LubriMist® Model VO
Oil Mist Generating System
Installation and Operating Manual

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Lubrication Systems Company
THE RIGHT CHOICE

THE LEADER IN OIL MIST TECHNOLOGY

LubriMist® Model VO
Oil Mist Generating System
Installation and Operating Manual

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Model 'VO' *LubriMist*® Oil Mist Generator
INSTALLATION AND OPERATION MANUAL

Introduction

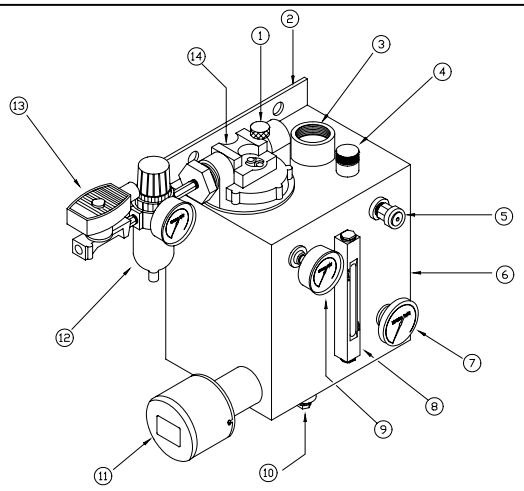
A *LubriMist*® Oil Mist System is a centralized lubrication system that generates, conveys, and automatically delivers lubricant to bearings, gear boxes, chains, and sliding surfaces in various industrial machinery and equipment. This publication provides instruction and information for the *LubriMist*® Oil Mist Generator Unit Model "VO." Design, application, and distribution of *LubriMist*® Oil Mist are covered in other publications. Call the Lubrication Systems Company office nearest you for additional information.

Description

The *LubriMist*® Model "VO" Oil Mist generating unit, with its three gallon reservoir and flanges for easy mounting, is designed for intermediate size systems where manual control and monitoring are acceptable. Model "VO" is available in 40, 100, 300 and 500 BI capacities giving an overall flow range of 0.36 to 15.0 SCFM.

Standard features include a rectangular stainless steel reservoir with an oil level gauge; mist generating head (size as specified), low oil level switch, mist pressure gauge, relief valve, and immersion oil heater with thermostat and temperature gauge. Also included as standard equipment is an integral inlet air supply filter/regulator combination with gauge, and solenoid operated air valve.

The standard oil heater has a general purpose (NEMA 1) enclosure. However, by choosing the optional explosion proof oil heater, the Model "VO" is made suitable for installations in Class 1, Group D, Division 2 hazardous areas and is Certified for ATEX CAT 3G EEx nC IIC.T4. Optional configurations are available which omit the oil heater and thermometer, the air solenoid valve, or the low oil level switch. See the product model code provided below for a complete explanation of the standard model and options.



LEGEND
1 VORTEX OIL MIST GENERATOR HEAD
2 MOUNTING FLANGES
3 MIST OUTLET - 2 INCH NPT
4 OIL FILL PORT
5 PRESSURE RELIEF VALVE
6 THREE GALLON RESERVOIR
7 OIL TEMPERATURE GAUGE
8 OIL LEVEL GAUGE
9 MIST PRESSURE GAUGE
10 RESERVOIR DRAIN
11 IMMERSION OIL HEATER
12 AIR PRESSURE REGULATOR/FILTER WITH PRESSURE GAUGE
13 AIR SOLENOID VALVE
14 OIL LEVEL SWITCH

MODEL NO. (Standard Model Shown)

VO -	040 100 300 500	-	A	-	A	-	A

GENERATOR SIZE	OIL HEATER W/ THERMOSTAT & THERMOMETER	LEVEL ALARM	AIR SOLENOID VALVE
040 - 40 BI 100 - 100 BI 300 - 300 BI 500 - 500 BI	A* - 120 VAC / 375 W - General Purpose Enclosure.	A - Low Oil Level Switch	A*- 120VAC
	B - 120 VAC / 375 W - Explosion Proof Enclosure.	X - No Level Switch	B*- 24 VDC
	C - 240 VAC / 410 W - Explosion Proof Enclosure.		C*- 240 VAC
	D* - 240 VAC / 410 W - General Purpose Enclosure.		X - None
	X - No Oil Heater, Thermostat, or Thermometer.		
(*) OPTION NOT ATEX CERTIFIED			

FIG. 1

Standard Features

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Option Description	Option Code	Description	General Purpose Model Code Options	Level Switch Contact Rating	Ambient Rating See Notes (2) & (3)	Volts / Amps Model VO Assembly	
Generator Size	40	40 Bearing Inch	**40 or 100 or 300 or 500**				
	100	100 Bearing Inch					
	300	300 Bearing Inch				Volts	
	500	500 Bearing Inch				**120 VAC 50/60HZ**	**240 VAC 50/60 HZ**
Reservoir Oil Heater See Note (1)	A	General Purpose Immersion Oil Heater w/Thermostat & Thermometer – 120 VAC – 375 Watts	**A or D or X**			**AMPS / POWER**	
	B	Explosion Proof Immersion Oil Heater w/Thermostat & Thermometer – 120 VAC – 375 Watts			-**20**C< T amb <+**40**C	3.1 Amp / 3.7 kW	
	C	Explosion Proof Immersion Oil Heater w/Thermostat & Thermometer – 240 VAC – 410 Watts			-**20**C< T amb <+**40**C		1.7 Amp / 4.0 kW
	D	General Purpose Immersion Oil Heater w/Thermostat & Thermometer – 240 VAC – 410 Watts					
	X	No immersion oil heater, thermostat, or thermometer			-**20**C< T amb <+**49**C	N0T APPLICABLE	
Reservoir Level Switch	A	Low oil level switch	**A or X**	**20 W @ 120/240 VAC**			
	X	No oil level switch					
Air Solenoid Valve	A	Solenoid Air Valve 120 VAC - 10 Watts	**A or B or C or X**			0.08 Amp / 10 W	
	B	Solenoid Air Valve 24 VDC - 10 Watts				0.4 Amp / 10 W	
	C	Solenoid Air Valve 240 VAC - 10 Watts				0.04 Amp / 10 W	
	X	No air solenoid valve				NOT APPLICABLE	

Notes

(1) When LubriMist Model "VO" is supplied as a Back Up unit to another Primary Oil Mist Generator, the VO Reservoir Oil Heater is supplied at the same voltage as the Primary Oil Mist Generator.

(2) Ambient Rating is -20C<AMB<+40C for all assemblies where Back Up Unit is include as optional equipment to a Primary Oil Mist Generator regardless of Primary Oil Mist Generator rating.

(3) Amperage shown is for the LubriMist Model "VO" Oil Mist Generator component as listed. When the "VO" is supplied as a Back Up unit to another Primary Oil Mist Generator, the "VO" Back Up units is pre-wired through a three-position switch. Units are furnished pre-mounted and pre-wired with the Primary Oil Mist Generator so that only the Primary Oil Mist Generator or VO can be energized at any time.

(4) Amperage ratings are shown for individual components. All components are wired and connected separately by purchaser.

(5) Complete "VO" Model Code designations may include optional suffixes for add on accessories. List all that apply. Space is blank when none are selected.
Option –1; Kenco Oiler for Auto Fill to main OMG.

LubriMist®

MODEL NO.
SERIAL NO.
SERIES NO.
LEVEL SWITCH CONTACT RATING
OIL HEATER
VOLTS **FREQ.**
POWER
AIR SOLENOID
VOLTS **FREQ.**
POWER

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THE RIGHT CHOICE
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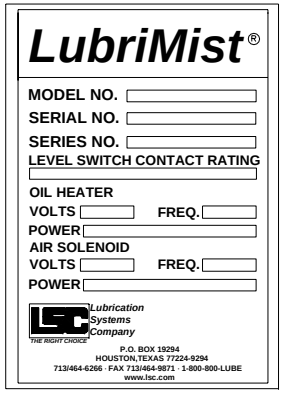
Table 1 Tagging and Labeling (General Purpose)

Option Description	Option Code	Description	Class 1 Div 2 Model Code Options	Level Switch Contact Rating	Ambient Rating See Notes (2) & (3)	Volts / Amps Model VO Assembly	
Generator Size	40	40 Bearing Inch	**40 or 100 or 300 or 500**				
	100	100 Bearing Inch					
	300	300 Bearing Inch				Volts	
	500	500 Bearing Inch				**120 VAC 50/60HZ**	**240 VAC 50/60 HZ**
Reservoir Oil Heater See Note (1)	A	Option not permissible for Class 1 Div 2	**B or C or X**			**AMPS / POWER**	
	B	Explosion Proof Immersion Oil Heater w/Thermostat & Thermometer – 120 VAC – 375 Watts			-**20**C< T amb <+**40**C	3.1 Amp / 3.7 kW	
	C	Explosion Proof Immersion Oil Heater w/Thermostat & Thermometer – 240 VAC – 410 Watts			-**20**C< T amb <+**40**C		1.7 Amp / 4.0 kW
	D	Option not permissible for Class 1 Div 2					
	X	No immersion oil heater, thermostat, or thermometer			-**20**C< T amb <+**49**C	N0T APPLICABLE	
Reservoir Level Switch	A	Low oil level switch	**A**	**20 W @ 120/240 VAC**			
	X	No oil level switch					
Air Solenoid Valve	A	Solenoid Air Valve 120 VAC - 10 Watts	**X**				
	B	Solenoid Air Valve 24 VDC - 10 Watts					
	C	Solenoid Air Valve 240 VAC - 10 Watts					
	X	No air solenoid valve					



SUITABLE FOR
CLASS 1 GROUP D DIVISION 2
HAZARDOUS LOCATIONS

Notes
(1) When LubriMist Model "VO" is supplied as a Back Up unit to another Primary Oil Mist Generator, the VO Reservoir Oil Heater is supplied at the same voltage as the Primary Oil Mist Generator.

(2) Ambient Rating is -20C<AMB<+40C for all assemblies where Back Up Unit is include as optional equipment to a Primary Oil Mist Generator regardless of Primary Oil Mist Generator rating.

(3) Amperage shown is for the LubriMist Model "VO" Oil Mist Generator component as listed. When the "VO" is supplied as a Back Up unit to another Primary Oil Mist Generator, the "VO" Back Up units is pre-wired through a three-position switch. Units are furnished pre-mounted and pre-wired with the Primary Oil Mist Generator so that only the Primary Oil Mist Generator or VO can be energized at any time.

(4) Amperage ratings are shown for individual components. All components are wired and connected separately by purchaser.

(5) Complete "VO" Model Code designations may include optional suffixes for add on accessories. List all that apply. Space is blank when none are selected.
Option –1; Kenco Oiler for Auto Fill to main OMG.

Table 2 *Tagging and Labeling (Class 1 Div. 2)*

Option Description	Option Code	Description	ATEX Model Code	Level Switch Contact Rating	Ambient Rating See Notes (2) & (3)	Volts / Amps Model VO Assembly	
Generator Size	40	40 Bearing Inch	**40 or 100 or 300 or 500**				
	100	100 Bearing Inch				Volts	
	300	300 Bearing Inch				**120 VAC 50/60HZ**	**240 VAC 50/60 HZ**
	500	500 Bearing Inch				**AMPS / POWER**	
Reservoir Oil Heater See Note (1)	A	Option not permissible for ATEX construction	**B or C**				
	B	Explosion Proof Immersion Oil Heater w/Thermostat & Thermometer – 120 VAC – 375 Watts			-**20**C< T amb <+**40**C	3.1 Amp / 3.7 kW	
	C	Explosion Proof Immersion Oil Heater w/Thermostat & Thermometer – 240 VAC – 410 Watts			-**20**C< T amb <+**40**C		1.7 Amp / 4.0 kW
	D	Option not permissible for ATEX construction					
	X	No immersion oil heater, thermostat, or thermometer			-**20**C< T amb <+**49**C	N0T APPLICABLE	
Reservoir Level Switch	A	Low oil level switch	**A**	**20 W @ 120/240 VAC**			
	X	No oil level switch					
Air Solenoid Valve	A	Option not permissible for ATEX construction					
	B	Option not permissible for ATEX construction					
	C	Option not permissible for ATEX construction					
	X	No air solenoid valve	**X**				

Notes

(1) When LubriMist Model "VO" is supplied as a Back Up unit to another Primary Oil Mist Generator, the VO Reservoir Oil Heater is supplied at the same voltage as the Primary Oil Mist Generator.

(2) Ambient Rating is -20C<AMB<+40C for all assemblies where Back Up Unit is include as optional equipment to a Primary Oil Mist Generator regardless of Primary Oil Mist Generator rating.

(3) Amperage shown is for the LubriMist Model "VO" Oil Mist Generator component as listed. When the "VO" is supplied as a Back Up unit to another Primary Oil Mist Generator, the "VO" Back Up units is pre-wired through a three-position switch. Units are furnished pre-mounted and pre-wired with the Primary Oil Mist Generator so that only the Primary Oil Mist Generator or VO can be energized at any time. See the appropriate *Name Plate Labeling Instructions - ATEX Approved Equipment for Primary Oil Mist Generator* amps.

(4) Amperage ratings are shown for individual components. All components are wired and connected separately by purchaser.

(5) Y.O.M. is Year Of Manufacture.

(6) Complete "VFP" Model Code designations may include optional suffixes for add on accessories. List all that apply. Space is blank when none are selected.
Option –1; Kenco Oiler for Auto Fill to main OMG.

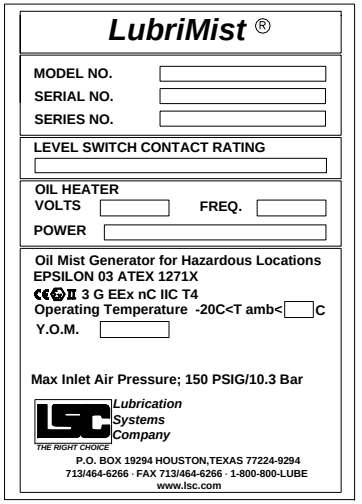


Table 3 *Tagging and Labeling (ATEX)*

EU Certificate of Conformity

The Manufacturer: Lubrication Systems Company
1740 Stebbins Dr.
Houston, Texas 77043
USA

Hereby declares that

The product: LubriMist® Model VO Oil Mist Generator

Is in conformity with the following Directives:

European Directive 94/9/EC CAT 3 ATEX

European Directive 73/23/EEC as amended by European Directive 93/68/EEC "Low Voltage Directive"

European Directive 89/336/EEC as Amended by European Directive 93/68/EEC "EMC Directive"

The Manufacturer declares that the machine described above is protected for use in potentially explosive atmosphere. The apparatus marking shall include the following code:

CE Ex II 3 G EEx nC IIC T4

Epsilon Compliance, UK. Certificate Number EPSILON 03ATEX1271X

The following Harmonized European Standards have been applied:

EN 62326: 1997: 1997 + Amendments A1 & A2 *Electrical Equipment For Measurement, Control And Laboratory Use - EMC Directive* (Emissions Only, Immunity covered by component CE test)

EN 61010-1: 2001 *Safety Requirements Electrical Equipment For Measurement, Control And Laboratory Use.*

EN 50021: 1999 *Electrical Apparatus for Potentially Explosive Atmospheres – Type of Protection "n".*

Signed By: Charles Ehlert

Title: Director of Quality and New Product Development

Date: August 2004

NOTE: This Certificate of Conformity applies only to ATEX tagged LubriMist® Model VO Oil Mist Generators.

Safe Operating Electrical Conditions*

- Indoor/outdoor Use
- Ambient temperature range
  - o -20°C to +40°C (-4°F to +104°F) for VO's with immersion oil heater
  - o -20°C to +49°C (-4°F to +120°F) for VO's without immersion oil heater
- Altitude to 2000m
- Relative humidity not exceeding 80%
- Mains supply fluctuations not exceeding 10%
- Over voltage category II IEC 60364-4-443
- Pollution degree 2

***** Actual ambient operating temperature for the proper production of oil mist depends on various factors such as oil viscosity grade, ambient temperature, etc. Please call LSC for further information.

Mechanical Operating Conditions

- Operating regulated air pressure range: 15 psig (1 bar) to 65 psig (4.5 bar)
- Maximum instrument air inlet pressure: 125 psig (8.6 bar)
- Minimum instrument air inlet pressure: 65 psig (4.5 bar)
- System Output Mist Pressure 20 inches Water Column (508 mm Water Column)

Installation

IMPORTANT: All ATEX approved construction must be installed in accordance with the requirements of BS EN60079-14:1997 – Part 14 Electrical installations in hazardous areas (other than mines).

Install the Model 'VO" to a wall or column in an upright position using the four mounting holes on the unit reservoir flange. The oil level gauge should be in full view, and the oil fill port, located on the top of the reservoir, must be accessible. Allow space for adjusting the oil heater thermostat and oil heater maintenance.

There are no ventilation requirements as long as the unit meets the operating conditions.

Mist Distribution System Connection

Connect the oil mist distribution system to the oil mist outlet (2" NPTF) located on the top of the reservoir. Do not use Teflon tape or conventional pipe dope on the pipe thread. LSC's part number 77600947 should be use on the pipe thread, which is a non-hardening thread lubricant.

Compressed Air Supply

Connect a clean, dry compressed air supply on the left side of the oil mist unit to the integral air filter/regulator (1/4" NPT). Note: Maximum air supply pressure is 125 PSIG (8.6 BAR) and minimum air supply pressure is 65 PSIG (4.5 BAR).

This LubriMist® Oil Mist Generator has been designed and factory tested with LubriMist® Synthetic Oil (LSO). LSC recommends LSO for this oil mist generator in order to insure optimum performance.

Electrical

Electrical connections should be made by a qualified electrician. The user wires all components independently. See " Electrical" section for electrical component configuration and wiring diagrams. The low-level alarm switch can be used for local or remote annunciation (customer to provide Alarm annunciation). The air solenoid valve and oil heater should be provided with a local user provided disconnect.

Warning:

If the equipment is not used in the manner described in this manual the protection provided by the equipment may be impaired.
THIS INSTRUMENT MUST BE EARTHED. Earth Grounding connection is located inside the wiring enclosure of the oil heater.
EXPLOSION HAZARD – For units used in hazardous areas do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous**.**

IMPORTANT:

Electrical power service must have adequate circuit protection. See Tables 1-3 *Tagging and Labeling* for selection. Electrical connection should be made by a qualified electrician and comply with local wiring regulations.

Start-Up

Prior to start-up, recheck all connections and insure that all fittings are tight and electrical connections are properly made. Insure that the oil mist distribution system, reclassifiers, and application point connections, vents and drains are properly installed.

To Start the *LubriMist*® Model "VO"

1. Remove the oil fill cap, located on top of the reservoir, and fill the oil reservoir, taking care not to exceed the "high" level mark on the oil sight gauge. Oil selection should be made based on lubrication and viscosity requirements dictated by the machinery components being serviced. *DO NOT USE MOTOR OIL* or any other oil that has viscosity-improving additives. Replace the oil fill cap. If user furnished oil level alarm has been installed it should now be off or "Normal." See Fig. 3 for reservoir fill capacities.

While filling the oil supply reservoir, monitor the oil level gauge. **DO NOT OVER FILL.** An air space must be maintained above the oil level for mist generation and flow between the mist generator and the mist outlet. If your system includes auto drain legs allowance must be made to collect the return oil volume. Overfilling will result in oil overflowing out of the fill connection and onto the ground, and it will impede oil mist generation.

2. Turn on the air supply to the integral air filter/regulator. For units equipped with an air solenoid valve, turn on the electrical power to the air solenoid valve to allow airflow to the mist generator.
3. Adjust the regulated air pressure by adjusting the integral air filter/regulator (Item No. 10, Fig. 2) until the desired mist pressure reading is achieved. The mist pressure gauge (Item No. 8, Fig. 2) should be set at 20" H_2O for "Mist" type systems and 35" H_2O for "Condensing" and "Spray" type systems. Minimum Regulated Air Pressure is 10 PSIG.
4. Energize the oil heater circuit. Monitor the oil thermometer as the heater increases the oil temperature. The oil heater should de-energize and maintain an operating oil temperature of 110°F (43 °C). Adjustments to the oil temperature can be made by adjusting the oil thermostat located inside the wiring enclosure of the oil heater (Item 11, Figure1). A temperature gauge is located on the reservoir for manual verification of proper temperature setting.

CAUTION:
Adjustments to the oil heater thermostat require that the oil heater terminal enclosure cover be removed. To avoid electrical shock and explosion hazard, turn off electrical power before removing the cover and making adjustments. The cover should be reinstalled and securely fastened before power is re-initiated to the unit.

Prior to making any adjustments to the oil mist generator make sure that the system is located in a non-hazardous area and/or that the proper work permit has been obtained if required. There is a possibility of creating an ignition source i.e. spark. Only a qualified person should make adjustments.

Operation

The daily operation of the oil mist system has been reduced to checks of the generator and lubricated equipment. Except for emergencies, routine adjustment of the generator is not required. Each oil mist system, once installed and balanced, supplies a constant amount of oil mist to a number of lubrication points. Any change in the oil mist pressure or in the regulated air pressure (load pressure) from the initial set points is an indication that some component has failed. Minor adjustments that might offset the failure symptoms may lead to more serious problems before detection and corrections can be made.

Daily Check

1. Check reservoir oil level. Fill as required. Unit must be shut down to fill through the oil fill cap.
2. Check the regulated air pressure and mist header pressure. Changes or fluctuations in mist pressure readings indicate broken or plugged lines and fittings in the distribution system. These problems must be corrected before adjusting the regulated air supply.
3. Check reservoir oil temperature to insure that the oil heater is operating properly.

Maintenance

The following maintenance procedures are recommended to help insure proper system operations:

1. Replace air filter element semi-annually.
2. Inspect and clean interior of reservoir semi-annually.
3. Inspect and clean oil suction tube screen semi-annually.

IMPORTANT:
DO NOT DISASSEMBLE THE VORTEX MIST HEAD.

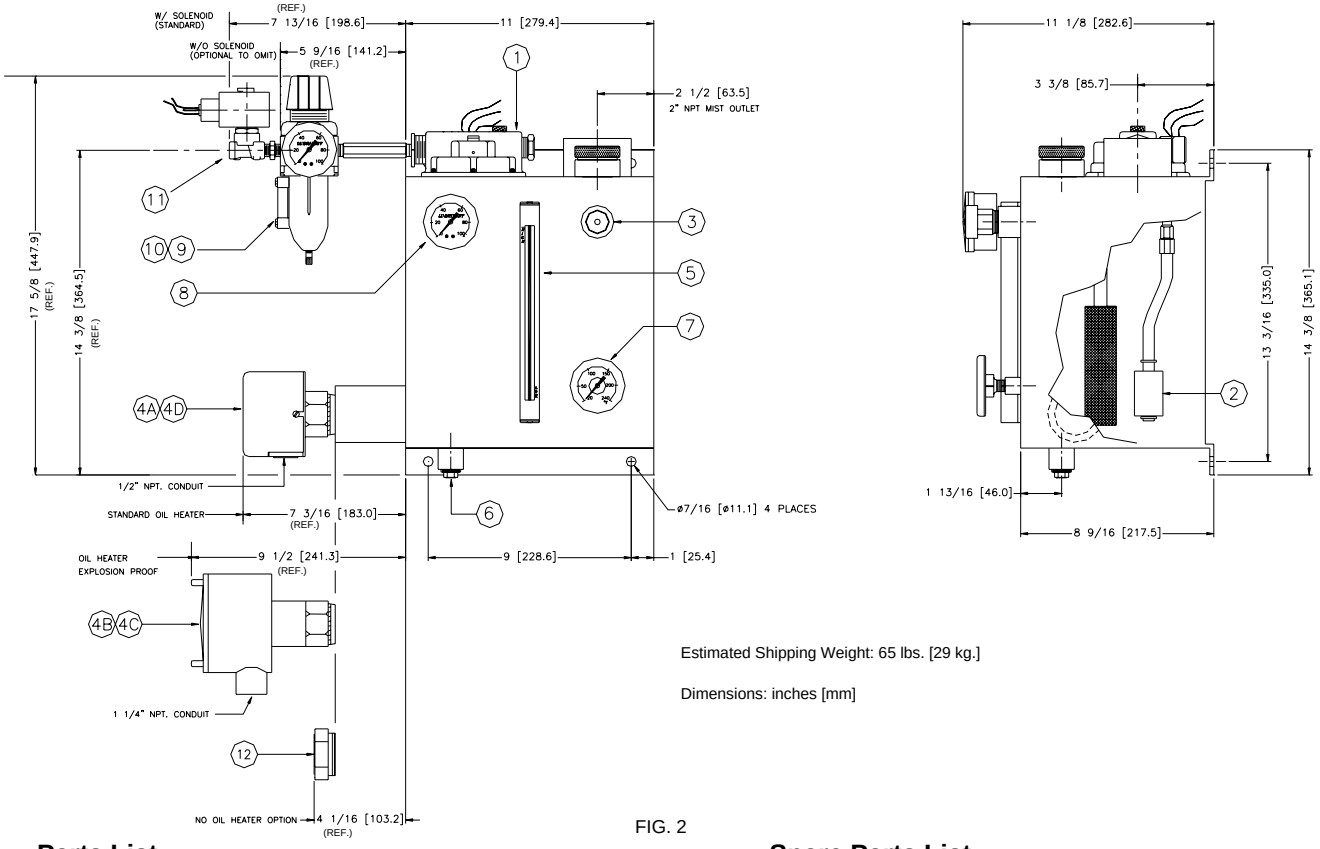
Replacement of filter/regulator element kit

A qualified person should make replacement of spare parts.
The filter element kit part number 77500472 should be cleaned or replaced whenever noticeable drop in pressure occurs. To replace or clean the filter element, shut off and vent all air line pressure to the unit being cleaned. Before removing the bowl, turn adjusting screw counterclockwise until it stops. Carefully remove the bowl. Remove filter element baffle and retainer. Wipe parts clean with soapy water or denatured alcohol.
Caution! Never use solvents like carbon tetrachloride, trichloroethylene, acetone, or paint thinner to clean any parts. If using compressed air to blow dry, be sure to wear appropriate eye protection. Torque bowl before using. Torque bowl and element retainer hand tight, (5 to 10 inch/lbs).

Warning:
Shutting off the air line supply will stop oil mist from being delivered to its lubricating point destination.
Do NOT leave oil mist generator unattended while replacing the filter element.

EXPLOSION HAZARD – Substitution of components may impair suitability for II 3G EEx nC IIC T4
EXPLOSION HAZARD – Substitution of components may impair suitability for Class I, Division 2.
EXPLOSION HAZARD – Static Discharge Hazard. Clean Plastic Surfaces With Damp Cloth Only.

Model 'VO' *LubriMist*® Oil Mist Generator



Estimated Shipping Weight: 65 lbs. [29 kg.]

Dimensions: inches [mm]

FIG. 2

Parts List

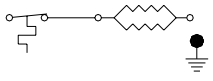
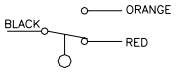
ITEM NO.	PART NO.	DESCRIPTION
1		**Mist Head**
	77-500-046	040 BI Mist Head
	77-000-006	100 BI Mist Head
	77-000-036	300 BI Mist Head
	77-500-058	500 BI Mist Head
2	77-500-050	Low Oil level Switch Assembly
3	77-780-269	Relief Valve
4A	77-600-686	Oil Heater w/Thermostat and General Purpose Enclosure 120VAC / 375 W / Single Phase
4B	77-600-685	Oil Heater w/Thermostat and Explosion Proof Enclosure 120VAC / 375 W / Single Phase
4C	77-500-364	Oil Heater w/Thermostat and Explosion Proof Enclosure 240VAC / 410 W / Single Phase
4D	77-900-978	Oil Heater w/Thermostat and General Purpose Enclosure 240VAC / 410 W / Single Phase
5	U-10923-B8	Oil Level Gauge
6	77-500-795	Oil Drain Plug
7	U-10924-A	Thermometer
8	U-902-S	Mist Pressure Gauge, 0-100 in H_2O
9	U-902-R	Regulated Air Pressure Gauge, 0-100 PSIG
10	77-600-968	Integral Air Filter/Regulator
11	U-10612	Air Solenoid Valve 120VAC
	77700223	Air Solenoid Valve 24VDC
	77720310	Air Solenoid Valve 240VAC
12	76050074	Plug, 1-1/2" SS T304 HX HD 3000#

Spare Parts List

PART NO.	DESCRIPTION
77-500-048	Low Level Oil Switch (1)
77-600-686	Oil Heater w/Thermostat & General Purpose Enclosure 120VAC/375W/Single Phase (1)
77-600-685	Oil Heater w/Thermostat & Explosion Proof Enclosure 120VAC/375W/Single Phase (1)
77-500-364	Oil Heater w/Thermostat & Explosion Proof Enclosure 240VAC/410W/Single Phase (1)
77-900-978	Oil Heater w/Thermostat & General Purpose Enclosure 240VAC/410W/Single Phase (1)
77-600-968	Integral Air Filter/Regulator
77-500-472	Replacement Kit for Filter/Regulator
77-780-269	Pressure Relief Valve
U-902-R	Regulated Air Pressure Gauge
U-902-S	Mist Pressure Gauge
U-10612	Air Solenoid Valve 120VAC (1)
77700223	Air Solenoid Valve 24VDC (1)
77720310	Air Solenoid Valve 240VAC (1)
U-10924-A	Oil/Air Temperature Gauge (1)
LSO681	Lubrimist Synthetic Oil 68 1GAL
	Mist Heads (See Model Code for Proper Selection)
77-500-046	040 BI Mist Head
77-000-006	100 BI Mist Head
77-000-036	300 BI Mist Head
77-500-058	500 BI Mist Head
Note: (1) Required when part of original package	

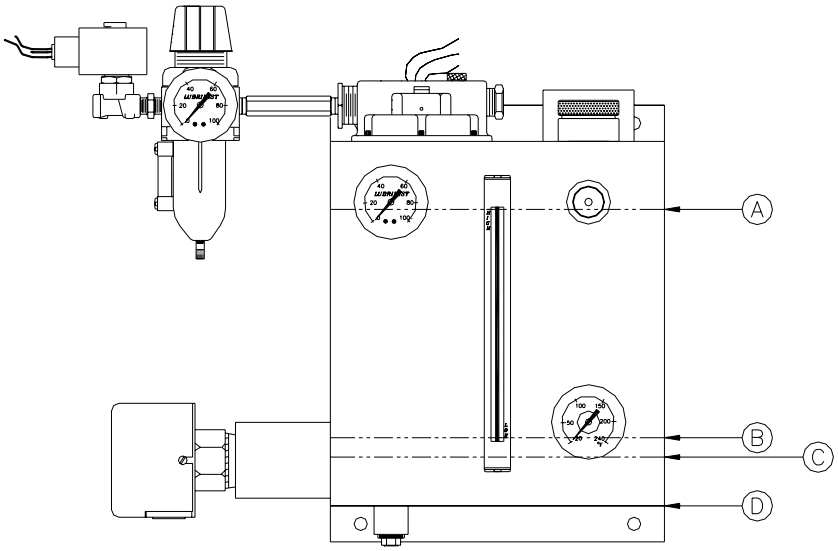
Electrical:

Purchaser independently wires all components.
Electrical connection should be made by a qualified electrician and should comply with local wiring regulations.
Some models may not have all components. See the Product Model Code (Fig. 1) for details.
A switch or circuit breaker shall be included in the building installation; it shall be in close proximity to the equipment and within easy reach of the OPERATOR; it shall be marked as the disconnecting device for the equipment.

AIR SOLENOID VALVE ITEM NO. 12 FIG. 2	IMMERSION OIL HEATER W/T-STAT ITEM NO. 4 FIG. 2	LOW OIL LEVEL ALARM SWITCH ITEM NO. 2 FIG. 2
		
110VAC / 50HZ / 0.09A 120VAC / 60HZ / 0.08A 10 WATTS NORMALLY CLOSED	110VAC / 50HZ / 3.4A / 1-PHASE 120VAC / 60HZ / 3.1A / 1-PHASE 375 WATTS; NEMA 7 OR GENERAL PURPOSE ENCLOSURE THERMOSTAT SET AT 110°F (43°C)	120VAC / 0.16A / 20WATTS HERMETICALLY SEALED MAX. CONTACT RATING: 220VAC / 1A
220VAC / 50HZ / 0.05A 240VAC / 60HZ / 0.04A 10 WATTS NORMALLY CLOSED	220VAC / 50HZ / 1.9A / 1-PHASE 240VAC / 60HZ / 1.7A / 1-PHASE 410 WATTS; NEMA 7 OR GENERAL PURPOSE ENCLOSURE THERMOSTAT SET AT 110°F (43°C)	
24VDC / 0.4A / 10 WATTS NORMALLY CLOSED		24VDC / .8AMPS / 20WATTS, HERMETICALLY SEALED MAX. CONTACT RATING: 220VAC / 1A

(NOTE: Disconnects Provided by Purchaser)

Oil Level



Reservoir Capacities
Model "VO"

KEY	LOCATION	VOLUME TO D (GALLONS)
A	HIGH LEVEL MARK	3.3
B	LOW LEVEL MARK	1.9
C	LOSS OF SUCTION	0.6
D	BOTTOM OF RES.	---

Nominal Dry Weight: 65 lbs.

FIG. 3

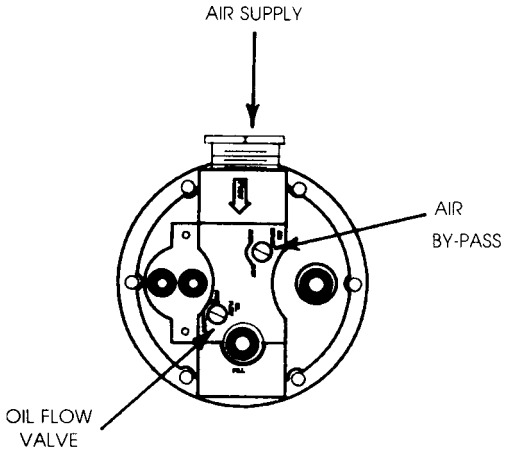
Controlling the Oil Mist

LubriMist® Vortex oil mist generation technology allows for maximum control and adjustment of oil mist properties. There are three basic controls. Refer to Fig. No.'s 2 & 4.

1. The INTEGRAL AIR FILTER/REGULATOR is used to adjust the volume of airflow to the Vortex chamber, which in turn controls oil mist volume. Refer to Item 10, Fig. 2. The volume of oil mist is proportioned to each bearing or application point by the reclassifier. With the air by-pass valve (described below) closed, the air pressure regulator setting must be high enough for oil mist production. Regulated air pressure should be adjusted to maintain proper mist pressure. Since changes in regulated air pressure affect the volume of oil mist produced, it also affects oil consumption.
2. The OIL FLOW VALVE controls oil mist density (oil/air ratio). Its normal position is fully closed. By turning it counterclockwise toward "Less" (opening the bypass) the mist density can be reduced when leaner density oil mist is desired. It should not be opened more than three turns. Adjustments to the oil flow valve do not affect oil mist pressure in the distribution lines or in the generator. See Fig. No. 4 for location.

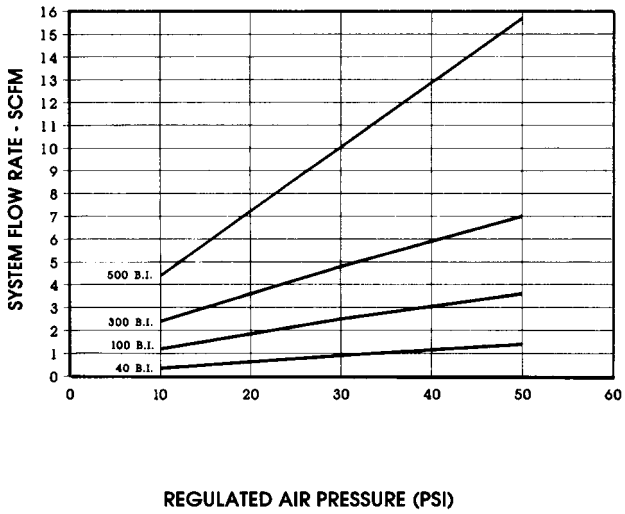
   Note: The oil/air ratio or mist density is also dependent on the characteristics of the oil, oil temperature, and supply air temperature. Density decreases with lower temperatures and higher oil viscosity.
3. The AIR BY-PASS VALVE controls mist pressure without increasing oil output. Its normal position is fully closed, but by turning it counter clockwise toward "Open" more air will be added to the oil mist leaving the generator thus increasing mist pressure. Velocity of mist through the distribution lines and reclassifiers will also increase when this valve is opened. See Fig. No. 4 for location.

   Note: Opening the air by-pass valve reduces the oil/air ratio or mist density. However, oil output is not affected.



Top view of 40, 100, 300 and 500 BI generator head showing controls for oil flow and air by-pass valves.

FIG. 4



Air Flow through LubriMist® Vortex Mist Heads
Air by-pass closed
(Discharging to atmosphere)

FIG. 5

FOR SALES, 24 HOUR SERVICE OR TECHNICAL INFORMATION:

Lubrication Systems Company
THE RIGHT CHOICE

P.O. Box 19294
HOUSTON, TEXAS 77224-9294
713/464-6266 • FAX 713/464-9871 • 800-800-LUBE

DESIGN • MANUFACTURING • INSTALLATION • MAINTENANCE • TRAINING

Misting Oil

All LubriMist Model VFP Oil Mist Generators are tested prior to shipment using LubriMist® Synthetic Oils (LSO). See the following pages for MSDS information. Please note that Material Safety Data Sheets for grades of LSO along with other useful information is available on our website www.lsc.com.

MATERIAL SAFETY DATA SHEET
Lubrication Systems Company

PAGE: 1
REVISION: 11/24/03
MSDS NO.: 30868

LubriMist® Synthetic Oil – 68

SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

LubriMist® Synthetic Oil – 68

CHEMICAL FAMILY:

Petroleum Product Additive

PRODUCT DESCRIPTION:

Lubricant containing phthalate and adipate diesters, and other materials judged not to affect the potential health or environmental impact of the product.

CONTACT ADDRESS:

Lubrication Systems Company
1740 Stebbins Drive, Houston, TX 77043

** EMERGENCY TELEPHONE NUMBERS:	(24 Hours)	**
** CHEMTREC	800- 424-9300	**
** CHEMTREC outside USA	703-527-3887	**
** Infineum USA L.P.	800-726-2015	**

NON EMERGENCY TELEPHONE NUMBER: (8am-5pm M-F)
FOR GENERAL PRODUCT INFORMATION CALL: 800-800-LUBE

SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS

The composition of this mixture may be proprietary information. In the event of a medical emergency, compositional information will be provided to a physician or nurse.
This product is not hazardous as defined in 29 CFR1910.1200

SECTION 3 HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS

EYE CONTACT:

Will cause slight eye discomfort, but will not injure eye tissue.

SKIN CONTACT:

Low order of toxicity.

INHALATION:

Negligible hazard at ambient temperature (-18 to 38 Deg C; 0 to 100 Deg F)
Avoid breathing vapors or mists.

INGESTION:

Minimal toxicity.

SECTION 4 FIRST AID MEASURES

EYE CONTACT:

Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.

Continues on page 2

MATERIAL SAFETY DATA SHEET
Lubrication Systems Company

LubriMist® Synthetic Oil –

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SKIN CONTACT:

Immediately flush with large amounts of water; use soap if available. Remove contaminated clothing, including shoes, after flushing has begun. If this material is injected into or under the skin, or into any part of the body, regardless of the appearance or size of the wound, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

INHALATION:

Using proper respiratory protection, immediately remove the affected victim from exposure. Administer artificial respiration if breathing is stopped. Keep at rest. Call for prompt medical attention.

INGESTION:

First aid is normally not required.

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SECTION 5 FIRE-FIGHTING MEASURES

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FLASH POINT: 480 Deg F. METHOD: PMCC ASTM D93 NOTE: Typical
FLAMMABLE LIMITS: NOTE: Not Available
AUTOIGNITION TEMP.: NOTE: Not available

GENERAL HAZARD

Low Hazard, liquid can burn upon heating to temperatures at or above the flashpoint. Toxic gases will form upon combustion. "Empty" containers retain product residue (liquid and/or vapor) and can be dangerous. DO NOT pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, parks, static electricity, or other sources of ignition; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Empty drums should be completely drained, properly bunged and promptly re-turned to a drum reconditioner, or properly disposed of.

FIRE FIGHTING

Use water spray to cool fire exposed surfaces and to protect personnel.
Isolate "fuel" supply from fire.
Use foam, dry chemical, or water spray to extinguish fire.
Respiratory and eye protection required for fire fighting personnel.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS

Fumes, smoke, Carbon Monoxide (CO) and Oxide of Nitrogen (Toxic)

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SECTION 6 ACCIDENTAL RELEASE MEASURES

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LAND SPILL

Eliminate sources of ignition. Prevent additional discharge of material, if possible to do so without hazard. For small spills implement cleanup procedures; for large spills implement cleanup procedures and, if in public area, keep public away and advise authorities. Also, if this product is subject to CERCLA reporting (see Section 15 REGULATORY INFORMATION) notify the National Response Center.

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Continues on page 3

MATERIAL SAFETY DATA SHEET
Lubrication Systems Company

LubriMist® Synthetic Oil – 68

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Prevent liquid from entering sewers, watercourses, or low areas. Contain spilled liquid with sand or earth. Recover by pumping or with a suitable absorbent. Consult an expert on disposal of recovered material and ensure conformity to local disposal regulations.

WATER SPILL

Remove from surface by skimming or with suitable adsorbents. If allowed by local authorities and environmental agencies, sinking and/or suitable dispersants may be used in non-confined waters. Consult an expert on disposal of recovered material and ensure conformity to local disposal regulations.

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SECTION 7 STORAGE AND HANDLING

==========

ELECTROSTATIC ACCUMULATION HAZARD:

No, but use proper bonding and/or grounding procedure.

STORAGE TEMPERATURE, Deg F:

Ambient

LOADING/UNLOADING TEMPERATURE, Deg F:

140 Maximum

STORAGE/TRANSPORT PRESSURE, mmHg:

Not available

LOADING/UNLOADING VISCOSITY, cSt:

Not available

STORAGE AND HANDLING:

Keep container closed. Handle and open containers with care. Store in a cool, well ventilated place away from incompatible materials. Do NOT handle or store near an open flame, heat or other sources of ignition. Protect material from direct sunlight. This material is not a static accumulator, but use proper bonding and/or grounding procedures. Do NOT pressurize, cut, heat, or weld containers. Empty product containers may contain product residue. Do NOT reuse empty containers without commercial cleaning or reconditioning.

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SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

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EXPOSURE CONTROLS

The use of local exhaust ventilation is recommended to control process emissions near the source. Laboratory samples should be handled in a lab hood. Provide mechanical ventilation of confined spaces. See respiratory protection recommendations.

PERSONAL PROTECTION

For open systems where contact is likely, wear safety glasses with side shields, long sleeves, and chemical resistant gloves. Where contact may occur, wear safety glasses with side shields.

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Continues on page 4

MATERIAL SAFETY DATA SHEET
Lubrication Systems Company

LubriMist® Synthetic Oil – 68

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Where concentrations in air may exceed the limits given in this Section and engineering, work practice or other means of exposure reduction are not adequate, NIOSH approved respirators may be necessary to prevent overexposure by inhalation.

WORKPLACE EXPOSURE GUIDELINES

A SUPPLIER RECOMMENDS THE FOLLOWING OCCUPATIONAL EXPOSURE LIMITS:
5 mg/m3 for synthetic lubricants. .

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SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

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SPECIFIC GRAVITY at Deg F:	0.96 at 60 Typical
DENSITY at Deg F:	8.0 lbs/gal at 60
VAPOR PRESSURE, mmHg at Deg F:	Negligible at ambient
SOLUBILITY IN WATER, wt. % at Deg F:	Negligible
VISCOSITY OF LIQUID, cSt at Deg F:	68 at 104 Typical 7.6 at 212 Typical
SP. GRAV. OF VAPOR, at 1 atm (Air=1):	Greater than air
FREEZING/MELTING POINT, Deg F:	Less than ambient
EVAPORATION RATE, n-Bu Acetate=1:	Negligible
BOILING POINT, Deg F:	604 IBP

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SECTION 10 STABILITY AND REACTIVITY

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STABILITY:

Stable

CONDITIONS TO AVOID INSTABILITY:

Avoid overheating.

HAZARDOUS POLYMERIZATION:

Will not occur

CONDITIONS TO AVOID HAZARDOUS POLYMERIZATION:

None

MATERIALS AND CONDITIONS TO AVOID INCOMPATIBILITY:

Strong oxidizing agents

HAZARDOUS DECOMPOSITION PRODUCTS:

Not applicable

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SECTION 11 TOXICOLOGICAL INFORMATION

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Please refer to Section 3 for available information on potential health effects.

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Continues on page 5

MATERIAL SAFETY DATA SHEET
Lubrication Systems Company

LubriMist® Synthetic Oil – 68

SECTION 12 ECOLOGICAL INFORMATION

No specific ecological data are available for this product. Please refer to Section 6 for information regarding accidental releases and Section 15 for regulatory reporting information.

SECTION 13 DISPOSAL CONSIDERATIONS

Please refer to Sections 5, 6 and 15 for disposal and regulatory information.

SECTION 14 TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION (DOT):
This product is not DOT regulated.

SECTION 15 REGULATORY INFORMATION

TSCA:

All of the components of this product are listed on the TSCA Inventory.

CERCLA:

If this product is accidentally spilled, it is not subject to any special reporting under the requirements of the Comprehensive Environmental Response, Compensation and Liability Act. We recommend you contact local authorities to determine if there may be other local reporting requirements.

SARA TITLE III:

Under the provisions of Title III, Sections 311/312 of the Superfund Amendments and Reauthorization Act, this product is classified into the following hazard categories:
Not Hazardous.
This product does not contain Section 313 Reportable Ingredients.

SECTION 16 OTHER INFORMATION

HAZARD RATING SYSTEMS:

This information is for people trained in:
National Paint & Coatings Association's (NPCA)
Hazardous Materials Identification System (HMIS)
National Fire Protection Association (NFPA 704)
Identification of the Fire Hazards of Materials

	NPCA-HMIS	NFPA 704	KEY
HEALTH	1	0	4 = Severe
FLAMMABILITY	1	1	3 = Serious
REACTIVITY	0	0	2 = Moderate
			1 = Slight
			0 = Minimal

Continues on page 6

MATERIAL SAFETY DATA SHEET
Lubrication Systems Company

LubriMist® Synthetic Oil – 68

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CAUTION: HMIS ratings are based on a 0-4 rating scale with 1 representing minimal hazards or risks, and 4 representing significant hazards or risks. Recommended HMIS ratings should not be used in the absence of a fully implemented HMIS hazard communication program.

REVISION SUMMARY:
This is a first edition.

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REFERENCE NUMBER:	SUPERSEDES ISSUE DATE:
HDHA-B10906	March 22, 2002

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LAST PAGE