

PRODUCT DATA SHEET

12 Volt DC & 115 Volt AC Diaphragm Pump

Description of Included Models

Model Number	Use On	Description	Shipping Weight
SS417	2" buttress or NPT openings	The most cost effective of the Series 400 12 Volt DC pumps. Equipped with all the standard features, including hose, nozzle and suction tube.	26 lbs. 11.8 kgs.
SS420	Dome/Flat Top Mini-Bulk	The SS420 includes all the features of the SS415 plus a 1" x 12' (25.4mm x 3.7m) EPDM hose, ball valve nozzle and nozzle boot, a telescoping suction pipe and 2" NPT adapter	35 lbs. 15.9 kgs.
SS421	Dome/Flat Top Mini-Bulk	The SS421 includes all the features of the SS420 plus the 825 Digital meter as standard.	38 lbs. 17.2 kgs.
SS460	Dome/Flat Top Mini-Bulk	The hardworking SS460 AC pump is outfitted with a 1" x 12' (25.4mm x 3.7m) EPDM hose, 1" (25.4mm) manual ball valve nozzle, nozzle boot, telescoping suction pipe, 2" (50.8mm) NPT bung adapter and a 3-wire electrical cord.	32 lbs. 14.4 kgs.
SS461	Dome/Flat Top Mini-Bulk	Step up to the SS461 when you need an AC powered pump with all the features of the 460, but want the measuring accuracy of the Sotera 825 Digital Meter.	35 lbs. 15.9 kgs.

Accessories - Pump Tank Adapters

Part Number	Description
400KTF0077	2" NPT threaded bung adapter
400KTF6477	2" Butress threaded bung adapter
400KTG8082	4" GPI® threaded mini-bulk opening tank adapter
400F0172	Inlet flange for Bonar B120 tank
400F0174	Inlet flange for SynderGemthread tank
400KTF0069	6" mini-bulk opening to 2" butress threaded opening
400KTF1596	6" mini-bulk opening. 13 bolt or 6 bolt
445KTF1691	6 3/8" mini-bulk opening for E-Z Handler™ mini-bulk tank - 12 bolt

NOTE: See selection guide in the Reference Literature section for the correct selection guidelines in the use of these adapters.

Performance

Maximum Outlet Pressure	15 PSI (1.09 BAR)
Maximum flow rate¹	13.0 GPM (49.3 LPM)
Maximum Viscosity of fluid pumped	3000 CPS (SAE140 Gear Oil at 68°F)
Maximum ambient operating temperature	130 °F (54 °C)*
Minimum ambient operating temperature	-10 °F (-23 °C)*
Minimum dry vacuum	9 Inches of Hg.
Minimum suction lift**	10 Feet

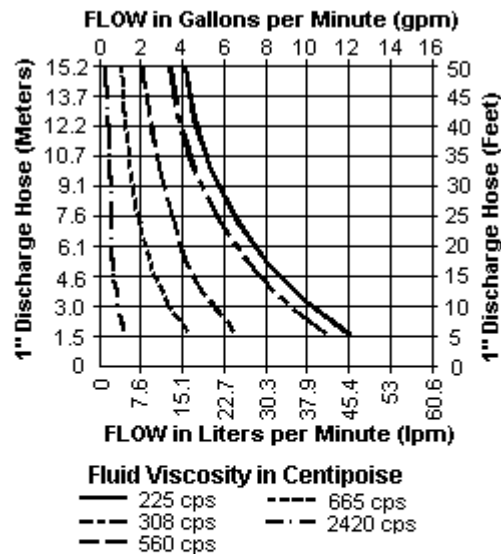
¹Flow rate at nominal voltage using a standard hose and manual nozzle with low viscosity fluid (example: water).

* Consult factory for extreme temperature applications outside this range.

** The lift in feet is equivalent to the vertical distance from the surface of the fluid in the tank to the inlet of the pump, PLUS the friction losses through the vertical and horizontal runs of pipe, all elbows and other fittings. The system should be designed to require a minimum amount of suction lift.

Flow Curve

400 Flow for Various Viscosities and Discharge Hose Lengths




NOTES:

1. SUCTION LOSSES - Pump mounted on 208 liter drum, 1/2 full with a standard suction pipe.
2. VERTICAL HEAD LOSSES - Hose horizontal with pump.
3. OTHER LOSSES - Additions for other in-line components
 - SureStop Disconnect - 0.15 M
 - Other disconnects - 4.0 M
 - 1" Check Valves - 2.7 M
 - 1" Elbow - 0.8 M

Fluid Compatibility

The Series 400 Diaphragm Pumps have been found to be compatible with a significant listing of fluids (all 1997 formulations used in North America). See the listing of those fluids contained in the Parts and Technical Service Guide shipped with your pump or included in the **Reference Literature** section.

The Series 400 Diaphragm Pumps are NOT compatible with the following fluids: very strong acids and any fluid with a flash point below 100 °F

	DANGER
	<p>Not for use with fluids that have a flash point below 100°F (37.8°C, ie: gasoline, alcohol). Refer to NFPA 325M (Fire Hazard Properties of Flammable Liquids, Gases and Volatile Solids) for flash points of common liquids.</p> <p>Static electricity buildup and discharge could result in arc and explosion.</p>

If in doubt about the compatibility of a specific fluid, contact the supplier of the fluid to check for any adverse reactions to the following wetted materials:

Fluorocarbon

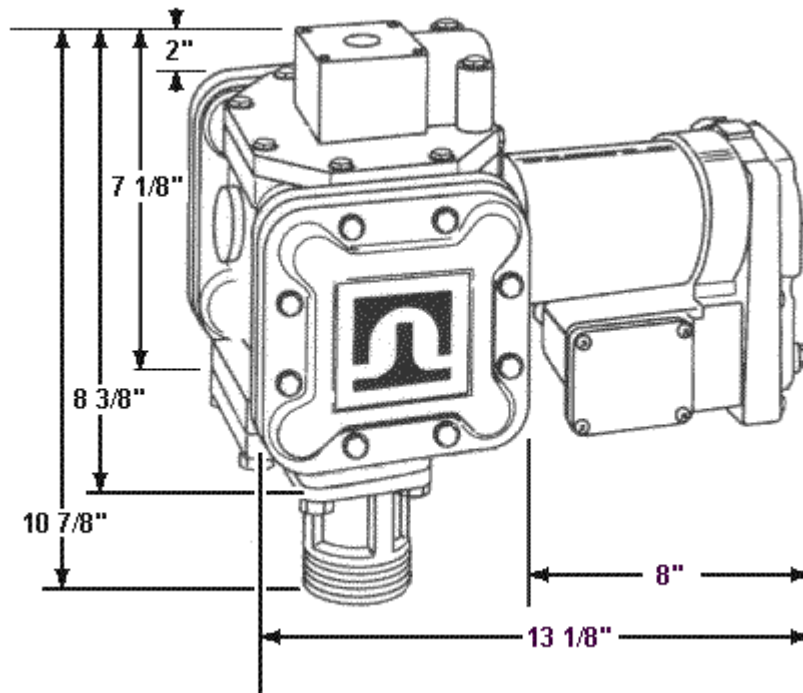
Santoprene™

Polypropylene

300 Series Stainless Steel

Buna N (captured seals)

Dimensions



Repair

Refer to **Parts and Technical Service Guide** packed with the pump and/or available for reference and printing in the Reference Literature section of this web page for the procedure to be followed for motor/gear assembly removal, gear assembly replacement and diaphragm assembly/check valve replacement.

If return for warranty repair is ever necessary, please follow the procedure referenced in the **Reference Literature** section.

Maintenance

To keep the pump running at its best, periodically perform the following procedures:

Chemical Applications -

Do not allow any chemical to remain in the pump for any extended period of time, whereby the chemicals are allowed to "dry out". Using the proper cleaning agent, thoroughly clean the diaphragm and check valve assemblies by flushing the pump with:

1. Diesel or kerosene for petroleum based chemicals
2. Water for water based chemicals

All Applications -

1. On an annual basis, check the four #10-24 X 1/2" machine screws (item 11) holding the diaphragms in place. If loose, tighten screws to prevent internal leakage.

Note: NEVER EXCEED 50 INCH-POUNDS of torque when replacing the pump covers or tightening the diaphragm screws. The threaded inserts could be stripped out.

2. Check the oil level in the pump gearbox periodically. The oil level should be level with the bottom edge of the sight cap holes located on the front of the pump body. Always check the oil level when the pump is level.
3. Replace oil with approximately 16 ounces of automotive grade SAE 30W through one of the sight cap holes if there is any indication of contamination after draining the contaminated oil. Contamination can be noted by a milky appearance to the oil or the level being above the base of the sight caps.
4. Examine the diaphragm/check valve assemblies for excessive wear annually or if oil contamination is noted, (items 7, 8, 9 and 10).

See meter's Parts and Technical Service Guide for additional recommended maintenance procedures.

Frequently Asked Questions

1. My pump only pumps for a few minutes and then stops. What is happening?

Generally "short cycling," indicates the motor is drawing too much current from the power source for some reason, and the thermal relay is opening to protect the insulation from the resulting heat build up. If this is what is happening the thermal relay will reset after 10 to 20 minutes and the motor will again operate. The causes of too high a current in this pump design are few and generally related to a motor defect such as a binding pump or motor bearing or shorted motor windings.

See the Troubleshooting Guide in your Owner's Manual packed with your unit or the copy available in the Reference Documents section of this More Info page for things to check.

2. The oil in the pump appears milky. Is there a problem?

The oil in the motor gearbox should appear clear and clean. A milky appearance or a change in color or appearance of this oil virtually always indicates that the oil should be changed. Drain the oil and thoroughly flush the gearbox with clean kerosene. If crankcase is contaminated, diaphragm replacement is recommended. Replace the lubricating oil with approximately 16 ounces of SAE 30W motor oil before returning the pump to service.

See the Troubleshooting Guide in your Owner's Manual packed with your unit or the copy available in the Reference Documents section of this More Info page for more details on these procedures.

3. Why do I have to use the heavy wire supplied with the DC pump for connection to my battery?

Your pump is a commercial grade unit and as such draws a high current from your battery to do the work required. If that current were routed through a light wire, heating and possible damage of the wire, and reduced voltage at the pump would be the result. The wire supplied with your pump is sized to provide that optimum performance you demand and the pump can provide if properly installed.

It is also recommended a 30 amp slow blow fuse be installed in the power line to insure safety, should a short circuit develop in the pump wiring. Although the pump draws much less in normal operation, motor starting currents are significantly higher, necessitating the higher rating on the fuse.