

# Capacitor **Start Kit**

40850A0E

## 1-Phase Start Circuit Instructions for LEP Dual Seal Grinder and Solids Handling Pumps

*for pumps with configuration code C11 or later*

### Specifications

Base Model Number <sup>1</sup>	Volts	Phase	Hz	RPM	FLA	SFA	LRA	Start Winding Current @ 0 RPM	Start Winding Voltage @ 0 RPM	Start Winding Current @ SINPAC Cutout	Start Winding Voltage @ SINPAC Cutout
(X)LGH032	230	1	60	3450	24	—	125	34	100	32	310
(X)LGV032	230	1	60	3450	21.5	—	125	34	100	32	310
(X)LGH052	230	1	60	3450	37	—	125	34	100	32	310
(X)LGV052	230	1	60	3450	33	—	125	34	100	32	310
3(X)LM032	230	1	60	1750	15.6	19	102	36	164	34.5	310
3(X)LM052	230	1	60	1750	24.5	28	129	35	170	33	310
3(X)LE032	230	1	60	1750	15.6	19	102	36	164	34.5	310
3(X)LE052	230	1	60	1750	24.5	28	129	35	170	33	310
3(X)LV032	230	1	60	1750	15.6	19	102	36	164	34.5	310
3(X)LV052	230	1	60	1750	24.5	28	129	35	170	33	310

1. (X) included in model number denotes hazardous location pump

7000 Apple Tree Avenue  
 Bergen, NY 14416  
 ph: 800.543.2550  
 fax: 585.494.1839  
[www.LibertyPumps.com/LEP](http://www.LibertyPumps.com/LEP)

**IMPORTANT:** All Liberty Pumps models are supplied with their own separate Installation/Operation/Maintenance manual(s). Ensure receipt of these manuals, and that they are read and understood prior to installing this kit. For questions, call Liberty Pumps customer service at 1-800-543-2550.

## Circuit Operation

The 1-phase motors used by Liberty Pumps have high starting torque and thus high currents exist on the auxiliary (start) windings. To switch the high starting currents, a 50A capable SINPAC switch is used.

Stearns SINPAC electric switches are reliable solid-state devices that have advantages over typical motor start switches. Being a solid-state device, they are sealed and not affected by dust, moisture, or vibration. From a performance standpoint, they are superior to a typical Potential Starting Relay as they do not rely on a magnetic field, springs, or moving parts that could be susceptible to mechanical failure to open the contacts. SINPAC switches work by continually monitoring and comparing the voltage between the main and auxiliary (start) winding. They are also line voltage compensating, meaning their performance is not impacted by changes in supply line voltage. The SINPAC switch is normally closed, but once the motor has accelerated to 75% of its synchronous speed, the switch (triac) opens. This function disengages the start capacitor from the circuit. If the motor becomes overloaded (during grinding or passing a solid) and slows to approximately 50% of synchronous speed, the SINPAC switch closes to engage the start circuit in an attempt to recover speed.

To check the SINPAC switch, disconnect the SINPAC switch from the circuit and measure the resistance between terminals 2 and 3; if the resistance is less than 500K  $\Omega$ , the switch must be replaced. To prevent premature start capacitor failures, a 15K  $\Omega$  bleeder resistor is used to bleed off residual voltage after the start capacitor has been removed from the motor circuit. Using a bleed down resistor will discharge the energy stored in the start capacitor. Engaging the start capacitor while it's charged can create energy spikes in the system that can damage components.

Table 1. Start Kit Contents

	Liberty Pumps P/N	Mfg P/N
1-phase Start Kit (contains all items listed separately below)	K001864	n/a
Start Capacitor 270–324 $\mu$ F 330 VAC	K001905	Mars 11070 or Equivalent
Run Capacitor 80 $\mu$ F 370 VAC	K001902	Mars 12199 or Equivalent
Start Switch	K001903	Stearns SINPAC 4-7-72050-15-U03
Bleed Resistor, 15k $\Omega$ , 2 W	K001904	COTS
Vertical Mounting Clamp, 1¾"	—	COTS
Vertical Mounting Clamp, 2"	—	COTS
Vertical Mounting Clamp, 2½"	—	COTS

## Wiring Diagram

