

Packaged Pump Sets

SPS Series: Enclosed Design
SKS Series: Skid Design

for diesel/fuel oil application

providing a reliable

fuel source for

diesel and turbine

engine driven

equipment and

oil fired boilers

model & accessory source guide

Price List 4A60408N Effective October 23, 2009 Supersedes 4A60408M Effective June 30, 2008

Pump Set Source Guide

Price Book #4A60408N
 Prices Effective October 23, 2009
 Prices FOB Springfield, Illinois
 Prices subject to change without notice

To order specify:

- Quantity
- Basic SPS/SKS model
- Optional equipment by number
- Be sure to include all pertinent information such as voltage ratings



WARNING: Do not use with gasoline. This Pump Set is not meant for use with gasoline nor with other flammable liquids having a flash point less than 100°F. Use with gasoline or use with any flammable liquids at a temperature exceeding the flash point of that liquid, presents an immediate explosion and fire hazard. Do not use the Pump Set at a temperature exceeding the flash point of its contents.

APPLICATION GUIDE

Consult the *Standard Equipment* list on page 3 and select the SPS/SKS pump set model that is closest to your requirements. When ordering specify Model, Options, and Voltage/Power Supply. Keep in mind:

- Specify the SPS/SKS-10 Model for relatively simple single pump applications to 10 GPM, .75 HP (larger SPS/SKS package may be required with additional options).
- Specify SPS/SKS-25/-55 Models for relatively large and/or complex single pumps, or with progressively more complex or large duplex or multiple pumps.

Use the...

Super-XL pump (standard 2 GPM pump and options 400-417) for applications where the pump starts and stops on demand, such as for automatic tank refilling. Use for viscosity to 1000 SSU. Use also for high pressure applications up to 2500 PSI.

Cast iron gear pump (options 418-428) for continuous duty applications, where the pump runs for extended periods of time. Use for boiler feed loop applications. Use also for noise sensitive applications. Viscosity range to 5000 SSU or higher with slow speed motor. Option 418, 420, 422, 424, 426, 428 to 100 PSI.

SPS Series:

Fully enclosed, freestanding design is space saving, tamper proof and can be installed outdoors (See Option 181). Interior space limitations limit accessory selection and pump size.

SKS Series:

Traditional skid design, open construction, hard piped. Great design flexibility accommodates wide range of accessories, pump sizes. Indoor installation only.

Cabinet/Skid Selection...

Simplex **SPS/SKS Packaged Pump Sets** are functionally sized. That is, choose the cabinet/skid size that accommodates the pump capacity/accessories required.

SPS-10: Simple single pump applications (up to 10 GPM - .75 HP), limited accessories

SPS-25: Complex single pump (up to 25 GPM, 1.5 HP) applications involving starters and level controllers,
 – or –
 simple duplex (up to 17 GPM - 1HP) and triplex pump (up to 2 GPM - .5 HP) applications involving starters and duplex controller

SPS-55: Complex and large, single pump (up to 35 GPM - 5 HP) applications involving starters and level controls
 – or –

complex duplex (up to 25 GPM - 2 HP), triplex (up to 7 GPM - 1 HP), quadplex pump (up to 2 GPM - .5 HP) applications involving starters and controllers

SKS: Size and complexity is dependent on available site space, rated TYPE 1 indoor

Engineered larger pump packages available. Contact Simplex.

Accessories Codes...

SPS/SKS Packaged Pump Sets are priced on the facing page in various accessory configurations as follows:

- **BS:** Basic, single pump
- **SS:** Super, single pump: includes essential options
- **BD:** Basic, duplex pumps
- **SD:** Super, duplex pumps: includes essential options
- **ED:** Engineers specification, duplex pumps: includes thorough selection of options

	SPS-10	SPS-25	SPS-55
SINGLE Basic (-BS)	1,716.00	2,802.00	3,979.00
Super (-SS)	2,789.00	4,005.00	5,187.00
DUPLEX Basic (-BD)		4,933.00	6,520.00
Super (-SD)		9,060.00	10,444.00
Engineer Specifications (-ED)		11,981.00	13,769.00

STANDARD EQUIPMENT

Note: All base prices include standard 2 GPM, 1/3 HP, 115V AC pumps. Add optional pumps and motors to these base prices as required.

All SPS/SKS Pump Sets include containment sump with leak sensor. Standard SPS sets are Nema-1 indoor but can be ordered Nema-3R (See Option 181). SKS sets are Nema-1 indoor only.

SINGLE PUMP

Basic (-BS)

- Super-XL 2GPM, 1/3HP, 115V AC pump
- Opt. 191, containment sump leak sensor

Super (-SS)

- Super-XL 2GPM, 1/3HP, 115V AC pump
- Opt. 260, door mounted disconnect switch with interlock
- Opt. 768, single-phase starter with coil wired to terminal block
- Opt. 087, shut-off valves on inlet and outlet
- Opt. 095, pressure relief valve
- Opt. 070, check valve
- Opt. 191, containment sump leak sensor

DUPLEX PUMP

Basic (-BD)

- Super-XL 2GPM, 1/3HP, 115V AC pump
- Opt. 345, automatic duplex pump controller
- Opt. 070, check valve
- Opt. 087, shut-off valves on inlet and outlet
- Opt. 191, containment sump leak sensor

Super (-SD)

- Super-XL 2GPM, 1/3HP, 115V AC pump
- Opt. 345, automatic duplex pump controller
- Opt. 070, check valve
- Opt. 260, door mounted disconnect switch with interlock
- Opt. 768, single-phase starter
- Opt. 087, shut-off valves on inlet and outlet
- Opt. 095, pressure relief valve
- Opt. 191, containment sump leak sensor

Engineer Specifications (-ED)

- Super-XL 2GPM, 1/3HP, 115V AC pump
- Opt. 345, automatic duplex pump controller
- Opt. 070, check valve
- Opt. 260, door mounted disconnect switch with interlock
- Opt. 768, single-phase starter
- Opt. 087, shut-off valves on inlet and outlet
- Opt. 095, pressure relief valve
- Opt. 060, fuel strainer
- Opt. 100, pressure gauge with isolation hand valve, each pump outlet
- Opt. 101, vacuum gauge with isolation hand valve, each pump inlet
- Opt. 285, loss of flow alarm/lag pump activate
- Opt. 191, containment sump leak sensor

Consult Simplex for cabinet size when multiple options are required.

4 Mechanical Options

Option Description

015	Auxiliary hand pump, piston type, 20 gallons per 100 strokes. Requires SPS-55 or SKS-55 upgrade. Self-primers to 6 meters (20 feet) of lift. (1" NPT)	810.00
060	Fuel strainer	
	a) For use with standard 2-5 GPM pumps	151.00
	b) For use with optional 7-25 GPM pumps (options 400-428).....	205.00
	c) For use with pumps larger than 25 GPM (options 428-432)	251.00
062	Duplex strainer with selector valve, SPS-50 or SKS only. No break transfer. Inactive strainer may be removed for cleaning.	
	a) 1" NPT	2,468.00
	b) 1½" NPT	4,567.00
	c) 2" NPT	7,589.00
070	Check valve	
	a) For use with 2-17 GPM pumps.....	151.00
	b) For use with option 417; 25 GPM pump and larger	209.00
080	Solenoid valve. For AC systems. Specify voltage.	
	a) ½" NPT, for use with standard 2 GPM pump or option 420, 422: 3, 5 GPM pumps.....	520.00
	b) ¾" NPT, for use with option 400, 410, 415: 7, 10, 17 GPM pumps	540.00
	c) 1" NPT	1,152.00
	d) 1¼" NPT, for use with option 417: 25 GPM pump	1,242.00
	e) 2" NPT	1,574.00
083	Solenoid valve, as above, for DC systems. Specify voltage.	
	a) ½" NPT	670.00
	b) ¾" NPT	1,035.00
	c) 1" NPT.....	1,274.00
087	Manual shut-off valve, ball type	
	a) ½", bronze	44.00
	b) ¾", bronze	84.00
	c) 1", bronze.....	107.00
	d) 2", bronze.....	167.00
	e) 3", bronze.....	533.00
088	Manual shut-off valve, ball type	
	a) ½", fire rated	170.00
	b) ¾", fire rated	302.00
	c) 1", fire rated.....	400.00
	d) 2", fire rated.....	455.00
	e) 3", fire rated.....	678.00
089	Needle valve, 1".....	638.00
093	Fusible link valve, self-closing when acted upon by 165°F or greater. Supplied loose for remote installation or installed on tank as specified.	
	a) 1½" NPT	818.00
	b) 2" NPT.....	992.00
	c) 3" NPT.....	1,510.00
095	Pressure relief valve.	
	a) For use with standard 2 GPM pump or option 420, 422: 3, 5 GPM pumps.....	271.00
	b) For use with option 400, 410, 415: 7, 10, 17GPM pumps	323.00
	c) For use with option 417: 25 GPM pump.....	455.00
097	Back-pressure regulating valve.	
	a) 1" NPT	1,806.00
	b) 1½" NPT	2,908.00
100	Pressure gauge with isolation hand valve, installed on pump outlet; oil filled	
	a) 2"	221.00
	b) 4"	263.00
101	Vacuum gauge with isolation hand valve, installed on pump inlet; oil filled	
	a) 2"	221.00
	b) 4"	263.00
103	Flow gauge, in line with pump, to 30 GPM	759.00

Option	Description	
104	Ball motion flow indicator.....	385.00
105	Temperature Gauge	221.00
106	Stainless steel braided flex hose	450.00
107	Vibration isolator set	150.00
181	Weatherproof Modification, SPS-only.	
	a) SPS-10.....	345.00
	b) SPS-25.....	785.00
	c) SPS-55.....	979.00
191	Leak sensor (standard N/C for SPS/SKS containment sump).....	371.00

Control Devices and Alarms

260	Disconnect switch with door interlock for main power inlet connection. Guarded terminals for line connections, pad lockable handle mechanism interlocked to prevent opening of door until switch is turned "Off."	302.00
261	"On-Off" system circuit breaker with short circuit trips.	
	a) Single pole.....	194.00
	b) Three pole.....	487.00
262	50VA, 480/240/208: 120, single phase, control power transformer.....	388.00
271	Pilot light.....	104.00
281	"Pump Run-Off-Automatic" operation mode selector switch. (For option 345: Duplex Pump Systems, order two.)	291.00
285	Loss of flow alarm. Sensor detects fuel flow from pump and activates alarm if flow is lost while pump is running. Adjustable sensitivity and time delay. (For option 345: Duplex Pump Systems, order two.)	991.00
286	Differential pressure switch for fuel strainer	551.00
298	Control relay. Plug-in type. 3 PDT, 10A, 240V AC, 115V AC or 24V DC.....	144.00
334	Alarm horn.....	324.00

Level Controllers, Gauges, Fill Controllers

Controllers, gauges installed in SPS/SKS Pump Set for control of pumps and /or monitoring of remote tanks.

TC-25	Digital level indicator, 115V AC, for local or remote installation with 4-20mA output	1,688.00
226	Nema 4X, poly construction, wall-mount enclosure for TC-25 (indicator installed)	217.00
227	NEMA 3R Steel enclosure for use with TC-25	408.00
2010	Simplex SST Analog Level Controller (LC300) including 5-point level indicator, differential pump control (pump-in or pump-out), low level alarm/contacts, high level alarm/contacts, high level override shut-off, pump h-o-a switch, pump test push-button, power available indicator, pump running indicator. Can be used with duplex pump controller, Option #345. Includes transmitter assembly for installation in remote tank, requires 4" fitting. Specify tank depth	1,376.00
2011	Simplex PLC Level Controller, used in conjunction with Option 349 PLC based duplex pump controller, including 5-point level indicator, differential pump control (pump-in or pump-out), low level alarm/contacts, high level alarm/contacts, high level override shut-off, pump h-o-a switch, pump test push-button, power available indicator, pump running indicator. Can be used with duplex pump controller, Option #345. Includes transmitter assembly for installation in remote tank, requires 4" fitting. Specify tank depth	2,046.00
2015	Option for SST level controller: tank leak sensor and alarm. Includes leak sensor float switch or optical sensor. Specify dimensions	443.00
2016	Nema 3R wall-mount enclosure.....	745.00
2017	Nema 1 wall-mount enclosure.....	532.00

6 Duplex Pump Systems continued

Option Description

Duplex Pump Systems

Duplex pump options are used to increase the reliability of a pumping system through the addition of a second, backup pump and level control. In a duplex system, one pump is designated the "lead" pump and the other is the "lag" pump. The lead pump automatically refills the tank over the tank's normal operating range of 50% to full. Normally, once the tank has been initially filled, the fuel level should never drop below 50%. Less than 50% is indicative of either a failure of the lead pump or consumption in excess of pump capacity. The lag pump and its separate level controller, acting as a backup senses a drop in fuel level below 50% and starts the lag pump, which then continues to run, along with the lead pump, until the tank is full.

When ordering, remember that duplex systems include two motor-pumps and therefore require a quantity of two of any option related to the motor or pump, such as valves, strainers, etc.

345	Multifunction duplex pump controller system providing selectable operating modes, including:	
	• Automatic lead pump alternating with automatic lag pump backup	
	• Manual lead pump selection, automatic alternating, automatic lag pump backup	
	• Automatic twin pump operation (both pumps run simultaneously) automatic level control backup	
	• Manual operation	
	Basic System includes the following:	
	• Mode selector switch	
	• Pump running indicators for each pump	
	• Two 1/3 HP, 120V, 2GPM pumps, with check valves	1,930.00
285	Sensor to detect pump flow and indicate failure of pump. Use with duplex pump controller to start lag pump and activate alarm. (Order two for option 345: Duplex Pump Systems.).....	991.00
346	Running time meter, one for each pump. (Order two for option 345: Duplex Pump Systems.)	255.00
347	Manual duplex pump selector switch. Used to select one of two pumps or both pumps for automatic operation. In single pump mode, off-line pump not available for automatic operation. Includes:	
	• Selector switch with positions "Alternate" or "Both"	
	• Pump running lights	
	• Two 1/3 HP, 120V, 2 GPM pumps, with check valves	1,202.00
349	Basic PLC based duplex controller	2,822.00

Pumps and Motors

Note: Following optional pumps and motors are in lieu of and add to basic unit prices. Do not subtract price of pump and motor included in basic price. Pump capacity at 1725 RPM. 50 Hz operation reduces capacity to 83%.

Super XL Pumps

399	2 GPM pump (this is the standard pump <u>included</u> in basic price)	N/C
400	7 GPM pump in lieu of 2GPM basic unit pump. Requires a 1/2HP motor not included in price. (3/4" NPT)	417.00
410	10 GPM pump in lieu of 2GPM basic unit pump. Requires a 3/4HP motor not included in price. (3/4" NPT)	534.00
415	17 GPM pump in lieu of 2GPM basic unit pump. Requires a 1HP motor not included in price. (3/4" NPT)	1,052.00
417	25 GPM pump in lieu of 2GPM basic unit pump. Requires a 1 1/2HP motor not included in price. (1" NPT inlet, 3/4" NPT outlet)	1,555.00

Series 420 Pumps

High performance cast iron/steel rotor pump for use with heavy fuel or continuous circulation systems where pump runs virtually nonstop. HP is minimum motor size. UL Listed. Consult Simplex for specific applications at 50 psi.

418	1.8 GPM, Standard 1/3 HP	1,035.00
420	3 GPM, 1/2 HP.....	1,035.00
422	5 GPM, 3/4 HP.....	1,202.00

Series 500 Pumps

High performance cast iron/steel rotor pump for use with heavy fuel or continuous circulation systems where pump runs virtually nonstop. HP is minimum motor size. Consult Simplex for specific applications at 50 psi.

501	1 GPM, Standard.....	560.00
503	2 GPM, Standard.....	588.00
505	3 GPM, 1/2 HP.....	605.00
510	10 GPM, 3/4 HP	1,214.00
520	17 GPM, 1 HP.....	1,280.00
530	25 GPM, 1 1/2 HP	1,494.00
540	35 GPM, 2 HP.....	1,546.00
600	1/3 HP, 115V AC, single phase, 60 Hertz motor (this is the standard motor <u>included</u> in basic price)	N/C
605	1/3 HP, 230V AC, single phase, 60 Hertz motor, ODP	260.00
615	1/3 HP, 110V AC, single phase, 50 Hertz motor, ODP	518.00
616	1/3 HP, 220V AC, single phase, 50 Hertz motor, ODP	518.00

Option	Description	
621	1/3 HP, 230/460V AC, 3-phase, ODP motor with starter. Specify voltage.	1,291.00
622	1/3 HP, 230/460V AC, 3-phase, TEFC motor with starter. Specify voltage.	1,574.00
630	1/3 HP, 12V DC motor	1,366.00
635	1/3 HP, 24V DC motor	1,366.00
645	1/3 HP, 115V AC, single phase, 60 Hertz motor, TEFC	568.00
700	1/2 HP, 115V AC, single phase, 60 Hertz motor, ODP	240.00
705	1/2 HP, 230V AC, single phase, 60 Hertz motor, ODP	320.00
715	1/2 HP, 110V AC, single phase, 50 Hertz motor, ODP	691.00
716	1/2 HP, 220V AC, single phase, 50 Hertz motor, ODP	691.00
721	1/2 HP, 230/460V AC, 3-phase, ODP motor with starter. Specify voltage.	1,408.00
722	1/2 HP, 230/460V AC, 3-phase, TEFC motor with starter. Specify voltage.	1,822.00
730	1/2 HP, 12V DC motor	1,366.00
735	1/2 HP, 24V DC motor	1,406.00
745	1/2 HP, 230/115V AC, single phase, 60 Hertz motor, TEFC	750.00
768	Single phase magnetic motor starter with overload relay. Includes disconnect switch with short circuit protection. For 115V AC or 230V AC, single phase motors.	1,326.00
770	3-phase magnetic motor starter with overload relay. Includes disconnect switch with short circuit protection. For 230V AC or 460V AC, 3-phase motors.	1,326.00
800	3/4 HP, 115V AC, 60 Hertz, single phase motor, ODP	792.00
805	3/4 HP, 230V AC, 60 Hertz, single phase motor, ODP	792.00
822	3/4 HP, 230/460V AC, 60 Hertz, 3-phase motor, TEFC, with motor starter. Specify voltage.	1,898.00
825	3/4 HP, 230/460V AC, 60 Hertz, 3-phase motor, with motor starter, ODP. Specify voltage.	1,484.00
845	3/4 HP, 115/230V AC, 60 Hertz, single phase motor, TEFC. Specify voltage.	1,333.00
900	1 HP, 115V AC, 60 Hertz, single phase motor, ODP	919.00
905	1 HP, 230V AC, 60 Hertz, single phase motor, ODP	919.00
922	1 HP, 230/460V AC, 60 Hertz, 3-phase motor, TEFC, with motor starter. Specify voltage.	1,912.00
925	1 HP, 230/460V AC, 60 Hertz, 3-phase motor, with motor starter, ODP. Specify voltage.	1,402.00
945	1 HP, 115/230V AC, 60 Hertz, single phase motor, TEFC. Specify voltage.	1,460.00
1000	1 1/2 HP, 115V AC, 60 Hertz, single phase motor, ODP	945.00
1005	1 1/2 HP, 230V AC, 60 Hertz, single phase motor, ODP	945.00
1022	1 1/2 HP, 230/460V AC, 3-phase, 60 Hertz, TEFC, with motor starter. Specify voltage	1,928.00
1025	1 1/2 HP, 230/460V AC, 3-phase, 60 Hertz, with motor starter, ODP. Specify voltage	1,509.00
1045	1 1/2 HP, 115/230V AC, single phase, 60 Hertz, TEFC. Specify voltage.	1,492.00
1100	2 HP, 115V AC, 60 Hertz, single phase motor, ODP	1,314.00
1105	2 HP, 230V AC, 60 Hertz, single phase motor, ODP	1,314.00
1122	2 HP, 230/460V AC, 3-phase, 60 Hertz motor, TEFC, with motor starter. Specify voltage	857.00
1125	2 HP, 230/460V AC, 60 Hertz, 3-phase motor with motor starter, ODP. Specify voltage	1,314.00
1145	2 HP, 115/230V AC, 60 Hertz, single phase motor, TEFC	1,570.00
1200	3 HP, 115V AC, 60 Hertz, single phase motor, ODP	1,460.00
1205	3 HP, 230V AC, 60 Hertz, single phase motor, ODP	1,460.00
1225	3 HP, 230/460V AC, 60 Hertz, 3-phase motor with motor starter, ODP. Specify voltage	1,460.00
1305	5 HP, 230V AC, 60 Hertz, single phase motor, ODP	1,579.00
1322	5 HP, 230V AC, 3-phase, 60 Hertz motor, TEFC	1,130.00
1325	5 HP, 230/460V AC, 60 Hertz, 3-phase motor with motor starter, ODP. Specify voltage	1,579.00
1405	7 1/2 HP, 230V AC, 60 Hertz, single phase motor, ODP	1,715.00
1422	7 1/2 HP, 208V AC, 3-phase, 60 Hertz motor, ODP	1,412.00
1425	7 1/2 HP, 230/460V AC, 60 Hertz, 3-phase motor with motor starter, ODP. Specify voltage	1,715.00

3-PHASE MOTORS MAY BE OPERATED AT 190/380 V, 50HZ. 50HZ OPERATION REDUCES PUMP CAPACITY TO 5/6.

Export Crating

SPS-10, SKS-10	264.00	SPS-55, SKS-55	1,481.00
SPS-25, SKS-25	961.00		

Pump Performance

PUMP MODEL	DISPLACEMENT IN ³ (CC/REV.)	RPM	Flow, GPM LPM				
			100PSI (6.9Bar)	1000PSI (69Bar)	1500PSI (103Bar)	2000PSI (138Bar)	2500PSI (172Bar)
SUPER XL-11	.225(4.18)	1800	1.99 (7.54)	1.86 (7.05)	1.79 (6.78)	1.73 (6.56)	1.66 (6.29)
SUPER XL-39	.91(14.92)	1800	7.08 (26.83)	6.87 (26.04)	6.77 (25.66)	6.66 (25.24)	6.56 (24.86)
SUPER XL-62	1.42(23.28)	1800	11.10 (42.07)	10.81 (40.97)	10.70 (40.55)	10.60 (40.17)	10.40 (39.42)
SUPER XL-90	2.15(35.25)	1800	16.70 (63.29)	16.5 (62.54)	16.30 (61.78)		
SUPER XL-114	3.25(53.28)	1800	25.30 (95.89)	24.90 (94.37)	24.60 (93.23)	24.40 (92.48)	

Viscosity

SAYBOLT UNIVERSAL SSU	TYPICAL LIQUIDS AT 70°
31	WATER
35	KEROSENE
50	NO.2 FUEL OIL
80	NO.4 FUEL OIL
100	TRANSFORMER OIL
200	HYDRAULIC OIL
300	SAE 10W OIL
500	SAE 10 OIL
1,000	SAE 20 OIL
2,000	SAE 30 OIL
5,000	SAE 50 OIL
10,000	SAE 60-70 OIL

• 1 PSI=2.30 feet of water (specific gravity 1.0)

• 1 PSI=2.88 feet of oil (specific gravity 0.8)

PRESSURE AND CONVERSION TABLE

FEET WATER	1	2	3	4	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
PSI WATER	.43	.87	1.3	1.73	2.17	4.33	6.5	8.66	10.8	13.0	15.2	17.3	19.5	21.7	23.9	26.0	28.1	30.5	32.5	34.6	36.8	39.0
PSI OIL	.35	.70	1.05	1.4	1.75	3.5	5.2	7.0	8.7	10.5	12.2	14.0	15.7	17.5	19.2	21.0	22.7	24.5	26.2	28.0	29.7	31.5

Hydraulic Formulas

Horsepower

Horsepower = $\frac{\text{GPM} \times \text{PSI}}{1714}$

Torque

Torque (lb.in.) = $\frac{\text{CU IN./REV} \times \text{X PSI}}{2}$

Torque (lb.in.) = $\frac{\text{HP} \times 63025}{\text{RPM}}$

Flow

Flow (gpm) = $\frac{\text{CU IN./REV} \times \text{RPM}}{231}$

Conversion Factors

- 1hp=33,000 ft. lbs. per minute
- 1hp=42.4 btu per minute
- 1hp=0.746 kw/hr (kilowatt hours)

1 U.S. gallon = 231 cubic inches
 Pipe volume varies as the square of the diameter; volume in gallons=0.0034 D²L
 where: D= inside diameter of pipe in inches;
 L=length in inches.

Velocity in feet per sec. = $\frac{0.408 \times \text{flow (gpm)}}{D^2}$

where: D=inside diameter of pipe in inches.

Atmospheric pressure at sea level=14.7 PSI
 Atmospheric pressure decreases approximately 0.41 PSI for each 1,000 feet of elevation up to 23,000 feet.

Pressure (PSI) = feet head x 0.433 x specific gravity

Specific gravity of oil is approximately 0.85

Thermal expansion of oil is approximately 1 cu.in per 1 gal. per 10°F rise in temperature.

MOTOR AMPERES SINGLE-PHASE

HORSE POWER	STARTING	VOLTAGE	APPROX. FULL LOAD AMPS
1/3	SPLIT-PHASE	115	6.6
1/2	SPLIT-PHASE	115	9.2
1/3	CAPACITOR	115/230	7.0/3.5
1/2	CAPACITOR	115/230	9.2/4.6
3/4	CAPACITOR	115/230	10.4/5.2
1	CAPACITOR	115/208-230	13.4-6.8-6.7
1½	CAPACITOR	115/208-230	18.0/9.3-9.0
2	CAPACITOR	115/208-230	21.0/11.3-10.5
3	CAPACITOR	115/230	33.0/16.5
5	CAPACITOR	208-230	23.0-21.0
7½	CAPACITOR	208-230	35.2

3-PHASE

HORSE POWER	VOLTAGE	APPROX. FULL LOAD AMPS.
1/3	208-230/460	1.5-1.6/.08
1/2	208-230/460	2.3-2.4/1.2
3/4	208-230/460	2.9-3.0/1.5
1	208-230/460	3.5-3.6/1.8
1½	208-230/460	4.8-4.8/2.4
2	208-230/460	6.2-6.2/3.1
3	208-230/460	9.2-8.6/4.3
5	230/460	13.2/6.6
7½	230/460	20.0/10.0
10	230/460	26.6/13.3

Flashpoints

	FLASHPOINT °F (°C)
Diesel Fuel Oil No. 1-D	100 Min. (38) or Legal
Diesel Fuel Oil No. 2-D	125 Min. (52) or Legal
Diesel Fuel Oil No. 4-D	130 Min. (54) or Legal
Fuel Oil No. 1 (Kerosene) (Range Oil) (Coal Oil)	100-162 (43-72)
Fuel Oil No. 2	126-204 (52-96)
Fuel Oil No. 4	142-240 (61-116)
Fuel Oil No. 5 Light	156-336 (69-169)
Fuel Oil No. 5 Heavy	160-250 (71-121)
Fuel Oil No. 6	150-270 (66-132)
Jet Fuels Jet A and A-1	110-150 (43-66)