



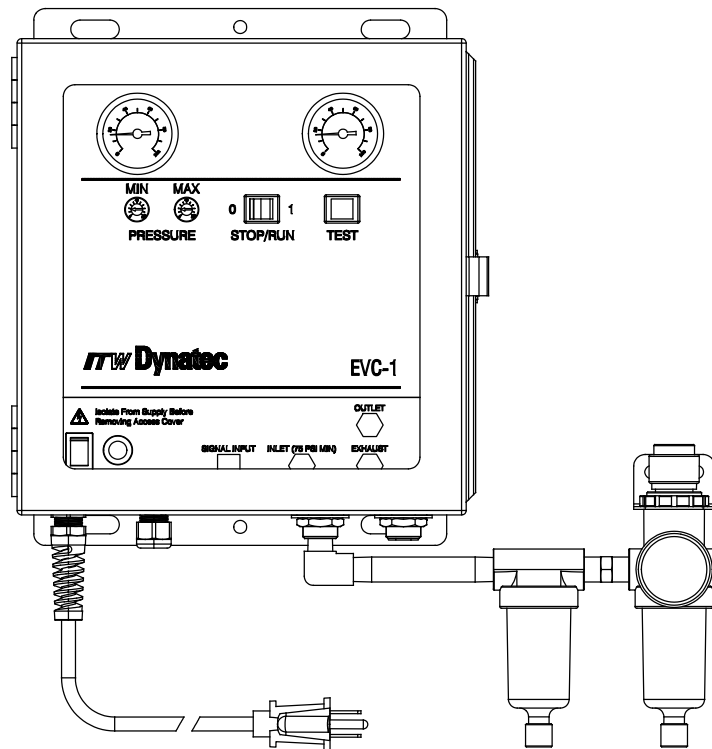
The Next Level of Technology

■ innovation ■ service ■ reliability

OPERATIONS AND SERVICE MANUAL

EVC-1 ELECTRONIC VOLUME CONTROL

PN 116480 EVC-1 Controller



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**

TABLE OF CONTENTS

Chapter - Page #

Chapter 1 Description & Specifications

Description	1-1
Description of Operation	1-2
Specifications	1-3
Dimensions	1-4

Chapter 2 Installation & Operation

Installation	2-1
Control Panel (diagram)	2-4
Bottom of Control Box (diagram)	2-4
Back View of Control Panel and PC Board Components	2-5
Operation	2-6

Chapter 3 Troubleshooting

Troubleshooting Guide	3-1
-----------------------------	-----

Chapter 4 Schematics

Wiring Schematic	4-1
Pneumatic Schematic	4-2

Chapter 5 Component Illustration & Bill of Material

EVC-1 Service Components	5-2
Pneumatic Control Components	5-3
Pneumatic Pressure Relief Valve & Repair Kit	5-4

Appendix: EVC-1 Retrofit to Adhesive Supply Units

Description	App. 1
System Interconnect Diagram	App. 1
Piston Pump ASU/ EVC-1 Retrofit Diagram	App. 2
Gear Pump ASU/ EVC-1 Retrofit Diagram	App. 3

Declaration of incorporation

according to the EU Machinery Directive 2006/42/EG, Annex II, 1.B
for partly completed machinery

Manufacturer:

ITW Dynatec,
31 Volunteer Drive
37075 Hendersonville, TN

Person residing within the Community authorised to compile the relevant technical documentation:

Andreas Pahl
ITW Dynatec GmbH,
Industriestraße 28
40822 Mettmann

Description and identification of the partly completed machinery:

Product / Article: Adhesive volume control system
Serial no: _____
Machine number: _____
Project number: EVC-1
Project name: EVC-1
Function: Microprocessor based adhesive volume control used in conjunction with a pneumatic pressure relief valve to tailor adhesive output to machine rate and start/stop.

It is declared that the following essential requirements of the Machinery Directive 2006/42/EG have been fulfilled:

1.3.4.; 1.5.1.; 1.5.16.; 1.5.2.; 1.6.3.

It is also declared that the relevant technical documentation has been compiled in accordance with part B of Annex VII.

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

- 2004/108/EG:2004-12-15 (Electromagnetic compatibility) Directive 2004/108/EC of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC
- 2006/95/EG:2006-12-12 (Voltage limits) Directive of the European Parliament and of the Council of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (codified version)

Reference to the harmonized standards used:

- EN ISO 14121-1:2007 Safety of machinery - Risk assessment - Part 1: Principles (ISO 14121-1:2007)
- EN 60204-1:2006-06 Safety of machinery - Electrical equipment of machines - Part 1: General requirements
- EN ISO 12100-1/A1:2009 Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology
- EN ISO 12100-2:2003/A1 Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles

The manufacturer or his authorised representative undertake to transmit, in response to a reasoned request by the national authorities, relevant information on the partly completed machinery. This transmission takes place:

This does not affect the intellectual property rights!

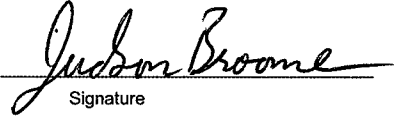
Declaration of incorporation

according to the EU Machinery Directive 2006/42/EG, Annex II, 1.B
for partly completed machinery

Important note! The partly completed machinery may be put into service only if it was determined, where appropriate, that the machinery into which the partly completed machinery is to be installed meets the provisions of this Directive.

Hendersonville, TN, 2012.10.11

Place, date



Signature
Judson Broome
General Manager

Chapter 1 DESCRIPTION AND SPECIFICATIONS

Description

The ITW Dynatec EVC-1 Volume Control is a microprocessor-based adhesive volume control system. It is used in conjunction with a pneumatic pressure relief valve to control the overall volume output of a piston pump or gear pump adhesive supply system. Using a parent machine line speed reference signal, the microprocessor and internal air pressure transducer adjust the air pressure delivered to the pneumatic PRV located in the adhesive supply unit.

Controls mounted on the front panel and on the PC board allow the user to tailor the glue application rate at parent machine start and machine stop, to reduce over-gluing and glue squeeze-out on the product.

Examples of applications where the EVC-1 is useful include cartoning, case-sealing, tray making, labeling and bag making.

The EVC-1 enclosure is a rugged design with a clear polycarbonate window in the door, which allows the front panel controls to be viewed without opening the door. The enclosure meets environmental ratings of NEMA 4/IP65, protecting against water and solid object infiltration when the door is latched and all I/O connections on the bottom panel are properly connected.

The EVC-1 may be operated on 100V-240V AC single-phase power. The controller is supplied pre-wired with a standard NEMA 5-15 120V line cord. The controller accepts either a 0-10VDC or 4-20mADC parent machine line speed reference signal through the supplied cordgrip on the bottom panel. All air connections are 1/4NPT. A filter-regulator is supplied with the controller for proper air preparation.

Description of Operation

The EVC-1 contains an electronic voltage-to-air pressure transducer. The transducer operates on an internally generated 0-10VDC voltage signal. The signal is independent of the customer-supplied parent machine line speed reference signal.

The internal microprocessor receives the parent machine reference signal (either 0-10V or 4-20mA as desired) and converts it to a proportional 0-10V transducer supply voltage. The MIN and MAX controls on the front panel are used to fine tune the transducer supply voltage for the particular application. The MIN control is used to add voltage (hence output pressure) at machine stop. The MAX control is used to deduct voltage (hence output pressure) at maximum machine speed. During normal parent machine operation, the EVC-1 will control the output air pressure linearly between the MIN and MAX settings.

Further adjustment of the output pressure is available with the SW1 selector switch on the PC board. The SW1 switch controls the maximum transducer supply voltage, and therefore the maximum output air pressure. The EVC-1 will continue to control the output air pressure linearly between the MIN and MAX settings.

A TEST switch is located on the front panel. This switch is used during setup to simulate full line speed. This allows the MAX setting to be made without running the parent machine.

The EVC-1 contains a 24V solenoid valve that switches the output air pressure. The solenoid valve is activated when the RUN switch is in the ON position. Moving the RUN switch to the OFF position, or removing power to the EVC-1, will close the solenoid valve and relieve all output air pressure.

Two ball valves are located in the enclosure. These ball valves can be used to bypass the electronic controls entirely, and allow the pneumatic PRV to be controlled only by the external air pressure regulator supplied with the EVC-1.

Specifications

Environmental

Operating temperature 0°-50°C (32°-122°F)
Storage temperature -30°-70°C (-22°-158°F)
Enclosure rating NEMA 4/IP65

Physical

Dimensions see layout on page 1-4
Weight 6.2 kg (13.7 lb)

Electrical

Supply voltage 100-240 VAC
Maximum supply power 25W
Fuses (5x20mm, IEC 127 sheet 2) 1.0 amp (internal)
Input signal 4-20 mADC or 0-10 VDC signal, selectable

Pneumatic

Supply pressure 75 psi (5.1 bar) minimum
Air consumption, maximum 0.4 CFM (12 l/min.)+
Output pressure 0-68 psi (0-4.6 bar), variable

Chapter 2 INSTALLATION & OPERATION

Installation

The EVC-1 Controller is easy to setup and operate. It is highly recommended, however, that the entire contents of this manual be read before installation to become familiar with the features of this equipment and to avoid potential safety hazards.

NOTE: When the EVC-1 is used with a piston pump-equipped adhesive supply unit, a line speed tracking kit must also be installed in the ASU for proper system operation. This prevents quick-stroking of the pump at parent machine line stop. See the appropriate ASU manual for more information.



DANGER HIGH VOLTAGE

Line voltage is present at several places inside this controller when it is connected to an AC power source. Electrical shock will result if contact is made with line voltage. This shock may be extremely hazardous. Do not disassemble or assemble this unit or make electrical connections unless all line voltage sources are removed.

Step 1: Installation

Refer to the Retrofit Diagrams in the Appendix of this manual for an overview of installation requirements.

The EVC-1 should be located in an area not normally subject to excessive moisture or vibration. For best operation, the controller should be located as close to the adhesive supply unit (ASU) as possible. The length of the air line between the EVC-1 and the ASU should not exceed 6 feet.

Mount the EVC-1 to a flat surface through the slots and/or holes provided in the mounting flanges. A dimensional layout is shown in Chapter 1. Allow sufficient space below the controller to make electrical and air connections. Make sure that the door can be opened through its entire arc.

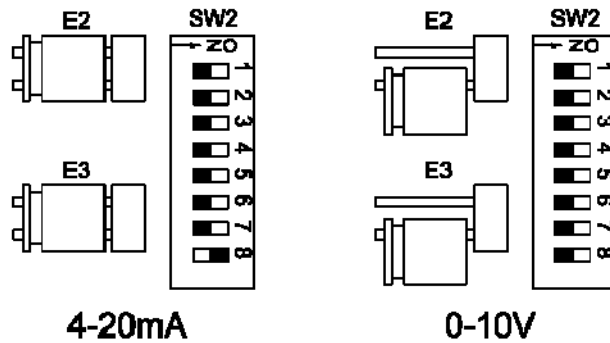
The required connections to the controller are:

1. **Supply Power:** The EVC-1 will accept 100V-240V AC power.
2. **Line Speed Reference:** The EVC-1 will accept either a 0-10V DC or 4-20mA DC line speed reference signal. The line speed reference input is polarity sensitive. Refer to the schematics below or the labels on the PC board for proper connection.
3. **Supply Air:** The EVC-1 requires a compressed air source of at least 75 psi (5.1 bar) for full-range operation. External air connections are 1/4 NPT.
4. **Output Air Supply to ASU:** PTFE tubing and quick-connect tube fittings are supplied with the EVC-1 for easy connection to the pneumatic pressure relief valve in the ASU. Straight and 90 degree fittings are supplied. The supplied tubing length is 6 feet and should not be exceeded.

Step 2: Line-Speed Reference Signal Configuration

At installation, the EVC-1 must be configured for the type of line speed reference signal (0-10V or 4-20mA). On the PC board, there are two jumpers (E2 and E3) and one DIP switch (SW2) that must be set to the correct position. The factory settings are for 0-10V. The following diagram shows the proper settings for each input type.

NOTES: a. Use care when removing and installing the front panel to avoid kinking any air lines.
 b. Jumper E1 is not used and does not need to be set.



LINE SPEED REFERENCE CONFIGURATION

Step 3: Maximum Pressure Output Configuration

The SW1 rotary selector switch on the PC board may be used to reduce the maximum output air pressure of the EVC-1. The factory setting is '0' (maximum pressure). The switch settings and corresponding pressures are shown in the table below.

IMPORTANT: The glue pressures shown in the table are calculated with the standard 14:1 ratio pressure relief valve.

NOTE: Switch settings below 4 may be used, but pressure control may not be as stable at low parent machine speeds.

	SW1 Position	Max Output Air Pressure	Max Glue Pressure	
	0	68 psi	950 psi	
	9	61 psi	850 psi	
	8	54 psi	750 psi	
	7	47 psi	660 psi	
	6	40 psi	560 psi	
	5	32 psi	450 psi	
	4	25 psi	350 psi	

Step 4: MIN and MAX Control Configuration

Once installation is complete and the SW1 switch has been set to the desired setting, the MIN and MAX controls can be adjusted for the application. For this step of the setup, the adhesive supply unit should be at ready condition with the pump ON. The parent machine should be in STOP condition. Adhesive applicator heads should be OFF.

It is not possible to give a recommendation for the exact MIN and MAX control settings, since application demands vary widely. However, a good starting point is to set both controls at 50%, then make adjustments from there to achieve the desired results.

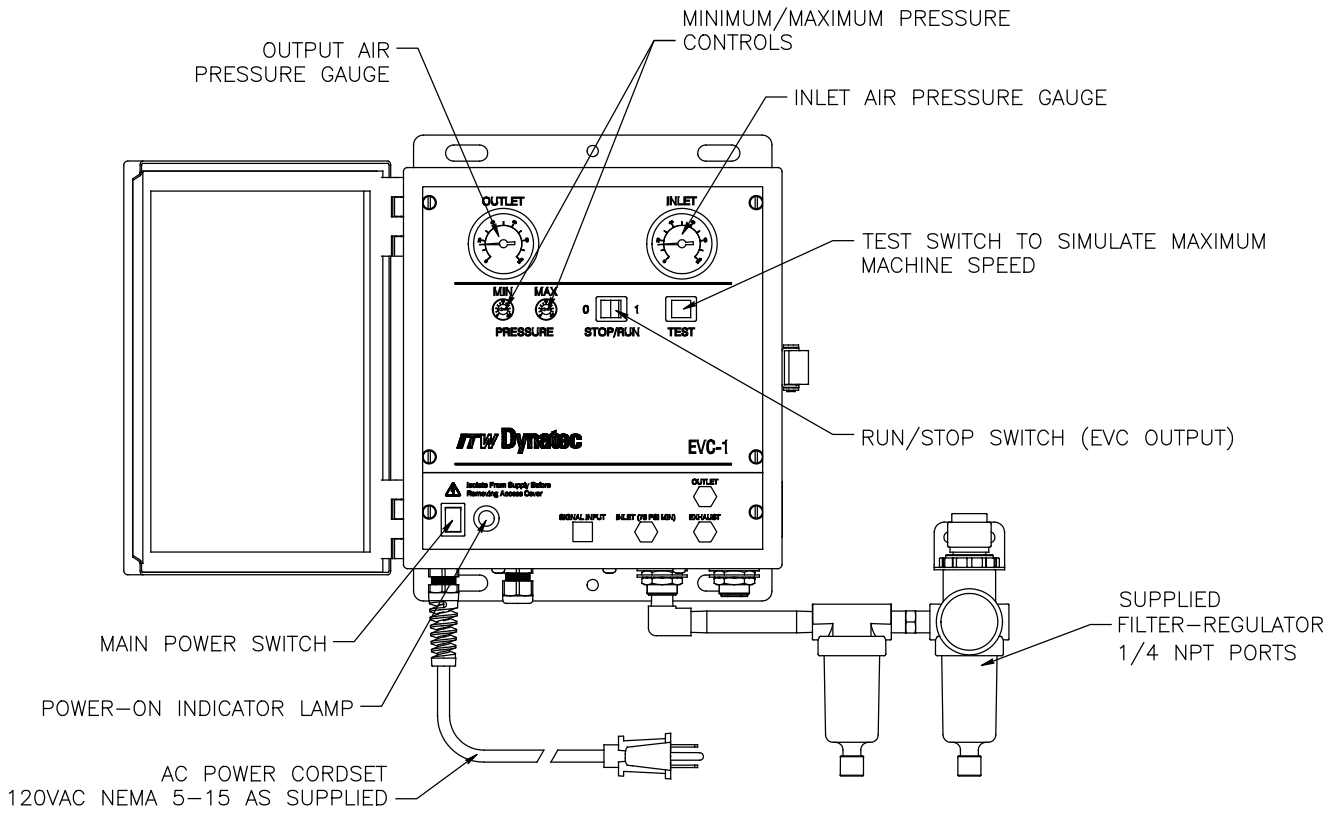
1. Turn the main power switch ON. The amber lamp should be lit.
2. Move the RUN/STOP switch to the RUN position.

NOTE: The 0-100 markings on the MIN and MAX controls refer to the percent setting of the control, NOT to voltage.

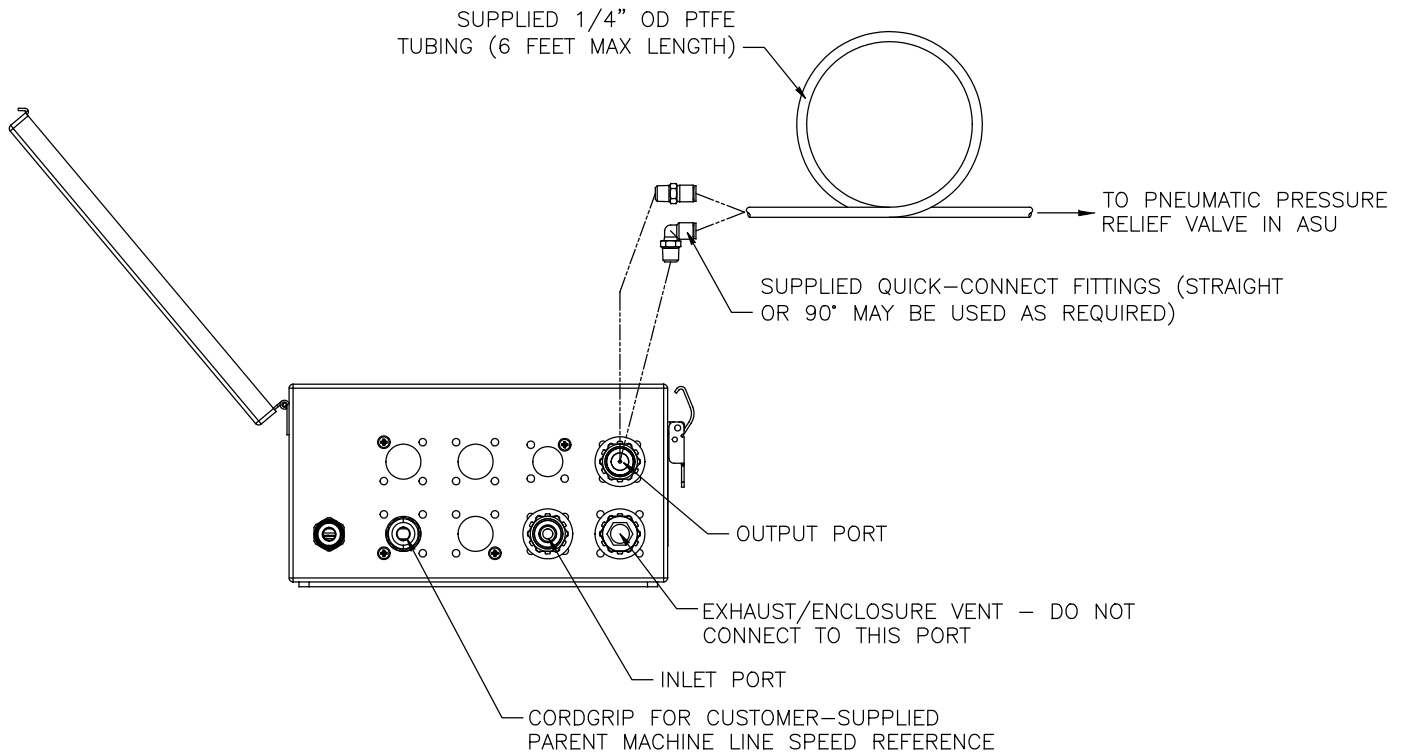
3. Adjust the MIN control to the desired pressure setting. If the adhesive supply unit is equipped with an adhesive pressure gauge, observe the gauge to obtain the desired adhesive pressure. Clockwise rotation will increase the minimum glue pressure, and counter-clockwise rotation will decrease the minimum glue pressure.
4. Depress and hold the TEST switch. This simulates maximum machine speed. Adjust the MAX control to the desired pressure setting. If the adhesive supply unit is equipped with an adhesive pressure gauge, observe the gauge to obtain the desired pressure. Clockwise rotation will increase the maximum glue pressure, and counterclockwise rotation will decrease the maximum glue pressure. Once the desired pressure is reached, release the TEST switch.
5. Run the parent machine in normal operation and observe the glue pressure and adhesive application on the product. Make changes to the MIN and MAX controls as necessary to obtain the desired application volume and appearance on the product.

IMPORTANT: The MIN and MAX controls are somewhat interdependent, since the microprocessor continually calculates the proper pressure curve between the two control settings. Therefore, it may be necessary to adjust the controls more than once, with the parent machine running, to obtain the final desired settings.

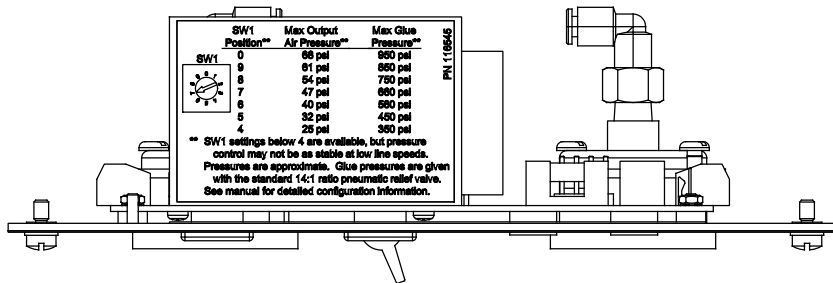
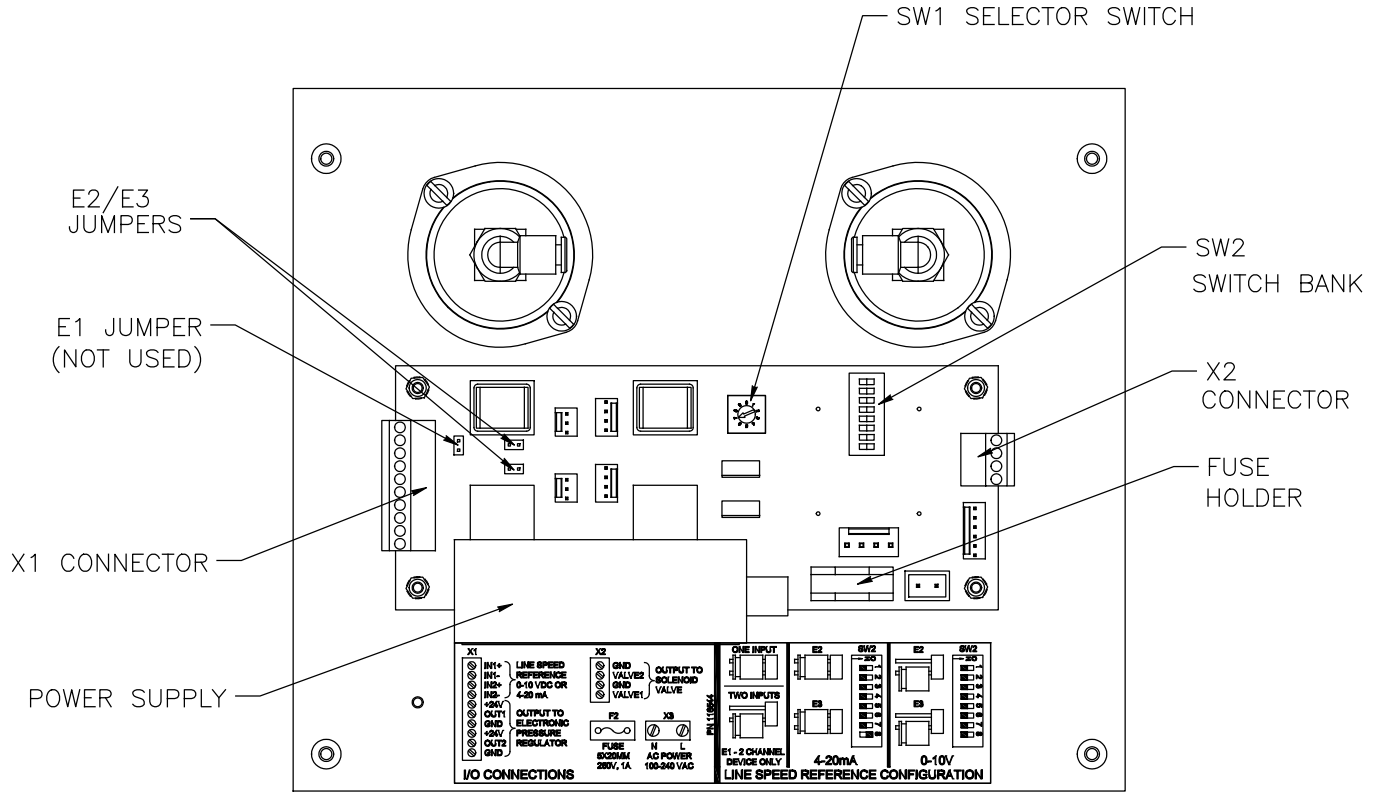
Control Panel



Bottom of Control Box



Back View of Control Panel and PC Board Components



Operation

The main power switch on the lower control panel is used to switch the AC power to the PC board and internal 24VDC power supply. The amber lamp will be lit whenever the power supply is active.

The RUN/STOP switch on the upper control panel is used to control the EVC-1 output. In the RUN position, the EVC-1 will follow the parent machine line speed. In the STOP position, the EVC-1 will not follow the parent machine line speed, and all output air pressure will be exhausted.

Once the EVC-1 is installed and setup is complete, no further adjustments to the pressure range are normally necessary. If minor adjustments to the MIN and MAX controls do become necessary, the enclosure door may be opened and the controls adjusted during machine operation.

Zero-State Operation (Glue Pressure Dump)

If it is necessary to relieve glue pressure, for service or maintenance for example, this may be done in several ways when using the EVC-1.

1. The power to the EVC-1 can be disconnected. This de-energizes the internal 24V solenoid valve, which dumps all output glue pressure.
2. The EVC-1 can be turned OFF via the main power switch or the RUN switch. This also de-energizes the internal solenoid valve.
3. The air pressure to the EVC-1 can be disconnected.
4. The power to the solenoid valve can be interrupted. This requires a customer-supplied relay or contact closure between the PC board and the solenoid valve.

NOTES: a. If air pressure is removed from the EVC-1 while powered ON, a humming or clicking noise may be heard. This is the internal pressure transducer and is normal.

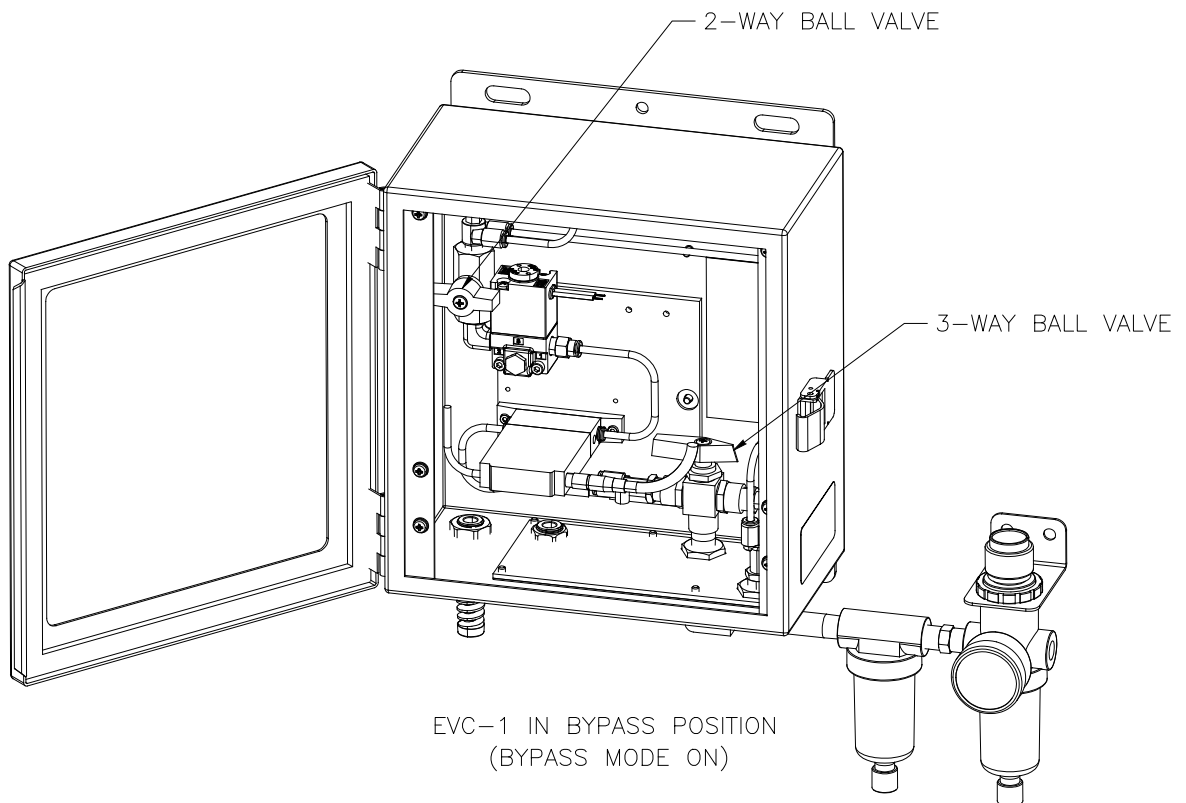
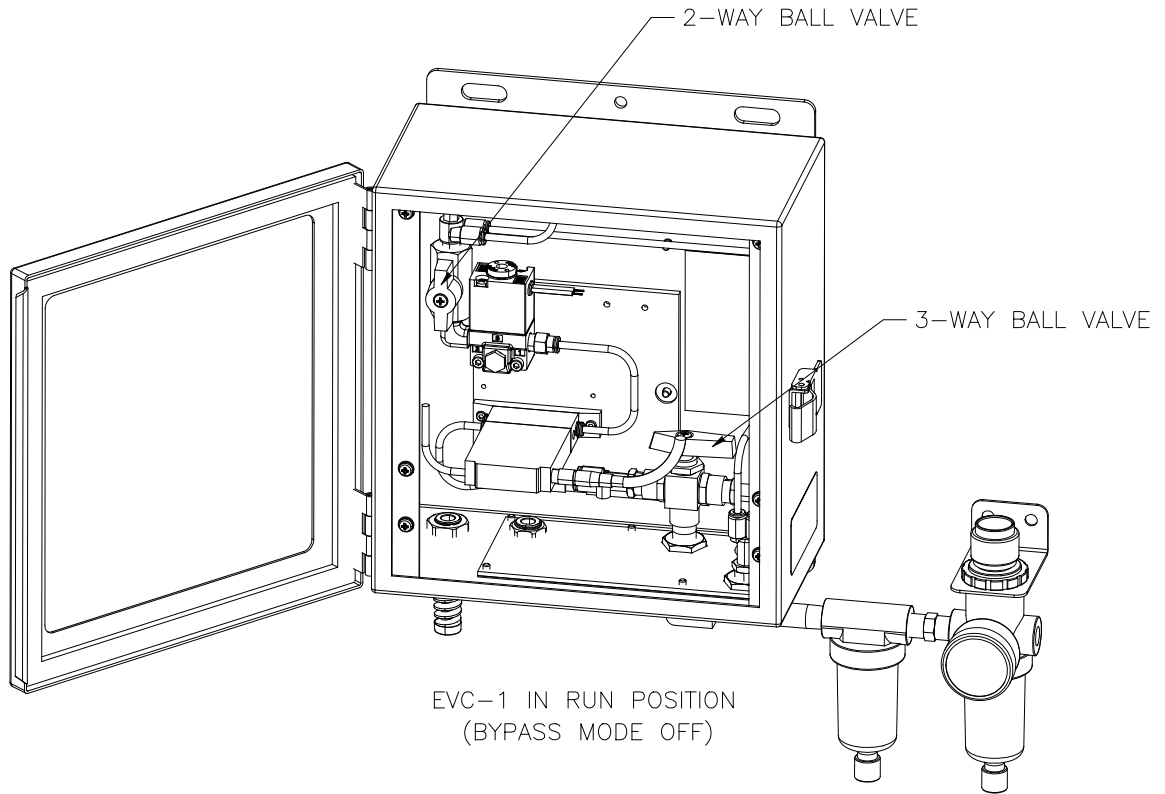
b. Switching off the power to the adhesive supply unit will not guarantee zero-state operation unless one of the above steps is also performed.

Air Pressure Bypass Mode

If for any reason it is necessary to bypass the electronic controls, two ball valves are provided in the enclosure for this purpose. Bypassing the electronic controls allows the output air pressure of the EVC to be controlled solely by the external air pressure regulator. All EVC-1 pressure control functions will be disabled. The following procedure may be used:

1. Disconnect power to the EVC-1.
2. Open the door and remove the upper control panel. Use care not to kink any air lines.
3. Locate the small 2-way ball valve connected to the solenoid valve. Turn the handle one-quarter turn to close the valve.
4. Locate the larger 3-way ball valve connected to the inlet air supply. Turn the handle one-half turn. The handle arrow should be pointing away from the electronic pressure transducer.

NOTE: Both ball valves must be turned to completely bypass the EVC-1 electronic controls.



cont.

5. Replace the upper control panel and close the door.
6. Adjust the external air pressure regulator to obtain the desired output air pressure.
7. If the ball valves have been adjusted correctly, both gauges on the upper control panel should show the same pressure.

NOTE: Use caution when starting the adhesive system after this procedure, since the air pressure supplied to the adhesive system can be higher than it was before, resulting in higher glue pressures.

Chapter 3 TROUBLESHOOTING

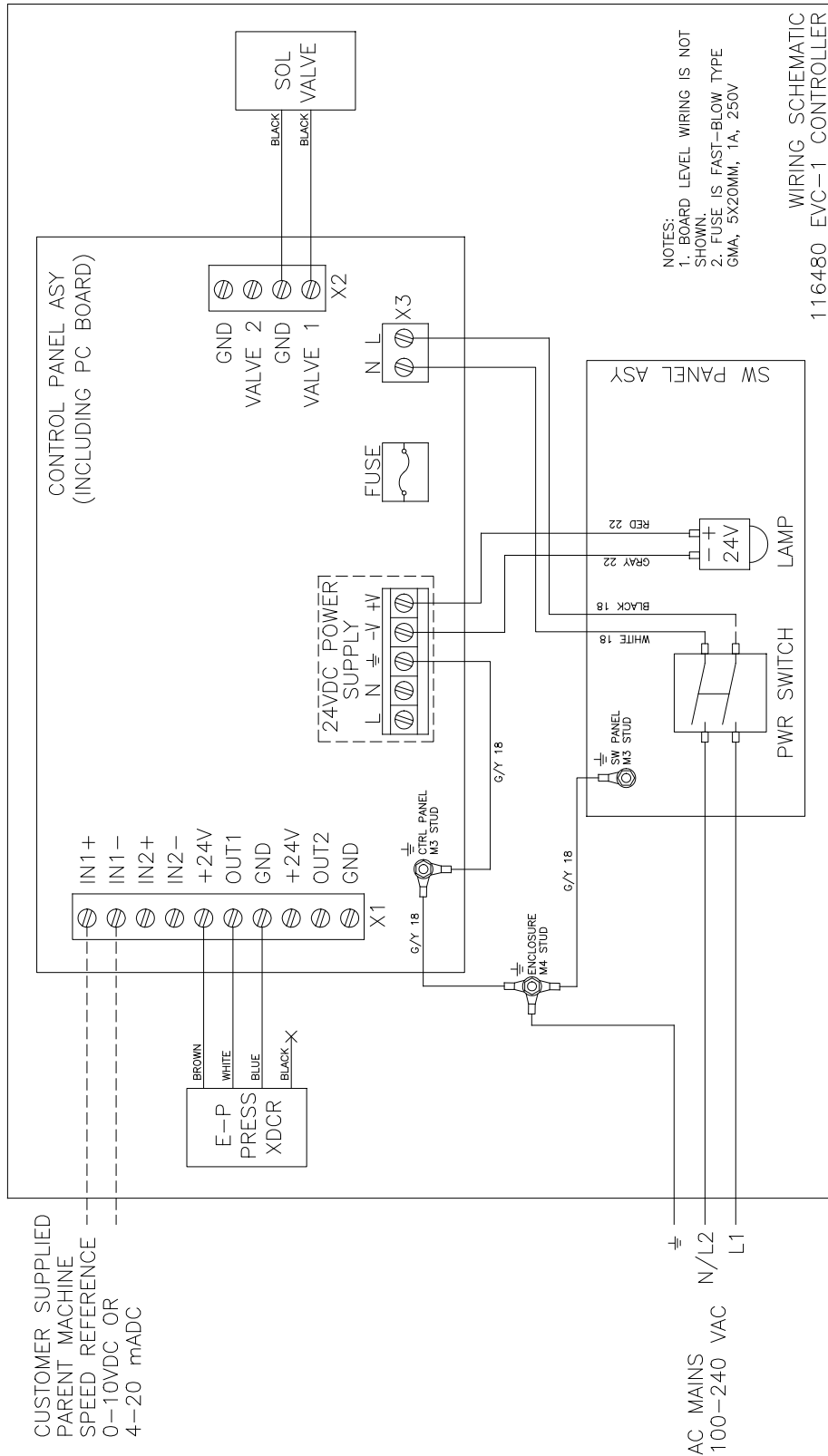
Note: Re-read Chapter 1 Safety Precautions” of the adhesive application system’s manual before performing any troubleshooting or repair procedures. All troubleshooting or repair procedures must be performed by qualified, trained technicians.

Troubleshooting Guide

Problem	Solution
No pressure output from controller, power indicator does not light	<ol style="list-style-type: none">1. Verify EVC-1 has power source and power switch is ON.2. Verify line voltage is between 100 and 240VAC.3. Check that fuse is intact. The proper fuse is 5x20mm, 1A, 250V rating.4. Check output of 24VDC power supply. Output should be 24V +/-5%.
No pressure output from controller, power indicator is lit.	<ol style="list-style-type: none">1. Verify RUN/STOP switch is in the RUN position.2. Verify compressed air input to EVC-1 is at least 75 psi.3. Check the polarity of the line speed reference signal. Refer to the electrical schematic for proper polarity.4. Observe the red LED on the top of the pressure transducer. The LED should be lit and steady when EVC is powered ON. If the LED is not lit, check the wiring between transducer and PC board.5. If the LED on the pressure transducer is blinking, switch OFF the EVC-1 and wait for 20-30 seconds. Switch the EVC-1 back ON. The LED should be steady. If it continues to blink, contact ITW Dynatec for technical assistance.6. Check the solenoid valve wiring. Check the solenoid valve for proper operation. The solenoid has a manual operator that can be depressed to manually activate the valve.7. Check that the ball valves are in the RUN position and not in the BYPASS position.8. Check that no air lines are disconnected or leaking inside the unit. Refer to the pneumatic schematic for proper air line connections.

Problem	Solution
<p>Gauges show the same pressure, regardless of control settings</p> <p>EVC-1 controls do not seem to have full range of operation</p>	<p>Check that the ball valves are in the RUN position and not in the BYPASS position.</p> <ol style="list-style-type: none">1. Check that incoming air pressure is at least 75 psi (5.1 bar).2. Check that the SW1 selector switch is in the desired position.3. Check that the MIN and MAX controls are in the desired position. Readjust as necessary.4. Check that the line speed reference configuration (4-20mA or 0-10V) matches the signal from the parent machine.

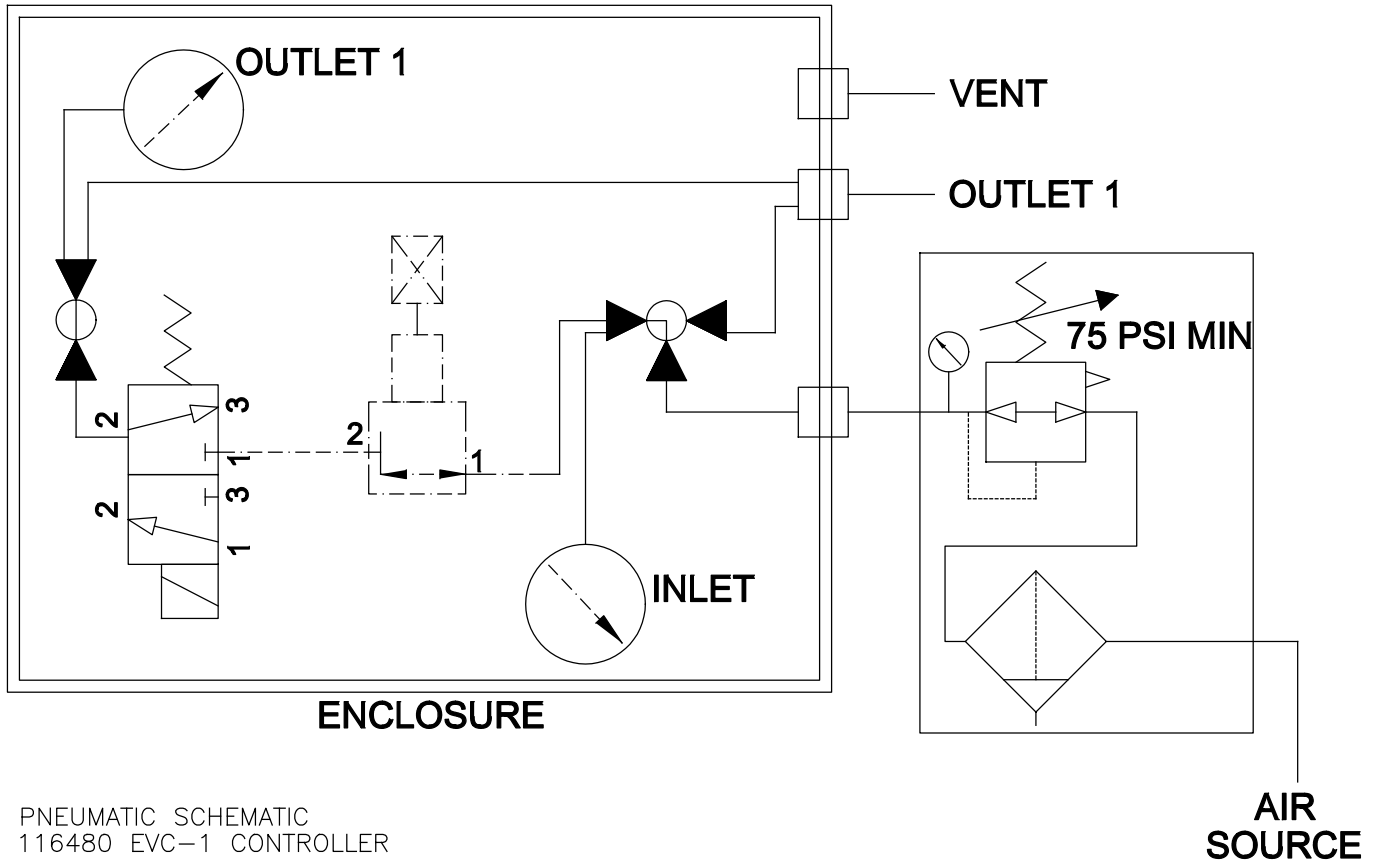
Chapter 4 SCHEMATICS



NOTES:
 1. BOARD LEVEL WIRING IS NOT SHOWN.
 2. FUSE IS FAST-BLOW TYPE GMA, 5X20MM, 1A, 250V

WIRING SCHEMATIC
 116480 EVC-1 CONTROLLER

CUSTOMER SUPPLIED
 PARENT MACHINE
 SPEED REFERENCE
 0-10VDC OR
 4-20 mA DC



PNEUMATIC SCHEMATIC
116480 EVC-1 CONTROLLER

Chapter 5 COMPONENT ILLUSTRATIONS & BILL OF MATERIAL

WARNING



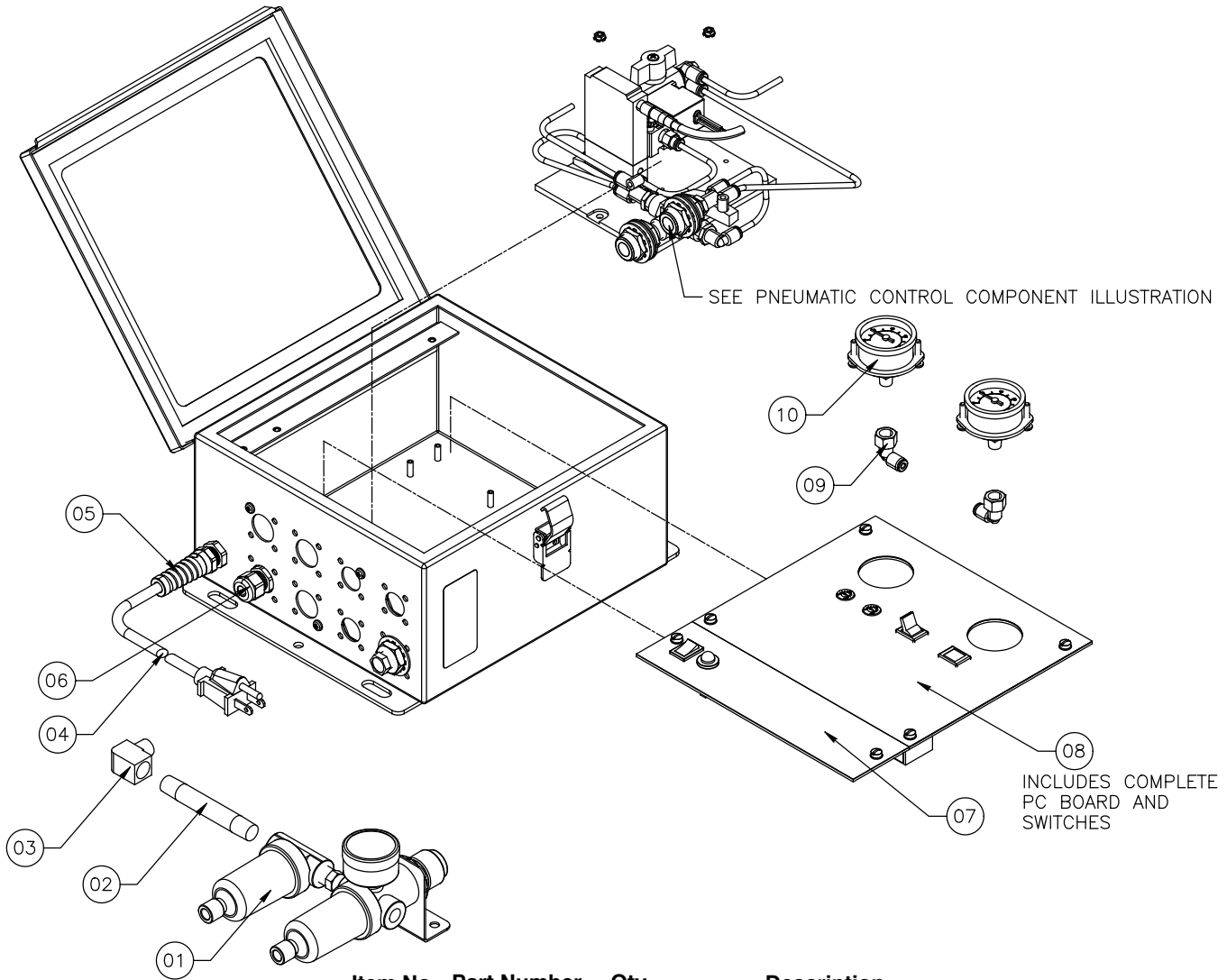
All parts must be periodically inspected and replaced if worn or broken. Failure to do this can affect equipment's operation and can result in personal injury.

Chapter Format

This chapter contains the component illustration (exploded-view drawing) for the EVC-1 Controller. These drawings are useful for finding part numbers as well as for use when maintaining or repairing the unit.

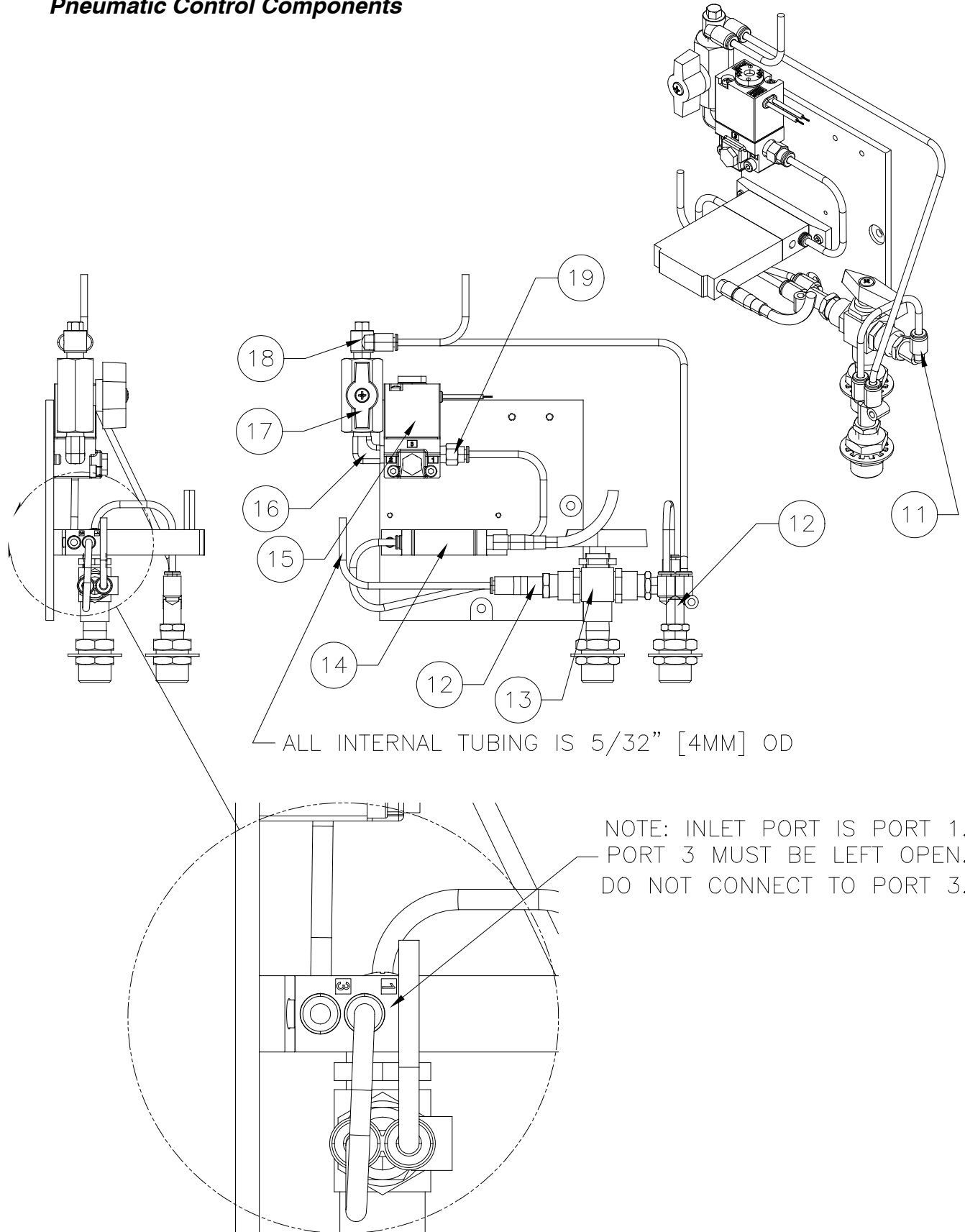
Note: most common nuts, bolts and fasteners can be obtained locally at your hardware store. Specialty fasteners are available by contacting Dynatec's Customer Service.

EVC-1 Service Components



Item No.	Part Number	Qty.	Description
23	N06412	1	EA FTG, 90° ELBOW, 1/4 TUBE X 1/4NPT (NOT SHOWN)
22	N06430	1	EA FTG, STR, 1/4 TUBE X 1/4NPT (NOT SHOWN)
21	N07677	6	FT TUBING, TFE, 1/4"OD X 1/16" WALL (NOT SHOWN)
20	102762	1	EA FUSE, 5X20, 1A, 250V FAST-BLOW (NOT SHOWN)
19	116395	1	EA FTG, STR, 1/8NPT X 5/32 TUBE
18	116531	1	EA FTG, BRNCH-ELB, 1/8NPT X 5/32 TUBE
17	116548	1	EA BALL VALVE, 2-WAY, 1/8NPT
16	116543	1	EA FTG, MALE ELBOW, 1/8NPT
15	116394	1	EA SOL VALVE, 3-WAY, 1/8NPT
14	116393	1	EA PRSR TRANSDUCER, E-P
13	116533	1	EA BALL VALVE, 3-WAY, 1/4NPT
12	116392	2	EA FTG, BRNCH-Y, 1/4NPT X 5/32 TUBE
11	809476	1	EA FTG, 90° ELBOW, 1/4NPT X 5/32 TUBE
10	115846	2	EA GAUGE, PANEL
09	116397	2	EA FTG, 90° ELBOW, 1/8NPT FEM X 5/32 TUBE
08	116540	1	EA CONTROL PANEL ASY, EVC-1
07	116534	1	EA SWITCH PANEL ASY, EVC-1
06	109472	1	EA CORDGRIP
05	106409	1	EA CORDGRIP, LINE CORD
04	116541	1	EA LINE CORD, 120VAC, NEMA 5-15
03	072X040	1	EA FITTING, 1/4NPT, 90° STREET ELL
02	N03740	1	EA FITTING, NIPPLE, 1/4NPT X 3.5"
01	100380	1	EA FILTER/REGULATOR, 1/4 NPT

Pneumatic Control Components

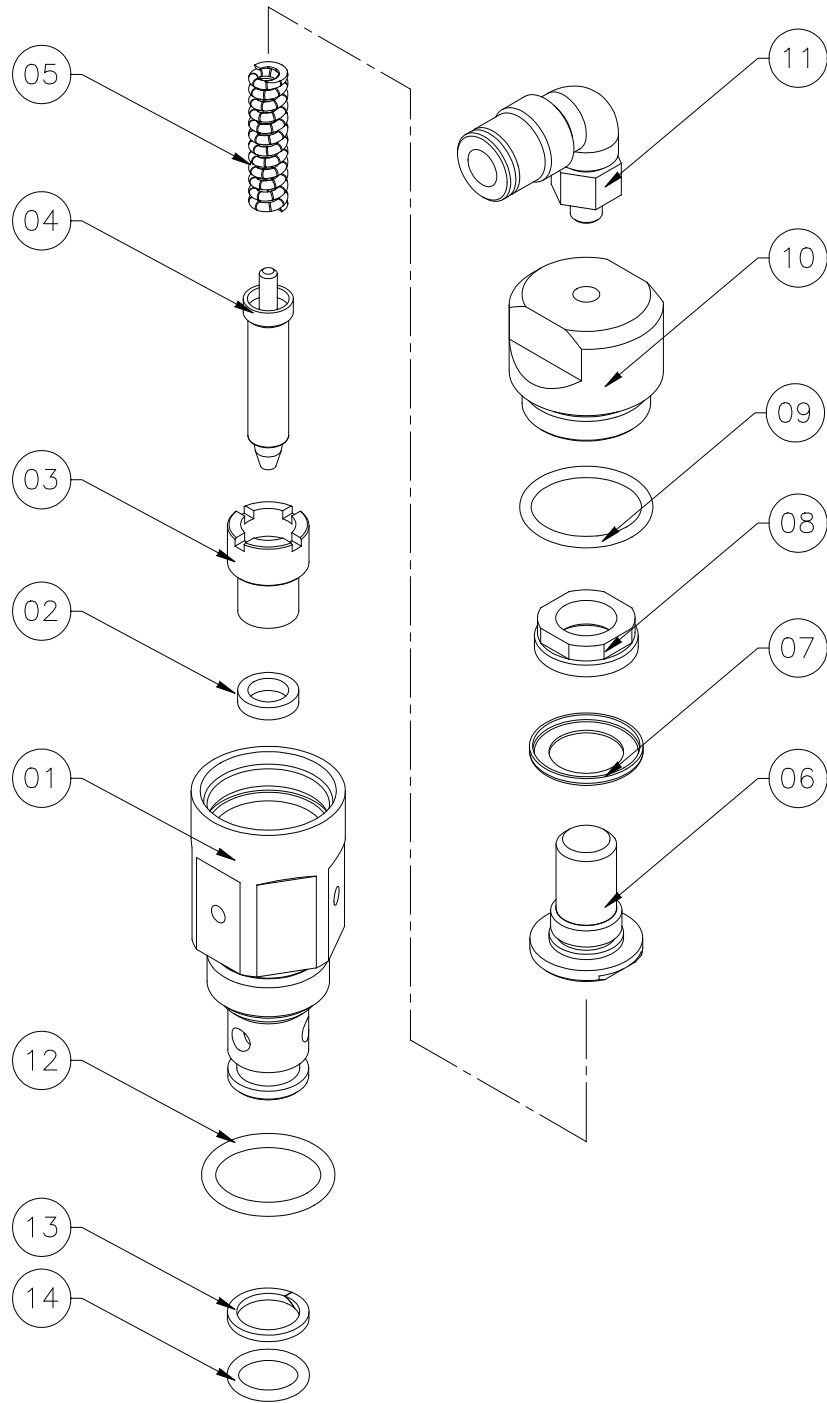


Bill of Materials for PN 115540 Pneumatic Pressure Relief Valve

Item No.	Part Number	Qty.		Description
15	108700	A/R	EA	LUBE, HT TFE
14	N00179	1	EA	O-RING, -012, VITON
13	N05733	1	EA	BACKUP RING, -012, SPLIT PTFE
12	N01601	1	EA	O-RING, -908, VITON
11	115438	1	EA	FTG, 90°, M5 X 1/4" TUBE
10	115538	1	EA	CAP, VALVE BODY
09	N00184	1	EA	O-RING, -017, VITON
08	115536	1	EA	RETAINER, PISTON SEAL
07	115537	1	EA	PISTON SEAL
06	115535	1	EA	PISTON, LOWER
05	115539	1	EA	SPRING, COMPRESSION
04	115533	1	EA	STEM, VALVE
03	115534	1	EA	SEAL RETAINER
02	115437	1	EA	SEAL, STEM
01	115532	1	EA	VALVE BODY

Bill of Materials for PN 116326 Repair Kit for Pneumatic Pressure Relief Valve (PN 115540)

Item No.	Part Number	Qty.		Description
15	108700	A/R	EA	LUBE, HT TFE
14	N00179	1	EA	O-RING, -012, VITON
13	N05733	1	EA	BACKUP RING, -012, SPLIT PTFE
12	N01601	1	EA	O-RING, -908, VITON
11	115438	1	EA	FTG, 90°, M5 X 1/4" TUBE
09	N00184	1	EA	O-RING, -017, VITON
07	115537	1	EA	PISTON SEAL
05	115539	1	EA	SPRING, COMPRESSION
02	115437	1	EA	SEAL, STEM



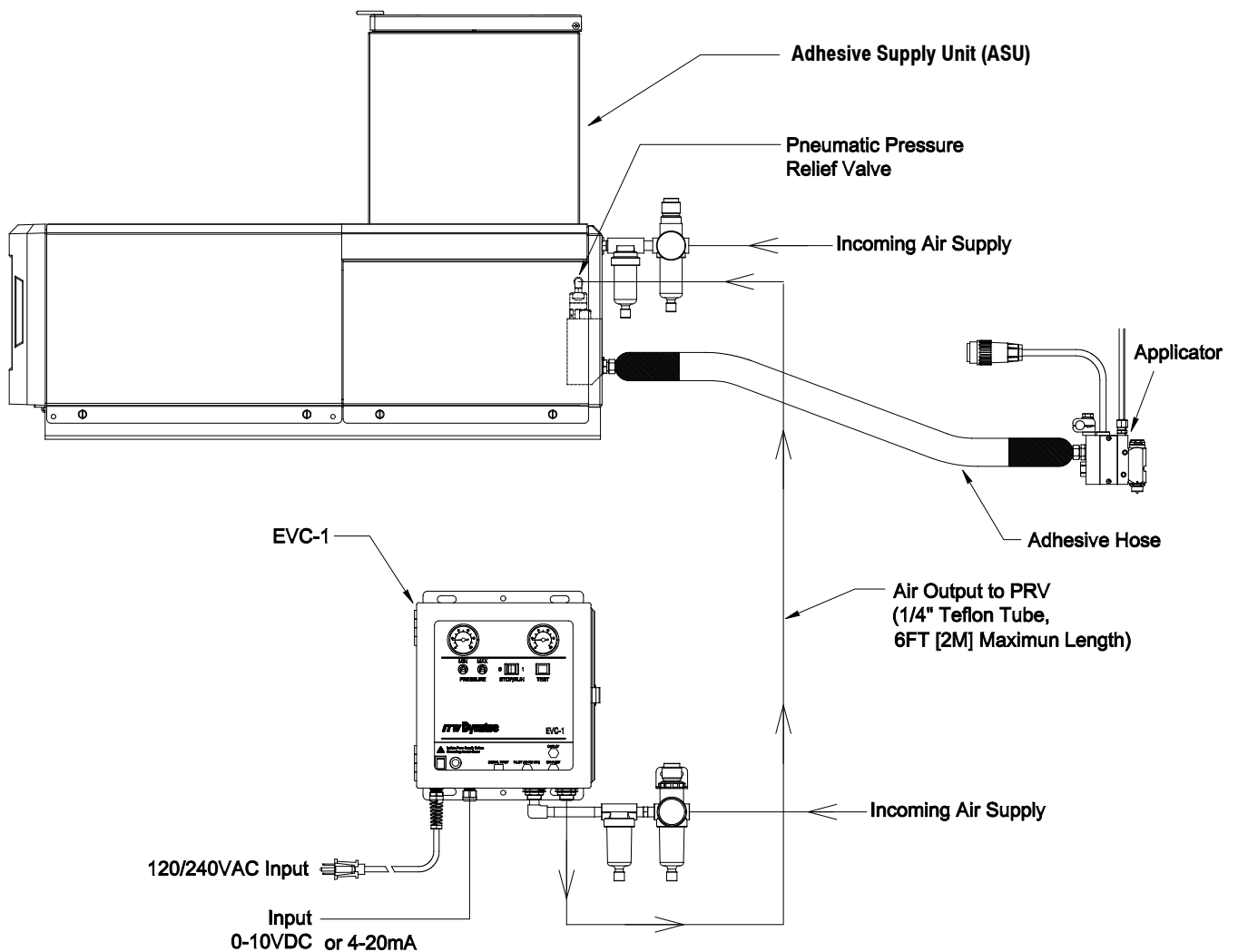
Component Illustration: PN 115540 Pneumatic Pressure Relief Valve

Appendix EVC-1 RETROFIT TO ADHESIVE SUPPLY UNITS

Description

The following diagrams are provided to outline the steps necessary to retrofit an ITW Dynatec Dynamelt S Adhesive Supply Unit (ASU) with an EVC-1 Controller.

Separate instructions are given for piston pump-driven and gear pump-driven ASUs. Note that the piston pump units must have a PN 113376 Line Speed Tracking Kit installed.

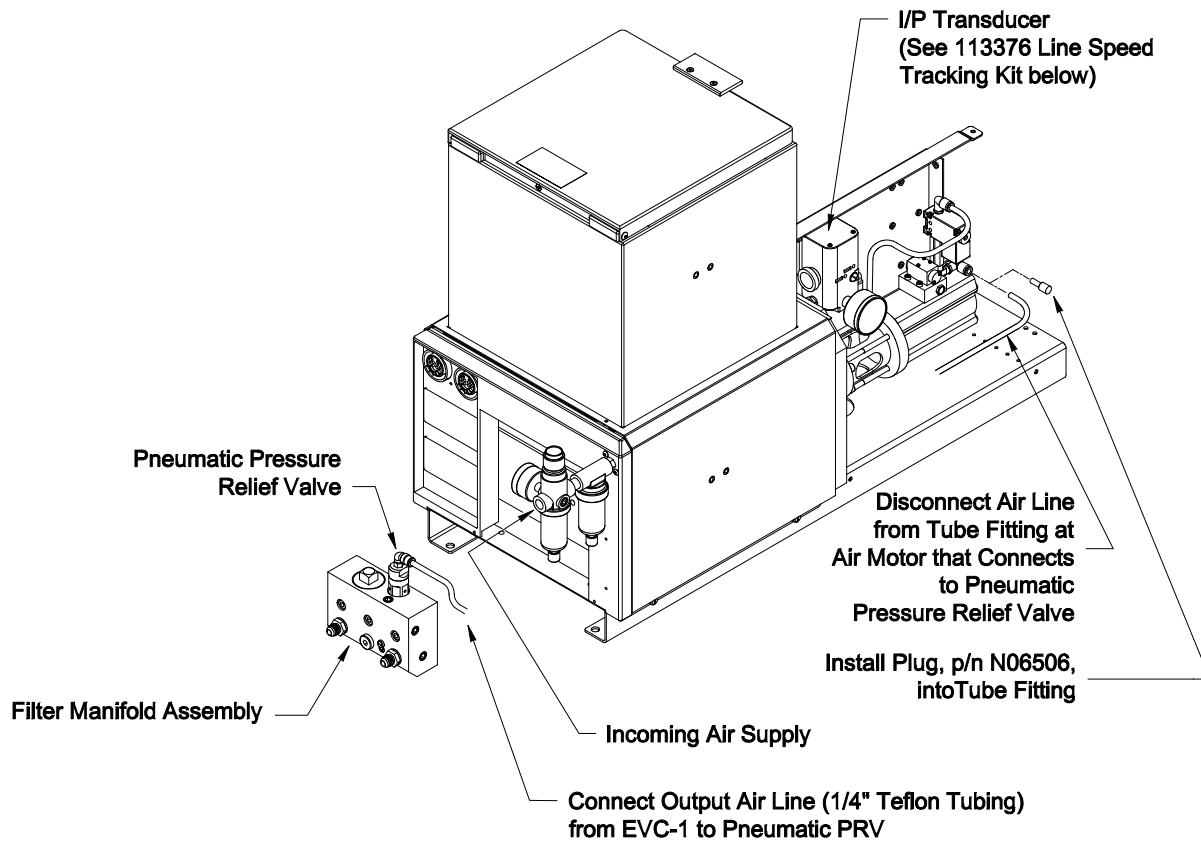


System Interconnect Diagram

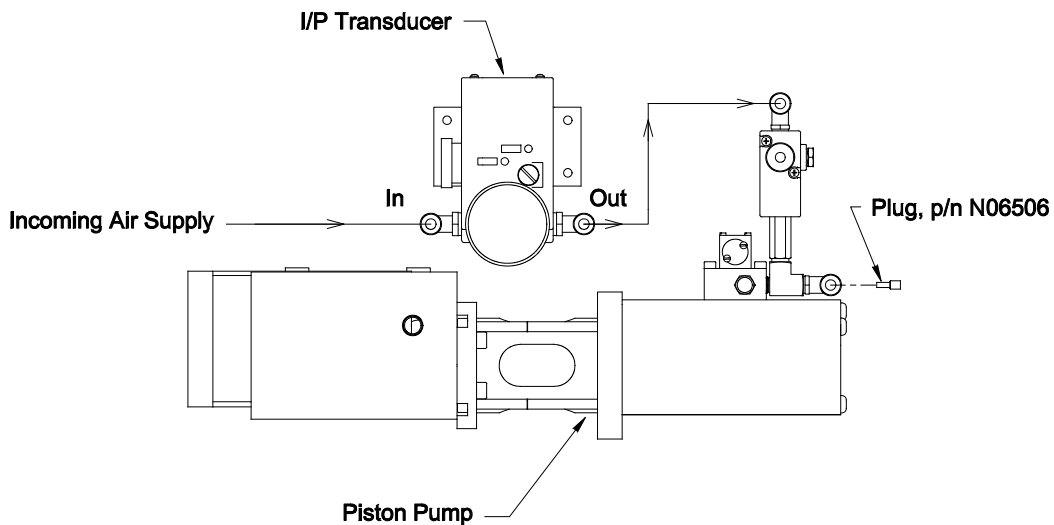
Piston Pump ASU/ EVC-1 Retrofit Diagram

NOTE: PN 113376 Line Speed Tracking Kit must be installed.

EVC-1 Installation on Piston Pump Dynamelt S ASUs Equipped with Pneumatic Pressure Relief Valve



Air Line Diagram for PN 113376 Line Speed Tracking Kit



Gear Pump ASU/ EVC-1 Retrofit Diagram

EVC-1 Installation on Gear Pump Dynamelt S ASUs Equipped with Pneumatic Pressure Relief Valve

