

Engineering Specifications for Diesel Fuel-Oil Maintenance System

Scope:

Diesel fuel-oil maintenance system shall consist of an FM-labeled, self-contained circulating system, connected to main fuel-oil tank(s) for removal of water and particle matter. Basis of design is Fuel Technologies International, model FT-I-___-FM, Santa Maria, California.

Approvals:

System must be approved by Factory Mutual (FM) as an automated stored-diesel-fuel maintenance equipment. System must be labeled "FM APPROVED" and be listed in the FM Global Approval Guide, under Flammable Liquid Equipment. Equipment that does not satisfy this requirement will not be considered as acceptable.

Performance:

System shall be designed for nearly 100% water removal and particle filtration down to 2 micron. Each system shall have the flow rate capacity to turn over the largest connected full tank one time within 24 hours maximum. System shall be designed to allow continuous operation with brief interruptions to manually change filters and clean strainers.

Construction:

Fuel maintenance system shall be housed in a NEMA-3R steel enclosure, designed for wall or rack mounting indoors or outdoors. Enclosure shall be equipped with double doors for easy access to internal components. Enclosure shall be powder-coated and shall contain a leak detection sensor interconnected to system controller.

Components:

Fuel maintenance system shall include the following primary components:

1. Circulating pump: rotary, positive displacement gear pump coupled to electric motor of suitable size to provide desired flow rate capacity. Motor shall be open drip-proof type, 115/230Vac, 60/50 Hertz, 1 phase with thermal protection.
2. Filtration elements shall be staged to provide large particle mesh strainer, centrifuge for separation of particle and free water, coalescing filter for particle removal and 100% water separation, emulsion water removal and 2-micron particle removal. All filter elements shall be spin-on type and/or replaceable-element type.
3. Controller shall be a UL-listed assembly consisting of:
 - a) Siemens S7-224 PLC with 24 input/output and program memory. PLC shall be capable of monitoring motor contactor and overload, all stages of filtration, leak detection within enclosure, water level sensor and system pressure/vacuum.
 - b) Siemens circuit breaker, 2 pole, 16 amp rated at 480Vac.
 - c) Salzer lockable disconnect switch rated at 600Vac.
 - d) Siemens motor contactor and thermal overload, 16 amp, single phase, 115Vac, 1/2hp, Class 10.
 - e) Siemens 36 pole terminal block, 26 amp, 18-12awg.
 - f) Siemens TP070 touch-screen, Windows-based 32-bit software with RS485 interface.
 - g) Mallory signal device, audible, 120vac, slow pulse, 80-95dB.
 - h) Controller shall be programmed to allow timed operation of the fuel circulating pump and solenoid valves (when used with multiple tanks) to circulate 20-25% of the fuel tank's capacity every seven (7) days. Alternate schedule shall be programmable as directed by owner.

i) Controller shall provide audible and visual description for each alarm condition, and shall also provide one set of Form C dry contacts for remote indication of general alarm status.

j) A strip heater, with UL component recognition, shall be provided within controller compartment, 50-watt, thermostat-controlled.

Installation/Plumbing:

The supply or suction line shall be installed at the sump, or low end of the fuel storage tank, with a foot valve, 1" from the bottom. The return line shall be installed at the opposite end of the storage tank. Caution should be taken not to exceed the 15-ft. lift capability of the fuel circulation pump. Should vertical suction lift exceed 15 ft., the circulation pump shall be removed and replaced with an submersible or external pump-set in or near the storage tank. External pump shall be wired to control panel. A flow control valve and a flow meter are required to set flow at desired rate.

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