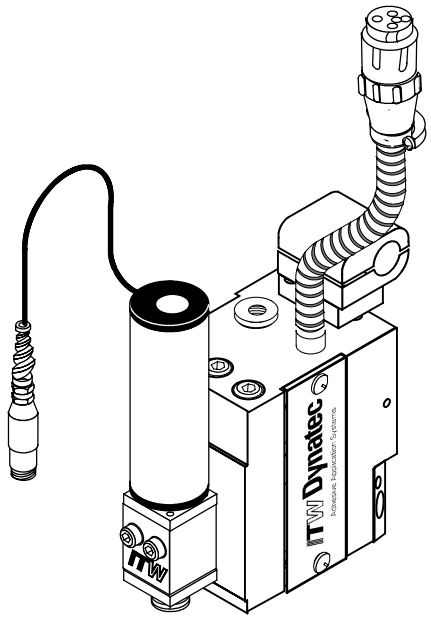
OPERATIONS AND SERVICE MANUAL

MOD-PLUS™ ELECTRIC HOT MELT ADHESIVE APPLICATOR HEADS



For an online copy of this manual, go to www.itwdynatec.com/manuals.htm

IMPORTANT ! - READ ALL INSTRUCTIONS BEFORE OPERATING THIS EQUIPMENT

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

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

Moving Forward Through Technology ™

⚠ SAFETY INSTRUCTIONS

GENERAL CONSIDERATIONS

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

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

SERVICING EQUIPMENT

1. Only trained personnel are to operate and service this equipment.
2. Never service or clean equipment while it is in motion.

   Shut off the equipment and lock out all input power at the source before attempting any maintenance.
3. Follow the maintenance and service instructions in the manual.

SIGNS

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

ADDITIONAL CONSIDERATIONS

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

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Chapter 1
SAFETY PRECAUTIONS

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

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

Electrical

Dangerous voltages exist at several points in this equipment. To avoid personal injury, do not touch exposed connections and components while input power is on. Disconnect, lockout and tag external electrical power before removing protective panels.

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

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

High Temperatures

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

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

High Pressure

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

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

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

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

Protective Covers

Keep all guards in place!

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

Eye Protection & Protective Clothing

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

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

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

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

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

Always wear steel-reinforced safety shoes.

Safe Installation and Operation

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

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

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

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

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

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

Treatment for Burns From Hot Melt Adhesives

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

Care should be used when working with hot melt adhesives in the molten state. Because they rapidly solidify, they present a unique hazard.
Even when first solidified, they are still hot and can cause severe burns. When working near a hot melt application system, always wear safety gloves, safety glasses and long-sleeved, protective clothing.

Always have first-aid information and supplies available.

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

Service

Refer all servicing to qualified personnel only.

Explosion/ Fire Hazard

Never operate this unit in an explosive environment.

Use cleaning compounds recommended by ITW Dynatec or your adhesive supplier only. Flash points of cleaning compounds vary according to their composition, so consult with your supplier to determine the maximum heating temperatures and safety precautions.

Lockout/ Tagout

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

Be familiar with all lockout sources on the equipment.

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

Use of PUR (Polyurethane) Adhesives

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

Consult with your adhesive manufacturer for specifics about required ventilation.

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

In This Manual

WARNINGS and CAUTIONS are found throughout this manual.

WARNINGS mean that failure to observe the specific instructions may cause injury to personnel.

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

Chapter 2
DESCRIPTION AND SPECIFICATIONS

Description

ITW Dynatec's MOD-PLUS™ Electric Applicator Head is an electrically operated, single or multi-nozzle hot melt adhesive applicator assembly with an integrated filter cartridge that prevents particulate matter from obstructing flow through the head. It is used with intermittent adhesive pressure and constant adhesive pressure hot melt adhesive supply units (ASUs).

Each Mod-Plus Electric applicator features one to four adhesive valve modules mounted to a single service block. Each module is opened and closed by an electric solenoid. Springs are used to keep the valve closed when no electric signal is supplied to the solenoid. The rate of adhesive flow from the applicator is determined by the adhesive pressure applied by the ASU's pump and the size of the nozzle orifice.

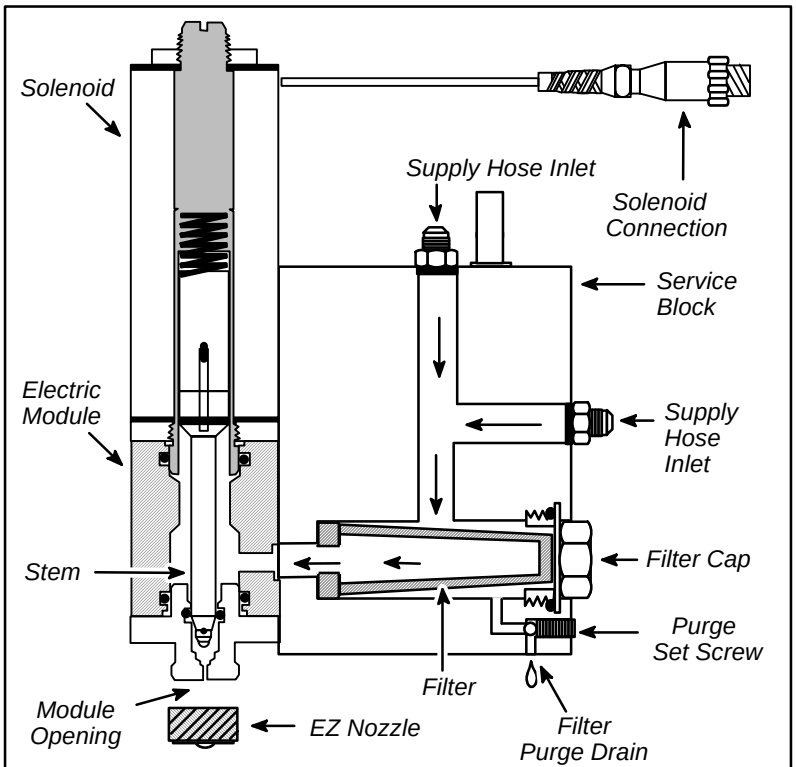
The applicator is heated by replaceable cartridge heating elements which are controlled by an integrated RTD sensor and electronic control.

As seen in the illustration below, the module is mounted onto a service block. A stem inside the module is magnetically triggered by a solenoid, which allows adhesive to flow through the module.

The heated adhesive supply hose may be connected at the rear of the service block or at the top. Adhesive flows from the hose into and through the channels within the block to the module. An electric signal opens the adhesive valve, allowing adhesive to flow through the module's nozzle when the valve is open.

Three standard Mod-Plus Electric applicators, supporting one to four modules, are available. Each model can be configured for either ITW Dynatec's DynaControl or Dynamini controller, Dynaplus/ Dynapro systems, Microprocessor Temperature Control/CompuVision (MCV) or Electronic Temperature Control with Readout (ETC/RO), or it can be configured for a competitive upgrade. Water-resistant models are available for all of these configurations.

Three standard Mod-Plus Electric modules are available: a high-speed DC version, a high-viscosity DC version and a 120 VAC version. See the valve specifications for the performance characteristics of each valve.



The Mod-Plus Electric Module

Specifications

Environmental:

Storage/ shipping temperature . . . . . -40°C to 70°C (-40°F to 158°F)
Ambient service temperature . . . . . -7°C to 50°C (20°F to 122°F)

Physical:

Dimensions . . . . . see dimensional layout on following page
Weight . . . . . Model 0441: 0.68 to 2.05 kg (1.5 to 4.5 lb.)
Mounting . . . . . M5x .8 screws with insulators or 1/2" rod mount, insulated clamps, 12 to 13 mm rod

Performance:

Temperature range . . . . . 38°C to 218°C (100°F to 425°F)
Warm-up time . . . . . 20 minutes for cold start/ 10 minutes for module change only

Adhesive pressure range *Standard High-Speed DC module:* 69 bar maximum (1000 psi maximum)
. . . . . *Optional High-Viscosity DC module:* 69 bar maximum (1000 psi maximum)
. . . . . *Optional AC module:* 48 bar maximum (700 psi maximum)

	Maximum Viscosity			Maximum Cycle Rate		
Coil Power Supply	Standard Module 106144	High Visc. Module 108750	AC Module 109017	Standard Module 106144	High Visc. Module 108750	AC Module 109017
ILD-2 Driver [C]	6000 cps	12000 cps	NA	6000 cyc. per min. at 1200 cps or less	600 cyc. per min.	NA
VL-1 Driver [D]	6000 cps	12000 cps	NA	1000 cyc. per min.	continuous only	NA
120 VAC	NA	NA	6000 cps	NA	NA	600 cyc. per min.

	Maximum Flow Rate			Minimum Open/Closed Time		
Coil Power Supply	Standard Module 106144 [A]	High Visc. Module 108750 [B]	AC Module 109017 [A]	Standard Module 106144	High Visc. Module 108750	AC Module 109017
ILD-2 Driver [C]	650cc/ min. @ 1000 cps	600cc/ min. @ 6000 cps	NA	4/ 6 ms	50/ 50 ms	NA
VL-1 Driver [D]	650cc/ min. @1000 cps	600cc/ min. @6000 cps	NA	30/ 30 ms	continuous only	NA
120 VAC	NA	NA	650cc min. @1000 cps	NA	NA	50/ 50 ms

Table Notes: A. Maximum flow at 6000 cps is 350cc/ min.
B. Maximum flow at 12000 cps is 230cc/ min.
C. Each ILD-2 Driver can power up to eight modules.
D. Each VL-1 Driver can power one module.

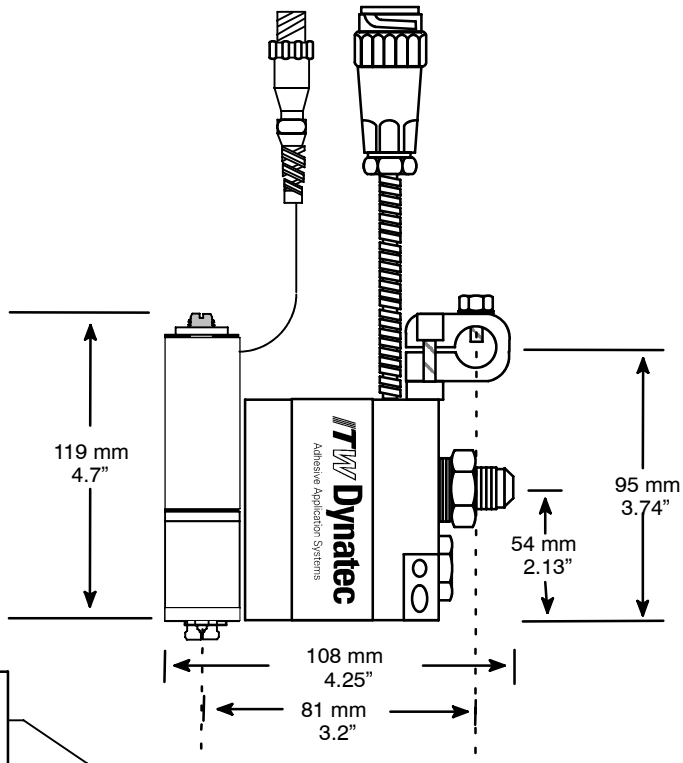
Electrical:

Applicator supply voltage . . . . . 120 VAC or 200-240 VAC/ 1p/ 50-60 Hz
Module supply voltage . . . . . ITW-Dynatec supplied valve driver
Module Power requirements . . . . . 120 VAC module = 125 w max./ module
. . . . . DC module/ VC-1 driver = 80 w max./ module
. . . . . DC module/ ILD-2 driver = see ILD-2 manual
Applicator Power requirements:

Model	No. Modules	Spacing Between Nozzle Centers	Wattage	
			120 VAC	240VAC
BF0441	1	- - -	200	200
BF0662	2	44 mm	240	400
BF1104	4	25 mm	360	585

Dimensions

	WIDTH	
Model No.	**A**	**B**
BF0441	44mm 1.73”	n.a.
BF0662	66mm 2.6”	44mm 1.73”
BF0652	65mm 2.56”	38mm 1.50”
BF0472	47mm 1.732”	25mm .984”
BF1104	109.9mm 4.33”	25mm .984”



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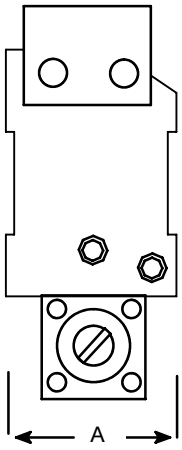

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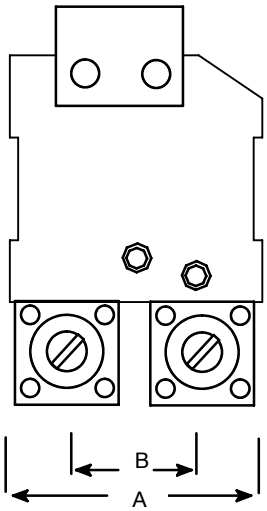

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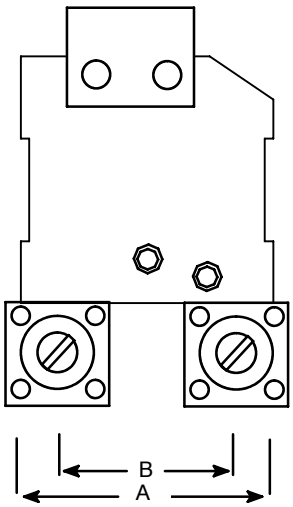

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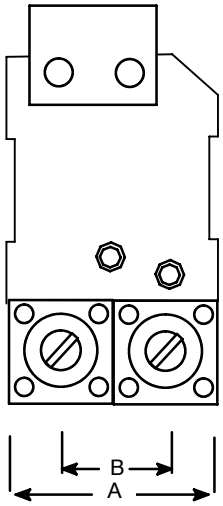

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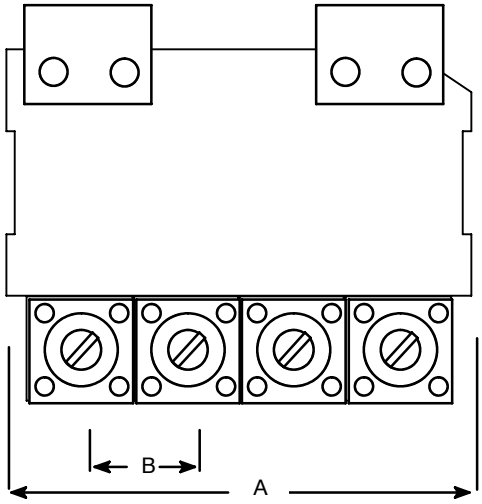

Chapter 3
INSTALLATION & START UP

Note: Re-read Chapter 1 "Safety Precautions" before performing any installation or start-up procedures. All installation and start-up procedures must be performed by qualified, trained technicians.

Handling and Shipping

MOD-PLUS™ Electric applicator head assemblies are packaged within protective cushioning material in a fiber packing carton. This package may be shipped inside another carton along with other individual boxes containing components of the system.

Service Requirements

The applicator assembly consists of a service block and one or two modules.

Incoming electrical power and temperature control for the applicator head is supplied through the flexible cable exiting the adhesive supply hose cuff. The applicator has a circular, plastic connector which mates with the connector attached to this cable.

Incoming (operating) electrical power for the module is supplied either through a valve driver, a timer, or a customer-supplied power source. See the installation diagrams on the following pages for configuration.

Driver Requirements

See Specifications (Ch. 2) for ITW drivers/ electric modules performance comparisons.

Installation Instructions

The applicator head has been tested at the factory and is ready for installation and operation.

Electric valve drivers are triggered by ITW Dynatec-supplied or customer-supplied 24 VDC timers or limit switches which sense the position of the package or object to which adhesive is being applied. Refer to your valve driver manual for specific installation instructions. Switches should be mounted on moveable brackets to provide adjustment for proper location of adhesive application.

Refer to the installation diagram on the following page for location of components referred to in the following section.

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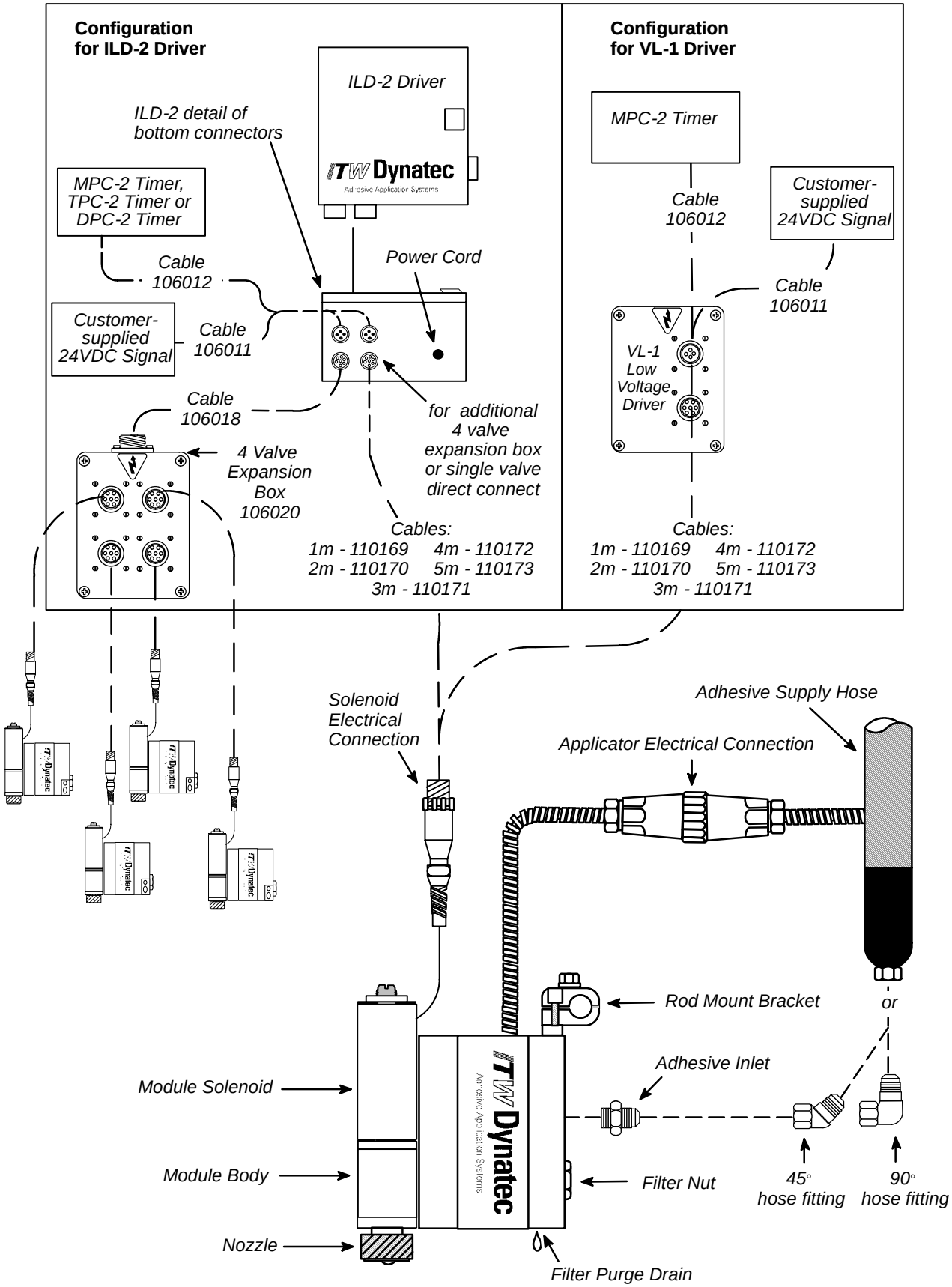
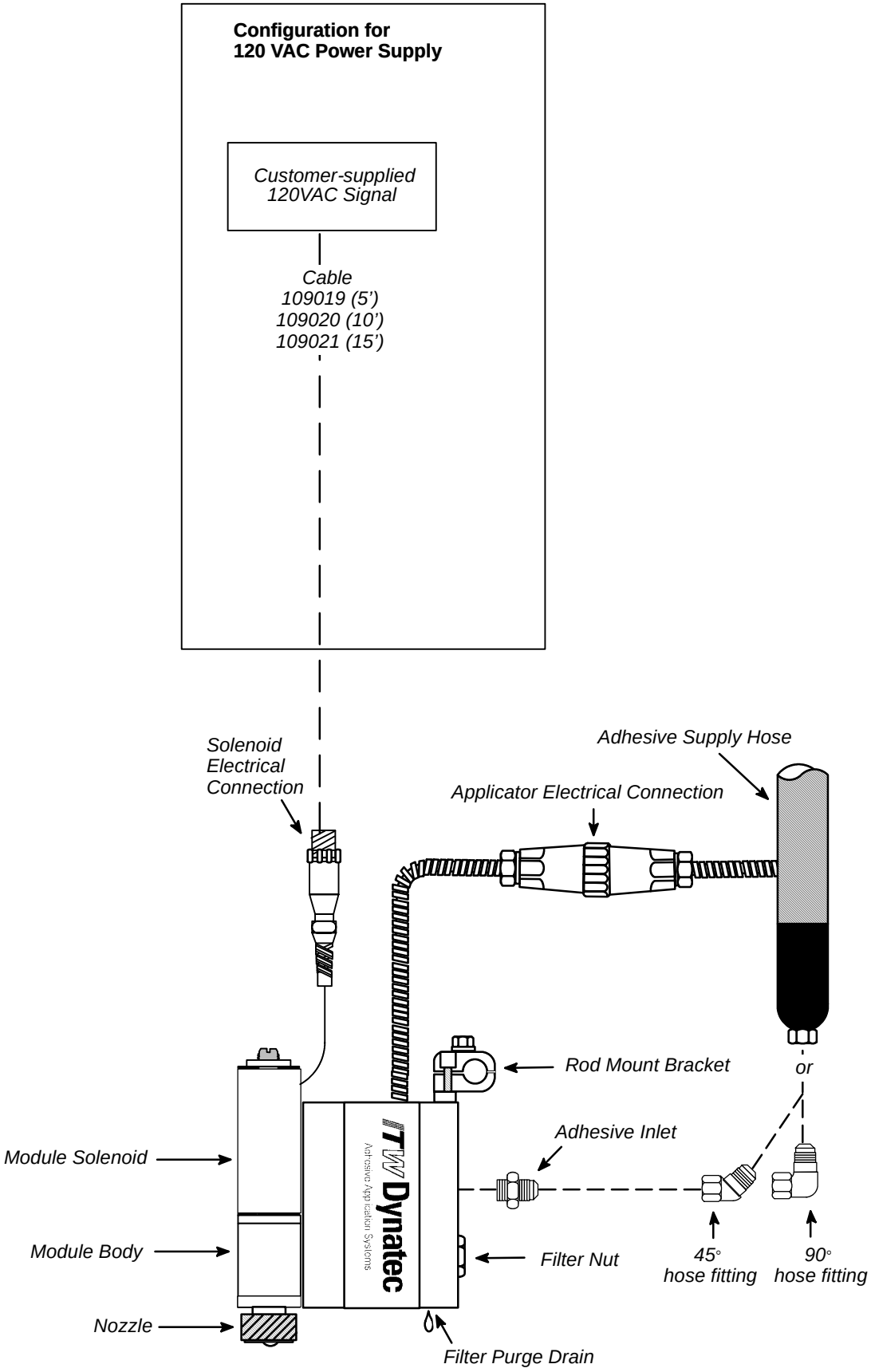


Installation Diagram Using ILD-2 or VL-1 Driver



Installation Diagram Using 120VAC Power Supply

1. The applicator should be supported from brackets that permit lateral and vertical adjustments. Mount the applicator on a 12mm to 13mm rod or bracketry using 5mm screws and insulators provided. Allow access to the filter. For proper application, the maximum distance from the nozzle tip to the substrate should not exceed 6.4mm (1/4 inch).

2. Before making the adhesive connection to the applicator, align the adhesive supply hose with its electrical connector oriented in relation to the electrical connector on the top of the applicator. Connect the swivel fitting of the hot melt hose to the adapter on the service block, using either the inlet port located above the filter nut or the port located on the top of the applicator (behind the applicator electrical connection in the diagram). When tightening the hose fitting, hold the hose cuff to prevent the hose core from rotating.

3. Make the electrical connection from the hose to the applicator by connecting the female connector of the hose to the male connector of the applicator.

4. Make the electrical connection from the driver, timer, or other power source to the solenoid by connecting the female connector of the driver's extension cable to the male connector of the solenoid.

5. It is advisable to check the temperature of the applicator. This can be done through the temperature readout of the adhesive supply unit. Surface temperature may be checked with a separate pyrometer and surface probe or with a dial thermometer. Turn the system power switch ON. Permit the applicator to warm up at least 20 minutes (10 minutes for module change) before reading temperature.

6. Purge the applicator of air and oil, using the following procedure:.

WARNING HIGH PRESSURE

During the purging procedure, hot adhesive and oil can come out of the head under high pressure. Wear safety glasses, gloves and protective clothing.

WARNING

Use a stable, deep container to collect hot-melt adhesive and/ or oil.

a. Turn the applicator ON. Allow adhesive and applicator to warm up.

b. Remove the nozzle from the module by loosening the nozzle cap. Place a heat resistant container under the module to collect the material that drains from the applicator

c *i. If equipped with a VL-1 Driver, timer, or other power source:*
Energize the solenoid by manually energizing the timer output or power source.

or

ii. If equipped with the ILD-2 Driver:
Energize the solenoid by toggling the channel switch on the ILD-2 to the "test" position.

7. Replace nozzle, orienting the nozzle tip so it points toward the substrate.

Chapter 4
MAINTENENCE

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

The MOD-PLUS™ Electric applicator requires no regular maintenance. Wipe the applicator clean of adhesive with a clean cloth while still hot at the end of each shift. Inspect the applicator periodically as outlined in the following table.

Maintenence Schedule

ITEM	CHECK	FREQUENCY	ACTION
Adhesive supply hose fitting connection	Inspect for leaks	As required	Tighten if loose
Nozzle performance	Inspect all nozzles for proper operation	As required	Clean nozzle or re-adjust stroke limiter
Filter Drain	Purge chamber to remove contami-nants	Weekly	Open drain
Built-in filter	Inspect for cleanliness	Monthly or as required by use	Replace filter element

Purging the Filter Chamber

WARNING HIGH PRESSURE

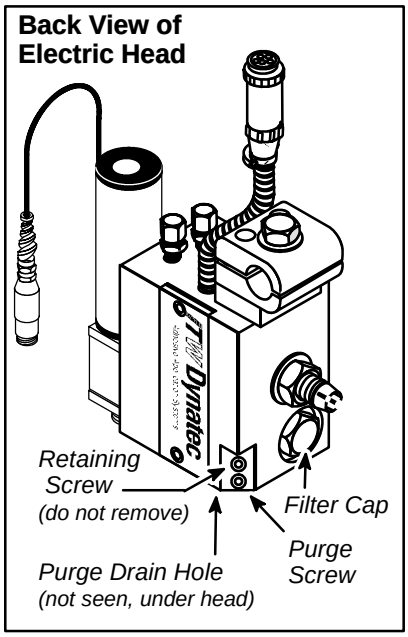
During the purging procedure, hot adhesive can come out of the applicator under high pressure. Wear safety glasses, gloves and protective clothing.

The applicator should be at operating temperature. Turn the ASU's pump/ motor OFF.

1. Place a heat-resistant container under the purge drain.

2. With a 5mm hex key (allen wrench), slowly loosen the purge screw (do not try to remove it) and allow the adhesive and residues to flow out of applicator. Be sure to stand clear since there may be residual adhesive pressure in the applicator.

3. Turn on the pump/ motor. When all the contaminants have run out and the glue is clean, re-tighten the screw.



Replacement of the Built-in Filter

Observe the same warning and conditions as in "Purging the Filter Chamber", above.

The applicator should be at operating temperature. Turn the ASU's pump/ motor OFF.

1. Place a heat-resistant container under the purge drain.

2. With a 5mm hex key (allen wrench), slowly loosen the purge screw and allow the adhesive to flow out of applicator. Stand clear since there may be residual adhesive pressure in the applicator.

3. Remove the filter cap with an open wrench and replace the filter element.

CAUTION: Apply a coat of anti-seize compound onto the threads of the filter cap before re-installing it.

4. Re-install the filter cap slowly, taking care to seat the cap o-ring without pinching it.

Nozzle Cleaning

Occasionally nozzles can become clogged with char, residue or other foreign material. This can result in the decrease or even loss of glue flow. ITW Dynatec has three nozzle cleaning kits available, which are orifice-size specific:

PN 101877	Nozzle Cleaning Kit: 0.010 to 0.017 orifice
PN 101878	Nozzle Cleaning Kit: 0.018 to 0.027 orifice
PN 101879	Nozzle Cleaning Kit: 0.028 to 0.040 orifice

WARNING HIGH PRESSURE

Before using the nozzle cleaning kit: Turn OFF the ASU, then slowly open the head's purge drain to relieve adhesive pressure.

The nozzle must be at operating temperature when cleaned. Turn the ASU OFF. If the ASU is equipped with a piston pump, remove the air pressure from the pump. Purge the residual adhesive pressure in the head using the filter drain. Remove the nozzle retaining nut and nozzle with a 14mm open wrench.

Use the reamers in the kit to clear the orifice. Carefully insert the reamer into the tip of the nozzle. Since there are several orifice sizes available, first make sure that the reamer is compatible with the orifice size you are about to clean.

CAUTION: If a reamer of too large a diameter is used to clean the orifice, it could result in a broken reamer jammed in the nozzle, or damage to the nozzle itself.

Chapter 5
TROUBLESHOOTING & SERVICE

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

In General

If failure occurs, first verify the following:
1. all the electrical connections are made properly,
2. the ASU's main power switch is ON,
3. the pump is ON,
4. the drivers are connected properly and have power,
5. the temperature controller is in operation and the setpoints are correct for the application, and
6. all components are heating properly.

Note: If the Mod-Plus Electric valve was installed on the applicator without the coil in place, or if the coil has been removed for several minutes, then the adhesive in the pressure tube may be partially solidified. After installing the coil, allow approximately ten minutes for the adhesive in the pressure tube to re-melt before attempting to energize the valve.

Troubleshooting Guide

Section One: Head Temperature Troubleshooting

Problem	Possible Cause	Solution
Applicator does not reach operating temperature	1. Temperature setpoint is too low.	1. Check setpoints and adjust as necessary. See ASU manual.
	2. Inoperative heater cartridge.	2. Check heater and heater connections. Replace heater if necessary; see instructions in this chapter.
	3. Inoperative temperature sensor.	3. Check sensor and sensor connections. Replace sensor if necessary; see instructions in this chapter.
Applicator is too hot	1. Applicator temperature setpoint is too high.	1. Check setpoints and adjust as necessary. See ASU manual.
	2. Inoperative temperature sensor.	2. Check sensor and sensor connections. Replace sensor if necessary; see instructions in this chapter.

Troubleshooting Guide, cont.

Section Two: Adhesive Bead Size and Pattern Corrections

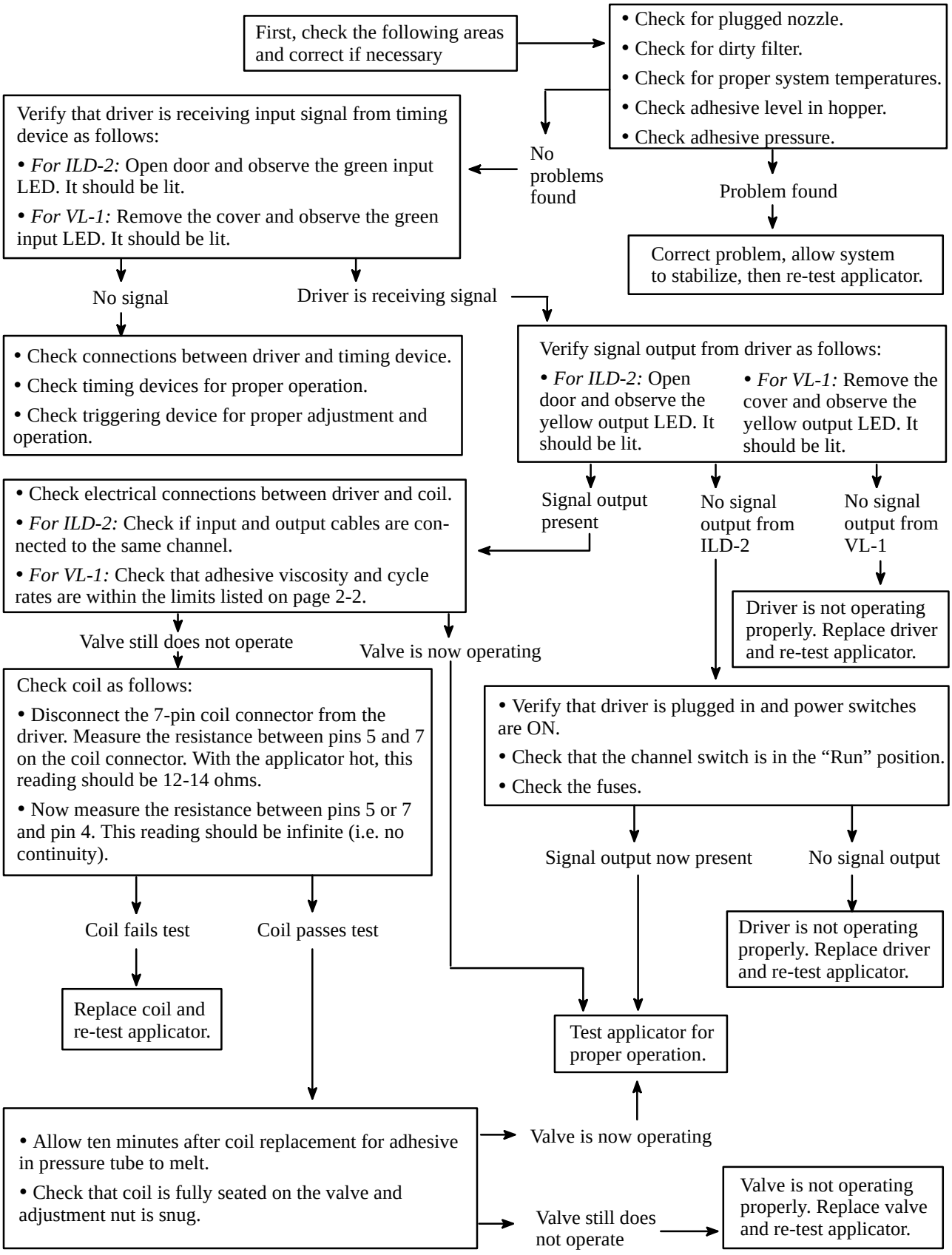
Problem	Possible Cause	Solution
Adhesive output too low. (Bead size too small)	1. Adhesive pressure is too low.	1. Raise adhesive pressure. See ASU manual.
	2. Nozzle orifice is too small for the application.	2. Change to a larger orifice nozzle.
	3. Nozzle is partially clogged.	3.Clean or replace nozzle. See Ch. 4.
	4. Filter is dirty.	4. Change or clean filter. See Ch. 4.
	5. System temperatures are too low for the adhesive in use.	5. Correct system temperatures. See ASU manual.
Adhesive output too high. (Bead size too large)	1. Adhesive pressure is too high.	1. Reduce adhesive pressure. See ASU manual.
	2. Nozzle orifice is too large for the application.	2. Change to a smaller orifice nozzle.
Adhesive output is OK, but pattern is erratic or inconsistent.	1. Adhesive pressure is too low.	1. Raise adhesive pressure. See ASU manual.
	2. Nozzle is partially clogged.	2.Clean or replace nozzle. See Ch. 4.
	3. Triggering device (photo eye, proximity switch, etc.) is out of alignment or malfunctioning.	3. Check and correct as necessary.
	4. Timer settings are incorrect or timer is malfunctioning.	4. Check and correct as necessary.

cont.

Problem	Possible Cause	Solution
	6. *If using the VL-1 driver:* total cycle rate or "on-time" may be out of range.	6. The minimum "on-time" for the VL-1 is 30 ms; the minimum total cycle time is 60 ms. If the application is outside this range, the ILD-2 driver must be used. See the VL-1 manual for more information.
Pattern registration (timing) is incorrect	1. Triggering device (photo eye, proximity switch, etc.) is out of alignment.	1. Check device and adjust as necessary.
	2. Pattern compensation (offset) is incorrect.	2. Adjust pattern compensation. *Note: If the Mod-Plus Electric head has replaced an existing pneumatically-operated head, the pattern compensation programmed for the pneumatic head will likely be incorrect for the Mod-Plus Electric head. The Mod-Plus Electric valve reacts much faster than a pneumatic valve, and usually requires very little, if any, compensation in the timer.*

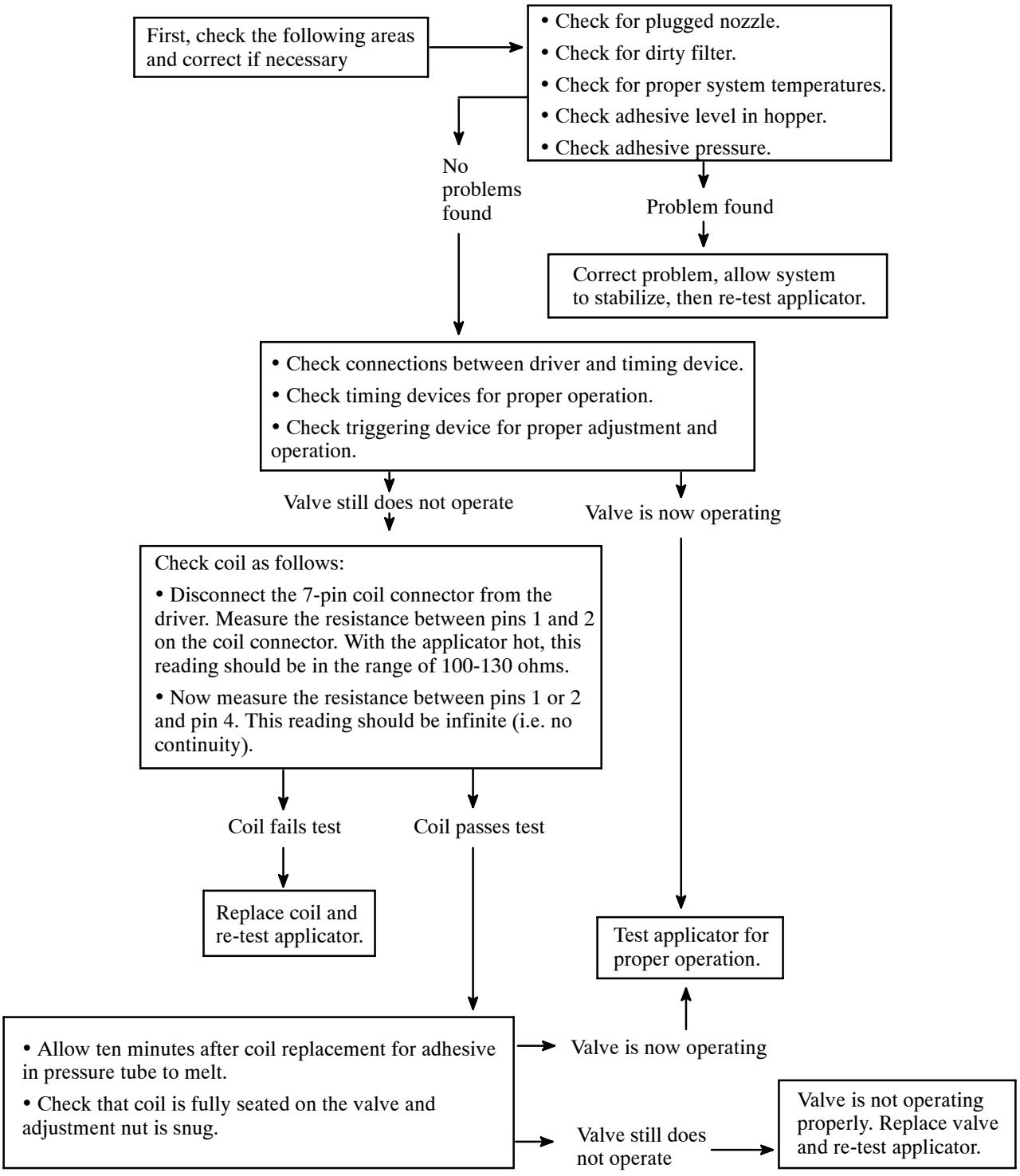
Troubleshooting Guide, cont.

Section Three: No Adhesive Output from Valve for modules PN 106144 and PN 108750 only



Troubleshooting Guide, cont.

Section Four: No Adhesive Output from Valve for module PN 109017 only



Replacement of the Module

Turn the ASU OFF. Turn all adhesive pressure OFF.

WARNING HIGH PRESSURE

During the purging procedure, hot adhesive can come out of the applicator under high pressure. Wear safety glasses, gloves and protective clothing.

1. Place a heat-resistant container under the manifold.

2. With a 5mm hex key (allen wrench), slowly loosen the purge screw and allow the adhesive to flow out of applicator. Be sure to stand clear since there may be residual adhesive pressure in the applicator.

3. Remove the module from the service block by removing the two shoulder bolts on the front of the module with a 4mm hex key screwdriver (allen wrench). Make sure that the old o-ring located on the back of the module is also removed (the new module will include a new o-ring).

4. Mount the new module onto the service block and tighten the screws (15 in-lb maximum)..

Module Assembly Instructions

Use the component illustration and parts list on pages 6-8 and 6-9 as a reference with the following instructions for the Mod-Plus Electric module. ITW Dynatec's Module Renew Kit (see Chapter 7) contains all needed items to renew one module.

CAUTION: Use care when handling the module pressure tube and stem which contain thin-walled components. Do not use pliers, clamps, a vice, etc. on these parts.

CAUTION: IT IS IMPORTANT not to mix parts from more than one module during the rebuilding process. Doing so would cause the stroke settng to be incorrect, which could cause improper operation of the module. For this reason, ONLY ONE MODULE SHOULD BE REBUILT AT A TIME.

1. Coat o-rings with a liberal amount of High Temp Lube (PN N07588).

CAUTION: DO NOT SUBSTITUTE! Failure to use High Temp Lube (N07588) may result in premature seal breakdown and leakage of glue from the applicator.

2. Check that o-ring grooves are clean and free of adhesive. Install o-rings (items 13 & 14 on page 6-5) into stem seat assembly, taking care to ensure that o-rings are in good condition, with no visible nicks or cuts.

3. Install o-ring (item 14) into the stem seat assembly, placing it into the middle (of three) grooves (see cross-section on page 6-9).

4. Install the stem seat assembly (item 16) onto module body (item 12) using the four M3 screws (item 7) provided.

cont.

5. Coat the ball end of the stem (item 6) with High Temp Lube (N07588).

6. Install the stem through the module body and into the seat, engaging the o-ring in the seat.

7. Place the spring (item 4) in the recess at the top of the stem.

8. Place pressure tube and flange assembly over the needle and seat the pin in the body into the hole in the flange. Attach with the M3 screws provided.

CAUTION: The pressure tube must be bottomed into the flange before assembly to prevent binding the needle.

9. Re-attach module to the head with two shoulder screws.

10. Place the solenoid over the pressure tube and twist until it drops down onto the flange.

11. Thread lock nut (item 2) onto pressure tube.

To disassemble, reverse above order.

Testing of Heater Cartridge or Temperature Sensor

1. Turn the ASU OFF and make sure all adhesive air pressure and the pump are turned OFF.

2. Unplug the electrical cable from the adhesive supply hose to expose the pins in the cable.

Note: Pin connectors and pinout numbers will vary depending on the control scheme of the applicator. See Ch. 8 for a diagram of each.

Testing Resistance of the Heater Cartridge

a. The resistance value (Ohms) of your heater cartridge may be obtained from the chart below, or it may be calculated using the formula:
(to determine wattage, see chart on pg. 7-3)

$$\frac{\text{Volts}^2}{\text{Watts}} = \text{Ohms}$$

120 VAC		200-240 VAC		240 VAC	
Watts	Ohms	Watts	Ohms	Watts	Ohms
200 240	72 60	400	144	220	245

b. *For DynaControl or Dynamini:* With an ohmmeter, contact pins 7 and 8 and measure resistance.
For Dynaplus/Pro: With an ohmmeter, contact pins 8 and 9 and measure resistance.
For ETC/RO or MCV: With an ohmmeter, contact pins 3 and 5 and measure resistance.
For Upgrade: With an ohmmeter, contact pins 1 and 2 and measure resistance.

c. A tolerance range of ± 5% is allowed. A heater cartridge that tests outside of this range must

be replaced. Replacement instructions follow in this chapter.

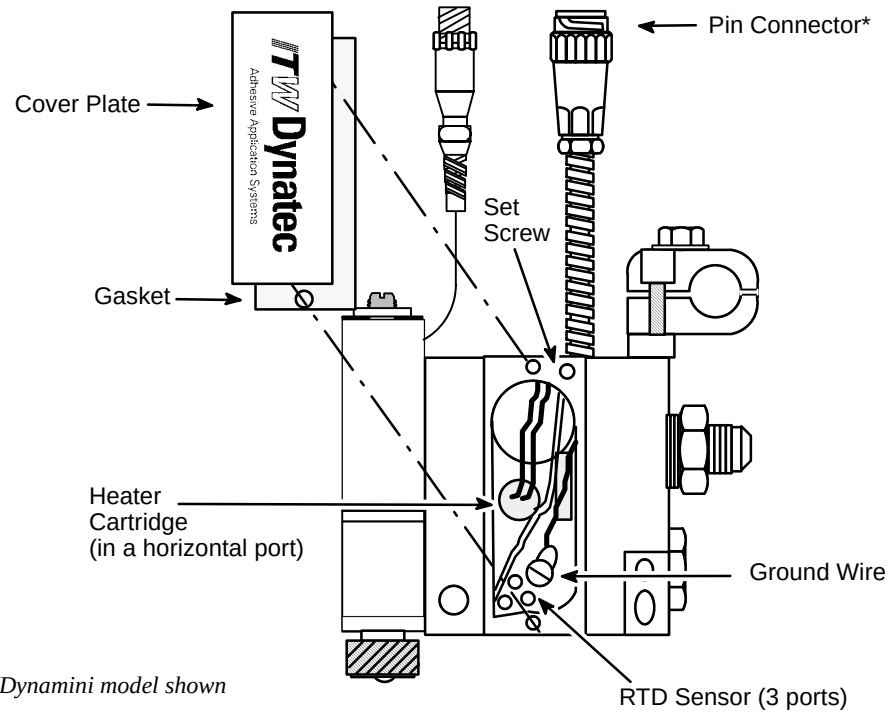
Testing Resistance of the RTD Temperature Sensor

The values listed in the following chart are at 25°C (77°F).Check the sensor's resistance at the connector pins listed in the chart for the appropriate controller.

Control	Sensor Type	Ohms @ 25°C (77°F)	Connector Pins
DynaControl/Dynamini	Pt100	110	5 and 6
DynaPro/DynaPlus	Pt100	110	2 and 3
MCV	Pt100	110	6 and 10 (sensor 1)
MCV	Pt100	110	8 and 12 (sensor 2)
Upgrade	N120	138	3 and 5
ETC/RO	NiFe	100	6 and 10 (sensor 1)
ETC/RO	NiFe	100	8 and 12 (sensor 2)

A tolerance range of ± 5% is allowed. A sensor that tests outside of this range must be replaced. Replacement instructions follow in this chapter.

Replacement of Heater Cartridge or Sensor



Heater/ RTD Sensor Replacement Diagram

ITW Dynatec has a High Temp Heater Splice Kit available (PN 102645). Each kit contains sufficient connectors and shrink tube to replace a heater cartridge (the heater is ordered separately).

1. Disconnect power to the ASU and make sure all adhesive pressure is purged and pumps are turned OFF.

2. Disconnect the electrical cable assembly from the hose.

3. Remove the wire access cover plate and the gasket via two holding screws.

4. Cut the wires of the heater cartridge (or sensor) at the splice.

5. Pull the heater (or sensor) out of the service block.

6. Apply a thin coat of thermal paste (PN 001V061) to the new cartridge heater (or new sensor).

7. Put new cartridge heater (or new sensor) in service block. Connect wires with splice and shrink tube.

8. Replace access cover plate and gasket.

Re-Assembly Procedures and General Cautions

Unless noted, head 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 N07588).

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

CAUTION: *SOME FITTINGS* used for adhesive on 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.

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 always be re-tightened at operating temperature.

Chapter 6
COMPONENT ILLUSTRATIONS & BILLS OF MATERIAL

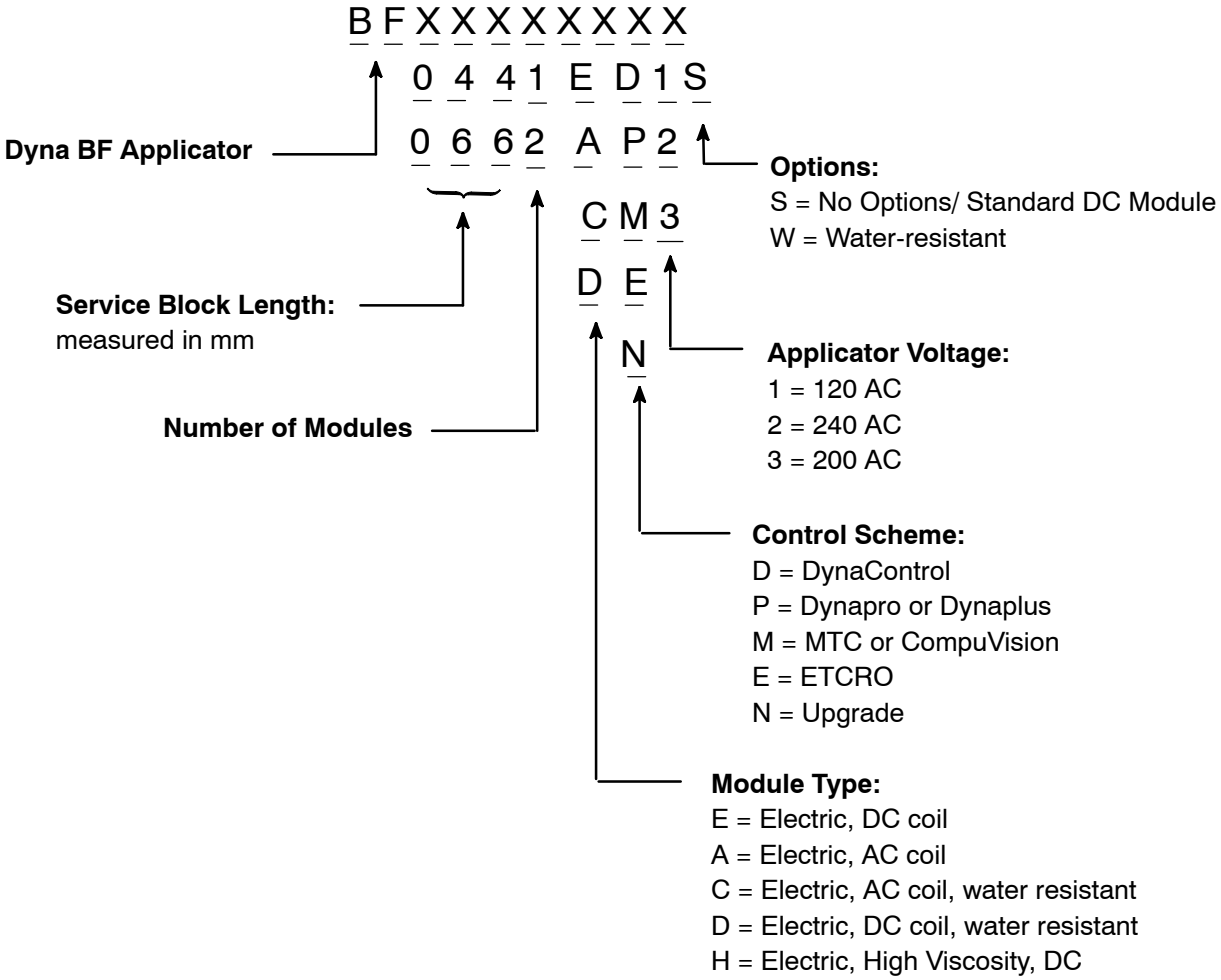
WARNING

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

The following pages provide exploded-view reference drawings to assist users of Mod-Plus Electric modular applicators to identify parts and aid in servicing the equipment.

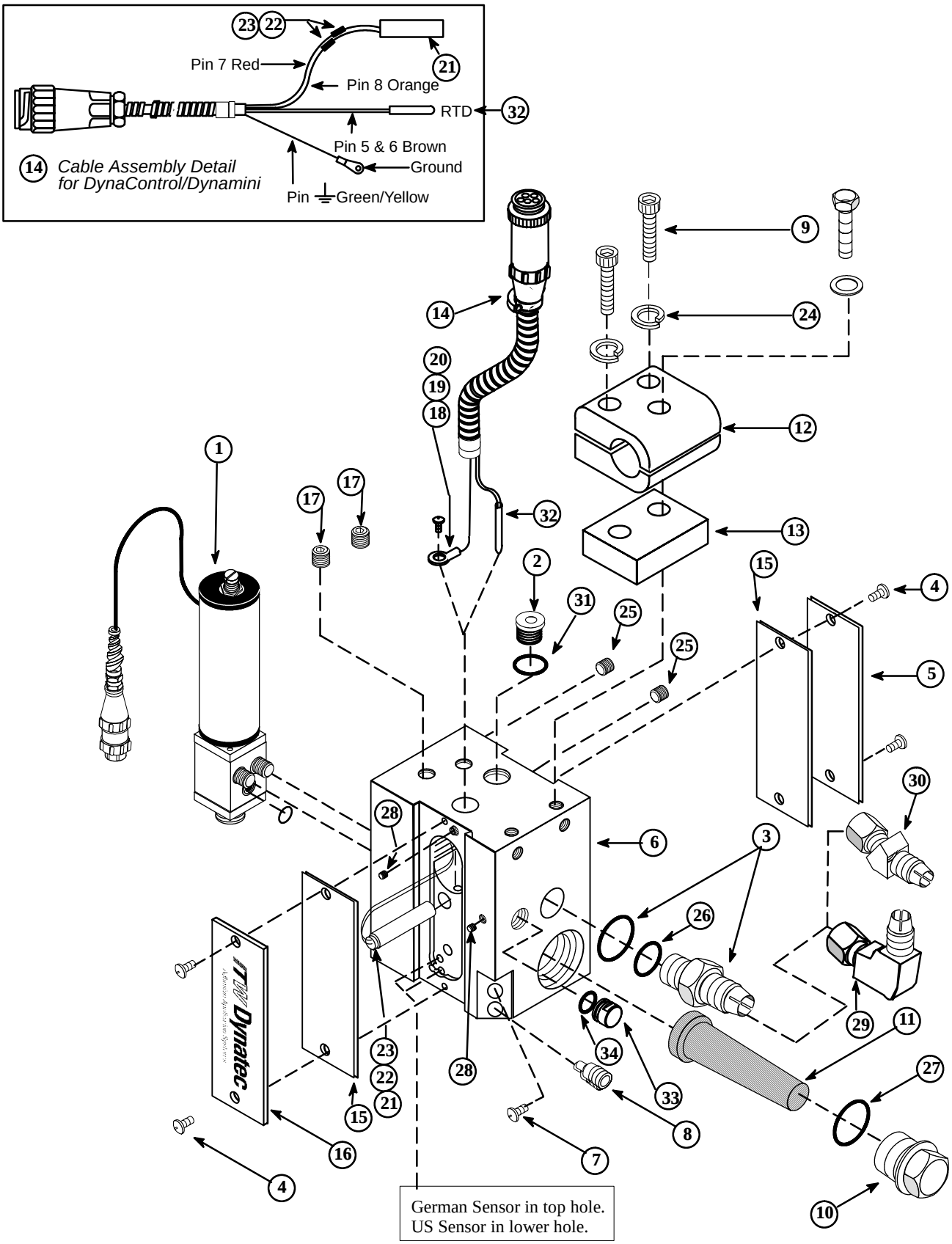
Note: most common nuts, bolts and fasteners can be obtained locally at your hardware store. Specialty fasteners are available by contacting Dynatec's Customer Service.

Mod-Plus Electric Applicator Model Designation Guide



Bill of Materials for a Typical 1 Port Mod-Plus Electric Applicator

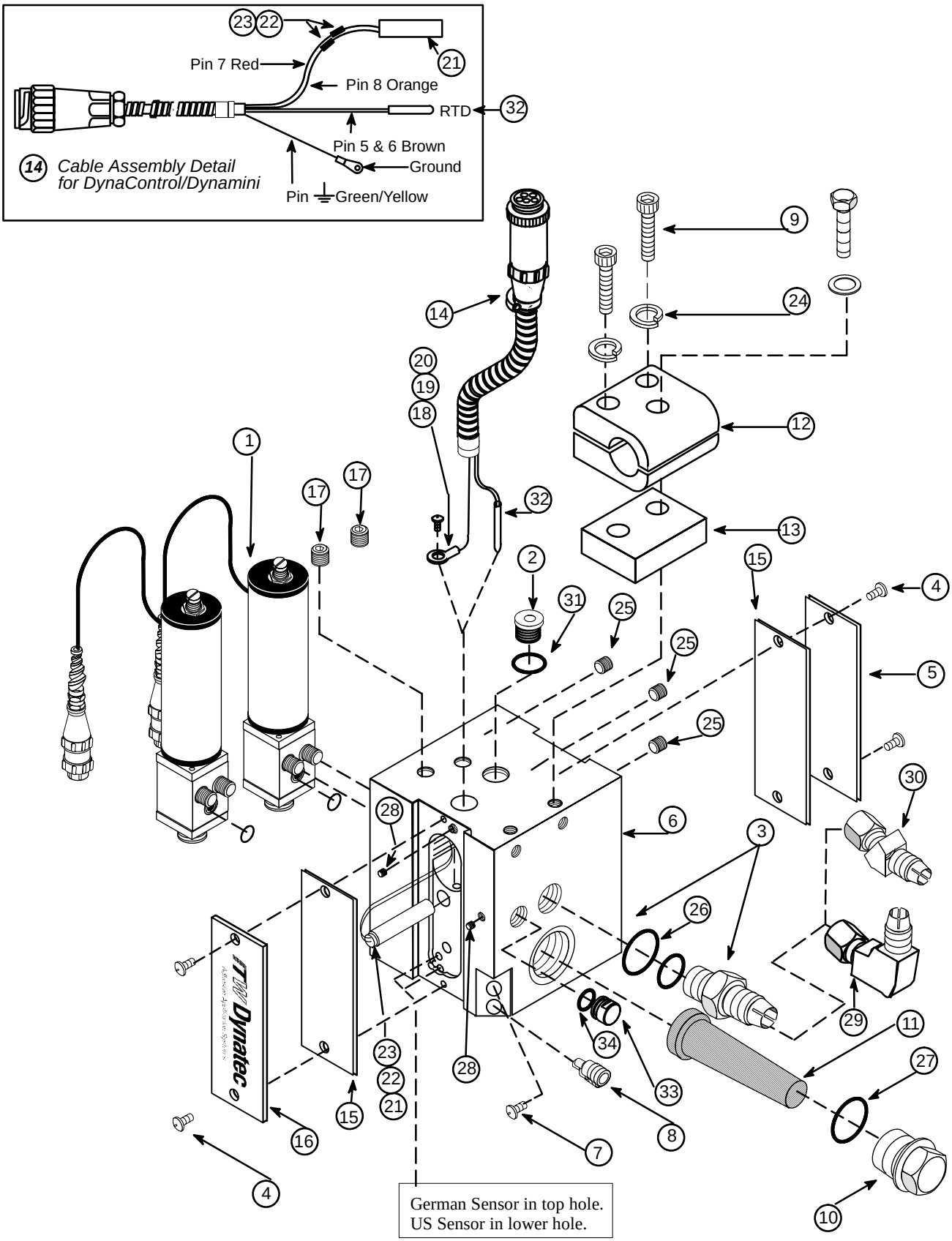
Item No.	Part Number	Description	Qty.
1	106144,	Electric Module Assembly, DC	1
	108750 *or*	Electric Module Assembly, High Viscosity, DC	
	109017	Electric Module Assembly, 120VAC	
	110183	Electric Module Assembly, DC	
	110184	Electric Module Assembly, 120VAC	
2	101625	Fitting Plug	1
3	101624	Fitting Adapter with Ring	1
4	101628	M3-5 x 8mm Screw	4
5	103347	Identification Plate	1
6	103466	Service Block, BF0441	1
7	101833	10-32 x 1/2 Tamper Proof Screw (retaining screw)	1
8	104852	M10-1.5 x 12 Cone, Relief Screw	1
9	102447	M5 x 25 SHC Screw	2
10	101620	Filter Cap, BF Head	1
11	101618	Filter, 150 micron (optional)	1
12	104129	Mounting Clamp	1
13	L14899	Insulator, Mounting Clamp	1
14	103467	Cable Assembly for DynaControl 240v	1
	104521	Cable Assembly for DynaControl 120v	1
	104523	Cable Assembly for DynaPlus/Pro	1
	104526	Cable Assembly for ETC/RO	1
	800223	Cable Assembly for MCV	1
	104528	Cable Assembly for Upgrade (assy. includes sensor)	1
	104127	Cable Assembly for DynaControl 240v/ Washdown	1
	104522	Cable Assembly for DynaControl 120v/ Washdown	1
	104524	Cable Assembly for DynaPlus/Pro/ Washdown	1
	104527	Cable Assembly for ETC/ Washdown	1
	104525	Cable Assembly for MCV/ Washdown	1
	104529	Cable Assembly for Upgrade (assy. includes sensor)/ Washdown	1
15	101622	Gasket, Wire Access	2
16	103733	Wire Access Cover Plate	1
17	N00753	1/8 NPT Level Seal Plug	2
18	101627	M3-.5 x 6 Phillips Head Screw	1
19	N04268	Terminal Ring	1
20	078C088	Washer #4	1
21	- - -	Heater (see ordering guide on pg. 7-3)	1
22	N01756	Parallel Connector	2
23	048J271	Shrink Tube	0.13 ft.
24	N00695	Lock Washer #10	2
25	N01124	1/16 NPT Level Seal Plug	1
26	N00196	O-ring 111	1
27	N00186	O-ring 019	1
28	N07830	M3-5 x 4, Flat Point Socket Head Set Screw	2
29	N07831	90° Swivel Fitting (optional)	1
30	103085	45° Swivel Fitting (optional)	1
31	N00181	O-ring 014	1
32	- - -	Temperature Sensor (see ordering guide on pg. 7-3)	
33	N00179	O-ring, -012	1
34	109551	Cable Entry Plug	1



Component Illustration: Typical 1 port Mod-Plus Electric Applicator
(DynaControl/Dynamini version illustrated)

Bill of Materials for a Typical 2 PORT Mod-Plus Electric Applicator

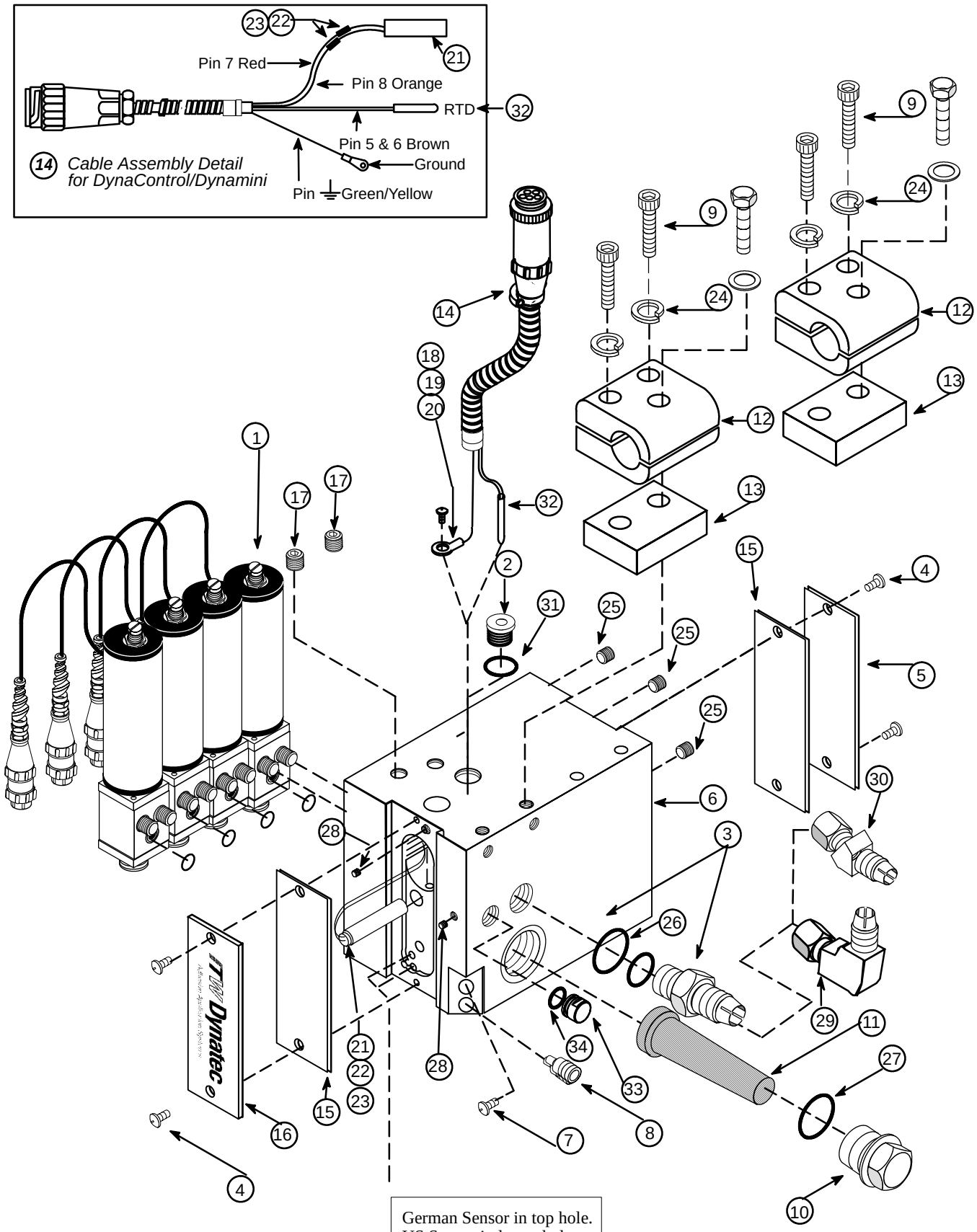
Item No.	Part Number	Description	Qty.
1	106144,	Electric Module Assembly, DC	2
	108750 *or*	Electric Module Assembly, High Viscosity, DC	
	109017	Electric Module Assembly, 120VAC	
	110183	Electric Module Assembly, DC	
	110184	Electric Module Assembly, 120VAC	
2	101625	Fitting Plug	1
3	101624	Fitting Adapter with Ring	1
4	101628	M3-5 x 8mm Screw	4
5	103347	Identification Plate	1
6	104261	Service Block, BF0662	1
	110377	Service Block, BF0472 (1" Centers)	‘
7	101833	10-32 x 1/2 Tamper Proof Screw (retaining screw)	1
8	104852	M10-1.5 x 12 Cone, Relief Screw	1
9	102447	M5 x 25 SHC Screw	2
10	101620	Filter Cap, BF Head	1
11	101618	Filter, 150 micron (optional)	1
12	104129	Mounting Clamp	1
13	L14899	Insulator, Mounting Clamp	1
14	103467	Cable Assembly for DynaControl 240v	1
	104521	Cable Assembly for DynaControl 120v	1
	104523	Cable Assembly for DynaPlus/Pro	1
	104526	Cable Assembly for ETC/RO	1
	800223	Cable Assembly for MCV	1
	104528	Cable Assembly for Upgrade (assy. includes sensor)	1
	104127	Cable Assembly for DynaControl 240v/ Washdown	1
	104522	Cable Assembly for DynaControl 120v/ Washdown	1
	104524	Cable Assembly for DynaPlus/Pro/ Washdown	1
	104527	Cable Assembly for ETC/ Washdown	1
	104525	Cable Assembly for MCV/ Washdown	1
	104529	Cable Assembly for Upgrade (assy. includes sensor)/ Washdown	1
15	101622	Gasket, Wire Access	2
16	103733	Wire Access Cover Plate	1
17	N00753	1/8 NPT Level Seal Plug	2
18	101627	M3-.5 x 6 Phillips Head Screw	1
19	N04268	Terminal Ring	1
20	078C088	Washer #4	1
21	- - -	Heater (see ordering guide on pg. 7-3)	1
22	N01756	Parallel Connector	2
23	048J271	Shrink Tube	0.13 ft.
24	N00695	Lock Washer #10	2
25	N01124	1/16 NPT Level Seal Plug	3
26	N00196	O-ring 111	1
27	N00186	O-ring 019	1
28	103470	M3-5 x 4, Flat Point Socket Head Set Screw	2
29	N07831	90° Swivel Fitting (optional)	1
30	103085	45° Swivel Fitting (optional)	1
31	N00186	O-ring 019	1
32	- - -	Temperature Sensor (see ordering guide on pg. 7-3)	
33	N00179	O-ring, -012	1
34	109551	Cable Entry Plug	1



Component Illustration: Typical 2 Port Mod-Plus Electric Applicator
(DynaControl/Dynamini version illustrated)

Bill of Materials for a Typical 4 PORT Mod-Plus Electric Applicator

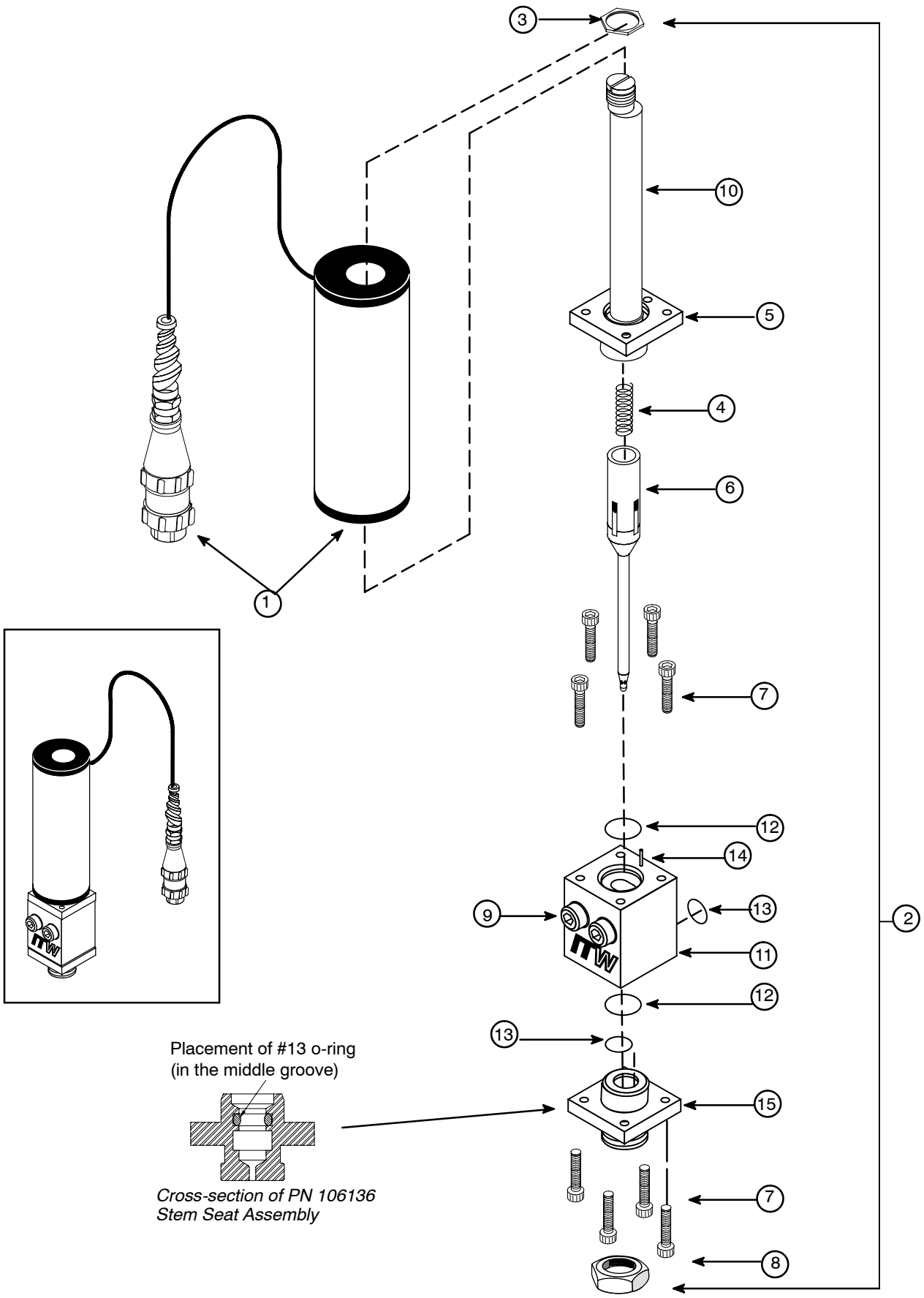
Item No.	Part Number	Description	Qty.
1	106144,	Electric Module Assembly, DC	4
	108750 *or*	Electric Module Assembly, High Viscosity, DC	
	109017	Electric Module Assembly, 120VAC	
	110183	Electric Module Assembly, DC	
	110184	Electric Module Assembly, 120VAC	
2	101625	Fitting Plug	1
3	101624	Fitting Adapter with Ring	1
4	101628	M3-5 x 8mm Screw	4
5	103347	Identification Plate	1
6	109470	Service Block, BF1104	1
7	101833	10-32 x 1/2 Tamper Proof Screw (retaining screw)	1
8	104852	M10-1.5 x 12 Cone, Relief Screw	1
9	102447	M5 x 25 SHC Screw	2
10	101620	Filter Cap, BF Head	1
11	101618	Filter, 150 micron	1
12	104129	Mounting Clamp	1-2
13	L14899	Insulator, Mounting Clamp	1-2
14	103467	Cable Assembly for DynaControl 240v	1
	104521	Cable Assembly for DynaControl 120v	1
	104523	Cable Assembly for DynaPlus/Pro	1
	104526	Cable Assembly for ETC/RO	1
	800223	Cable Assembly for MCV	1
	104528	Cable Assembly for Upgrade (assy. includes sensor)	1
	104127	Cable Assembly for DynaControl 240v/ Washdown	1
	104522	Cable Assembly for DynaControl 120v/ Washdown	1
	104524	Cable Assembly for DynaPlus/Pro/ Washdown	1
	104527	Cable Assembly for ETC/ Washdown	1
	104525	Cable Assembly for MCV/ Washdown	1
	104529	Cable Assembly for Upgrade (assy. includes sensor)/ Washdown	1
15	101622	Gasket, Wire Access	2
16	103733	Wire Access Cover Plate	1
17	N00753	1/8 NPT Level Seal Plug	2
18	101627	M3-.5 x 6 Phillips Head Screw	1
19	N04268	Terminal Ring	1
20	078C088	Washer #4	1
21	- - -	Heater (see ordering guide on pg. 7-3)	1
22	N01756	Parallel Connector	2
23	048J271	Shrink Tube	0.13 ft.
24	N00695	Lock Washer #10	2
25	N01124	1/16 NPT Level Seal Plug	3
26	N00196	O-ring 111	1
27	N00186	O-ring 019	1
28	103470	M3-5 x 4, Flat Point Socket Head Set Screw	2
29	N07831	90° Swivel Fitting (optional)	1
30	103085	45° Swivel Fitting (optional)	1
31	N00186	O-ring 019	1
32	- - -	Temperature Sensor (see ordering guide on pg. 7-3)	
33	N00179	O-ring, -012	1
34	109551	Cable Entry Plug	1



Component Illustration: Typical 4 Port Mod-Plus Electric Applicator
(DynaControl/Dynamini version illustrated)

Bill of Materials: PN 109017 High-Speed Mod Plus Electric Valve & Coil Assembly, 120VAC
Bill of Materials: PN 106144 High-Speed Mod Plus Electric Valve & Coil Assembly, DC
Bill of Materials: PN 108750 High-Viscosity Mod Plus Electric Valve & Coil Assembly, DC
Bill of Materials: PN 110183 (Water Resistant, High Speed DC) & 110184 (W.R 120Vac)

Item No.	*Part Number*					*Description*	*Qty.*
	109016	**106144**	**108750**	**110183**	**110184**		
1	**109016**	**104425**	**104425**	**109775**	**109776**	**Coil**	**1**
2	**109014**	**106139**	**108744**	**106139**	**109014**	**Mod Plus Electric Valve Assm.**	**1**
3	104418	104418	104418	104418	104418	Coil Nut	1
4	109013	104423	104423	104423	109013	Compression Spring, Needle	1
5	108746	108746	108746	108746	108746	Flange, Pressure Tube	1L
6	109836	109836	108740	109836	109836	Needle Assembly	1
7	108745	108745	108745	108745	108745	M3-5 x 8mm SHC Screw	8
8	L09219	L09219	L09219	L09219	L09219	Nozzle Nut	1
9	L18038	L18038	L18038	L18038	L18038	Mod Plus Mounting Screw	2
10	104414	104414	104414	104414	104414	Pressure Tube	1
	108748	**108748**	**108748**	**108748**	**108748**	**Electric Valve Body Assembly**	**1**
11	108747	108747	108747	108747	108747	Electric Valve Body	1
12	N00181	N00181	N00181	N00181	N00181	O-ring, -014	2
13	N00175	N00175	N00175	N00175	N00175	O-ring, -008	2
14	108743	108743	108743	108743	108743	Roll Pin	1
15	**106136**	**106136**	**106136**	**106136**	**106136**	**Seat Assembly**	**1**



Cross-section of PN 106136
Stem Seat Assembly

Component Illustration: Assembly 106144 or 108750 Mod-Plus Electric Module

Chapter 7
ORDERING GUIDES

Mod-Plus Single Orifice Nozzles

Part Number EZ-style	Part Number Button-style	Orifice Diameter	Orifice Length
100706	L19965	.25mm (0.010 inch)	1.27mm (0.050 inch)
100707	L19966	.30mm (0.012 inch)	1.27mm (0.050 inch)
100709	L19967	.38mm (0.015 inch)	1.91mm (0.075 inch)
100710	L19968	.51mm (0.020 inch)	1.91mm (0.075 inch)
100711	L19969	.64mm (0.025 inch)	1.91mm (0.075 inch)
100712	L19970	.76mm (0.030 inch)	1.91mm (0.075 inch)
100713	L19971	.89mm (0.035 inch)	1.91mm (0.075 inch)
100714	L19972	1.02mm (0.040 inch)	1.91mm (0.075 inch)

Mod-Plus Multi-Orifice Nozzles

Part Number	# of Orifices	Orifice Diameter	Angle
L09350-1015	2	.25mm (0.010 inch)	15°
L09350-1022	2	.25mm (0.010 inch)	22°
L09350-1030	2	.25mm (0.010 inch)	30°
L09350-1045	2	.25mm (0.010 inch)	45°
L09350-1060	2	.25mm (0.010 inch)	60°
L09350-1090	2	.25mm (0.010 inch)	90°
L09350-1515	2	.38mm (0.015 inch)	15°
L09350-1522	2	.38mm (0.015 inch)	22°
L09350-1530	2	.38mm (0.015 inch)	30°
L09350-1545	2	.38mm (0.015 inch)	45°
L09350-1560	2	.38mm (0.015 inch)	60°
L09350-1590	2	.38mm (0.015 inch)	90°
L09350-2015	2	.51mm (0.020 inch)	15°
L09350-2022	2	.51mm (0.020 inch)	22°
L09350-2030	2	.51mm (0.020 inch)	30°
L09350-2045	2	.51mm (0.020 inch)	45°
L09350-2060	2	.51mm (0.020 inch)	60°
L09350-2090	2	.51mm (0.020 inch)	90°
L09350-2515	2	.64mm (0.025 inch)	15°
L09350-2522	2	.64mm (0.025 inch)	22°
L09350-2530	2	.64mm (0.025 inch)	30°
L09350-2545	2	.64mm (0.025 inch)	45°
L09350-2560	2	.64mm (0.025 inch)	60°
L09350-2590	2	.64mm (0.025 inch)	90°

cont.

Mod-Plus Multi-Orifice Nozzles, cont.

Part Number	# of Orifices	Orifice Diameter	Angle
L09350-3015	2	.76mm (0.030 inch)	15°
L09350-3022	2	.76mm (0.030 inch)	22°
L09350-3030	2	.76mm (0.030 inch)	30°
L09350-3045	2	.76mm (0.030 inch)	45°
L09350-3060	2	.76mm (0.030 inch)	60°
L09350-3090	2	.76mm (0.030 inch)	90°
L09276-1015	3	.25mm (0.010 inch)	15°
L09276-1022	3	.25mm (0.010 inch)	22°
L09276-1030	3	.25mm (0.010 inch)	30°
L09276-1045	3	.25mm (0.010 inch)	45°
L09276-1515	3	.38mm (0.015 inch)	15°
L09276-1522	3	.38mm (0.015 inch)	22°
L09276-1530	3	.38mm (0.015 inch)	30°
L09276-1545	3	.38mm (0.015 inch)	45°
L09276-2015	3	.51mm (0.020 inch)	15°
L09276-2022	3	.51mm (0.020 inch)	22°
L09276-2030	3	.51mm (0.020 inch)	30°
L09276-2045	3	.51mm (0.020 inch)	45°
L09276-2515	3	.64mm (0.025 inch)	15°
L09276-2522	3	.64mm (0.025 inch)	22°
L09276-2530	3	.64mm (0.025 inch)	30°
L09276-2545	3	.64mm (0.025 inch)	45°
L09276-3015	3	.76mm (0.030 inch)	15°
L09276-3022	3	.76mm (0.030 inch)	22°
L09276-3030	3	.76mm (0.030 inch)	30°
L09276-3045	3	.76mm (0.030 inch)	45°
L10382-10	4	.25mm (0.010 inch)	all quads are
L10382-15	4	.38mm (0.015 inch)	35° inner angle,
L10382-20	4	.51mm (0.020 inch)	76° outer angle.
L10382-25	4	.64mm (0.025 inch)	

Mod-Plus Electric Head Heater Cartridges (12.5 mm diameter)

# of Modules/ Model	200-240VAC		120VAC	
	Part Number	Description	Part Number	Description
1 Module/ BF0441	104128 (240v)	220w x 33mm	104254	200w x 33mm
2 Modules/ BF0662	104249	400w x 55mm	104255	240w x 55mm
4 Modules/ BF1104	104251	585w x 99mm	104257	360w x 99mm

Mod-Plus Electric Head RTD Sensors

Control	Part Number	Quantity	Description
DynaControl/Dynamini	N07958	1	Pt100
Dynaplus/Pro	N07958	1	Pt100
MTC/ CompuVision	N07958	2	Pt100
ETC	N08176	2	NiFe
Upgrade	N07864	1	N120

Service Kits & Assemblies

High-Speed & High Viscosity Module Renew Kit PN 106141

Contains all the parts necessary to renew one module, including spring, module-attaching screws, coil nut, seal lubricant, o-rings and instructions.

Replacement DC Coil Assembly PN 106140
Replacement AC Coil Assembly PN 109034
Replacement DC Water-resistant Coil Assembly PN 110185
Replacement AC Water-resistant Coil Assembly PN 110186

Contains a coil and coil nut.

Replacement High-Speed Valve Assembly PN 106139
Replacement High-Viscosity Valve Assembly PN 108750
Replacement AC Valve Assembly PN 109014

Contains a complete valve assembly, without the coil.

Nozzle Cleaning Kits

Three nozzle cleaning kits are available, sized to be orifice-specific:

PN 101877	Nozzle Cleaning Kit .010 to .017 orifice
PN 101878	Nozzle Cleaning Kit .018 to .027 orifice
PN 101879	Nozzle Cleaning Kit .028 to .040 orifice

High Temp Splice Kit PN102645

This kit consists of a foot of shrink tube and nine connectors (splices). The kit will enable you to replace the heater or sensor in one applicator.

Recommended Service Parts List

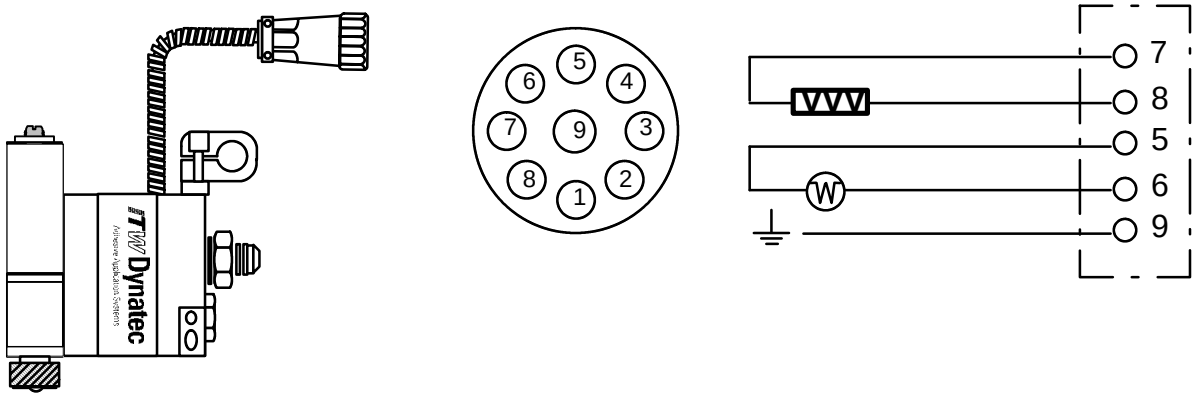
Part Number	Description	Qty.
See Ordering Guide, pg. 7-3	Heater	1
See Ordering Guide, pg. 7-3	RTD Sensor	1
N00196	O-ring 111	1
N00186	O-ring 019	1
N00181	O-ring 014	1
102645	High Temp Heater Splice Kit	1
101618	Filter, 100 micron (standard)	2
106141	High-Speed Module Renew Kit, *consists of:*	1 per module
N00181	O-ring 014	2
N00175	O-ring 008	2
104418	Coil Nut	1
L18038	Module Mounting Screw	2
106137	SHC Screw, M3-0.5x8	8
104423	Needle Spring	1
108689	Seal Lube, 1/4 oz.	1
- -	Instruction Sheet	1
109033	120VAC Module Renew Kit, *consists of:*	1 per module
N00181	O-ring 014	2
N00175	O-ring 008	1
104418	Coil Nut	1
L18038	Module Mounting Screw	2
106137	SHC Screw, M3-0.5x8	8
109013	Needle Spring	1
108689	Seal Lube, 1/4 oz.	1
- -	Instruction Sheet	1

Chapter 8
ENGINEERING DRAWINGS & SCHEMATICS

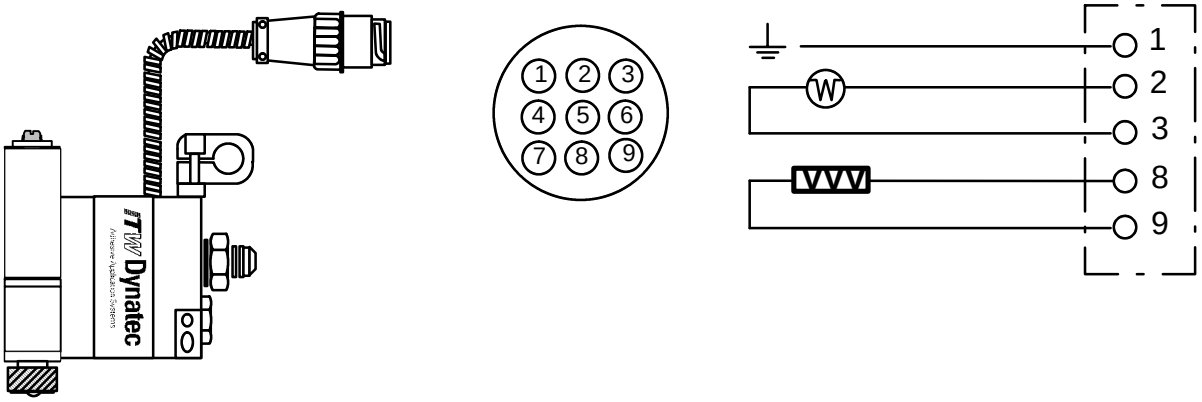
Applicator Pin Connectors & Electrical Schematics

Note: Pin connectors are viewed from the exposed end. Pins not shown on schematics are not used.

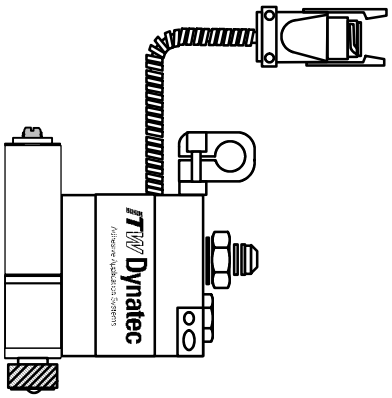
DynaControl/Dynamini Uses PN N07958 RTD Sensor, Pt100.

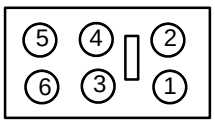


Dynaplus/Pro Uses PN N07958 RTD Sensor, Pt100.

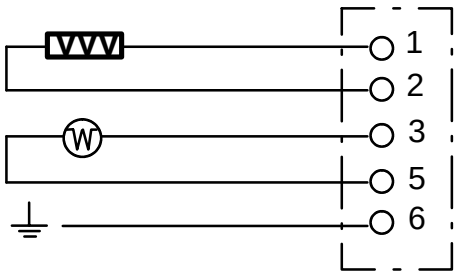


Upgrade Uses PN N07864 RTD Sensor, N120.





Note: pin out numbers are not labeled on the Upgrade connector.

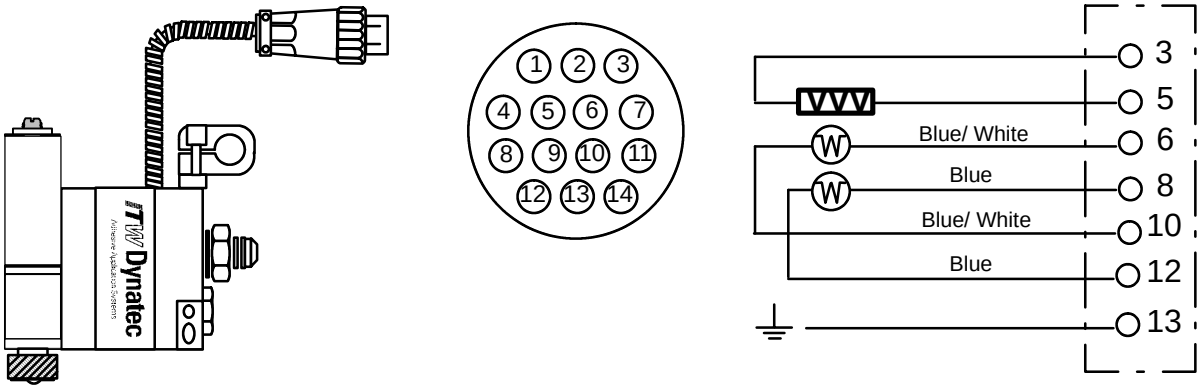


Symbols Used: Heater

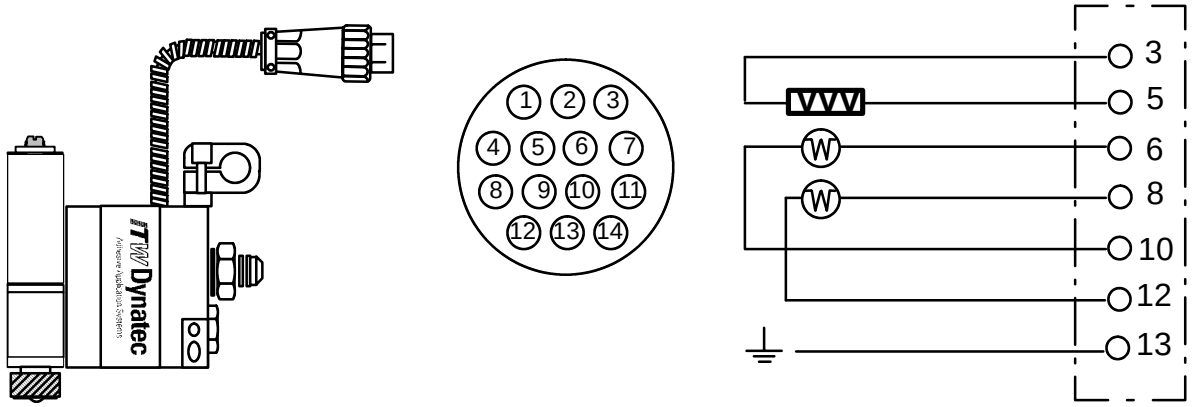
RTD Sensor

Ground

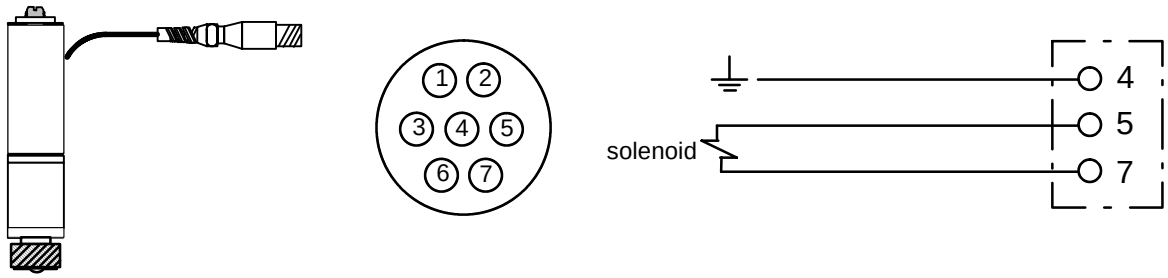
Electronic Temperature Control with Readout (ETC) Uses two PN N08176 RTD Sensors, NiFe.



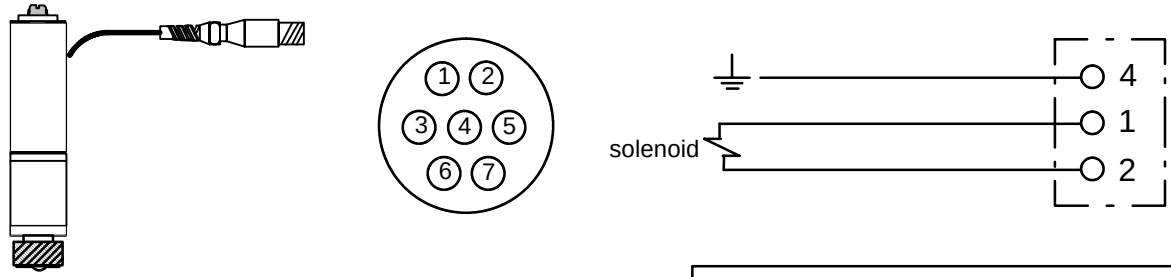
Microprocessor Temperature Control or CompuVision (MCV) Uses two PN N07958 RTD Sensors, Pt100.



PN 106144 & 108750 Electric Module Pin Connector & Electrical Schematic



PN 109017 Electric Module Pin Connector & Electrical Schematic



Symbols Used: Heater — RTD Sensor — Ground