

ADDITIVE INJECTION



Model TPI-4T-4A-1 PORTABLE MULTI-ADDITIVE INJECTOR

FLUID TECHNOLOGY

Although suitable for other applications, the TPI-4T-4A-1 is designed specifically to produce military specification JP-8 jet fuel by injecting FSII, CI and SDA additives. Each additive is delivered continuously and is blended evenly at ratios from 4-2,500 PPM by volume. Like all Hammonds fluid powered injectors, the TPI-4T-4A-1 requires no outside power, product meters, or control of any kind. Developed specifically for the United States Air Force, hundreds of TPI-4T-4A-1 tactical injectors have performed in four wars and delivered countless millions of gallons of JP-8 fuel in virtually every climate and operating environment throughout the world.

SPECIFICATIONS

- Number of additives: 3 standard, 4 optional
- Injection Ratios:
 - Three additives: (1) 0-1,500 PPM (2) 0-65 PPM
 - Four additives: (1) 0-1,500 PPM (1) 0-275 PPM (2) 0-65 PPM
- Minimum injection ratio: 10 PPM standard
- Normal operating range: 100–600 GPM (378.4 - 2,270.6 liters per minute)
- Minimum product flow rates: 50 GPM (189.2 l) (minimums vary with line pressure)
- Product temperature: -40° F to + 250° F (-4.4° C - 121.1° C)
- Maximum product line pressure: 125 PSI (8.8 kg/cm)
(PSI max varies with injection ratios, higher pressure pumps are available as options)
- Maximum hydrostatic pressure: 350 PSI (24.6 kg/cm)
- Product viscosities: to 10,000 SSU
- Products Handled: Oils, fuels, chemicals, air slurries
- Duty cycle: continuous
- Fluid connections - product: 3" (7.6 cm) or 4" (10.2 cm) cam lock, additives: 1/4" (.6 cm) NPT or 3/4" (1.9 cm) NPT

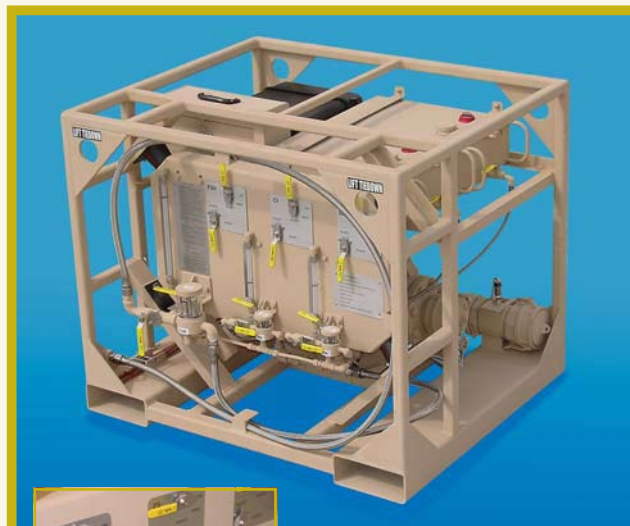
CONSTRUCTION MATERIALS

- Fluid Motor: All hard anodized aluminum with stainless steel shaft
- Injectors: All wetted parts 300 series stainless steel with Teflon trim
- Mechanical Seal: Carbon on ceramic

NOTE: Additional information on back

INNOVATION—pure and simple

To contact a Hammonds additive injection specialist,
please call (800) 582-4224.



Ratio adjustments
for each additive.



Prime and purge valve
provides a clean system
after shutdown. No
operator contact with
fuel or additive.



Calibration gauges allow
adjustment without contact
with the additive.



6-gallon (22.7 l)
CI and SDA tanks



Custom
product
connections



HAMMONDS TECHNICAL SERVICES

6807 W. Little York Houston, TX 77040
Phone (800) 582-4224 • Fax (281) 847-1857
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No External Power

The exclusive "swing vane" positive displacement fluid motor captures just enough energy from the flowing fuel to power and control the injectors. Since the system is fluid powered, it is passive in operation, starting and stopping when flow is present. The TPI-4T-4A-1 is completely proportionate to flow.

Operates Automatically

Once installed in a delivery line, the system will operate automatically without having to be turned "ON" or "OFF".

ON/OFF Operation

The TPI-4T-4A-1 is passive in that it operates when product passes through the fluid motor. When flow stops, injection stops. The system maintains the proper ratio throughout the entire operating range. If additive is not desired, a simple on/off valve is standard at each additive inlet. Additive can be turned off or on selectively at any time during operation and the unit can run indefinitely with additives in the OFF position.

No Meters

Because our fluid powered motor acts as a meter, it requires no directions, pulses or controls from outside product meters. The fluid motor responds smoothly to changes in flow rate and system pressure, maintaining accurate injection ratios over the full range of the system's operating parameters.

STANDARD EQUIPMENT

- Hammonds positive displacement driver
- 4" Cam lock type inlet/outlet with covers
- Four stainless steel fluid ends
- All stainless steel manifolding
- Adjustable-while-running stroke adjustment
- Teflon and Atlas elastomers (injectors)
- Suction calibration gauges for each additive
- Suction strainer included in each sight flow indicator
- Additive purge/prime system for all additives
- Heavy-duty mounting frame
- Operating instructions on main panel
- Instruction manual with calibration charts
- Graduated calibration bottle
- Factory loop tested at customer's conditions
- Additive lines (3), stainless steel braided lines with fittings
- Suction siphon assembly with hose for 55 gallon (208.1 l) drums of FSII
- 6 gallon (22.7 l) stainless steel tanks for CI and SDA
- MIL specification epoxy coating
- Tool kit
- Spare parts kits
- BII test kit

OPTIONAL EQUIPMENT

- Custom product connections
 - NTT flanges
 - 150# RF ANSI flanges
 - Victaulic connections
 - Threaded companion flanges
- Additional additive injector for ratios to 1,500 PPM (680.4 kg per minute)
- Custom frames
- Custom cover for storage
- Solid skid panel for operation in sandy conditions



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Ratio Stability at Low Flows

Even if startup and shut down flow rates are below stated minimums, the system can be calibrated to maintain overall ratios. Ratios for total product throughput are maintained.

Better Blending

Unlike some concepts that inject large slugs of additive at metered intervals, the TPI-4T-4A-1 dispenses a precise amount of additive continuously, eliminating gaps in the blending process. Additive is injected upstream of the fluid motor which completes the mixing process.

Additive Supply

A flooded suction is preferred for low ratio (0-50 PPM, 0-22.7 kg per minute) additives. This flooded condition is provided by elevating additive supply tanks. Higher ratio additives may be drawn from a 55-gallon (208.1 l) drum through a siphon tube. Distances from drums should be kept as short as possible.

Back Pressure

Pressure and flow rates are not significantly affected if operated within the normal operation range of the system. Factory can furnish specifications.

