

# VIKING PUMP

A Unit of IDEX Corporation

Viking® Duplex Fuel Oil Systems and Control Panels

## Factory Built and Tested Solutions for Simple Installation Startup and Operation

# DFO



- 25 Years experience
- Single source responsibility
- Compact integrated system
- Mounting flexibility
- Ease of Selection
- Factory-Built / Local Support

Capacity to 284 LPM (75 GPM)

Pressure to 3,448 kPa (500 PSI)

Viscosity 1 to 500 cSt (38 to 2,500 SSU)

Temperature -20°C to +82°C (-4°F to +180°F)

**IDEX**  
IDEX CORPORATION

# Duplex Fuel Oil Systems Applications



## The Viking Advantages

### Viking Duplex Fuel Oil systems:

Factory engineered and built to order Duplex Fuel Oil systems and control panels for oil transfer applications like:

- Fueling diesel generators for backup electrical power generation
- Boosting low pressure fuel oil on oil-fired boilers and oil-fired furnaces
- Oil filtration/recirculation to ensure clean and / or water-free oil
- Fuel oil transfer from storage to day tank.

### Viking Advantages

- Experience – Viking Pump have been worldwide leaders of PD pumping solutions since 1911 and have over 25 years of engineering and manufacturing DFO systems.
- One Source-One Responsibility – With a Viking DFO set we pre-engineer, pre-plumb, and with available pre-wiring give you a complete “plug-n-play” system so you don’t have to worry about sourcing and assembling the components.
- Compact – The Viking DFO set provides you with a compact integrated system that allows you mounting flexibility.
- Ease of Selection – With Viking’s easy select software, you can design, specify, and order standard and custom DFO systems to suit your application.
- Factory-Built / Local Support – With Viking’s extensive Distributor network we can provide you with local support and start-up assistance for you Viking DFO set.

### Customer Benefits:

- Reliable fuel delivery with plumbed-and-wired standby pump
- Alternate pumps automatically minimize run time on any one pump
- Proven, factory manufactured sets built custom to your order
- UL-CSA electrical control panels
- Available with standard or UL rated pumps
- Quick access comparison sheets, specification sheets and illustration drawings
- Easily requested CAD submittal drawings
- Over 25 years experience engineering and manufacturing duplex fuel oil systems
- Easy sizing with 8-Step Selection Program  
(CD available, through your local authorized Viking Distributor)

## Typical Applications:

### Emergency Generators



### Turbine Generators



### Boilers



# Standard Equipment - Pump Sets



## Standard Equipment

Viking Heavy Duty Positive Displacement Rotary Gear or Spur Gear Pumps (2)

Flexible couplings with Orange Peel OSHA guards (2)

Motors - Totally Enclosed Fan Cooled, foot mounted, NEMA, UL, CSA (2)

Common steel baseplate shall be made of heavy gauge steel plate with 1 1/2" high drip-lip and 1/2" NPT drain (1)

### Suction Line Equipment

- Viking Lid-Ease Basket Strainers, cast iron body, 40 mesh stainless steel basket (2)
- Ball valves, 600 PSI pressure rated, full port, two piece bronze body, PTFE seat (2)
- Compound Gauges, 30" Hg-0-30 PSI 2.5" dial, bronze internals, stainless steel case, liquid filled (2)
- Gauge Valves - bronze ball valves, 600 PSI rated (2)

### Discharge Line Equipment

- Spring Check Valves, 400 PSI pressure rated, bronze body, PTFE poppet (3)
- Ball valves, 600 PSI pressure rated, full port, two piece bronze body, PTFE seat (2)
- Relief Valves - continuous bypass type, cast iron body, stainless steel spring (2)
- Pressure Gauges, 0-200 PSI, 2.5" dial, bronze internals, stainless steel case, liquid filled (2)
- Gauge Valves - bronze ball valves, 600 PSI rated (2)

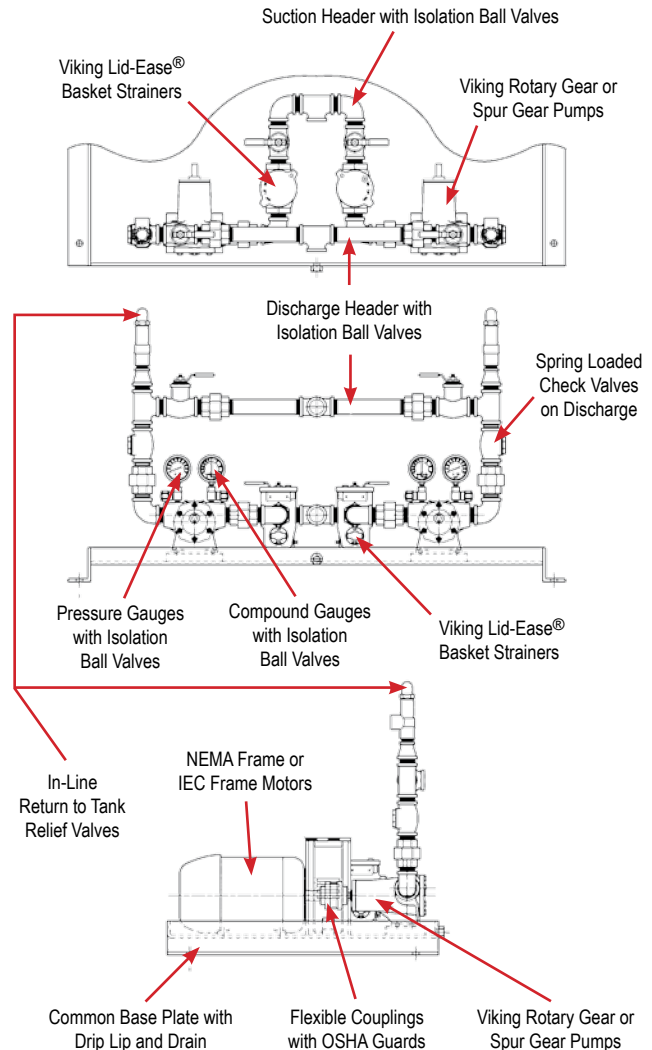
### Suction and Discharge Piping

- Schedule 40 carbon steel piping and nipples, 150 PSI malleable iron screwed fittings

Unit to be coated with Vinyl Toluene Alkyd, quick dry enamel.

**Duplex pump set to be leak tested with 100 PSI air and soap water.**

## Typical Standard Equipment Example



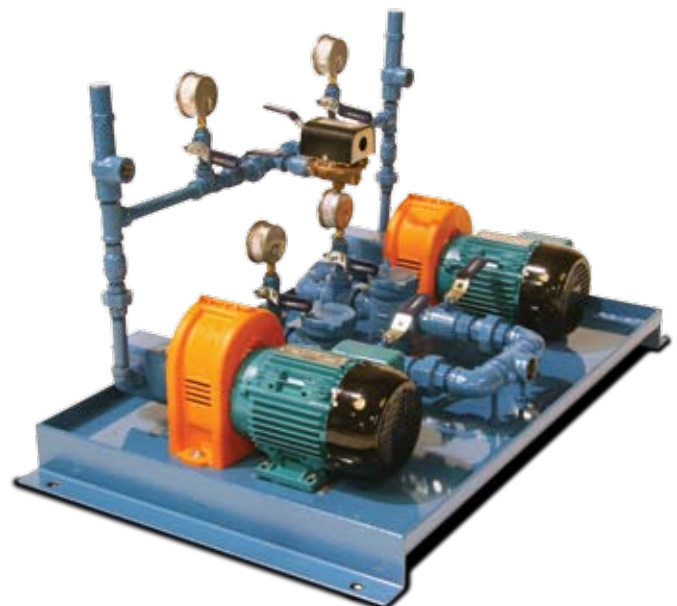
## Suction Strainers

Viking Lid-Ease® Simplex Basket Strainer (2)
Duplex Basket Strainer (1)
Y-Strainers (2)
UL-Listed Simplex Basket Strainer (2)
UL-Listed Duplex Basket Strainer (1)

Standard equipment is Viking Lid-Ease Strainer w/40 mesh.  
All strainers offered in 20, 40 or 60 mesh.

## Phase-Cycle-Voltage

1 ph 60 Hz 115 Volt
1 ph 60 Hz 230-240 Volt
3 ph 60 Hz 208-230-460 Volt
3 ph 60 Hz 575 Volt
3 ph 50 Hz 380-415 Volt



# Optional Equipment - Pump Sets



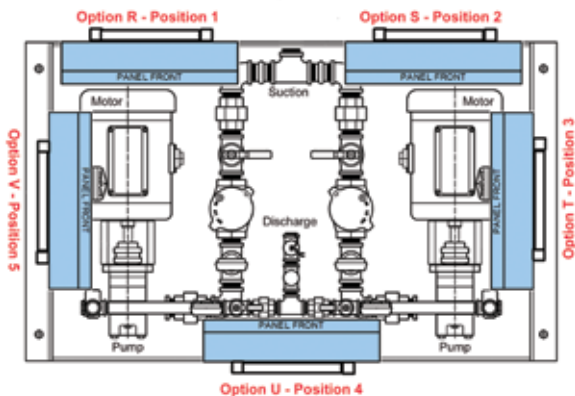
"A" or "B"	A	Pressure Switch - Single Stage, 20-200 PSI (41.4 to 1379.3 kPa) in EEMAC1 enclosure, installed
	B	Pressure Switch - Dual Stage - High and Low, 6-200 PSI (41.4 to 1379.3 kPa) in EEMAC1 enclosure, installed
	C	Pressure Control Valve Bronze body, Buna-N diaphragm, 0 to 75 PSI (0 to 517.2 kPa) c/w two shut off and one by-pass valve, installed
"D" or "E"	D	Flow Switch - Low Pressure to 100 PSI , NEMA 1, brass housing, SS vane, with junction box, c/w 120VAC, SPDT switch, installed
	E	Flow Switch - High Pressure to 1450 PSI , NEMA 7, brass housing, SS vane, less junction box, c/w 120VAC, SPDT switch, installed
"F" or "G"	F	Thermometer, industrial , bi-metal type, 3" round dial, 1/2"NPT mount -5° to 115°C (20° to 240°F), installed
	G	Thermometer, 91T100 industrial , 9" long Valox case with glass lens, 3/4"NPT mount, 0° to 115°C (30° to 240°F), installed
H	Flexible Connectors: (1) suction header, (1) discharge header, (1) return-to-tank Relief Valve, SS hose, steel nipples, supplied loose	
J	Water Removal Filter, spin-on type cartridge filter, 200 PSI, c/w disposable 10 micron element and visual indicator, installed	
K	Galvanized Base Plate	
L	4" Dial Guages - (2) Compound 30"Hg-0-30PSI & (2) Pressure 0-200 PSI	
"M" or "N"	M	UL-Listed Ball Valves, Strainer(s), and Relief Valves
	N	Stainless Steel Ball Valves and Check Valves (instead of standard bronze)
O	Turbine Flow Meter - installed	
P	Viton® Seals in Pumps (instead of Buna-N)	
Q	High Efficiency Motors (Available for 3 phase 1 HP and larger)	
"R" or "S" or "T" or "U" or "V"	R	Control Panel Mounted & Wired on Pump Set - Position 1
	S	Control Panel Mounted & Wired on Pump Set - Position 2
	T	Control Panel Mounted & Wired on Pump Set - Position 3
	U	Control Panel Mounted & Wired on Pump Set - Position 4
	V	Control Panel Mounted & Wired on Pump Set - Position 5
W	Hand Priming Pump - Piped c/w isolation valves	
X	Magnetic Float Switch w/Alarm for Drip Tray Leak Detection	
Y	Header for Return-to-Tank Relief Valves	

UL Listed Pumps

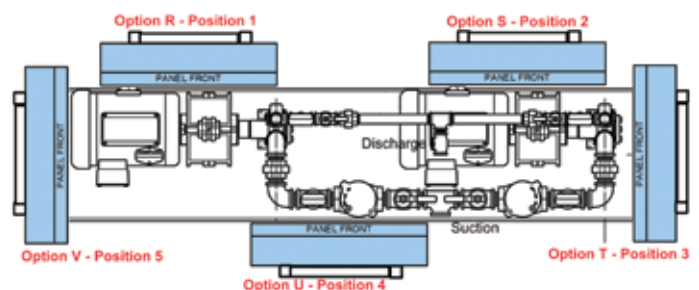
Cast Steel Pumps (4193 Series)

Consult factory for other options not listed

Control Panel Mounting and Wiring to Pump Set - (Side-by-Side Units)



Control Panel Mounting and Wiring to Pump Set - (F & FH In-Line Units Only)

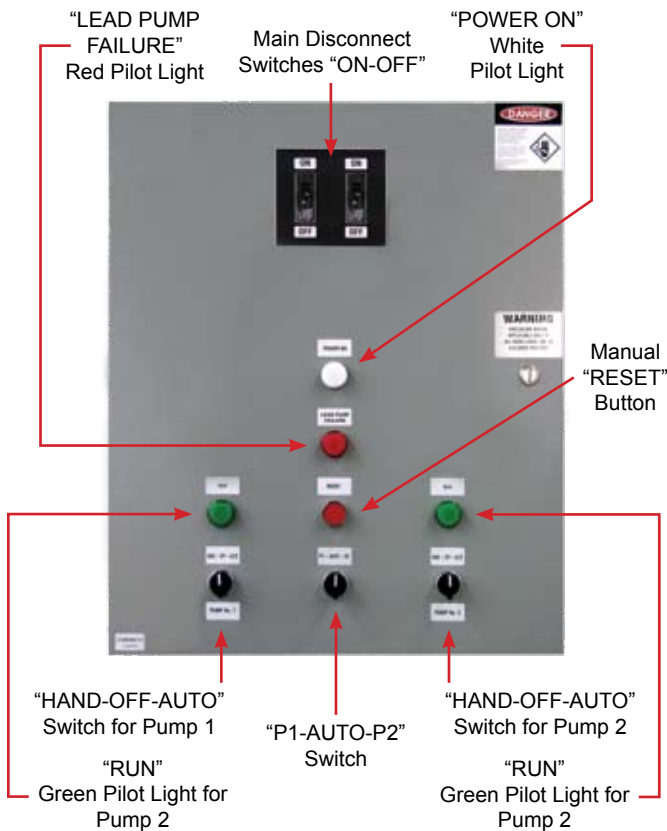


# Standard Equipment - Control Panels



## Standard Equipment:

- NEMA/CSA 1 enclosure
- Single pole circuit breaker (2) c/w through the door operation (120 volt) or individual disconnect switches, motor protectors and transformer (208-575 volt)
- Magnetic motor starters (2)
- Hand-Off-Auto selector switches (2)
- Power on pilot light (white)
- Run pilot light (green) (2)
- Terminal Strip
- Provision to connect 3 float switches (normally closed)
- Control circuit fuse
- Lead pump failure pilot light & manual reset, lag pump start
- P1 - Auto - P2 alternating selector switch



Standard control panel for Duplex Fuel Oil Pump Set is NEMA1 enclosure / CSA Listed. For USA customers, the panel is standard with UL508 Listing (see option Q in optional equipment)

### Customized Packages to Your Specifications

Consult our Factory Applications Engineers to help us build the fuel oil system to meet your applications needs, with specific brands or specifications of:

- Motors
- Special Painting
- Filtration
- Valves
- Custom Nameplates
- Gauges
- Piping and Fittings
- Solenoid Valves
- Controls

## Optional Equipment: Control Panel Chart

A	Motor run signal NO/NC - 1 per pump
B	Motor tripped red lights (2)
C	Motor tripped NO/NC signals (2)
D	High pressure cut out - red pilot light and manual reset
E	Low pressure cut out - red pilot light and override timers (2) (manual reset)
F	High pressure alarm signal
G	Low pressure alarm signal
H	Type ADB - 2 float switches, signal from generator and high level red light
I	Buzzer and silence push button
J	NEMA / CSA 2 enclosure - drip proof
K	NEMA / CSA 12 enclosure - oil & dust tight
L	NEMA / CSA 4 enclosure - water tight
M	Low flow signal to start lag pump c/w timers (2), red pilot lights and reset push button
N	Low level alarm signal and red pilot light
O	High level alarm signal and red pilot light
P	Low flow alarm signals (2)
Q	UL508 Listed Panel (Standard on USA Panel - Optional for Canadian panel)
R	Stop pump level main tank alarm signal and red pilot light
S	Low-level alarm signal and red pilot light (specify function)
T	High-level alarm signal and red pilot light (specify function)
U	Momentary test button
V	Key lock
W	Provision to connect valve (each)
X	Main disconnect for single phase controller
Y	Overload reset push-button (or handle)
Z	No alternator
1	NEMA 3R double door enclosure
2	Emergency push button shut-off switch
3	Time delay on Magnetrol contact (each, specify contact)
4	Main disconnect for three phase controller in lieu of pump disconnect

Consult Factory for other control panel options.



A Unit of IDEX Corporation

# Worldwide Leader Since 1911 for Positive Displacement Pumping Solutions for Industrial, OEM, and Sanitary Applications.

## Innovation and Experience

Viking Pump has been a pump industry leader and innovator since its founding in 1911. We continue to build on our ever growing experience delivering innovative new pumping solutions, including custom designs, to many thousands of customers who use millions of Viking® pumps in some of the world's toughest applications.

## Broad Performance Range

**Capacity:**

0.5 to 360 M<sup>3</sup>/Hr (0.1 to 1600 GPM )

**Pressure:**

0 to 172 Bar (0 to 2500 PSI)

**Temperature:**

-40°C to 370°C (-40°F to 700°F)

**Viscosity:**

0.5 to 1,000,000 cSt (28 to 4,500,000 SSU)

## Ultimate in Sealing Solutions

Viking's offering of packing, component mechanical seals, cartridge seals, and sealless Mag Drive technology provides the best choices for sealing flexibility needed to provide your application a customized sealing solution every time - saving you money, time, and unplanned downtime.

## Material Options Matched to Application

Viking's dedicated iron and alloys foundries provide pump construction materials from cast iron to Alloy C. Application-specific materials of construction extend pump life significantly, while reducing maintenance and unplanned downtime, which enables increased production and a better bottom line.

## Liquid Integrity Protection

Viking has developed multiple positive displacement pump principles to protect shear-sensitive liquids, and low-shear options to prevent damage to fibers, polymers, and solids. Full-jacketing options provide precise temperature control throughout the pump. The Viking Mag Drive® and other seal options prevent fluid contact with air, assuring liquid integrity.

## Local Applications and Engineering Support

Over 245 Authorized Viking Pump Distributors in 68 countries provide local application support and service, backed by Viking Application Engineers and Viking Region Managers strategically located around the world.

## Quality Manufacturing

Viking uses ISO9001-2000, ISO14001, Six-Sigma, and Lean/Kaizen in its worldwide manufacturing and assembly processes to remove waste, reduce development costs, and deliver superior products on schedule. Dedicated Viking foundries and manufacturing facilities utilize state-of-the-art CNC equipment to assure unmatched quality is built into every pump.

## Custom Designed Solutions

Viking has provided custom designed pumps to end-users and OEMs since its first pump in 1911, when Viking invented the gear-within-a-gear pumping principle to remove water from a rock quarry. Today, enabled by Viking's engineering staff, extensive applications experience, and in-house foundries, more than 20% of Viking's sales are new Viking designs, or pumps designs derived from more than 1000 Viking catalog pumps with more than 40,000 active configurations. So, whether you are an end-user or an OEM, Viking can provide custom designed pumping solutions to meet your specific needs.



**For more information, contact your local authorized Viking Pump Distributor or contact Viking at:**

### VIKING PUMP, INC.

A Unit of IDEX Corporation  
406 State Street  
Cedar Falls, Iowa 50613-0008 U.S.A.  
Telephone: (319) 266-1741  
Fax: (319) 273-8157  
Email: info.viking@idexcorp.com  
Web site: www.vikingpump.com

### VIKING PUMP OF CANADA INC.

A Unit of IDEX Corporation  
P.O. Box 398  
Windsor, Ontario N9A 6M3 Canada  
Telephone: (888) 845-7867  
Fax: (519) 256-5070  
E-mail: cinfo@idexcorp.com  
Web site: www.vikingpumpcanada.com

#### LATIN AMERICA

D.F. Mexico C.F.  
Phone: +52 (5) 5255-1357  
Fax: +52 (5) 5255-1356

#### MIDDLE EAST

Dubai - UAE  
Phone: +971-4-2257978  
Fax: +971-4-2259796

#### ASIA-PACIFIC GROUP

China - Beijing  
Phone: +86-10-6522-7567/27  
Fax: +86-10-6522-7563

#### ASIA-PACIFIC GROUP

China - Guangzhou  
Phone: +86-20-3886-6156  
Fax: +86-20-3886-2776

#### EUROPE

Shannon, Ireland  
Phone: +353 (61) 471933  
Fax: +353 (61) 475046

#### ASIA-PACIFIC GROUP

Singapore  
Phone: +65-6763-6633  
Fax: +65-6764-4020

#### ASIA-PACIFIC GROUP

China - Shanghai  
Phone: +86-21-5241-5599  
Fax: +86-21-5241-8339

#### ASIA-PACIFIC GROUP

India - Mumbai  
Phone: +91-22-6678-0048/53  
Fax: +91-22-6678-0055