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SPECIFICATION

Fuel Oil Pumping System and Controls for Standby Power / Boiler Applications

1. GENERAL DESCRIPTION AND STANDARDS

The Safesite™ FOC FUEL OIL CONTROL SYSTEM is designed for emergency power and boiler applications. The FOC System Controls intelligently integrates fuel system monitoring and pump control functions into one simple automated package. The FOC package shall include the controller, day tanks, pumps, and valves as included in this section. Pipe and valves as shown in the Drawings and not specifically listed in this section shall be included in the installing contractors bid to provide a complete and operational system.

The system in its entirety shall be configured and provided by Core Engineered Solutions, Inc. 518-635-4343 (NY) 800-628-5502 (VA).

The Safesite™ Fuel Oil Controller (FOC) shall be provided and shall integrate the following functions into one system:

1. Control Panel Specifications:
2. Power Requirements: Power input: 230VAC 1 phase with Neutral (others voltages available).
3. Enclosure: NEMA 4X (suitable for outdoor and high corrosion areas).
4. Listings: UL508A listed and meets NEC (NPFA70) and NFPA 30 &37 requirements. Suitable for class 2, division 2, Groups B, C, D.
5. Display: 6-inch Micro-Graphic Touch Panel with *TFT* color LCD, 320 x 240 dot, 32k color display with LED backlight.
6. PLC: Micro Analog PLC with Relay Ladder Logic Programming, Real Time Clock / Calendar and battery-backed memory.
7. Twist to Release Red 60 mm Mushroom-Style Emergency Stop Button with 90 mm Identification Legend.
8. Hand-Off-Auto Switch with Tank Selection.
9. Outputs to Building Management System (BMS):
10. System Summary Alarm (1) Dry
11. System Summary Warning (1) Dry
12. Auto Dialer for System Alarms and Warnings (*optional*)
13. Analog Outputs: 2 channels 4-20 mA or 0-5 VDC
14. Modbus RTU Communications Port (configurable up to 115.2k baud)

15. Main Storage Tank Monitoring (for 1 Main Storage Tank) Including:
16. Level Probe
17. Leak Sensor
18. Product Level in US Gallons.
19. Product Level in Inches.
20. Product Level in Percent of Full Tank Capacity.
21. High Level Alarm Status.
22. High Level Warning Status.
23. Low Level Warning Status.
24. Low Level Alarm Status.
25. Interstitial (Double Wall) Leak Sensor Status.
26. Present / Historical Alarm Conditions.
27. Fill Station Annunciation and Display (optional). See Drawings.
28. The Day / Belly Tank Level Monitoring Including:
29. Level Probe
30. Interstitial (Secondary Containment) Stainless Steel Leak Sensor
31. Product Level in US Gallons.
32. Product Level in Inches.
33. Product Level in Percent of Full Tank Capacity.
34. High Level Alarm Status.
35. High Level Warning Status.
36. Low Level Warning Status.
37. Low Level Alarm Status.
38. Interstitial (Double Wall) Leak Sensor Status.
39. Present/Historical Alarm Conditions
40. Fuel Oil Supply (FOS) Pump Controls Including:
41. Motor Starters (up to 2) with Overload Protection:
42. Pump Run Status
43. Monitors Motor Starters and Overload Protection

44. Controls Pumps up to 1.5 HP, Single Phase (3 Phase is Available)

45. Programmable Start/Stop and Alarm Levels. Standard Levels are Set at ___% for High Level; ___% Pump On ; __% Pump Off; ___% Low Level.

46. Sump Leak Sensor (optional)

47. Fuel Oil Return (FOR) Pump Controls for Each Day Tank

48. Monitors Motor Starters (up to 2 total) and Overload Protection

49. Pump Run Status.

50. Controls Pumps up to 1.5 HP, Single Phase (3 Phase optional)

51. Programmable Start/Stop Levels

52. Momentary Pump Test Button

53. Filtration/Fuel Recirculation Controls

54. Monitors Filter Differential Pressure Gauge

55. Monitors Filter/Separator Water Sensor Kit

56. Programmable 24/7 Filtration/Fuel Polishing Schedule for Main Storage Tank

57. Verifies Component Operations Based on the Programmable Schedule

58. System Hardware shall be fully tested and ready for field installation. Final configuration to be performed by an authorized factory representative.

2. EXAMINATION

1. The FOC system shall not be installed until substrates and adjacent construction has been properly constructed. Verify concrete tank slab, electrical service stub-ups, ESO location, bollard/barrier installation, clearances, setbacks, and other site related work that have impact to fueling system.
2. Notify Manufacturer of any detail or design deviations as may be determined by site conditions.

3. FUEL TANK INSTALLATION

3. Install FOC system in strict accordance with the manufacturer's recommendations, and applicable fire and environmental codes. State and local permits shall be obtained prior to installation.
4. The legs of all tanks shall be anchored or grouted with non-shrink grout to the slab per manufacturer’s recommendations. Engineered resilient pads interface may be used instead of grouting in accordance with the manufacturer's recommendations.
5. Tanks shall be grounded in accordance with electrical codes. Use grounding lugs installed by tank manufacturer.
6. Tanks shall be clearly marked on all sides with warning signs "FLAMMABLE" or "NO SMOKING," tank volume, product identification, and other signs as required by local jurisdictions and applicable code.

4. ELECTRICAL SYSTEMS

1. All wiring shall be designed and installed to meet the requirements of the NEC and NFPA 70. All necessary branch circuit conduit and wiring shall be installed, providing for a stub-up at designated location to which the FOC will be mounted. From there power and control wiring shall be as shown in drawing and approved by owner/contractor.
2. Pumps and all other equipment and all other equipment used in the hazardous areas should be UL listed.

5. FIELD QUALITY CONTROL

a. Perform system inspection as outlined in manufacturer's installation manual.
b. Test fueling distribution in accordance with NFPA 30 and other applicable codes. Properly dispose of any fuel generated in adherence to environmental regulations.
c. Submit field installation inspection report to manufacturer.
d. The final FOC system installation shall be inspected by the manufacturer or its certified contractor.

6. SYSTEM ACTIVATION

a. Prior to activating the FOC system, perform the following procedure:
b. Flush system piping with grade of fuel to be used by Owner to remove any debris and foreign matter in piping prior to filling tank for the first time.
    1. Service all system filters and screens and dispose of fuel in accordance with EPA and NFPA regulations after flushing.
    2. Open valves to correct position for system operation.
    3. The Installation Contractor shall be responsible for the review of, and compliance with local requirements for system inspection, reporting and registration, as well as administrative paperwork requirements.

7. ADJUSTING AND CLEANING

a. Touch-up any abraded areas with the application of same coating used by the manufacturer. Manufacturer to include sufficient quantity of touch-up paint for this purpose.
b. Repair or replace damaged components.

8. START UP AND OPERATIONAL TRAINING

a. A factory trained technician shall be onsite to conduct system start up.
b. Perform training of owner's personnel per the materials included with the FOC system manufacturer's installation manual.

For drawings or more information contact Core Engineered Solutions at www.core-es.com
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