GENERAL

The Air-Oil Generating system delivers high efficiency lubrication for high-speed spindles and other applications requiring accurate oil deliveries, in combination with air flow. The Air-Oil Generating Unit is versatile and allows multiple configurations that enable systems to be designed to suit various applications.

APPLICATION

The Air-Oil Generating Unit is a self contained lubricating system pre assembled and ready for installation. The unit contains the following elements: an electric SureFire Lubricator with precision gear oil pump, proprietary electronic controller to operate and monitor all functions, Air Treatment System (primary 5 micron filter and a secondary 0.01 micron coalescing filter), On-off Air Solenoid and an Air-Oil mixing manifold to inject oil into the air delivery tubing. The Air-Oil Generating system monitors and includes oil level warning, oil low level cut-out and two pressure monitoring devices. The proprietary control works in conjunction with optional “OSS” Oil Streak Sensing Units to monitor downstream oil particles flowing to critical bearings. The SureFire Controller operates in real time and has 3 internal relay outputs which can be connected to a host computer/PLC to monitor the system status and fault type if any. The control can be reset at the SureFire Lubricator.

The Air-Oil Generating Unit is designed to deliver small amounts of lubricant in a uniform and continuous feed basis. The oil is injected periodically into the output air stream every 1–5 minutes and depending on oil viscosity and air pressure, delivers continuous particles of lubricant to the bearing. The goal is to still have lubricant exiting the tubing at the end of the interval, then initiate another oil injection. Spindles with high RPM and DN values over 500,000 benefit the most from the continuous oil delivery, as well as small pitch chain, cam followers and linear bearing subjected to coolant and debris. The ground rule is the Air-Oil systems must be vented and have a flow path to carry the lubricant to the desired surface. Spindles, housings and linear bearings must be vented to work properly.

The Air-Oil Generating Unit is versatile and allows multiple configurations that enable systems to be designed to suit various applications. The advanced design delivers precise amounts of lubricant and eliminates residual drift of “oil fog” mist during operation. In general terms, Air-Oil can replace an existing Oil Mist or aerosol lubrication system, without modification of the spindle or system. Other machines that were formerly lubricated with grease-pack will require modification to allow air flow.

Contact BIJUR DELIMON for assistance and specific solutions.
OPERATION

The Air-Oil Generating Unit utilizes an air/oil Positive Displacement Injector (PDI) block to deliver a precise amount of oil into a controlled air flow. The air propels the oil droplets along the inside wall of the small bore tubing until it reaches the lubrication point. The tubing length stretches out the flow of lubricant so that a continuous flow arrives at the nozzle/lubrication point.

Air expansion at the nozzle outlet generates a controlled spray for efficient bearing lubrication. A wide selection of injector rates combined with individually adjustable air valves provide specific air/oil deliveries to maintain thin lubricant oil films to each high-speed anti-friction bearing or other surfaces.

Operation of the injectors occurs during an alternating pressure and relief cycle controlled by the lubricator operation.

TECHNICAL DATA

Reservoir capacity : ................................................................. 1.8 Liter; 2.7 Liter
Lubricant : .......................................................... Refer to Operators Manual no. 35717_Air-Oil Generating Unit_2012_1_GB
Lube connections : ................................................................. 1 Minimum / 12 Maximum
Electrical connections:

SureFire Lubricator options: .......................................................... 100/115 V AC, 200/220 V AC & 24 V DC
Air ON/OFF Solenoid options: .................................................. 115 V AC, 220 V AC, 24 V DC (2/2 N/C valve)
SureFire fault options: ................................................................. 3 programmable fault relays, 8 Pin M12 Connector
Inlet Air connection : ................................................................. 8 mm – 5/16” Tubing (push-to-connect)
Lube point connection : ............................................................. 4 mm or 6 mm or ¼” Tubing (push-to-connect)

Air treatment system Regulator : ................................................ ¼” Porting, C/W Gauge (psi or bar)
Primary filtration rating : ............................................................ 5 µm
Coalescing filtration rating : .............................................................. 0.01 µm
Solenoid valve : ............................................................................. N/C, DIN 43650-A
Oil filtration:

Inlet filter on pump : ................................................................. 450 µm Strainer
Pressure filter on panel : ............................................................. 5 µm
Air pressure switch on panel : .................................................... 44 psi (3 bar) rising, N/O, DIN 43650-A (wired to Surefire)
Oil pressure switch on panel : ..................................................... 225 psi (15.5 bar), N/O, DIN 43650-A (wired to Surefire)
Overall Dimensions : ............................................................... 522 mm x 372 mm x 190 mm
Cover Material : ........................................................................... ABS
Dry Weight (2.7 l SureFire with 4-way air-oil block) : ......................... 30 lb (13.5 kg)
Relative Humidity : ................................................................. 80% at 31°C decreasing linearly to 50% at 40°C
HOW TO ORDER

Lube Pump Spec
2 - SureFire 1.8L
3 - SureFire 2.7L

Control Type
A - Terminal Strip
B - Controller
C - Controller w/Oil Streak Sensing

Voltage
0 - 24 VDC
C - 100 / 115 VAC
0 - 200 / 220 VAC

Air Preparation System
D - Air Press. Reg. + Filter + Coalescing Filter + 115VAC Solenoid
E - Air Press. Reg. + Filter + Coalescing Filter + 220VAC Solenoid
F - Air Press. Reg. + Filter + Coalescing Filter + 24VDC Solenoid

Lubrication Type
L - Light Oil (10 to 1500cSt)
S - Standard Oil (20 to 1500cSt)

Tail Tube Size
4 - 4mm (5/32")
6 - 6mm
7 - 3/8"

Delivery Output*
G - 0.001cc/cycle
A - 0.005cc/cycle
B - 0.01cc/cycle
C - 0.10cc/cycle
D - 0.20cc/cycle
E - 0.30cc/cycle
F - 0.40cc/cycle
X - Blank
Z - Null

Air-Oil Block**
1 - 1 Outlet Air-Oil Block + Fittings
2 - 2 Outlet Air-Oil Block + Fittings
3 - 3 Outlet Air-Oil Block + Fittings
4 - 4 Outlet Air-Oil Block + Fittings
5 - 5 Outlet Air-Oil Block + Fittings
6 - 6 Outlet Air-Oil Block + Fittings
TYPICAL AIR-OIL LUBRICATION SCHEMATIC

SYSTEM COMPONENTS

1. Sure-Fire Lubricator
2. Air-Oil Mixing Block (4-Way)
3. UIL Filter
4. UIL Pressure Switch
5. Air Pressure Switch
6. SMC Air Treatment Unit
7. Oil Streak Sensor Kit
## SERVICE PARTS

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Part #</th>
</tr>
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<tbody>
<tr>
<td>4</td>
<td>M12 8 Pin Electrical Connector</td>
<td>23842</td>
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<tr>
<td>5</td>
<td>SureFire Lubricator W/Controller; 2 L</td>
<td>60301</td>
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<tr>
<td></td>
<td>SureFire Lubricator W/Controller; 3 L</td>
<td>60302</td>
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<td>6</td>
<td>Oil Filter; 5µm</td>
<td>43252</td>
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<td>7</td>
<td>Pressure Gauge</td>
<td>24541</td>
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<td>8</td>
<td>Oil Pressure Switch</td>
<td>26772-2</td>
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<tr>
<td>9</td>
<td>Air Pressure Switch</td>
<td>26641-2</td>
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<td>10</td>
<td>Air Pres Reg/Filter/CF/115 V AC Sol.</td>
<td>60195-5</td>
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<tr>
<td></td>
<td>Air Pres Reg/Filter/CF/230 V AC Sol.</td>
<td>60195-9</td>
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<td></td>
<td>Air Pres Reg/Filter/CF/24 V DC Sol.</td>
<td>60195-7</td>
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<td>11</td>
<td>Block air/oil 4-way</td>
<td>AV4AAAA 1</td>
</tr>
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<td>12</td>
<td>Grommets</td>
<td>60254</td>
</tr>
<tr>
<td>13</td>
<td>Handle</td>
<td>60133</td>
</tr>
<tr>
<td></td>
<td>-- Tubing 8 mm O.D. (not shown)</td>
<td>8N6-450</td>
</tr>
</tbody>
</table>

1 Standard 4-Outlet Block part #. For additional part #’s contact BIJUR DELIMON
2 All “-5” & “-9” part numbers have ‘psi’ scale. For ‘MPa’ scale change part number to “-2”
3 “-7” part number has a “psi” scale. For ‘MPa’ scale change part number to “-8”

**Replacement Filter Elements:**
- Oil Filter: 43254
- Air Filter Coalescing: 60200 (0.01 µm)
- Air Filter: 60201 (5 µm)
ACCESSORIES

Coiled Tubing
Tubing is normally mounted in the horizontal position or at a slight incline. Coils help to stretch out deliveries in short tubes for continuous lubricant flow. During shutdown, a small volume of oil collects at the bottom of each loop for faster delivery during start up.

![Coiled Tubing Diagram]

Tubing Specifications:

<table>
<thead>
<tr>
<th>Part #</th>
<th>No. of Coils</th>
<th>X (mm)</th>
<th>Y (mm)</th>
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<tbody>
<tr>
<td>26263-5</td>
<td>5</td>
<td>25</td>
<td>31.5</td>
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<tr>
<td>26263-7</td>
<td>7</td>
<td>52</td>
<td>59</td>
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</table>

Standard Straight Tubing
Standard Tube for connecting to Lube Point

<table>
<thead>
<tr>
<th>Part #</th>
<th>No. of Coils</th>
<th>X (mm)</th>
<th>Y (mm)</th>
<th>Material</th>
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<tbody>
<tr>
<td>4N2.5W</td>
<td>4 mm (5/32&quot;)</td>
<td>2.5 mm</td>
<td>Clear Polyurethane</td>
<td></td>
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<tr>
<td>8N31T</td>
<td>6 mm</td>
<td>4.0 mm</td>
<td>Clear Polyurethane</td>
<td></td>
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<tr>
<td>29635</td>
<td>¼&quot;</td>
<td>4.3 mm</td>
<td>Clear Polyurethane</td>
<td></td>
</tr>
</tbody>
</table>

Nozzles
Offered in various sizes, Nozzles normally produce a round spray pattern. Typically, this nozzle configuration is suitable for anti-friction bearings and other applications where precise wetting is required. Nozzle orifice size and air pressure determine the shape and velocity of the air and oil mix.

![Nozzle Diagram]

Nozzle Specifications:

<table>
<thead>
<tr>
<th>Part #</th>
<th>T1</th>
<th>T2*</th>
<th>L1 (mm)</th>
<th>L2 (mm)</th>
<th>D1 (mm)</th>
<th>D2 (mm)</th>
<th>H (mm)</th>
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<tr>
<td>27107-1</td>
<td>1/8 NPT</td>
<td>5/16-24</td>
<td>4</td>
<td>20</td>
<td>2.5</td>
<td>6</td>
<td>11.1</td>
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<td>27107-2</td>
<td>1/8 NPT</td>
<td>5/16-24</td>
<td>4</td>
<td>20</td>
<td>1.5</td>
<td>6</td>
<td>11.1</td>
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<tr>
<td>27107-3</td>
<td>1/8 NPT</td>
<td>5/16-24</td>
<td>10</td>
<td>26</td>
<td>2.0</td>
<td>5</td>
<td>11.1</td>
</tr>
<tr>
<td>27107-4</td>
<td>1/8 BSPT</td>
<td>M8X1</td>
<td>4</td>
<td>20</td>
<td>2.5</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>27107-5</td>
<td>1/8 BSPT</td>
<td>M8X1</td>
<td>4</td>
<td>20</td>
<td>1.5</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>27107-6</td>
<td>1/8 BSPT</td>
<td>M8X1</td>
<td>10</td>
<td>26</td>
<td>2.0</td>
<td>5</td>
<td>10</td>
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Additional Accessories

Oil Streak Sensing Unit See Datasheet #35719
DIMENSIONS (mm)

Overall

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
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<tbody>
<tr>
<td>Cover</td>
<td>522 mm</td>
<td>372 mm</td>
</tr>
<tr>
<td>Panel (w/o Cover)</td>
<td>510 mm</td>
<td>360 mm</td>
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</tbody>
</table>

Mounting

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Für unbehinderte Bewegung
For smooth motion