



Operators Manual

# OIL STREAK

Air-Oil Generating Unit

35717 · R3



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## Precautions & Symbols

The following symbols, used to identify safety instructions, are defined as follows:



Non-compliance will affect safety.



Electrical safety is involved.

**ATTENTION**

Safe operation of the lubricator and/or protection of the lubricator should be considered.



Electrical connections made to Earth ground.

**WARNING**

Conditions and actions that pose hazards to the user.

**N**

Electrical connections made to the neutral conductor are identified with the capital "N"

All safety and/or warning labels affixed to the Air-Oil Generating Unit must be maintained in a completely legible condition. Also, any modifications made to the Air-Oil Generating Unit (or to any of its components) must be approved by Bijur Delimon International prior to its use; otherwise the warranty and any liability by Bijur Delimon International will be null and void.

## Manufacturer's Statement

The manufacturer and/or distributor has provided the parts list and assembly diagram in this manual as a reference tool only. Neither the manufacturer or distributor makes any representation or warranty of any kind to the buyer that he or she is qualified to make any repairs or replace any parts to the product. In fact, the manufacturer and/or distributor expressly states that all repairs and parts replacements should be undertaken by certified and licensed technicians, and not by the buyer. The buyer assumes all risk and liability arising out of his or her repairs to the original product or replacement parts thereto, or arising out of his or her installation of replacement parts thereto.

## General

Before installing this unit, please read this *Operators Manual* carefully. Failure to follow these instructions can result in damage to the product and/or serious bodily injury. The Air-Oil Generating Unit meets all of the operating parameters for a positive displacement injector centralized lubricating system. You will need this manual for the safety warnings and precautions, assembly, operating, inspection, maintenance and cleaning procedures, parts list and assembly diagram. Keep your invoice with this manual. Write the invoice number on the inside of the front cover. Keep this manual and invoice in a safe and dry place for future reference.

## Application

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 Generator Unit is versatile and allows multiple configurations that enable systems to be designed to suit various applications.

## Overview

The Air-Oil Generating Unit is a self contained lubricating system preassembled and ready for installation. The unit contains the following elements: an electric SureFire II 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 II Controller operates in real time and has 2 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 II 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 bearings 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 Generator 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.

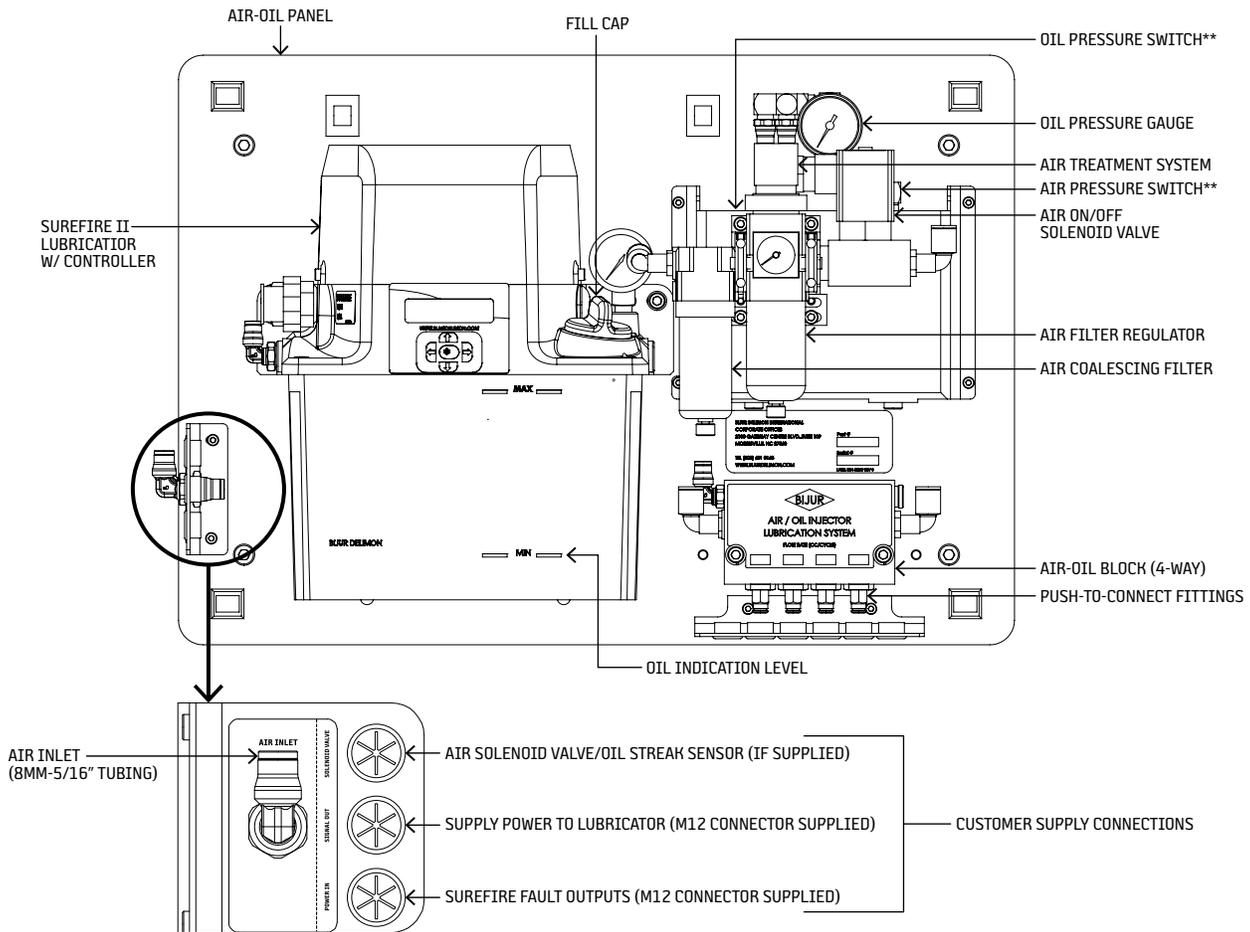
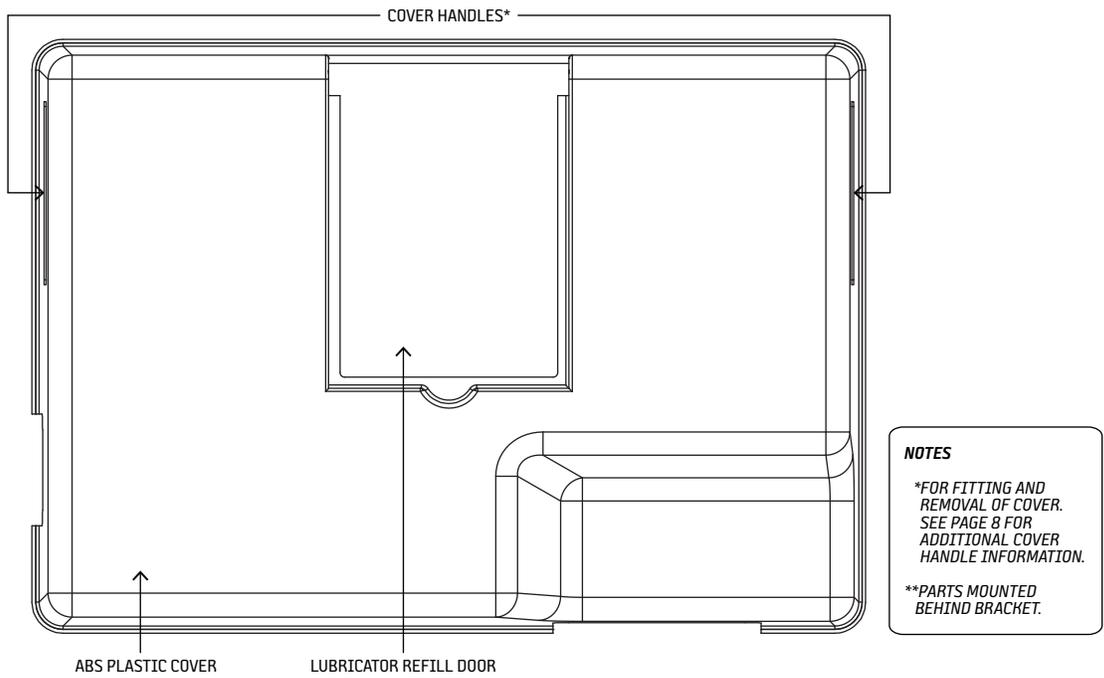
The system advantage over a Mist system is each lubrication point utilizes a Positive Displacement Injector (PDI) with eight oil outputs ranging 0.01 (1/3 oil drop) ~0.40cc (12 oil drops) per pump cycle. This permits exact oil volumes to be discharged into an air mixing valve, for controlled air and oil flows. Ideally the lubricant can use an uninterrupted tube path through metal or clear plastic tubing to the lubrication inlet point. Avoid bulkhead fittings, elbows and manifolds downstream, they disrupt the flow path and delay oil delivery on start-up.

The Air-Oil Generating Unit can deliver small or large air flows to the bearings and handle a wide range of oil viscosities. At 60 psi (4 bar) air flow in the adjustable Air-Oil manifold ranges from 1.7~ 125 Standard Cubic Feet Hour (SCFH) or 0.8~58 Normal Liters Per Minute. The non adjustable high-flow Air-Oil manifold delivers 5~7 Standard Cubic Feet Minute (SCFM) depending on a fixed nozzle size and air pressure. The high flow is used in high speed grinding to displace coolant ingress around the front labyrinth seal and certain Vertical Machine Center (VMC) where multiple bearings are lubricated from a single oil passage. The air flow balances the Air-Oil delivery.

### ATTENTION

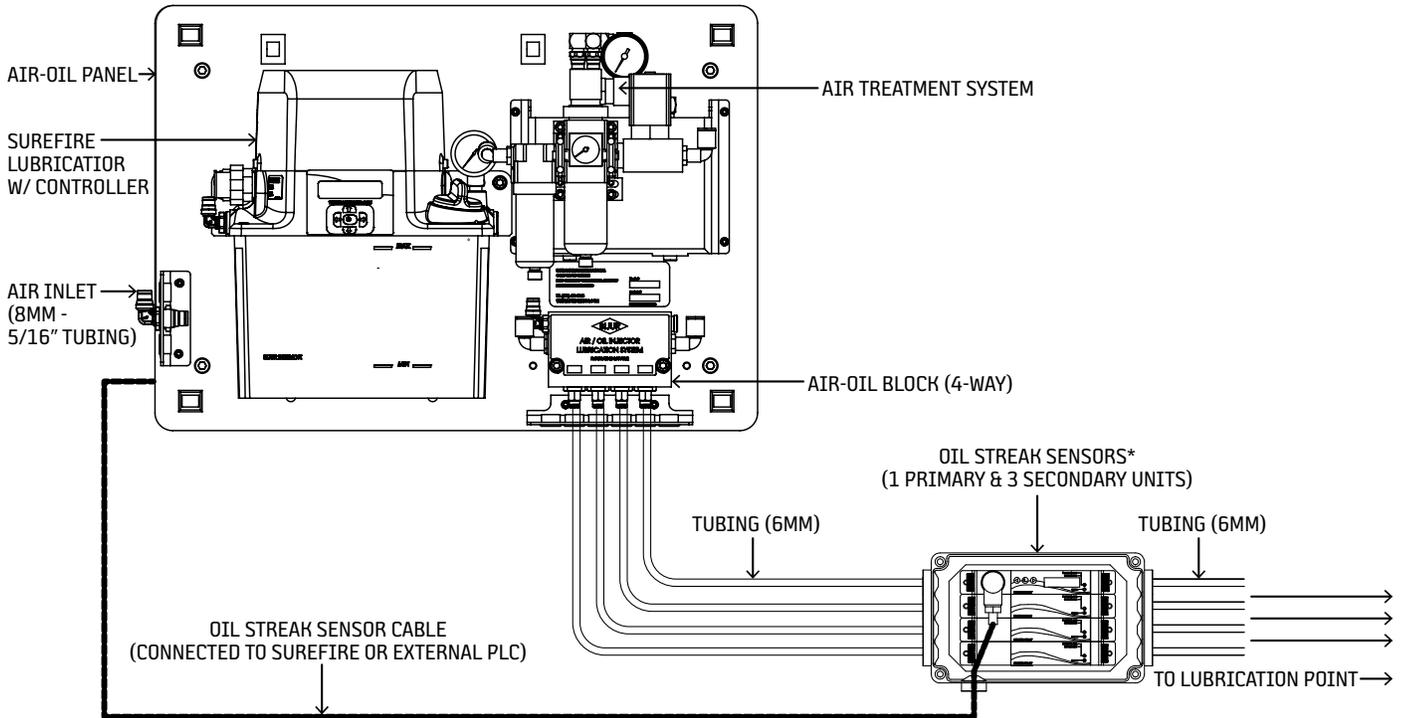
*See back cover for location listing and contact information.*

# Air-Oil Generating Unit at a Glance



## Installation Diagram

### Typical Layout: 4 Lubrication Points

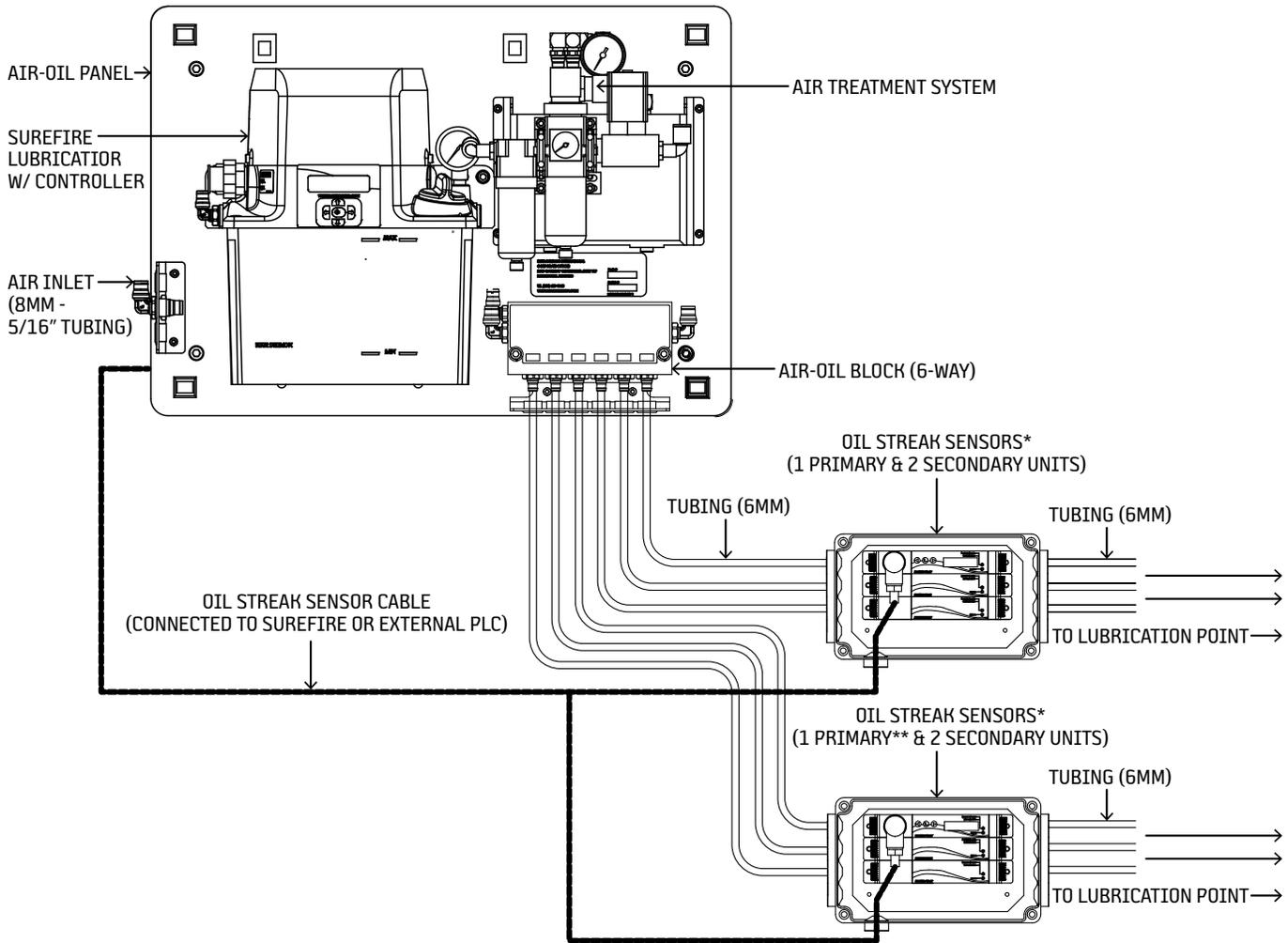


*\*OIL STREAK SENSORS IN ENCLOSURES*

### FEATURES

- INTEGRATED PACKAGING PROVIDES CLEAN, REGULATED AIR AND OIL FLOW TO BEARINGS.
- INDIVIDUAL, CONTROLLED AIR FLOW TO EACH POINT.
- MIXING BLOCK INJECTORS DELIVER PRECISE OIL OUTPUT.
- MODULAR SYSTEM - ADD OR CHANGE COMPONENTS AS REQUIRED.
- CUSTOMIZED KITS AVAILABLE FOR SPECIAL APPLICATIONS.

## Typical Layout: 6 Lubrication Points



*\*OIL STREAK SENSORS IN ENCLOSURES*

*\*\*AN ELECTRICAL ENCLOSURE IS REQUIRED WHEN MORE THAN ONE PRIMARY SENSOR IS USED*

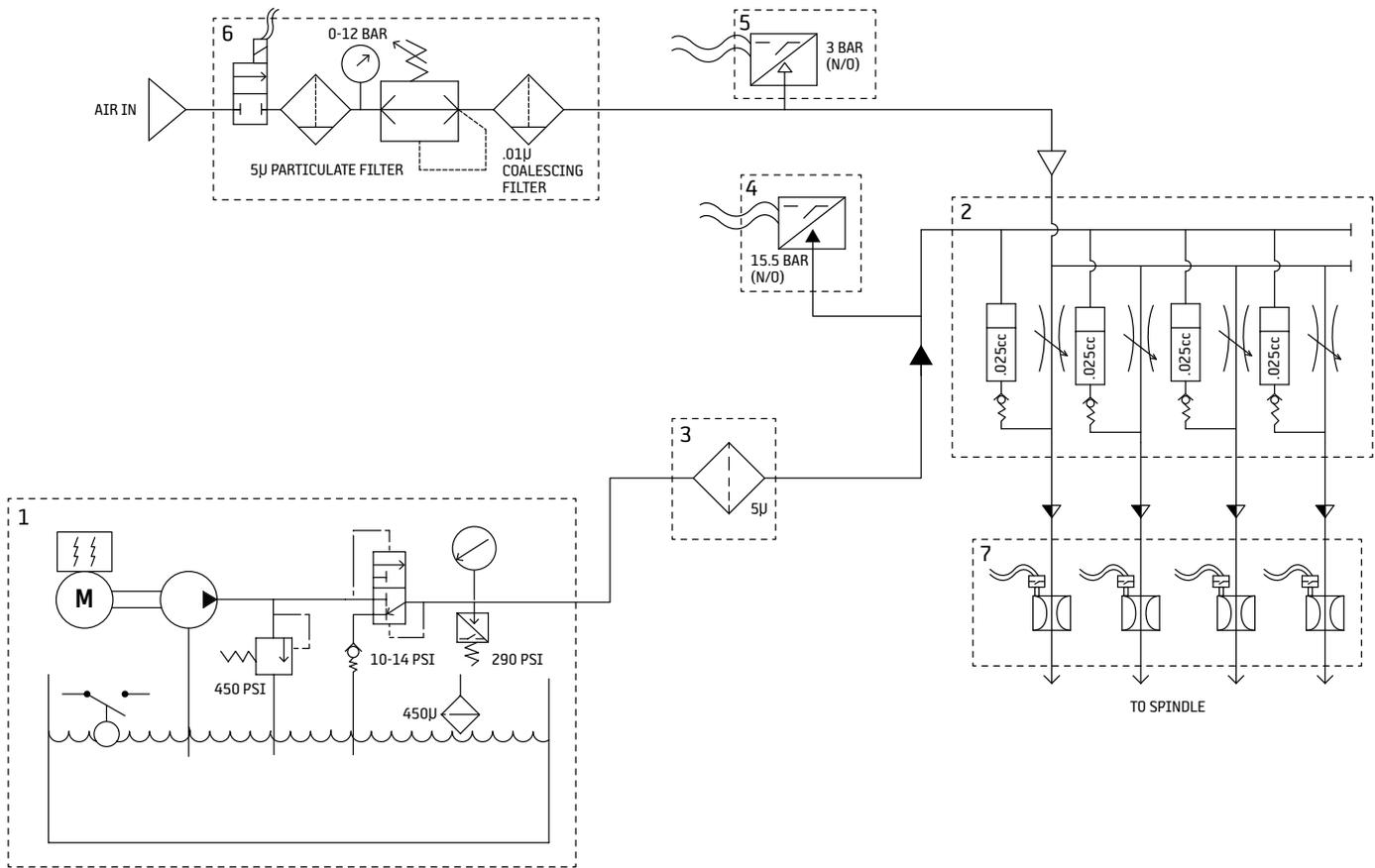
## Technical Data

|   |                                |  |
|---|--------------------------------|--|
| <b>Reservoir Capacity</b>                                     |                                | 2 liter, 3 liter   |
| <b>Lubricant</b>  |                                | Refer to <i>Choosing Oil Lubricant</i> (page 11)   |
| <b>Minimum Lube Connections</b>                               |                                | 1  |
| <b>Maximum Lube Connections</b>                               |                                | 12   |
| <b>Electrical Connections</b>                                 | SureFire II Lubricator Options | 100/115 VAC, 200/220 VAC & 24 VDC<br>DIN Power<br>M12 Signal Output<br>(Optional Cable Glands) |
|   | Air ON /OFF Solenoid Options   | 115 VAC, 220 VAC, 24 VDC (2/2 N/C Valve)   |
|   | SureFire II Fault Output       | 2 Fault contacts(Ref SureFire II Manual #36412)  |
| <b>Inlet Air Connection</b>                                   |                                | 8mm - 5/16" Tubing (Push-to-Connect)   |
| <b>Lube Point Connection</b>                                  |                                | 4mm or 6mm or 1/4" Tubing (Push-to-Connect)  |
| <b>Air Treatment System</b>                                   | Supplier                       | SMC  |
|   | Regulator                      | 1/4" Porting, C/W Gauge (psi or bar)   |
| <b>Primary Filtration Rating</b>                              |                                | 5 Micron   |
| <b>Coalescing Filtration Rating</b>                           |                                | 0.01 Micron  |
| <b>Solenoid Valve</b>   |                                | N/C, DIN 43650-A   |
| <b>Oil Filtration</b>   | Inlet Filter on Pump           | 450 Micron Strainer  |
|   | Pressure Filter On Panel       | 5 Micron   |
| <b>Air Pressure Switch On Panel</b>                           |                                | 44 psi (3 bar) rising, N/O, DIN 43650-A<br>(wired to SureFire II)                              |
| <b>Oil Pressure Switch On Panel</b>                           |                                | 225 psi (15.5 bar), N/O, DIN 43650-A<br>(wired to SureFire II)                                 |
| <b>Overall Dimension</b>                                      |                                | 522mm x 372mm x 184mm  |
| <b>Cover Material</b>   |                                | ABS  |
| <b>Dry Weight (2.7L SureFire II with 4 way air-oil block)</b> |                                | 30lb (13.5kg)  |
| <b>Relative Humidity</b>                                      |                                | 80% at 31°C decreasing linearly to 50% at 40°C   |

### ATTENTION

The Oil Streak Air-Oil Generating unit is for indoor use only.

## Typical Air-Oil Lubrication Schematic



### SYSTEM COMPONENTS

- |                              |                                       |                                |                              |
|------------------------------|---------------------------------------|--------------------------------|------------------------------|
| <b>1</b> SUREFIRE LUBRICATOR | <b>2</b> AIR-OIL MIXING BLOCK (4-WAY) | <b>3</b> OIL FILTER            | <b>4</b> OIL PRESSURE SWITCH |
| <b>5</b> AIR PRESSURE SWITCH | <b>6</b> SMC AIR TREATMENT UNIT       | <b>7</b> OIL STREAM SENSOR KIT |                              |

## Safety

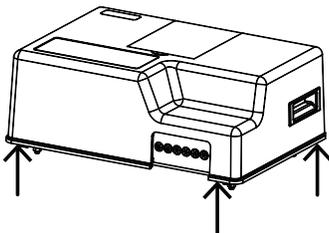
This *Operators Manual* covers fundamental concepts, which are to be observed for installation, operation and maintenance. Therefore, it is absolutely necessary that the *Operators Manual* be studied by the person doing the installation prior to installation and start-up. It is also necessary to have this *Operators Manual* nearby and available for reference in the future. The safety instructions mentioned in this *Operators Manual*, as well as all national operating and safety regulations for the safe operation of such equipment are to be observed.

## Installation

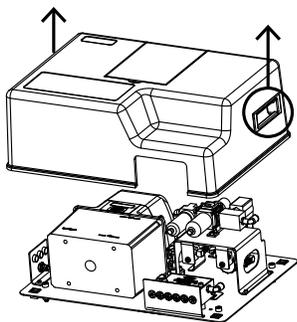


### Product Removal

Do not remove/lift the Air-Oil Generating Unit panel from the box using the cover handles. It is advised that you lift the Oil Streak unit by the panel bottom.



*The Air-Oil Generating Unit's cover handles are only for fitting & removing the Oil Streak unit cover.*



## Mounting

The Air-Oil Generating Unit should be mounted in a location free from vibrations and impacts. It must be mounted on a vertical face and not on a moving machine part. The Air-Oil Generating Unit is mounted using 4 x M8 screws. See *Dimensional Schematics* on page 19 for mounting dimensions.

1. Using the handles remove the panel cover and set aside.
2. Provide access to the lubricator for means of cleaning and visual inspection.
3. Always adhere to installation instructions of the machine manufacturer with regards to drilling and welding procedures. Observe minimum distances specified between holes and the upper and lower flange of the frame or between the holes.
4. Use drilling templates to locate and drill mounting holes. Mounting plates and templates are available for this product. When possible use existing mounting holes or studs.
5. Lubrication lines and electrical cable must be secured by means of clamps or straps to prevent them from rubbing or coming loose. Keep lines away from shocks and heat. For added protection tubing and cables should be wrapped with appropriate loom or spiral wrap.

## Reservoir Filling

Follow proper filling procedures (See Maintenance section *Refilling the Lubricator*):

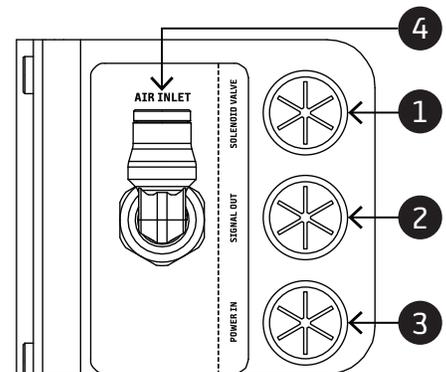
- Use only approved lubricant
- Use only new and clean lubricant and clean filling devices; dirt and other forms of contamination are a leading cause of pump failure.
- Use of either a manual or an automatic filling device is appropriate; care should be taken to avoid developing pressure inside the reservoir. Overfilling the reservoir can lead to pump damage and risk of injury.

### ATTENTION

*The Air-Oil Generating Unit must not be turned upside down when there is lubricant in the lubrication pump reservoir.*

## Inlet Air Connection

Connect the air supply using 8mm (5/16") tubing to the customer supply connections.



| Item | Description  |
|------|--|
| 1    | Air Solenoid Valve or Oil Steak Sensor (If required)                       |
| 2    | Lubricator mains power supply (M12 connector supplied on lubrication pump) |
| 3    | Lube pump fault outputs (M12 connector supplied on lubrication pump)       |
| 4    | Air Inlet Connector (Push-to-Connect); 8mm (5/16") tube                    |

**ATTENTION**

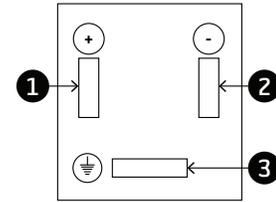
See Operations Manual #36412: SureFire II Controller Supplement for full details of programming the SureFire II Controller and details of the Fault Monitoring Systems, parts and accessories,

**Electrical Pin-Outs (SureFire II)**

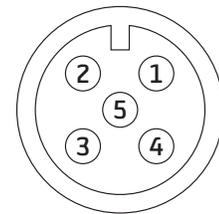
The user connects the input power(Controller type 115VAC, 230VAC or 24VDC) to the pump via a DIN Connector 43650A(C1) The 5-pin connector (C2) is the Signal Connector. For Terminal Strip Surefire II pumps, cable glands are supplied.(Check under motor cover for type and wiring schematic)

**Electrical Connection (Solenoid)**

The Air Solenoid Valve is supplied with a DIN Connector (C3) and must be wired per *Electrical DIN Connector (C3)* diagram during commissioning of the Air-Oil Generating Unit. The Solenoid Valve is a 2/2 - normally closed valve. The voltage depends on the unit that is ordered.

**Mains Power Connector (C1)****Power Electrical DIN Connector**

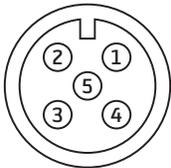
| Pin # | Description                  |
|-------|------------------------------|
| 1     | (+) AC/DC - Live - Brown     |
| 2     | (-) AC/DC Neutral - Blue     |
| 3     | Earth / Ground- Green/Yellow |

**Signal Connector (C2)****M-12 Signal Connector(MALE)**

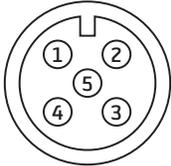
| Pin # | Description | Wire Color   |
|-------|-------------|--------------|
| 1     | K1 COMMON   | Brown        |
| 2     | K1 N/C      | White        |
| 3     | K1 N/O      | Blue         |
| 4     | K2 COMMON   | Black        |
| 5     | K2 N/C      | Green/Yellow |

**ATTENTION**

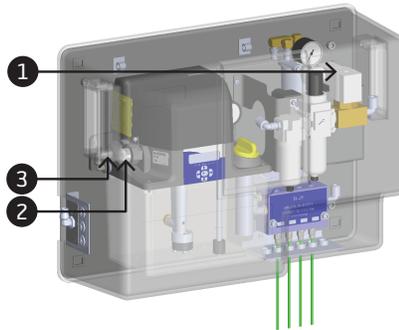
See below if SureFire II was ordered as special 24VDC with M12 Power and M12 Signal Connectors

**Mains Power Connector (C1)****24VDC M-12 Power Connector (MALE)**

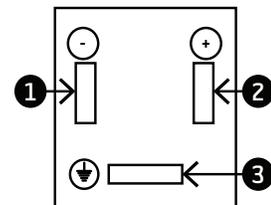
| Pin # | Description  | Wire Color   |
|-------|--------------|--------------|
| 1     | 24VDC (+)    | Brown        |
| 2     | ---          | White        |
| 3     | 0V (-)       | Blue         |
| 4     | ---          | Black        |
| 5     | Earth/Ground | Green/Yellow |

**Signal Connector (C2)****24VDC M-12 Signal Connector(FEMALE)**

| Pin # | Description | Wire Color   |
|-------|-------------|--------------|
| 1     | K1 COMMON   | Brown        |
| 2     | K1 N/C      | White        |
| 3     | K1 N/O      | Blue         |
| 4     | K2 COMMON   | Black        |
| 5     | K2 N/C      | Green/Yellow |



| Item     | Description  |
|----------|--|
| 1        | Air Solenoid Valve (C3 DIN Connector)  |
| 2        | DIN Connector (C1 Mains Power)   |
| 3        | M12 Connector (C2 Signal)  |
| Optional | M12 Connector (C4 Oil Streak Sensing)<br>If Control Type option "C" is selected in part number, a second M12 connector will be added to the SureFire II next to C2 M12 connector for connection of the Oil Streak Sensors. (not shown) |

**DIN Connector (C3)****Electrical DIN Connector (C3)**

| Pin # | Description |
|-------|-------------|
| 1     | (-) AC/DC   |
| 2     | (+) AC/DC   |
| 3     | Earth       |

## Choosing Oil Lubricant

Typical oil lubricants for high-speed anti-friction bearings consist of oil viscosities ranging from ISO VG32 to VG100. The Bijur Delimon Air-Oil Generating Unit is also capable of using as low as ISO VG10 (special gear head is required for ISO VG10 lubricant).

| ISO @100°F | Viscosity (cSt) | Nominal (SSU) |
|------------|-----------------|---------------|
| 32         | 30              | 142           |
| 46         | 45              | 200           |
| 68         | 65              | 300           |
| 100        | 100             | 465           |

## Calculating the Oil Amounts

A thin oil film separates the rolling elements from the raceways. The oil film should be of a sufficient thickness to prevent asperity contact between moving surfaces.

Lubricant requirement for the anti-friction bearings can vary with lubricants and operating conditions.

The formula below is offered as a guide only as the final requirements for individual applications can vary from these values:

### Lubricant Requirement Formula

$$V = 0.00003 * x D * B * R$$

*V = oil requirement in cc/hour*

*D = Bearing I.D. (mm)*

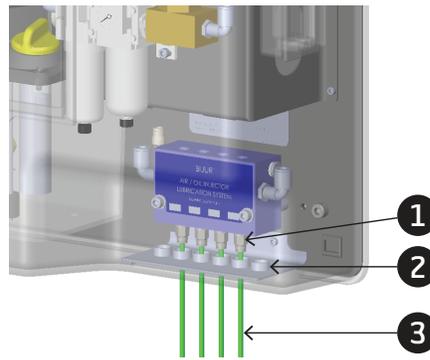
*B = Bearing Width (mm)*

*R = # of rows*

*\*0.00005 for bearings over 350mm ID*

## Lubrication Point Connections

The lubrication tubes are connected through the grommets and into the Push-to-Connect fittings on the Air-Oil Block. The tube used for connecting between the Air-Oil Block and the lubrication points should be transparent and can be 4mm (5/32"), 6mm or 1/4". This depends on the system that is ordered (if the system requires an Oil Streak Sensing unit than the tubes should be 4mm (5/32") or 6mm).



| Item | Description                                |
|------|--|
| 1    | Push-to-Connect fittings, on Air-Oil Block |
| 2    | Grommets                                   |
| 3    | Tubes to lubrication point                 |

Helical coiled tubing may be used where short line runs are encountered. In longer line runs, multiple coils may not be necessary. Two to five coils are available.

*Note: Fewer coils deliver proportionally less lubricant on start-up after shutdown.*

### ATTENTION

*Do not use oil containing solid lubricant additives with air-oil system.*

## Setting the Inlet Air Supply & Needle Valves

It is important to ensure that the air supplied to the lubrication point is very clean and it is highly recommended that a coalescing filter (0.01 microns) is fitted to the system.

Normal air flow settings are listed in the table to the right (for accurate flow readings connect a flow meter to the lubrication tube at the lubrication point). Increased flows are required for higher viscosity oils.

The flow rate is adjusted on the Air-Oil Block using the needle valves. You may adjust the flow rate of an individual outlet or multiple outlets, depending on your system.

### ATTENTION

*If a specific flow rate is required, remove the lubrication tube at the lubrication point and fit a flow meter. Adjust the flow rate, using the needle valves, to the required setting.*

*If the lubrication tube becomes blocked due to a malfunction the maximum pressure in the tube is 220 psi (15 bar).*

## Air & Oil Pressure Monitoring Switches

The Air-Oil Generating Unit is fitted with an air and oil pressure monitoring switch. Both switches are wired back into the lubricator as standard, they are monitored via the SureFire II Lubricator Controller and their status can be determined through the M12 fault contact connector (C2). See *Technical Data* on page 7 for a full specification for both switches.

### Air Flow Data per Outlet

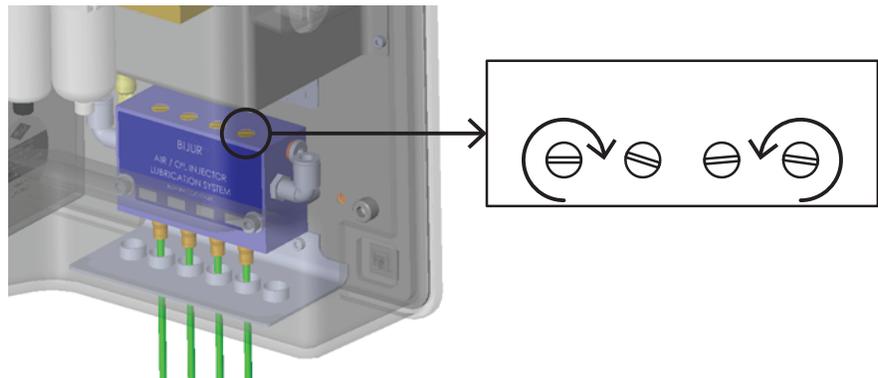
Outlet air flow vs needle valve position.

| Air Pressure @ Inlet | 1/6 Turn (Open)                            | 1/2 Turn (Open)                          | 1 Turn (Open)                             | 2 Turns (Open)                            | 4 Turns (Open)                             |
|----------------------|--|--|---|---|--|
| 50 psi (3.4 bar)     | 0.61 liter/min (1.3 ft <sup>3</sup> /hour) | 3.8 liter/min (8 ft <sup>3</sup> /hour)  | 11.8 liter/min (25 ft <sup>3</sup> /hour) | 27.3 liter/min (58 ft <sup>3</sup> /hour) | 51.7 liter/min (110 ft <sup>3</sup> /hour) |
| 60 psi (4.1 bar)     | 0.80 liter/min (1.7 ft <sup>3</sup> /hour) | 4.7 liter/min (10 ft <sup>3</sup> /hour) | 14.1 liter/min (30 ft <sup>3</sup> /hour) | 32.7 liter/min (70 ft <sup>3</sup> /hour) | 58.8 liter/min (125 ft <sup>3</sup> /hour) |
| 80 psi (5.5 bar)     | 1.30 liter/min (2.7 ft <sup>3</sup> /hour) | 6.6 liter/min (14 ft <sup>3</sup> /hour) | 18.8 liter/min (40 ft <sup>3</sup> /hour) | 42.3 liter/min (90 ft <sup>3</sup> /hour) | 75.2 liter/min (160 ft <sup>3</sup> /hour) |

*Note: With a 1.2 meter long tail tube, 2.7 mm inside diameter*

### Adjusting the Needle Valves

Turning the Needle Valve clockwise will decrease the flow rate while turning it counter clockwise will increase the flow rate.

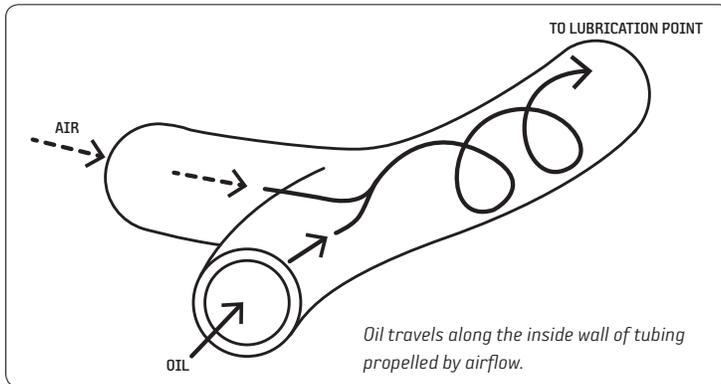


*Note: To adjust the needle valve a short slotted head screw driver is required.*

## Operation

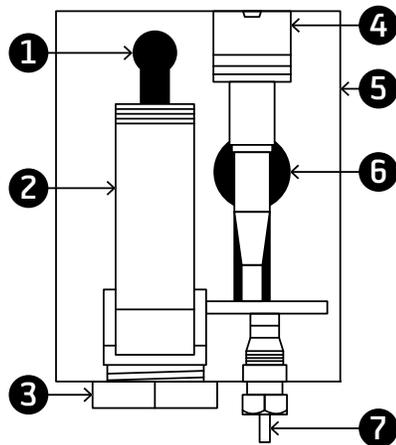
High performance machinery that utilizes high-speed roller bearings require a thin lubricant film to separate the rolling element from the raceway. Over-lubrication can be just as destructive as under-lubrication, accurate delivery of the correct viscosity oil is essential to maintain maximum bearing life at peak operating conditions. Bijur Delimon offers various formulas to calculate oil volume per hours as a starting point. Once the system is operational, performance oil flow can be monitored by temperature or vibration analysis. Once established the ideal interval can be determined and monitored by the "OSS" Oil Streak Sensor.

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.

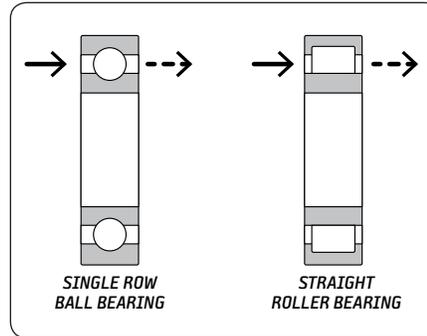


| Item | Description  |
|------|--|
| 1    | Oil Inlet (from lubricator)  |
| 2    | Positive Displacement Injector (self-contained cartridge for easy servicing) |
| 3    | Removable Plug   |
| 4    | Adjustable Needle Valve (Air)  |
| 5    | Air/Oil Block  |
| 6    | Air Inlet  |
| 7    | Air/Oil Mix Delivery Tail Tube   |

**ATTENTION**

In certain situations, lubricant may be directed to the outer bearing ring. Ensure that lubricant is not delivered into the pressure zone between the ball and outer ring. Always direct lubricant into the unloaded ring.

### How Air/Oil Flows Through Bearings



Bearings dynamics affect the delivery method of how air/oil flows through the tubing. Air/Oil deliveries must flow unimpeded through the bearing for successful lubrication. Always ensure a free air flow passage through the bearing element. Air restrictions and back pressure can impede proper deliveries to critical areas.

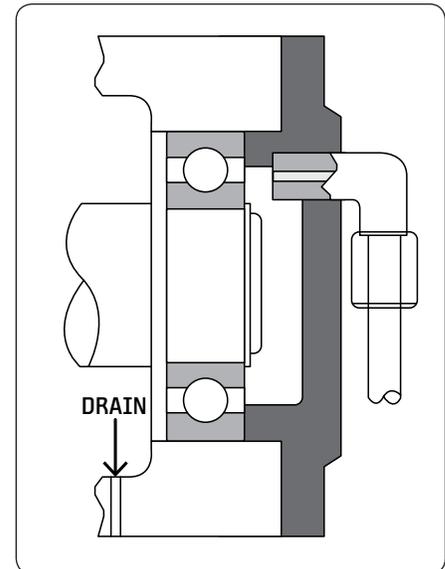
- If required, air flow pressures may be adjusted to overcome air turbulence created by high speed bearings.
- One nozzle is required for most applications, for larger bearings, greater than 150mm (6") a second nozzle maybe required.
- For single-row bearings, direct nozzle bore to the side of the bearing at lower inner ring surface. Do not direct the output delivery towards the ball cage of the bearing.
- Angular contact bearings develop a pumping action in one direction – the oil must be supplied in the direction shown above.

### How Tubing Connects to Bearing

The feed line can be 4mm, 6mm or 1/4" O.D. clear plastic tubing is recommended. The minimal tube length is one meter (3.3 feet). Greater line runs are permitted, runs less than 1 meter from air/oil block injector to bearing should incorporate a series of helical coils to increase developed length. Tubes with two to five coils are available.

### Venting the Bearing

It is necessary to locate a 4mm minimum diameter drain/vent in the bearing housing to minimize air back pressure and prevent oil collection in the sump.



## Start-Up Instructions

This *Operators Manual* covers fundamental concepts, which are to be observed for installation, operation and maintenance. Therefore, it is absolutely necessary that the *Operators Manual* be studied by the person doing the installation prior to installation and start-up. It is also necessary to have this *Operators Manual* nearby and available for reference in the future. The safety instructions mentioned in this *Operators Manual*, as well as all national operating and safety regulations for the safe operation of such equipment are to be observed.

### Starting Up the System

For the initial start-up remove the cover from the Air-Oil Generating Unit.

1. Fill the reservoir with the required lubricant; fill to above the minimum amount and do not exceed the maximum amount.
2. Make sure that the connection(s) from the Air/Oil Block to the Lubrication point(s) are made.
3. Make sure the air inlet connection is made. Turn the air regulator on the Air-Oil Generating Unit off fully. Turn on the mains air supply, this will allow air to flow as far as the air regulator or the Air Solenoid Valve if fitted.
4. Connect in the mains power to the lubricator, connect in the signal cable and connect up the Air Solenoid Valve and Oil Streak Sensing unit (if fitted to the system).
5. Turn on the mains power to the lubricator. If the lubricator is a SureFire II, which has a controller, this will need to be set-up as per the SureFire II Controller manual (*Operators Manual #36412: SureFire II Controller Supplement*).

The following parameters have to be set-up:

- Motor on-time (recommended 6/10 seconds on for 1 to 6-way outlet block).
- Motor off-time
- Pre-lube cycle – during initial commissioning, or after extended shutdowns, it is necessary to ensure a reliable supply of lubricant to the lubrication point before starting the spindle. The pre-lube will provide this lubricant by cycling the lubrication system a predetermined number of times over a short period of time. The number of pre-lube cycles will depend on the length of the lubrication tubes, for lubrication tubes less than 1 meter 8 cycles are recommended and for up to 10 meters 15 cycles recommended.
- The oil pressure switch should be enabled.
- The air pressure switch should be enabled.

### Initial Commissioning

During the pre-lube cycle the lubricant should wet the lubricating lines and the inflow channels in the spindle. This should leave a visible oil streak as far as the spindle bearings. Depending on the length and size of the lubricating line it may be necessary to repeat the pre-lube cycle one or more times.

### Restarting the System

Any lubricant that may have accumulated after extended down-time, at low points of the lubricating lines, should be delivered to the spindle with the air stream. Also, a pre-lube cycle should initiate to ensure that the lines to the lubrication points are adequately full of oil.

### ATTENTION

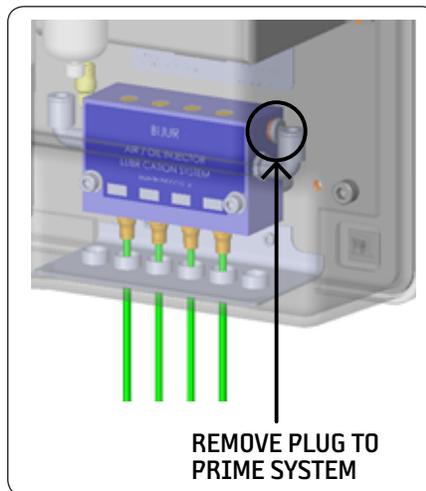
*When programming the SureFire II it is recommended to select the Controller option.*

**ATTENTION**

*\*It will take more cycles to prime a system with 0.01cc injectors than with a system with bigger size injectors.*

*Once there is a visible/uniform oil streak present in the lubrication tubes, the system is now ready for full operation.*

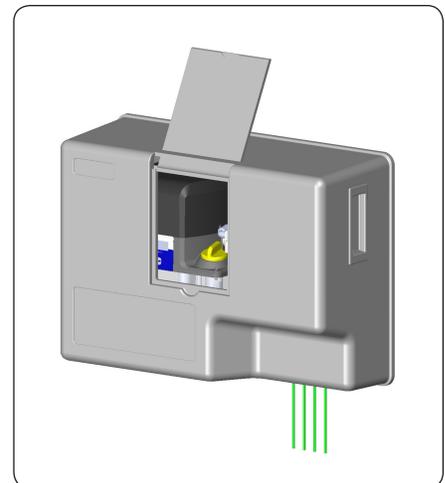
6. Turn on the Air Solenoid Valve, if fitted, and adjust the inlet air pressure to the required setting; minimum 60 psi (4 bar) and a maximum 88 psi (6 bar). This will allow air to travel into the air/oil block.
7. Air is now allowed to flow through the air/oil block and out the outlet tubes. The flow rate in the lubrication tubes can be setup by removing the lubrication tube from the lubrication point, fitting a flow meter to the tube end and adjust the needle valve on the air/oil block to get the required flow rate (See page 12 chart *Air Flow Data per Outlet* for alternative flow rate set-up).
8. Once the lubricator is on the system has to be primed. This is done by removing the plug on the air/oil block and pressing the prime button on the lubricator. Run 4 to 5 cycles to ensure all the air is removed from the system. Once the system is fully primed refit the plug.
9. The system now needs to fill the lubrication tubes with an oil streak. This is done by initiating the pre-lube cycle. Additional priming can be activated by pressing the prime button on the SureFire II Lubricator\*.
10. The system should be observed to ensure that there is a continuous streak in the full length of the lubrication tubes. This ensures that the supply of oil to the lubrication point is uniform.
11. Prior to fitting the cover check all of the air lines and oil lines for leaks with leak detection spray.
12. Once all of the above is completed, fit the cover and the system should be ready for operation.



## Maintenance

### Refilling the Lubricator

Open the door on the cover and remove the fill cap on the lubricator. When filling the reservoir it is recommended to use a funnel. Make sure that the reservoir is filled passed the minimum amount marked on the reservoir.



*Warning: Do not fill the oil past the MAX level marked on the reservoir.*

## Troubleshooting

| Symptoms   | Possible Cause   | Remedy   |
|--|--|--|
| Air pressure switch fault                            | The Air Solenoid Valve is not energized.   | Check to see if the solenoid is energized.   |
|  | The regulator on the panel is not open enough to allow adequate pressure.  | Ensure that incoming air is not below the minimum required pressure of 58 psi (4 bar).   |
|  | Check that there are no leaks in the air lines and fittings.   | Replace any faulty components.   |
|  | Check the filters on the air treatment to ensure the filters are very clean.   | Replace the air filters.   |
|  | The needle valves on the air/oil block are open too much and the system is not capable of building enough air pressure.  | Adjust the needle valves to allow the system to build a minimum of 58 psi (4 bar).   |
| Oil pressure switch fault                            | The lubricator is not building up the required pressure.   | Check that there are no oil leaks in the system.   |
|  | Check that the pressure reading on the SureFire II Lubricator is the same as the reading on the pressure gauge on the filter; both should be approx. 450 psi (31 bar). | <p>If the SureFire II is not building pressure to 450 psi (31 bar) there is a problem with the SureFire II Lubricator (see <i>Operators Manual #36412: SureFire II PDI Single Phase</i>).</p> <p>If the SureFire II Lubricator gauge is reading 450 psi (31 bar) and the pressure gauge on the filter is reading much less then the filter element in the filter needs to be replaced.</p> |
| One of the outlet injectors is not working           | The lubrication tube is blocked.   | Check to see that the lubrication tube is not blocked and air is travelling through it.  |
|  | There is a faulty injector.  | Replace the injector. For injector replacement part #'s contact Bijur Delimon.   |
| Warning or low level fault on SureFire II Lubricator | Check that the oil level is above the warning or low level marked on the reservoir.  | Refill the reservoir with the required amount of oil.  |
|  | If the oil level is filled to the MAX level and the fault still exists it is possible that there is a fault with the level switch or the controller.                   | Contact Bijur Delimon technical support.   |
| Oil Streak Sensing Unit fault                        | There is not a uniform oil streak present in the lubrication tubes.  | Adjust the system so that the oil streak is uniform. This can be achieved by reducing the lube cycle off time or / and adjusting the air flow rate.  |
|  | The oil sensor unit is set-up too sensitive for the application.   | Configure the oil streak sensor to suit the system - see oil streak manual for all parameters.   |
|  | There is no oil streak in one of the lubrication tubes.  | Investigate to see why the injector is not operating, see symptoms <i>One of the outlet injectors is not working</i> .   |

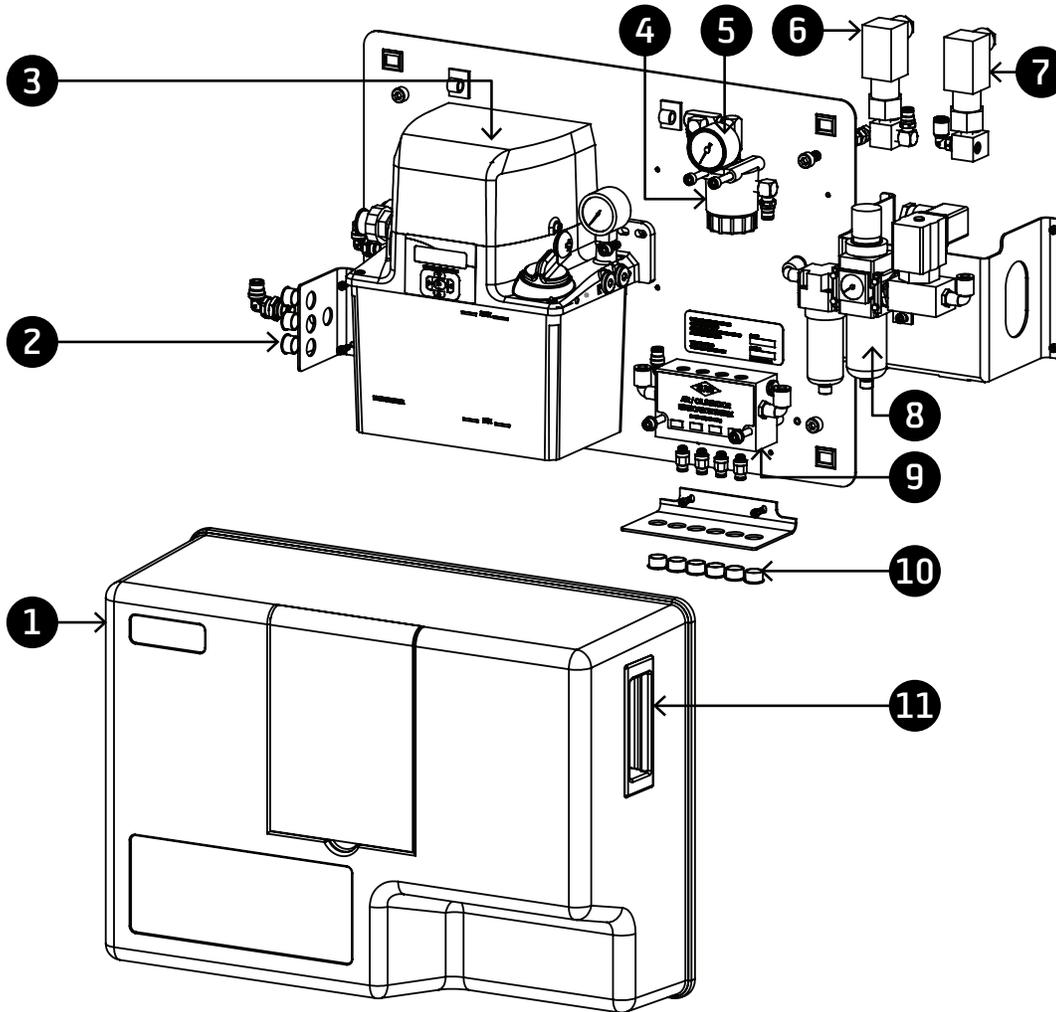
### ATTENTION

For further assistance contact our technical support team. See back cover for location listing and contact information.

## How to Order

See Datasheet #35720: Oil Streak Air-Oil Generating Unit for product and accessory part #'s.

## Service Parts



| Item | Description  | Part #        |
|------|--|---------------|
| 1    | Cover Assembly                                     | 60370         |
| 2    | Grommets   | 60254         |
| 3    | SureFire II Lubricator 115VAC w/Controller;3 Liter | SFX71101-115* |
| 4    | Oil Filter; 5 micron                               | 43252         |
| 5    | Pressure Gauge                                     | 24541         |
| 6    | Oil Pressure Switch                                | 26772-2       |
| 7    | Air Pressure Switch                                | 26641-2       |
| 8    | Air Filter Regulator + Solenoid Valve              | 60195-5*      |
| 9    | Block air/oil 4-way                                | AV4AAAA*      |

| Item | Description                | Part #  |
|------|----------------------------|---------|
| 10   | Grommets                   | 60254   |
| 11   | Handle                     | 60133   |
| ---  | Tubing 8mm O.D (Not shown) | 8N6-450 |

\* Standard part #'s. For additional part #'s contact Bijur Delimon.

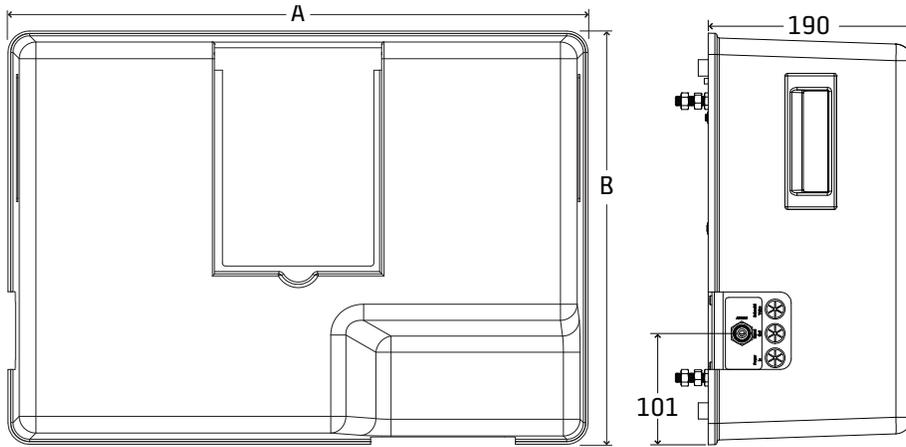
## Replacement Filter Elements

| Description                         | Part # |
|-------------------------------------|--------|
| Oil Filter                          | 43254  |
| Air Filter Coalescing (0.01 micron) | 60200  |
| Air Filter (5 micron)               | 60201  |

## Dimensional Schematics

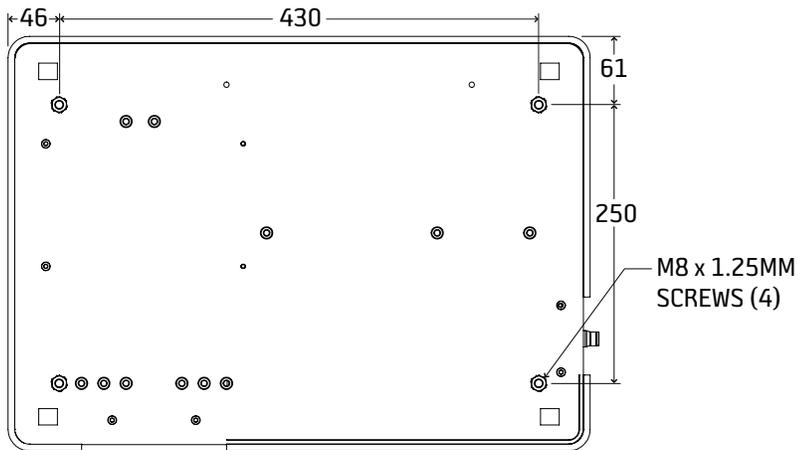
Measurements shown in millimeters.

### Overall



|                   | A     | B     |
|-------------------|-------|-------|
| Cover             | 522mm | 372mm |
| Panel (w/o Cover) | 510mm | 360mm |

### Mounting



# Innovators of engineered lubrication technology since 1872

Bijur Delimon International has ISO 9001:2008 and ISO 14000 quality certified manufacturing facilities around the world, so your centralized lubrication system meets the highest industry quality standards. It's all part of our commitment to quality and customer service.



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