
KNIGHT



Chem-Trak Tunnel Installation & Operation

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CAUTION: Wear protective clothing and eyewear when dispensing chemicals or other materials. Observe safety handling instructions (MSDS) of chemical mfrs.



CAUTION: To avoid severe or fatal shock, always disconnect main power when servicing the unit.



CAUTION: When installing any equipment, ensure that all national and local safety, electrical, and plumbing codes are met.

INTRODUCTION

Chem-Trak Tunnel Express is the ultimate in modularity, allowing versatile configurations to fit your laundry tunnel. With the ability to add various pumps, valves, and other accessories, Chem-Trak Tunnel Express ensures consistent wash quality and predictable costs in any plant.

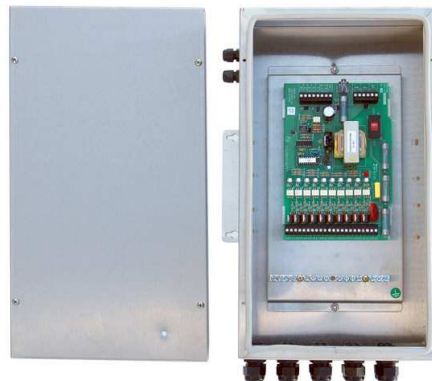
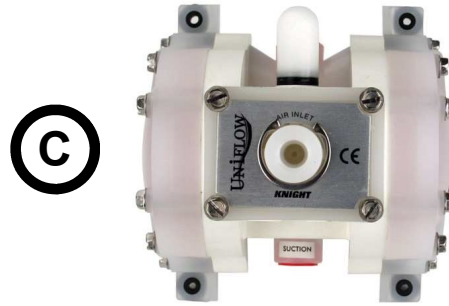
- Can run up to 12 chemical pumps (without flush) or 10 chemical pumps (with flush)
- The only tunnel dispenser system with AODD and EDP available: Air Operated Double Diaphragm Pumps (6.8 GPM)(25.7 LPM) and Electric Diaphragm Pumps (3.2 GPM)(12.1 LPM)
- Less service and maintenance is required with the AODD and EDP pumps because there are no tubes that need to be replaced
- High speed injection with flow rates up to 12 GPM (45.4 LPM) with improved accuracy / resolution of chemical dosing (+/- 2%)
- Exclusive module injection assembly allows for simple, fast, and non-invasive one person calibration
- Precision metering of pumps to +/- .10 oz/second
- Flush or no flush configurations
- Simple, multi-lingual control panel (English, Spanish, French, German, Italian, Dutch)
- Data management reports (Excel)
- Networkable with multi-washer and conventional Knight dispensers

SYSTEM COMPONENTS

See the diagram on the following page for identification of the system components listed below. The available pump options for the Chem-Trak Tunnel system consist of Air Operated Diaphragm, Peristaltic, or Electric Diaphragm. If necessary, various pump configurations can be utilized to meet specific application requirements.

- (A) **Power Supply: (not shown)** Isolates high voltage system operating power from the control box. The power supply box contains a transformer and electrical noise filter for added protection.
- (B) **Control Box:** Contains all system electronics and is the main command center for operation. The keypad allows programming of all system operating parameters. Also housed inside the control box are an air filter, air solenoids, and water flush valves.
- (C) **Air Operated Diaphragm Pumps:** Available in 3/8" for tunnel wash applications. Use of air operated diaphragm pumps provides high volume product delivery up to 6.8 GPM with a wide range of chemical compatibility. The pumps are controlled via air solenoids in the system control box.
- (D) **Peristaltic Pumps:** Available in 155 oz/min or 226 oz/min configurations. Use of peristaltic pumps provides easy installation and maintenance, and does not require an air supply. The pumps are controlled via POB circuit board inside the peristaltic pump cabinet.
- (E) **Electric Diaphragm Pumps:** Available in .66 GPM (76 oz/min) and 1.5 GPM flow rates. These pumps are controlled via the POB circuit board. A separate POB Enclosure is available for this application, or the pumps can utilize extra (unused) pump outputs on a POB board that is inside of a peristaltic pump cabinet.
- (F) **Flush Manifold (optional):** Used for diluting chemicals with water. The system has two separate water flush solenoids that can be setup for single or dual manifold configuration. The use of flush manifolds allows water flush delivery to multiple injection points on the tunnel washer.
- (G) **SIB Module:** The SIB signal input module provides an interface between the Chem-Trak Tunnel system and external washer signals. Connection from the SIB to the Chem-Trak Tunnel control box is through low voltage data cable.
- (H) **High Voltage POB Box:** The Pump Output Board mounted in a separate stainless steel enclosure controls on-off operation of electric diaphragm pumps and isolates all high voltage from the main controller.
- (I) **Manifold Injection Assembly:** Controlling pump flow rates and calibrating pumps is easy with this key system component. A special ball metering valve provides variable orifice diameters that control the flow rate of chemical from an air operated or electric diaphragm pump.

SYSTEM COMPONENTS



PRE-INSTALLATION

Before the equipment is installed, you should survey the installation site thoroughly. Listed below are some of the factors to consider when picking your location.

- ☑ Chemical location — pumps should be mounted within 10 linear feet of the chemical tanks. For bulk tank installations, pumps must be placed on, or near tanks.
- ☑ Mounting surface — ensure there is a sturdy wall (or panel) with enough space for all system components and routing of chemical tubes, air lines, and cables.
- ☑ Electrical — requires 115 VAC/60 Hz (or 240 VAC/50-60 Hz) power source, 1 amp service for air pump only applications (20 amp service recommended if using peristaltic pumps).
- ☑ Air Service — Available air pressure should be 70 PSI and 12 SCFM. Check specification of air compressor on site for adequate air flow.
- ☑ Water Service — only required if using flush manifolds. Ambient water service recommended and minimum 25 PSI flow pressure.
- ☑ Familiarize yourself with all applicable safety, electrical, and plumbing codes.

CONTROL BOX & POWER SUPPLY INSTALLATION

- (1) Mount the joggle bracket to the wall at a height that all users can access and read the display screen. Use the hardware in the accy kit or other appropriate hardware for the mounting surface.
- (2) Hang the control box unit on the joggle bracket. Secure the control box to the wall with provided hardware.
- (3) Mount the power supply box in close proximity to the control box unit and where operators can access the power switch in case of emergency.
- (4) Connect main power from a suitable breaker to the power input terminal block inside the power supply box, and per local wiring codes.
- (5) Connect power from the power supply box to the appropriate terminals on the main control board inside the control box using the cable provided (see wiring diagram for details).
- (6) Connect air line to input fitting on the air filter inside the control box. Hardware not provided.
- (7) Connect water supply (if flush will be used). Hardware not provided.

AIR PUMP INSTALLATION (OPTIONAL)

Before installation, choose a mounting location for the chemical pumps that is as close as possible to chemical containers. Be sure to allow enough space between pumps for ease of installation and service. Follow the installation steps below for each chemical pump that will be used.

- (1) Attach air input fitting provided in accy kit to the air inlet port on the pump.
- (2) Attach inlet and outlet barb fittings provided in the accy kit.
- (3) Mount the pumps within 10 linear feet of the chemical containers.
- (4) Connect pickup line to input side of pump.
- (5) Connect discharge line between output side of pump and point of injection. If using a flush manifold (up to 2 flush manifolds can be used) connect a line from a port on the corresponding manifold to the chemical injection point at the washer.
- (6) Route and connect air line for each pump to the corresponding air solenoid inside the control box.
- (7) Insert pickup line into appropriate chemical container.
- (8) Prime all chemical pumps. This can be done with manual prime buttons on the main control board or the control panel of the Chem-Trak Tunnel system.

EDP PUMP INSTALLATION (OPTIONAL)

The use of Electric Diaphragm Pumps requires a POB circuit board (with enclosure) to interface with the Chem-Trak Tunnel control box. Mount the high voltage POB box in a location that is preferably near the EDP pumps and the control box.

Before installation, choose a mounting location for the chemical pumps that is as close as possible to chemical containers. Be sure to allow enough space between pumps for ease of installation and service. Follow the installation steps below for each chemical pump that will be used.

- (1) Mount the pumps as close as possible to the chemical supply and no more than 10 ft above chemical containers.
- (2) Install braided tubing between the discharge (right) tube side of the pump and the injection point. Use stainless steel hose clamps and barb fittings to secure braided tubing to pump. If using a flush manifold, connect the discharge line to corresponding port on the manifold.
- (3) Install braided tubing between the suction (left) tube side and the barb fitting on the PVC pickup tube. Use stainless steel hose clamps and barb fittings to secure braided tubing to squeeze tube.
- (4) Insert pickup line into appropriate chemical container.
- (5) Connect each pump to corresponding terminals on the POB circuit board (see wiring diagram).
- (6) Connect the POB circuit board (inside the high voltage POB box) to corresponding terminals in the control box (see wiring diagram).
- (7) Connect power to the POB circuit board from the Power Supply Unit (see wiring diagram). Follow local wiring codes — this will typically require the use of conduit.
- (8) Prime all chemical pumps. This can be done with manual prime buttons on the POB board or the control panel of the system.

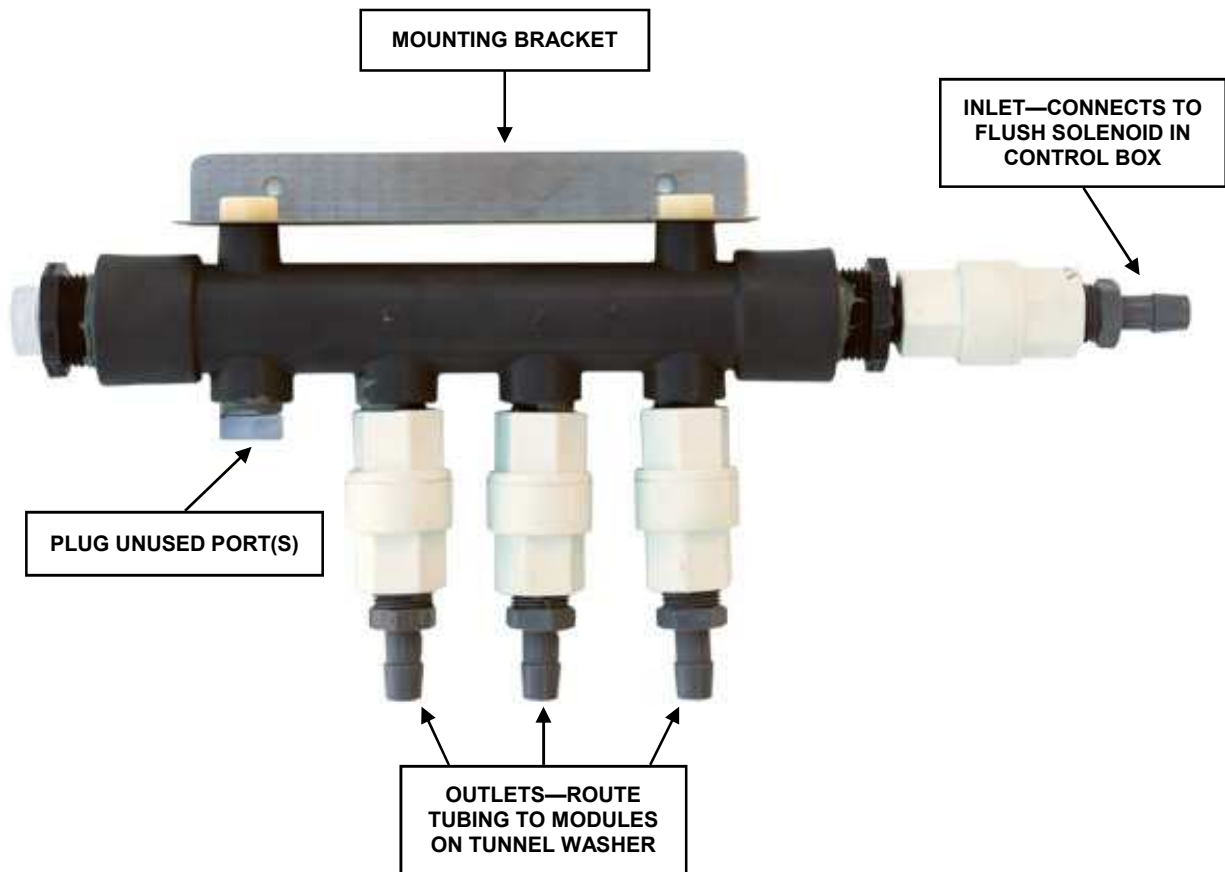
PERISTALTIC PUMP INSTALLATION (OPTIONAL)

- (1) Mount the peristaltic pump cabinet as close as possible to the chemical supply and no more than 10 ft above chemical containers.
- (2) Install braided tubing between the discharge (right) tube side of the peristaltic pump and the injection point. Use stainless steel hose clamps and barb fittings to secure braided tubing to squeeze tube. If using a flush manifold, connect the discharge line to corresponding port on manifold.
- (3) Install braided tubing between the suction (left) tube side and the barb fitting on the PVC pickup tube. Use the provided stainless steel hose clamps and barb fittings to secure braided tubing to squeeze tube.
- (4) Insert pickup line into appropriate chemical container.
- (5) Connect the POB circuit board (inside the peristaltic pump cabinet) to corresponding terminals in the control box (see wiring diagram).
- (6) Connect power to the POB circuit board from the Power Supply Unit (see wiring diagram). Follow local wiring codes — this will typically require the use of conduit.
- (7) Prime all chemical pumps. This can be done with manual prime buttons on the POB board or the control panel of the system.

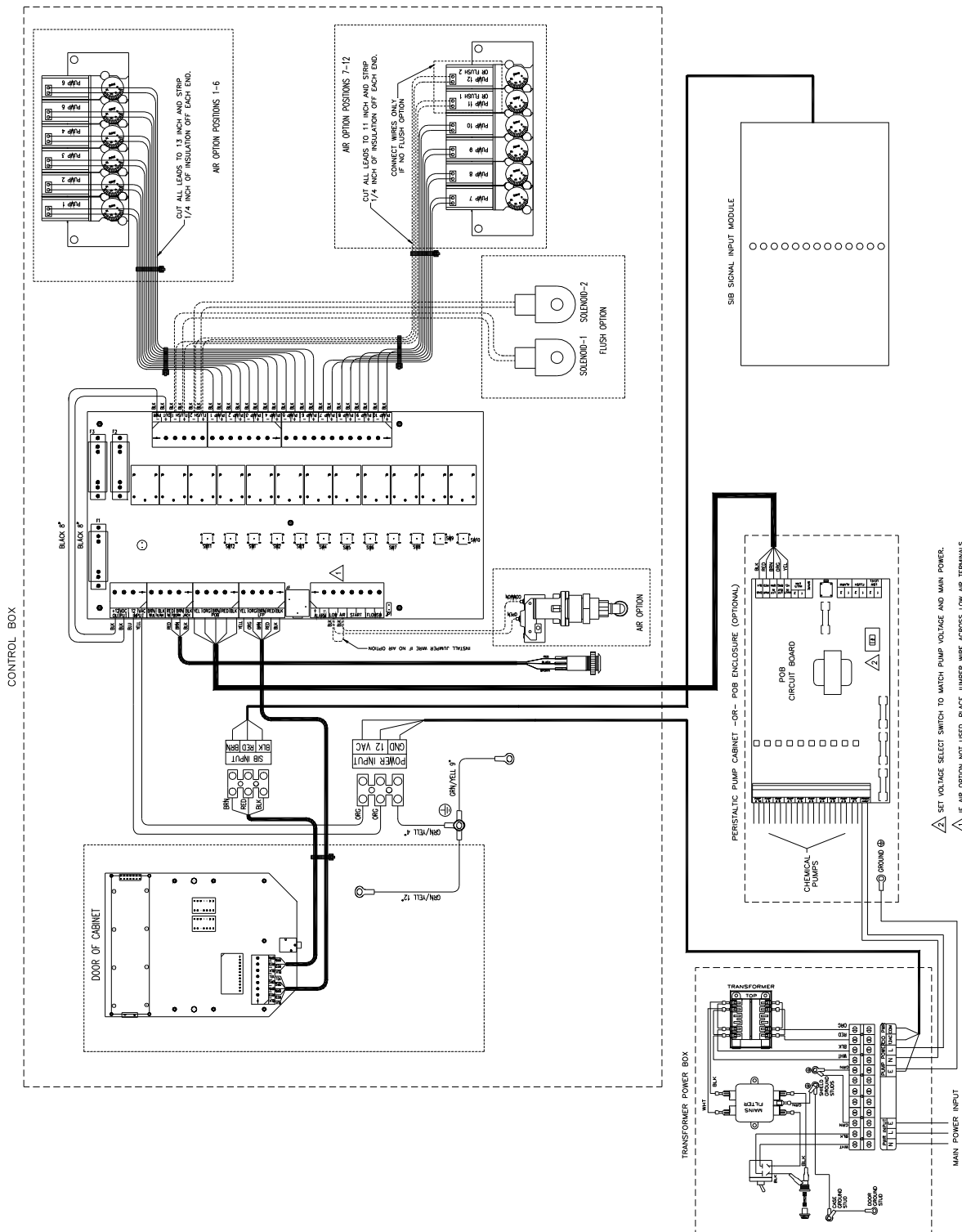
FLUSH MANIFOLD INSTALLATION (OPTIONAL)

The Chem-Trak Tunnel controller has the capability to interface with 1 or 2 flush manifolds. Each flush manifold can flush up to 5 modules, so if both manifolds are used, a maximum of 10 modules can be flushed.

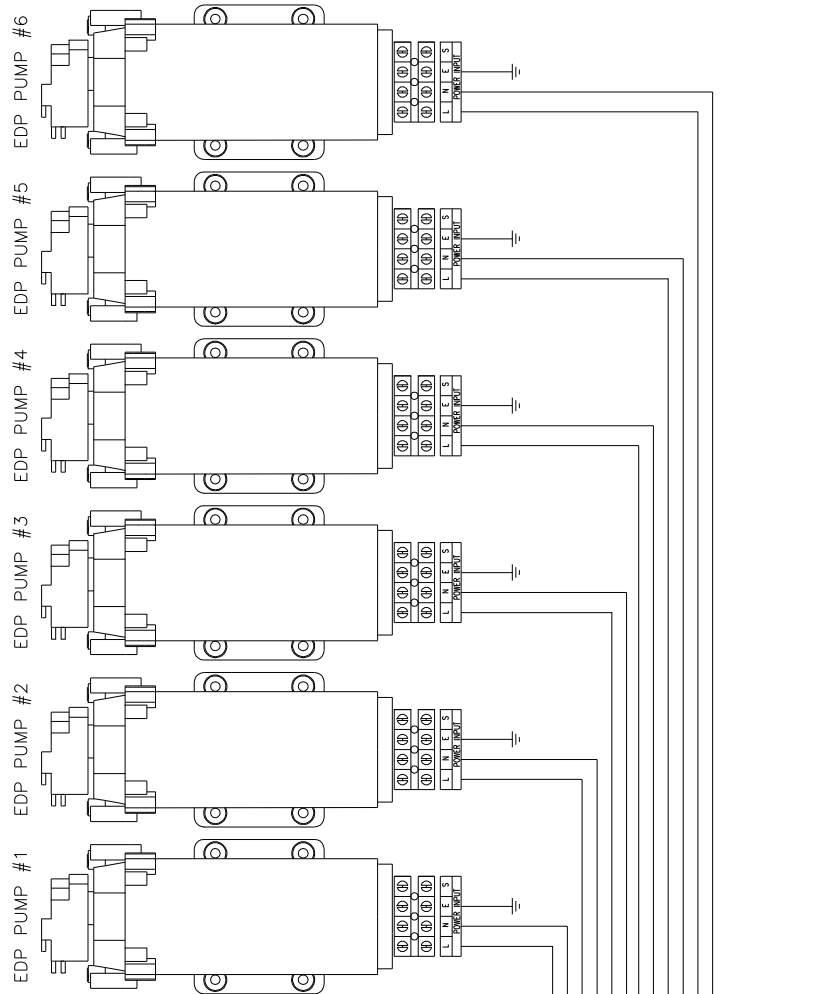
- (1) Mount the flush manifold using appropriate hardware. The flush manifold can be mounted to the wall, close to the tunnel or close to the control. It can also be mounted to the Unistrut (if so equipped).
- (2) Connect braided hose from the corresponding flush solenoid in the control box to the inlet of the manifold.
- (3) Connect braided hose from each of the outlet barb fittings to the corresponding module on the tunnel.
- (4) Plug any ports of the manifold that will not be used.



SYSTEM WIRING DIAGRAM

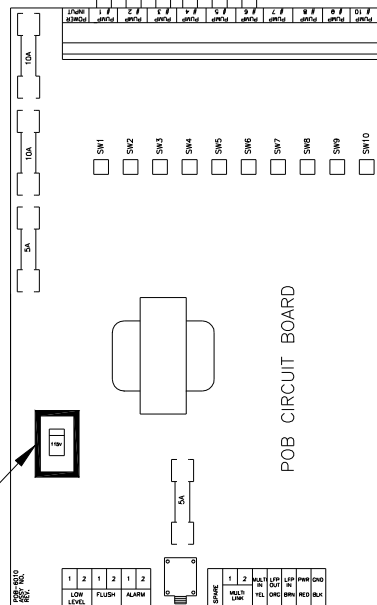


EDP PUMP WIRING DIAGRAM



THIS IS AN EXAMPLE OF USING ELECTRIC DIAPHRAGM PUMPS WITH THE ILCS EDGE SYSTEM. CONNECT THE EDP PUMPS AS SHOWN TO THE POB CIRCUIT BOARD. ENSURE THAT THE "E" TERMINAL IS CONNECTED TO A PROPER EARTH GROUND.

SET SWITCH TO APPROPRIATE VOLTAGE (MOTOR VOLTAGE 115/230)



SIB INSTALLATION

- (1) Mount the SIB near the washer's signal source using dual-lock fastening strips. If desired, the SIB can be mounted right inside the washer's control box.
- (2) Connect the SIB to the control box using 3 conductor cable.
- (3) Check the signal voltage output from the laundry machine. Measure the voltage between control signal and signal common, NOT control signal and case ground.
- (4) Connect signal wires to SIB per wire colors on the label of the SIB. If split commons are required, a resistor can be removed inside the SIB to allow use of 2 different signal commons



► Splitting Signal Commons

If you have one signal common (typical) connect it to "COM A" only. If you have two signal commons, you will need to remove a resistor inside the SIB before connecting common wires! Once the resistor is removed, you can then use COM A and COM B for different groups of signals shown in the table. Shut off all power sources before continuing.

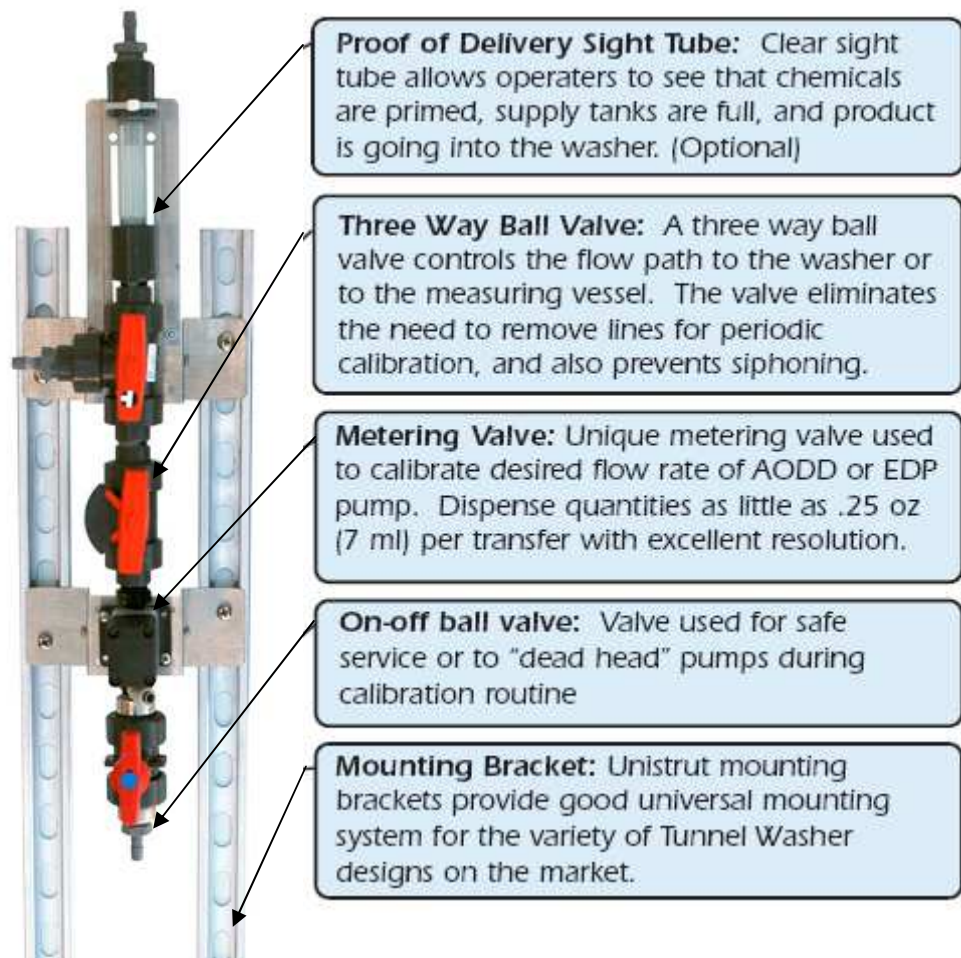
- (1) Remove screws from the bottom of the SIB to open it.
- (2) Locate the three resistors marked R15, R14, and R13, on the left side of the module (each resistor has a single black band to identify it).
- (3) Cut and remove the resistor that will "split" the commons between the desired pumps. Remove only one resistor.
- (4) Close the module and replace screws when finished.

<i>CUT RESISTOR</i>	<i>TO USE COM A FOR PUMPS</i>	<i>AND COM B FOR PUMPS</i>
R15	1 — 2	3 — 13
R14	1 — 3	4 — 13
R13	1 — 5	6 — 13

MODULE INJECTION ASSEMBLY

One of the key advantages of Tunnel Express is the ease of which pump calibration is achieved. Chem-Trak Tunnel Express offers the only injection assembly located at the washer that allows for easy and quick one person calibration and control. The injection assembly allows for metering the chemical flow rates, dead heading the pumps, directing chemical to the washer or to a measuring vessel for calibration, preventing siphoning, and visualizing the chemical flow. All these controls within arm length allows for easy one person control, and the quickest calibration you will experience.

The module injection assembly is intended for use with air pumps and EDP's. If using the peristaltic pump option, the module assembly is not feasible.



INSTALLATION & OPERATION

- (1) Mount the assembly near the module that it will feed chemical into.
- (2) Connect tubing from the discharge side of the chemical pump to the barb fitting at the bottom.
- (3) Connect tubing from the outlet fitting at the top of the assembly to the injection point on the module.
- (4) Route a tube that will be used for calibration to the side fitting on the 3-way valve.
- (5) Connect an air line to the inlet fitting on the air-operated ball valve. This line should be teed in with the air line that operates the corresponding chemical pump so that the ball valve opens when the pump is operated.

DISCLAIMER

Knight LLC does not accept responsibility for the mishandling, misuse, or non-performance of the described items when used for purposes other than those specified in the instructions. For hazardous materials information consult label, MSDS, or Knight LLC. Knight products are not for use in potentially explosive environments. Any use of our equipment in such an environment is at the risk of the user, Knight does not accept any liability in such circumstances.

WARRANTY

All Knight controls and pump systems are warranted against defects in material and workmanship for a period of ONE year. All electronic control boards have a TWO year warranty. Warranty applies only to the replacement or repair of such parts when returned to factory with a Knight Return Authorization (KRA) number, freight prepaid, and found to be defective upon factory authorized inspection. Bearings and pump seals or rubber and synthetic rubber parts such as "O" rings, diaphragms, squeeze tubing, and gaskets are considered expendable and are not covered under warranty. Warranty does not cover liability resulting from performance of this equipment nor the labor to replace this equipment. Product abuse or misuse voids warranty.

FOOTNOTE

The information and specifications included in this publication were in effect at the time of approval for printing. Knight, LLC reserves the right, however, to discontinue or change specifications or design at any time without notice and without incurring any obligation whatsoever.