

## SL Series Linear Forcer Instructions

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### 1 RELATED DOCUMENTS:

#### 1.1 Forcer Dimensional Drawing (See Table 1).

Model	Drawing
SL043	88-019797-01
SL063	88-018524-01
SL102	88-019779-01
SL140	88-019115-01

**Table 1.**

### 2 EQUIPMENT:

- 2.1 Heat sink compound
- 2.2 Forcer unit
- 2.3 Torque wrench
- 2.4 Thread locking compound
- 2.5 18-8 (or higher grade) stainless steel socket head mounting screws (See Table 2).

Model	Mounting Screw	Torque Value
SL043	M3 x 0,5	1.7 N-m (15 in-lbs)
SL063	M4 x 0,7	4.0 N-m (35 in-lbs)
SL102	M4 x 0,7	4.0 N-m (35 in-lbs)
SL140	M4 x 0,7	4.0 N-m (35 in-lbs)

**Table 2.**

### 3 PRELIMINARY SYSTEM SET-UP

- 3.1 Make sure all mounting surface dimensions and tolerances are met according to respective dimensional drawings, particularly carriage flatness and forcer-to-magnet air gap. Forcer “rubbing” and/or reduced forcer performance may result if these tolerances are not strictly adhered to. Forcer mounting hole patterns may be found on the dimensional drawing.
- 3.2 Make sure all cable bend radiuses are within the tolerance specified in respective dimensional drawings. Cables must be securely fastened so that they do not catch on other components while the forcer is in motion.
- 3.3 For water cooled forcers (W-option), do not exceed 175 kPa (25 psig) operating pressure. Gaskets may become damaged beyond repair if the operating pressure is exceeded. Distilled water is the recommended working fluid in water-cooled forcers. Tap water can leave deposits and promote corrosion in the cooling channels of the forcer.

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- 3.4 Non water-cooled forcers come equipped with a choice between two types of brass fittings. The plug fitting can be used if air-cooling will not be used. Thread the plugs into the openings on the cable exit side of the forcer unit until tight. If air-cooling is to be implemented, the provided brass hose barbs may be installed. Apply pipe thread compound or pipe thread tape to the threads of the fittings before threading into the openings. Install the fittings, turning them clockwise just until finger tight. With a wrench, tighten the fittings 2-3 revolutions beyond finger tight.

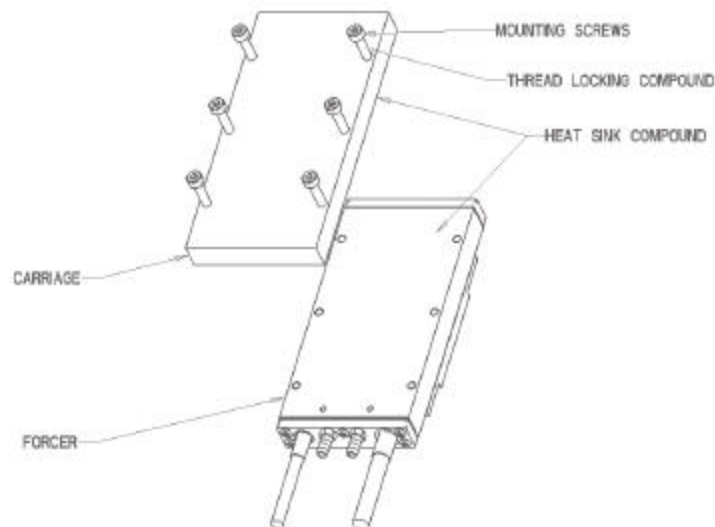
**Warning! Do not exceed 3 revolutions beyond finger tight, as damage to the forcer housing may result.**

## 4 FORCER MOUNTING INSTRUCTIONS

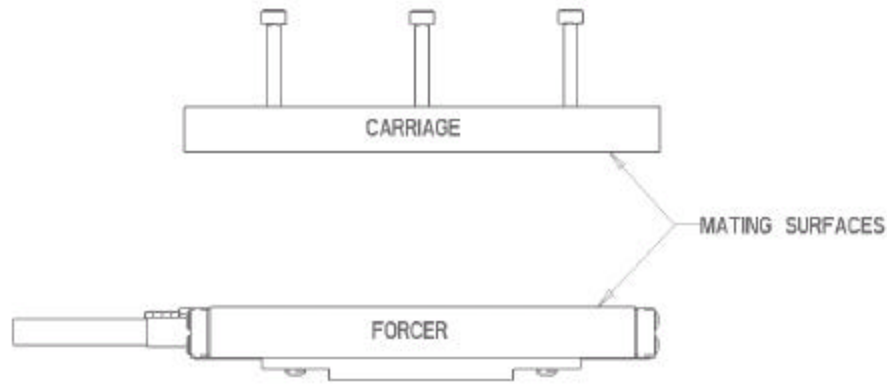


**CAUTION! The attractive force between the forcer and magnet bar is about 5-6 times the rated linear force of the motor. Caution should be used when installing the carriage-forcer pair into the system. Never place the forcer directly on or near the magnet bar unless the forcer is firmly attached to the carriage and the carriage is properly supported by the bearing system.**

- 4.1 Clean mating surfaces on both the forcer and the carriage with acetone and a clean towel (**Figure 2**).
- 4.2 Apply silicon heat sink compound to either carriage or forcer mating surfaces. Spread compound according to manufacturer's instructions using a plastic putty knife. (**Figures 1 and 2**)



**Figure 1.**



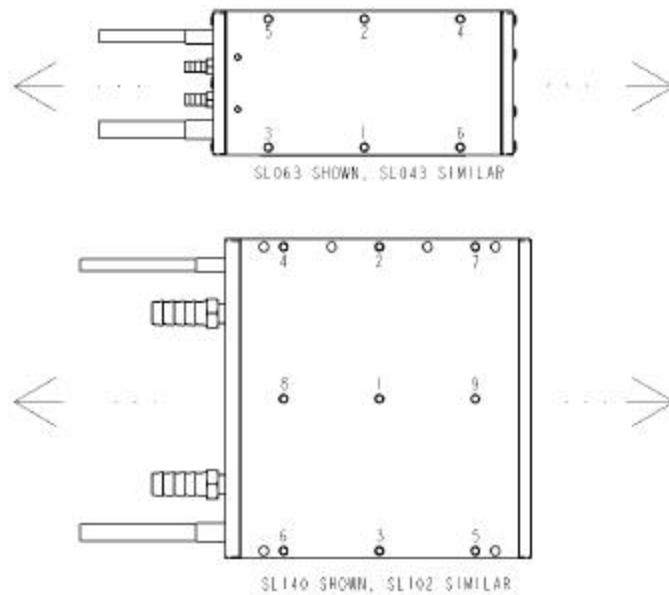
**Figure 2.**

- 4.3 Apply thread locking compound according to manufacturers instructions. Install mounting screws into all provided forcer mounting holes, but do not tighten at this point.

**Warning! Failure to use all mounting holes could result in forcer bowing. Magnetic attraction between forcer and magnet bars is approximately 5 – 6 times the linear force or about 15 lbs per magnet.**

Using a torque wrench, tighten each screw  $\frac{1}{4}$  turn each in the sequence shown in **Figure 3** until all screws are tightened to the recommended torque value in **Table 2**. As a general rule, tighten the center most screws first and work outward in a cross-wise pattern.

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**Figure 3.**

- 4.4 The SL140 model has a clearance hole bolt pattern in addition to the threaded hole bolt pattern (see respective dimensional drawings, **Table 1**). The clearance hole bolt pattern can be used to mount the forcer by threading screws into the mounting carriage, as opposed to threading into the forcer.
- 4.5 Use acetone and a clean towel to wipe off any excess silicone heat sink compound that may have squeezed out after tightening the bolts.
- 4.6 Check the forcer-to-magnet and hall sensor-to-magnet air gaps at several locations along the forcer's travel using non-magnetic feeler gauges. If any measurements are out of spec, remove the forcer unit and make any necessary adjustments.

### 5 WIRING DIAGRAM

	Wire Color	Description
<b>Forcer</b>	Red/Yellow	Phase A
	White/Yellow	Phase B
	Black/Yellow	Phase C
	Green/Yellow	Ground
<b>Thermal Switch</b>	Yellow/Orange	Thermal
	Yellow/Orange	Thermal
<b>Hall Sensor</b>	White/Brown	Hall 1
	White/Orange	Hall 2
	White/Violet	Hall 3
	White/Blue	+5V
	White/Green	Ground