

## INTRODUCTION

Dairy Chem Systems are designed to dispense non-foaming dairy cow teat dip products from a chemical storage vessel to a teat dip spray head or fill valve. VS versions use an external vacuum switch on the pipeline to control dispensing only when milking lines are in use. Systems with dual-pump configuration can be setup to operate in the following ways:

- Run both pumps simultaneously to inject two different chemicals.
- Run one pump at a time, but alternate between pumps at various intervals (using the selector valve on units so equipped) to extend the life of both pumps.
- Run one pump at a time, but only switch pumps when needed (using the selector valve on units so equipped) to keep one as a spare.

## SPECIFICATIONS

Chemical Compatibility	Santoprene: acids, alkalines, soaps, alcohols, ketones.
Air Operated Pump Materials	Polypropylene Body w/ Santoprene Seals and Diaphragm.
Air Requirements / Consumption	Minimum 40 PSI / Maximum 80 PSI clean dry air 5-10 SCFM during operation.

## SAFETY PRECAUTIONS

- Read and understand the MSDS sheets for the chemicals that will be used — consult your chemical supplier if you have any questions.
- Always wear safety goggles and protective gloves while handling chemicals.
- Avoid contact of chemicals with skin and eyes. If contact occurs, rinse affected area with water for 15 minutes, and seek medical attention, if needed.

## MAINTENANCE

- Periodically drain the bowl on the air regulator/filter by pushing up the stem on the bottom of the bowl till the water runs out.
- The bowl can be removed (by turning counter-clockwise) to clean the filter element. When replacing the bowl, be sure that the O-ring is properly positioned on top of the bowl.

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## INSTALLATION — SINGLE PUMP

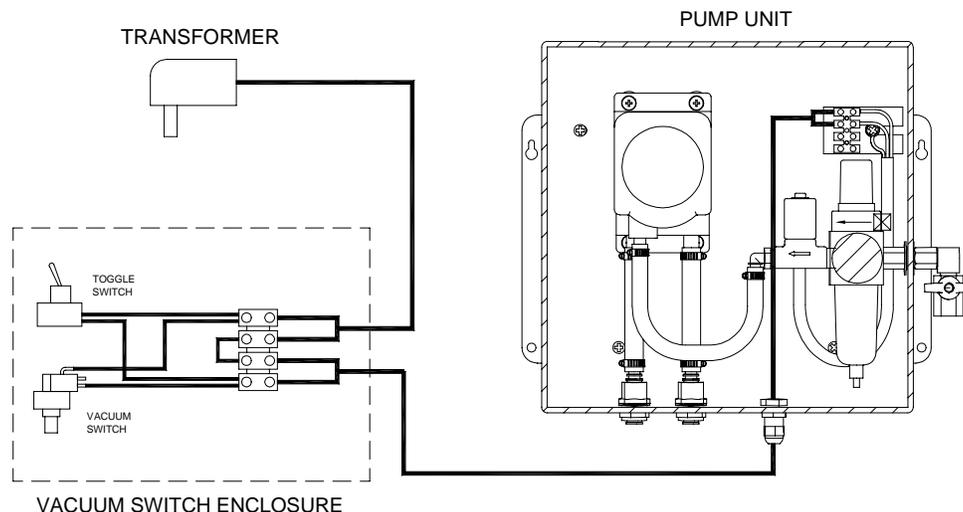
- (1) Select the desired location to mount the control box — should not be more than 6 ft (2 meters) from the floor.
- (2) Mount the control box using the hardware provided or other mounting hardware as needed.
- (3) There are two 1/4" and two 3/8" quick-connect barbed fittings provided with the unit. Attach the pickup line to the barbed end of the appropriate size fitting — insert the fitting into the left side port on the bottom of the unit. Route the other end of the pickup line to the chemical supply.
- (4) Attach the discharge line to the barbed end of the appropriate size fitting — insert the fitting into the right side port on the bottom of unit. Route the other end of the discharge line to the injection point.
- (5) Connect the air supply to the 1/4" NPT inlet valve on the right side of the unit. Be sure to use clean dry air only!

***The remaining steps are for vacuum switch equipped units only***

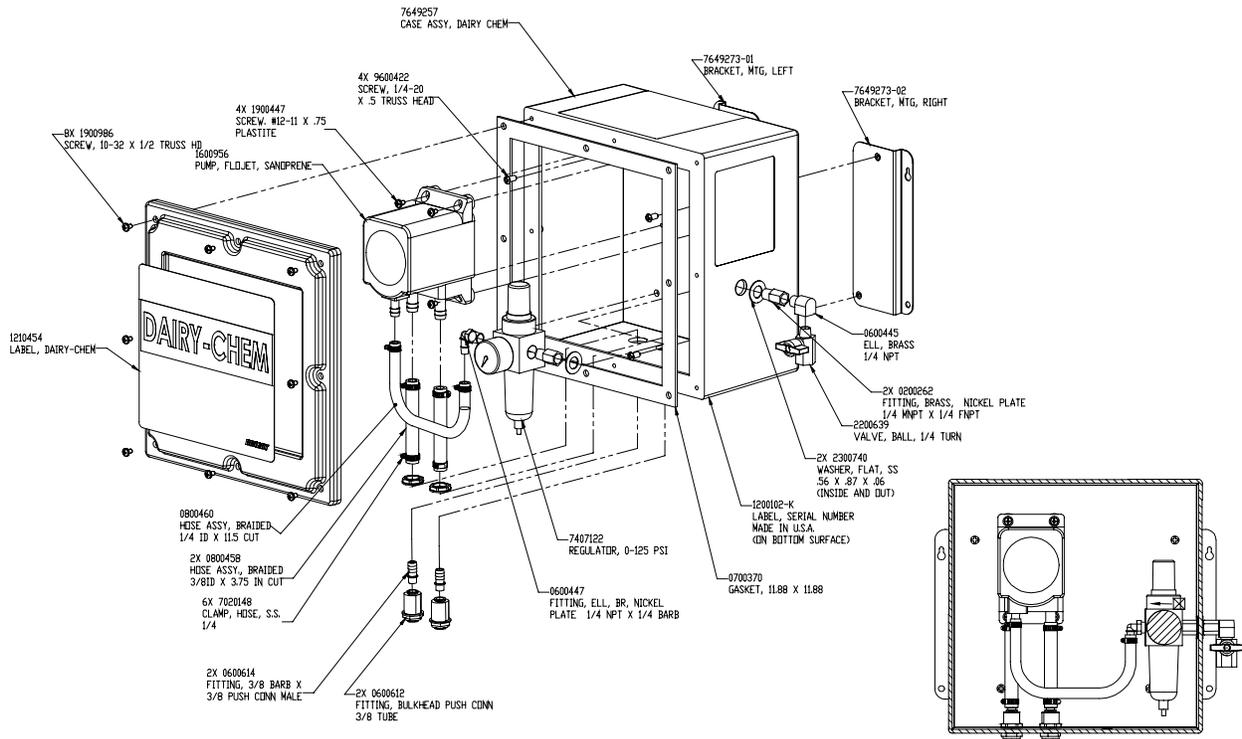
- (6) Mount the vacuum switch enclosure in a convenient location and nearby to a 115 VAC outlet.
- (7) Connect tubing from the vacuum source (pipeline) to the barb fitting on the vacuum switch enclosure. Route the tubing carefully to avoid pinching the tube at any point.
- (8) Wire the vacuum switch enclosure to the pump unit as shown in the wiring diagram below. Be sure to route the wire through the provided strain relief fittings on both the switch enclosure and pump unit.
- (9) Plug the transformer into the outlet.

## OPERATION — SINGLE PUMP

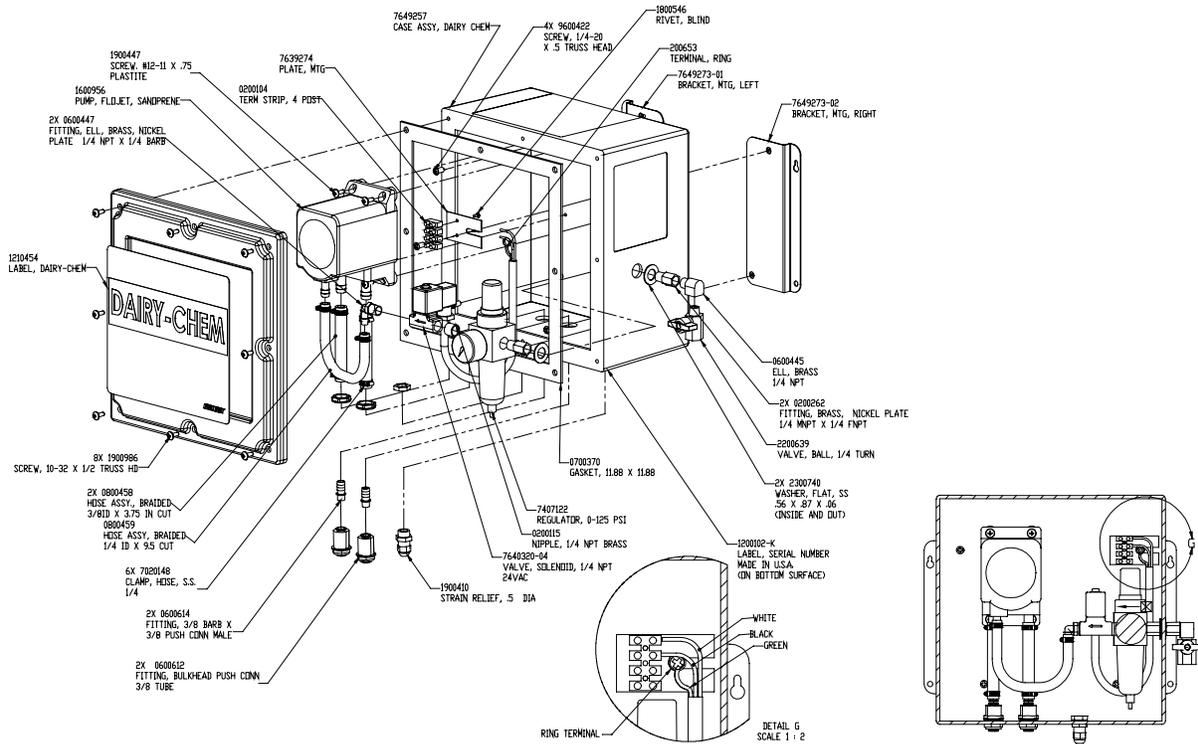
- (1) Turn the air inlet valve on (counter-clockwise till handle is vertical) to operate the pump.
- (2) This step is for vacuum switch equipped units only: The pump will run whenever there is vacuum present, or when the over-ride switch (toggle switch) is turned on. The tee-handle valve on the vacuum switch enclosure should be in the vertical position for normal operation, but can be used to by-pass the vacuum switch by turning to the horizontal position. This allows the unit to be controlled by the over-ride switch only.
- (3) The air pump will typically be easier to prime when running at a slower speed. The speed and volume delivery of the pump can be controlled by turning the regulator clockwise to increase pressure and counter-clockwise to decrease pressure.
- (4) Once the pump is primed, adjust the air pressure as needed to achieve the desired feed rate.
- (5) To stop the pump, turn the air inlet valve off (clockwise till handle is horizontal).



# SINGLE PUMP



# SINGLE PUMP (VS)



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## INSTALLATION — DUAL PUMP

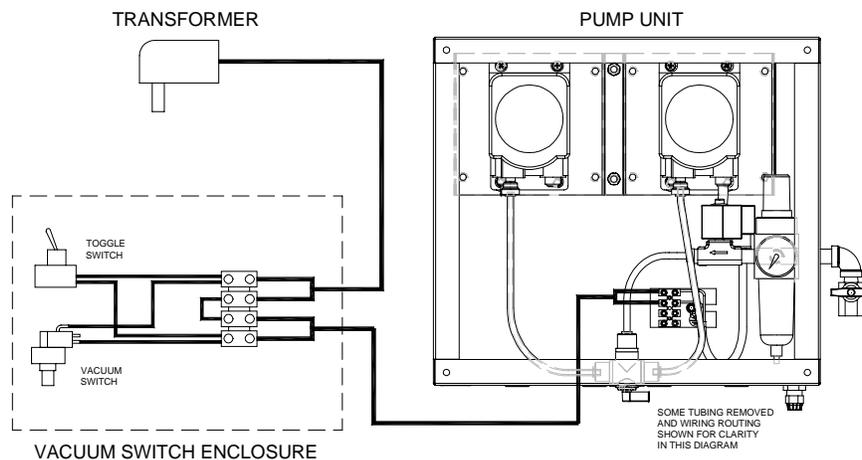
- (1) Select the desired location to mount the control box — should not be more than 6 ft (2 meters) from the floor.
- (2) Mount the control box using the hardware provided or other mounting hardware as needed.
- (3) Route the pickup line through the left side opening on the bottom of the unit and attach to the inlet push-connect fitting (on units without push-connect fittings, attach directly to left side port on bottom of pump). Route the other end of the pickup line to the chemical supply.
- (4) Route the discharge line through the right side opening on the bottom of the unit and attach to the outlet push-connect fitting (on units without push-connect fittings, attach directly to right side port on bottom of pump). Route the other end of the discharge line to the injection point.
- (5) Connect the air supply to the 1/4" NPT inlet valve on the right side of the unit. Be sure to use clean dry air only!

### *The remaining steps are for vacuum switch equipped units only*

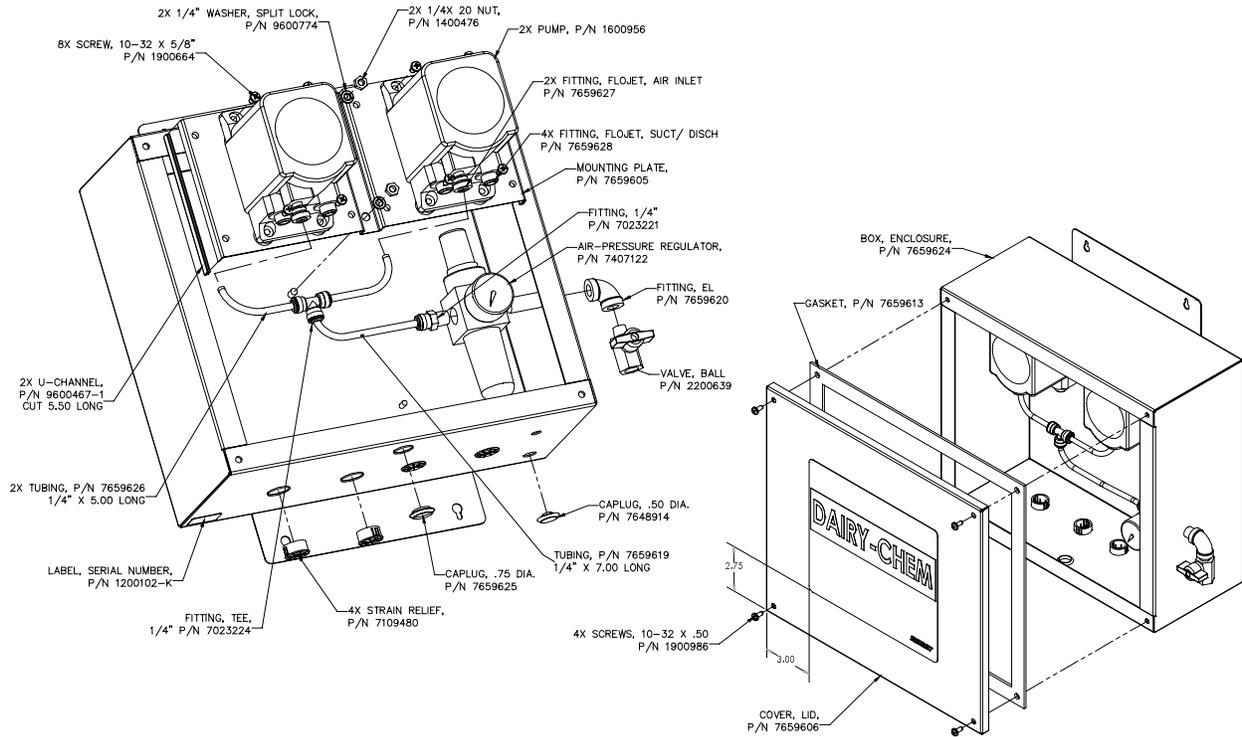
- (6) Mount the vacuum switch enclosure in a convenient location and nearby to a 115 VAC outlet.
- (7) Connect tubing from the vacuum source (pipeline) to the barb fitting on the vacuum switch enclosure. Route the tubing carefully to avoid pinching the tube at any point.
- (8) Wire the vacuum switch enclosure to the pump unit as shown in the wiring diagram below. Be sure to route the wire through the provided strain relief fittings on both the switch enclosure and pump unit.
- (9) Plug the transformer into the outlet.

## OPERATION — DUAL PUMP

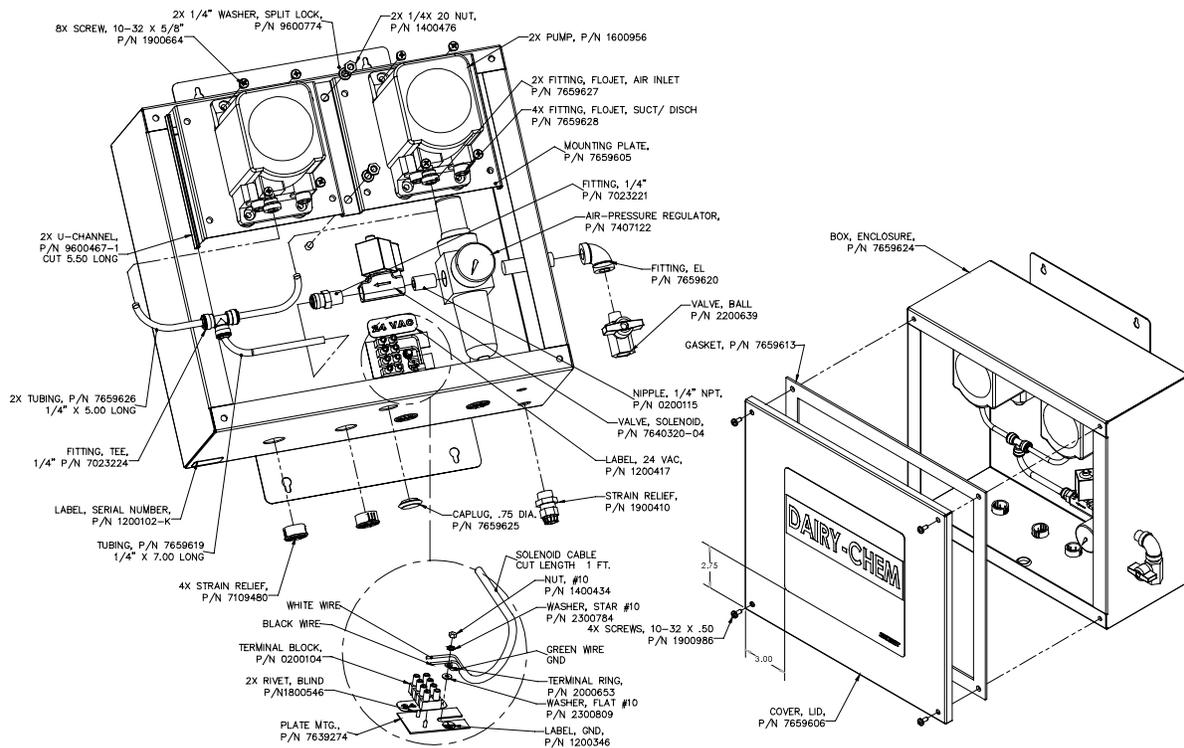
- (1) Turn the air inlet valve on (counter-clockwise till handle is vertical) to operate the pump — for units with a selector valve, choose which pump will be used.
- (2) This step is for vacuum switch equipped units only: The pump will run whenever there is vacuum present, or when the over-ride switch (toggle switch) is turned on. The tee-handle valve on the vacuum switch enclosure should be in the vertical position for normal operation, but can be used to by-pass the vacuum switch by turning to the horizontal position. This allows the unit to be controlled by the over-ride switch only.
- (3) The air pump will typically be easier to prime when running at a slower speed. The speed and volume delivery of the pump can be controlled by turning the regulator clockwise to increase pressure and counter-clockwise to decrease pressure.
- (4) Once the pump is primed, adjust the air pressure as needed to achieve the desired feed rate.
- (5) To stop the pump, turn the air inlet valve off (clockwise till handle is horizontal).



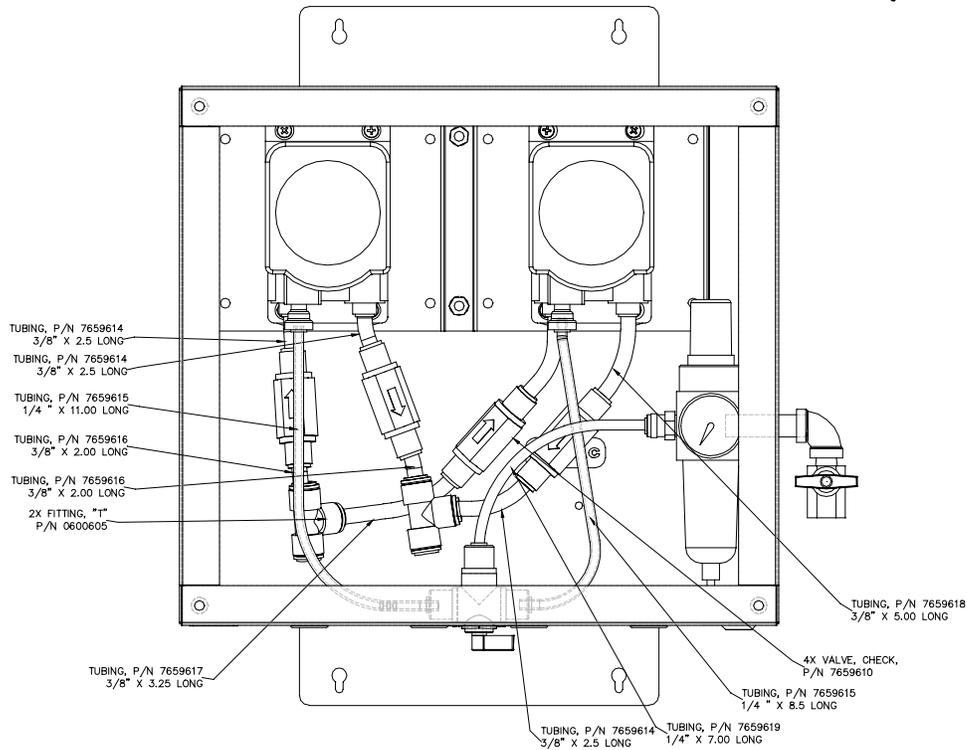
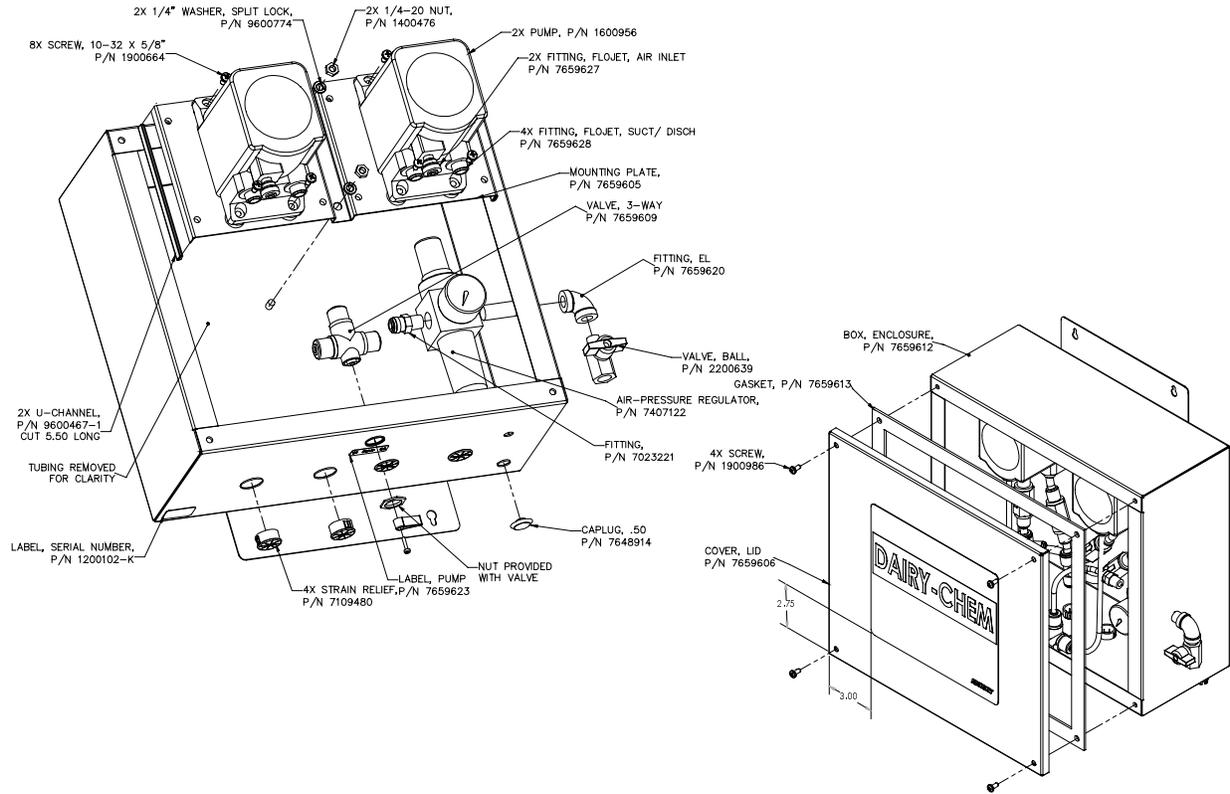
## DUAL PUMP WITHOUT SELECTOR VALVE



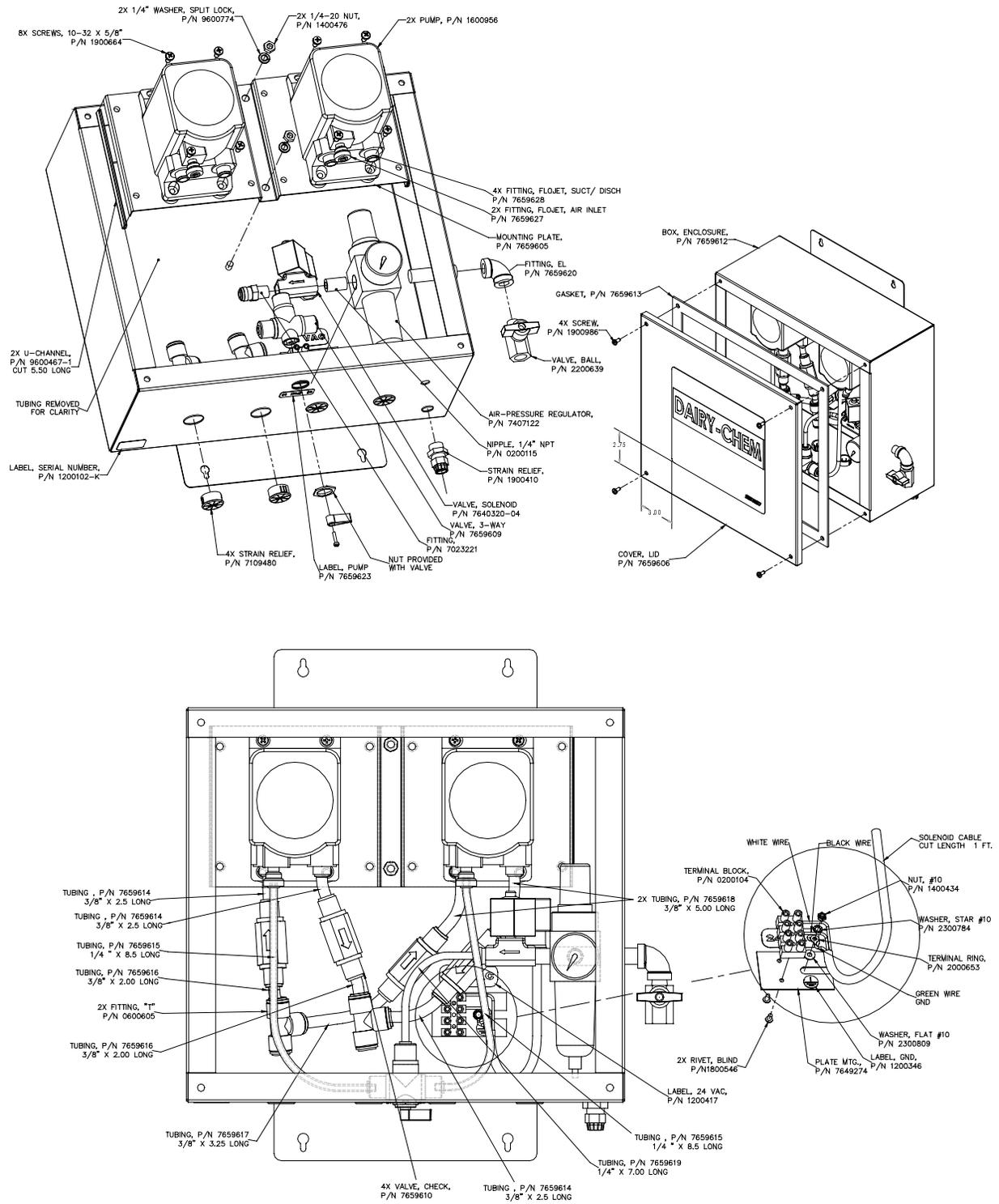
## DUAL PUMP WITHOUT SELECTOR VALVE (VS)



# DUAL PUMP WITH SELECTOR VALVE



# DUAL PUMP WITH SELECTOR VALVE (VS)



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## 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.

## TROUBLESHOOTING

<u>PROBLEM</u>	<u>SOLUTION</u>
(1) Unit will not operate.	<input type="checkbox"/> Check for proper air pressure (40 PSI or more into unit). 40 PSI on Air Gauge.
	<input type="checkbox"/> Check Air Regulator Filter for obstruction such as water, oil, or debris.
	<input type="checkbox"/> Check for plugged strainer and replace Air Regulator Filter Assembly, if necessary.
	<input type="checkbox"/> No vacuum, or leak in line (on units equipped with vacuum switch).
(2) Air passes through the pump without cycling.	<input type="checkbox"/> Repair or replace the pump.
(3) Pump cycles but no liquid is discharged.	<input type="checkbox"/> Check to see if pump is primed.
	<input type="checkbox"/> Suction line leak or obstruction.
	<input type="checkbox"/> Pump fittings loose or broken.
	<input type="checkbox"/> Suction line not submerged down into liquid.
	<input type="checkbox"/> Repair or replace the pump.

If all of the above check out okay.

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