



LIQUID LINE T-TRAP MAGNETS • PLATE & TUBE STYLE INSTALLATION AND OPERATIONS MANUAL

P.O. #: Part #: Serial #:

OPERATING PRINCIPLE

Industrial Magnetics, Inc.'s Liquid line T-Traps remove unwanted ferrous and work-hardened stainless contaminants from processing lines. They capture fine ferrous particles that are created by wear of upstream processing equipment and often pass undetected through electronic metal detectors.

Maximum magnetic efficiency is attained with low flow rates. It is easier to extract metal through low viscosity products than through high viscosity products.

T-Traps have two primary purposes: to protect vital plant equipment (pumps, dicers, mills, screens, etc.) from metal damage, and to protect product purity.



OPTIONAL CONFIGURATIONS

T-Traps are available in two styles, plate style or tube style.

The tube style models are ideal for liquids, purees and products that may contain small solids in high flow rate processing lines. Tube Style Liquid Line T-Traps are available in multi-tube or a single large tube configuration and recommended for liquids, purees, and non-fragile solids. The Tube Style Liquid Line T-Trap employs a slip-in cage of a stainless steel permanent magnetic tube(s), which captures ferrous tramp metal particles and improves the purity of the product.

Plate style T-Traps are designed for low volume applications that require gentle flow characteristics or for fragile products that may contain long, sinewy items, larger chunks and hard-to-move products such as fruit preserves, cooked meat chunks and cottage cheese.



Tube Style T-Trap



Single Plate Style T-Trap



Dual Plate Style T-Trap



Large Tube Style T-Trap



HEALTH AND SAFETY WARNINGS

GENERAL



Please be advised that in and around the application of magnetic equipment, there are potential safety concerns that can arise with sensitive medical devices:



- » Pacemaker behavior can be affected when they are near strong magnetic fields
- » Medical implants and external fixation systems can be influenced by magnetic fields
- » Hearing aid behavior may be affected when exposed to strong magnetic fields



Any individual that carries the above equipment or other sensitive medical devices should use caution when they are around or handling magnets. For more specific information the wearer should contact their physician.



Beware of pinch points from sudden attraction and unexpected movement between magnets and ferrous metal equipment components or tools.

CLEANING OPERATIONS - Take precautions during cleaning operations:



Ensure that product flow has been shut off to avoid airborne irritants and/or product contamination



Assess weight of the magnet to control movement when opening the unit



Avoid pinch points between the magnet and housing when opening and closing the unit

Use a rag or gloved hand for manual cleaning to avoid cuts or abrasions from tramp metal

1. Pinching or trapping can occur when opening and closing the unit. Do not allow the magnetic element within 24" of ferrous tools, equipment or other magnets.
2. Magnetic fields can negatively affect video screens, credit card magnetic strips, computer disks, watches, and other sensitive equipment. Do not allow the magnetic element to be close to any sensitive equipment.
3. Liquid and chemical burn hazards may be present depending on processing temperature and the products being handled or used for cleaning. Such hazards can occur during cleaning, or if gaskets are not properly seated, if defective gaskets are used, if the band retaining clamp is not properly seated, tightened, and locked, or if the clamp is inadvertently opened while processing.
4. Gasket failure can cause product to leak from the system. Inspect the gaskets for cuts or abrasions that could cause leaks. Evaluate gaskets by flexing them to ensure they are flexible and have not hardened. Be sure the gaskets fit smoothly in place and are not wrinkled or distorted.
5. Slip and fall hazards can be introduced if liquids spill on the floor when the T-Trap is opened. Prevent spills and drips from reaching the floor by using containers to catch the liquids. Personnel should wear non-skid footwear and non-skid mats should be properly located.
6. Total flow blockage or reduced flow can result from collected metal build-up inside the T-Trap. Clean the T-Trap on a regular basis to prevent the accumulation of unwanted debris.
7. Clamp failure can endanger personnel and damage equipment. Ensure the T-Trap parts fit together smoothly. The clamps must be properly seated in both grooves. The clamp's T-bolt must fully engage the pivoting yoke and it must be parallel with the body. The safety latch must engage the overthrow lever to assure that it is locked in the closed position.
8. High pressure in the line can create leaks at the gaskets. Extreme overpressures can break clamps and cause unexpected, dangerous movement of the magnet or lid. When a T-Trap is installed after a pump, never pressurize the line with all downstream valves closed.



INSTALLATION GUIDELINES

T-Traps may be mounted in vertical, horizontal or sloped positions without affecting their magnetic separation abilities. For Clean-In-Place systems installing the T-Trap in vertical lines allows total body drainage (no sump area). A waist/chest high location is ideal for ergonomics. In vertical line installations the magnet openings will always be located side-by-side.

When T-Traps are mounted in horizontal or sloped lines a sump area will always be present, so be prepared for product spillage when opening T-Traps for cleaning.

T-Trap bodies can be secured at any angle around a pipe's centerline that will allow best access for disassembly and cleaning. Body orientation may be dictated by adjacent equipment, accessibility, and the type of products being processed. Generally, side-by-side openings are easier to service but over-and-under mounting provides a bottom sump area better suited to trapping non-magnetic collected metal (rocks, stainless bolts, etc.). The T-Trap body is non-directional and cannot be installed backwards, unless non-similar line connections were ordered. To make body installation easier, lighten the body's weight by removing the magnetic element and the blank closure plate. Please read the sections "CLEANING & REASSEMBLING THE T-TRAP" before attempting. Remember not to place the magnetic element on or near any steel items or fixtures. If equipment protection is a primary consideration, install the T-Trap in front of a filler. If an electronic metal detector is in-line before the filler, place the T-Trap 18" or more ahead of the detector. The T-Trap will reduce rejects and capture particles smaller than the metal detector can sense. Install the T-Trap as far ahead of a pump's intake as possible - this allows product to minimize line pulsation by acting as a buffer.

It is not good practice to attach T-Traps to pump outlets. Pumps can generate significant pressure pulses that can damage downstream T-Traps. In these instances, install a pressure snubber to minimize the pressure surges. Many positive displacement pumps generate instantaneous line pressures sufficient to rupture lines and line components.

There can be significant hazard to personnel and property if pumps are energized with all downstream valves closed. It is recommended to install an appropriate pressure relief valve to eliminate pressure concerns.

BAND CLAMP TENSION

There are either one or two body band clamps on the T-Trap, depending on the model, that attach the cover and magnetic elements to the body. The clamps have quick release overthrow levers that are retained by safety latches. To achieve proper band clamp tension, adjust the Nylock nut on the end of the clamp's T-bolt when initially installing the T-Trap. This adjustment should be done with the _____ system at pressure. The nut should be tightened only enough to prevent product leakage. Maximum torque on the nut should never _____ exceed 20 foot-pounds. Over tightening or applying too much torque can crush the L-ring and bend the T-bolt's wrapper and the pivoting yoke.

Note that tightening the nut applies pressure to only one side of the clamp without applying equal pressure to the other side. To achieve even clamp pressure, after the nut is tightened to a point where it seals the unit and product does not leak, shut down the pump to release the line pressure, open the clamp, and then close it again. Do this any time the nut is adjusted. This equalizes the pressure around the entire clamping surface. Once a band clamp's tension is properly set, the clamp will repeat the same tension time-after-time. The clamp will stretch if improperly latched.

Be sure that the pivoting yoke correctly captures the clamp's T-bolt. The T-bolt should lie parallel with the T-Trap body, not perpendicular to it. This simple check will prevent the most common error responsible for product leakage, clamp failure and possible personnel injury. Clamp failures are dangerous and safety training is a must. Always use the lever handle to open and close the unit, not the nut.





CLEANING & REASSEMBLING THE T-TRAP

Downtime can be minimized if cleaning occurs at planned shutdowns or at product/batch changeover times. Cleaning frequency will also depend upon the amount of collected metal in the line and the production schedule. Frequent cleaning provides quicker identification of contaminants and thus faster ability to prevent their entry into the system.

Removing captured contaminants:

1. De-pressurize the line and lock out the pump before opening the T-Trap.

2. Tube-style T-Traps: Use water, low pressure compressed air or a gloved hand to move all collected metal to one side of the magnetic tubes.

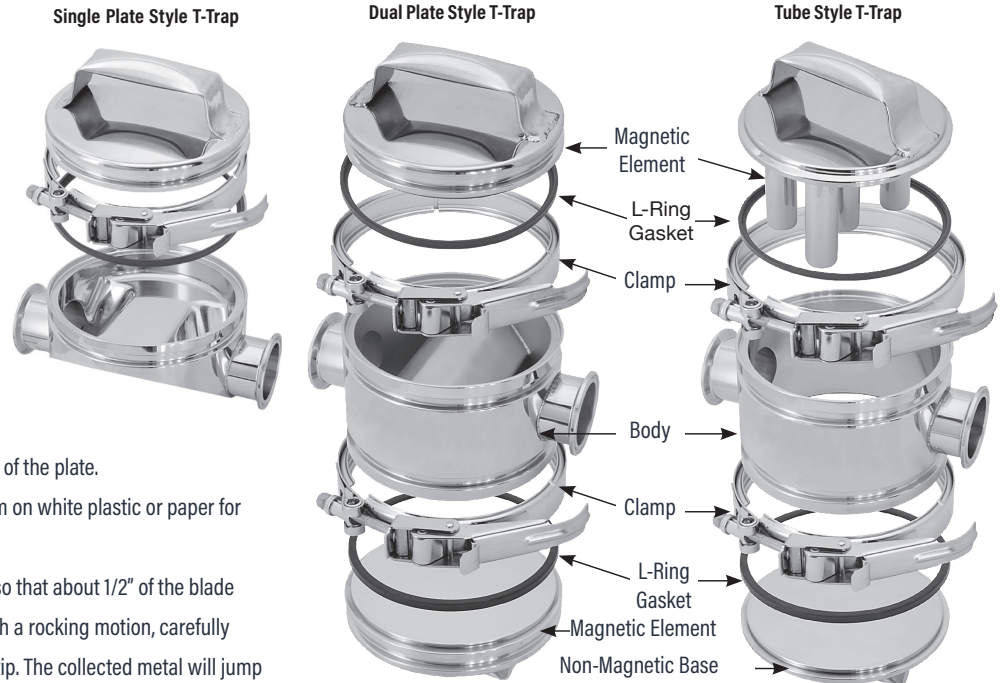
Plate-style T-Traps: Captured metal should form in two parallel rows about 1" off-center and perpendicular to the handle's direction.

3. Depending on the size and shape of the collected metal, use a gloved hand to pull the collected metal to the tip of each tube or the edge of the plate.

4. Remove the bigger pieces by hand and place them on white plastic or paper for later examination.

5. Firmly grip the blade of a flat bladed screwdriver so that about 1/2" of the blade protrudes in front of the thumb and forefinger. With a rocking motion, carefully touch each pile of collected metal with the blade tip. The collected metal will jump to the blade. Transfer the metal to the paper or plastic. Do not allow the screwdriver blade to touch the magnetic face or the face will be scratched.

6. Finish with sticky tape. It will remove the very finest particles.



After the collected metal has been removed, clean the magnets, the end cap plate, the gasket seals, the clamps and the inside of the T-Trap body before reassembling the unit. When cleaning the inside of the T-Trap body, inspect both gasket seal areas to assure that nothing is present to prevent achieving a good seal. Inspect the L-ring gaskets for surface damage. Flex, but do not stretch the gaskets to check their flexibility. Replace any gasket that has cuts, abrasions or has become hardened and is not capable of providing a proper seal. L-ring diameters are made slightly smaller than the parts they fit. Good L-rings fit smoothly and stay in place when assembled.

REASSEMBLING THE T-TRAP

SPECIAL NOTE: L-ring material expands when warm and may not fit snugly. Either allow the L-rings to cool and shrink to proper size or obtain cool (new) L-rings and set the cleaned, warm ones aside for future use. If EPDM gaskets are being used in a line that contains an oil product, the L-rings can be sticky or gooey. EPDM is not compatible with oils, including vegetable oils. Buna-N or Viton L-rings are the better choice for use with oils.

1. Place an L-ring gasket on the magnetic element's or blank closure plate's perimeter groove and smooth it into place.
2. Place an opened clamp loosely on the body groove where the magnet or blank closure plate will be attached.
3. Push the magnet or blank closure plate into the body with a twisting action and align the handle parallel with the direction of product flow.
4. Move the clamp into the mating body and magnet grooves. Tighten the clamp with the overthrow lever and insure that the safety latch fully engages the overthrow lever.
5. Check the clamp's T-bolt, where it captures the pivoting yoke. It must be parallel with the T-Trap body, not perpendicular to it; this is a common error. If the safety latch is not securely locked, release all clamp pressure and simply bend the safety latch by hand until it fully engages the overthrow lever.
6. Repeat the above actions to close the opposite side of the T-Trap if applicable to your model.

REMEMBER - THE MAGNETIC ELEMENT IS DIRECTIONAL -THE HANDLE MUST BE PARALLEL WITH THE PRODUCT FLOW.



ANALYSIS OF CAPTURED COLLECTED METAL

Captured debris should be examined with a 10–15 power magnifier to properly identify the captured particles. The naked eye cannot compete with a good magnifying glass when trying to analyze the source of the captured collected metal. Once identified, take the necessary steps to prevent future entry into the system.

Iron particles appear black or brown, stainless particles are shiny.

REPLACEMENT PARTS

Clamp life is directly proportional to usage, careless handling and line pressures. L-ring gasket life is affected by many factors. L-rings should be replaced if they are stretched, scratched, cut, stiff, brittle, lose flexibility or have assumed an improper permanent set by incorrect seating.

It is recommend that spare Clamp Assemblies & L-ring Gaskets (Food Grade Buna-N, EPDM or Viton) parts be kept in stock for unplanned replacement. Industrial Magnetics, Inc. tries to maintain spare parts in stock at all times for immediate delivery. When ordering parts, please provide the **T-Trap's Model Number and Line Size** OR the **Serial Number** (stamped on the body and the magnetic element). This information should be also be listed on Page 1 of this manual.

MAGNET DEGRADATION

The force of a permanent magnet can degrade over time and when subjected to external influences. The most common factors for loss of performance or failure include:

- » Blunt force impact such as dropping or banging on a magnet which can cause fractures
- » Temperatures exceeding the operating range of the magnet material
 - » 180°F for neodymium material
 - » 500°F for ceramic grade 8
 - » High temperature options are available
- » Exposure to electrical fields, such as generators or welding ground circuits, can result in loss of magnetism



It is recommended that magnetic devices are audited annually. IMI can provide a Magnet Audit and Plant Survey to evaluate magnetic equipment performance and assist with compliance to global industry standards; Pull Test Kits are available for self-auditing plant activity.

We believe Industrial Magnetics, Inc. offers the finest Liquid Line Magnets available today. Great pride has gone into the design and manufacture of this unit. Any comments or concerns should be directed to our Customer Service Department at 1-888-582-0821.

We appreciate the opportunity to serve you!