This document is a guide to assist in the installation, startup, and troubleshooting of the following pump and motor units – Blackmer LG1, LGF1, LGB1, LGL1.25, LGL1.5 and LGL150 Series and Ebsray RC20, RC25 pumps. Only qualified personnel trained in the safe installation and operation of the equipment should install the unit. When connecting a unit to power please follow NEC (National Electric Code) and any other (country specific) local electrical codes that may apply during installation. Please verify all electrical information prior to startup of unit. This document is not intended to be used as a reference or authority for design, construction, or application of electrical systems.

Motor Wire Sizing:

Table 1 lists motor sizes and the respective recommended wire size depending upon the distance between the source and the load. As the distance increases from the source to the load, the voltage drops, caused by the resistance and reactance of a particular size of the wire. The wire must be sized properly to allow for this voltage drop to remain within an acceptable range. This is especially important for single phase motor applications. The following guidelines are minimums.

Table 1: Recommended Motor Wiring *

Motor				Recommended Wire Size, AWG		
HP	Motor Phase	Voltage	Full Load Amperes	Length of Run in Feet		
				0-100	To 200	To 300
3	1	120	42.5	4	2	1/0
		240	21.25	10	8	6
	3	240	12	12	12	10
		480	6	12	12	12
5	1	120	70	3	1/0	2/0
		240	35	8	6	4
	3	240	19	12	10	8
		480	9.5	12	12	12
7.5	3	240	27.5	10	8	6
		480	13.75	12	12	12

* Information collected from standard voltage drop calculator, with a 3% allowable decrease in voltage drop or less using standard conditions. For conditions or distances other than those listed, consult the NEC handbook, local standards, or engineering handbook. Wire sizes are expressed in AWG (American Wire Gauge).

Phased Power:

It is recommended to use three phase power where applicable. The three phase motor is a simpler design, more efficient by design, and also less costly than the single phase motor. The three phase motor allows for a higher starting torque, smoother operation, and allows the use of a smaller wire size over greater distances. Single phase power can be converted to three phase power by using a phase converter, which is readily available and inexpensive.

System Design:

Systems shall be designed according to NFPA standards and local codes. It is recommended that a Blackmer or Ebsray manufactured bypass valve be used in the system as they are designed to allow the optimum system performance and stability. Below is a list of informational bulletins that also guide installation of a Blackmer and Ebsray pump and bypass valve.

Application Bulletin 500-001: Liquefied Gas Handbook

Installation, Operation, and Maintenance 501-K00: LGL150 Series Pumps

Installation, Operation, and Maintenance 501-A00: LG1, LGF1, LGB1 Series Pumps

Installation, Operation, and Maintenance 501-B00: LGL1.25 & LGL1.5 Series Pumps

Installation, Operation, and Maintenance 505-A01, A02, A03: Bypass Valves

Installation, Operation, and Maintenance 551-A00: Ebsray RC20 & RC25 Pumps

Installation, Operation, and Maintenance 551-E00: Ebsray RV18 Bypass Valves