DESCRIPTION OF OPERATION:

COOLUBRICATOR Systems are completely self-contained, positive displacement continuous spray systems. The System operates when the adjustable pulse generator automatically cycles the metering pump(s). The metering pump stroke and output is also adjustable. Simply supply an air signal to operate the system. The output adjustments are simple and the results are always dependable and consistent.

Liquid output is adjusted with the brass knob on each metering pump. Any amount of air can be added to atomize the liquid. A brass knurled air metering screw controls the flow of air atomizing out the nozzle which determines the density and distance of the spray. There is complete control of spray and accurate placement of the lubricant or other material being applied is assured. The spray output has an included angle of approximately 15-20 degrees depending on the amount of air introduced. The area covered can be increased or decreased by using the air and liquid adjustments.

Multiple metering pumps can be "stacked" in the COOLUBRICATOR, with each pump supplying its own nozzle. This provides additional spray coverage from multiple nozzles. Multiple nozzle COOLUBRICATOR Units are ideal for multiple spindle drills and taps, stock punching, or any application requiring material being sprayed from several points. Nozzle outputs are controlled by independent adjustments of the air metering screw and metering pump stroke adjustment knob - see COOLUBRICATOR Options on page 2. Fluid output may be increased by using 3 drop output pumps (Consult Factory) in place of standard 1 drop pumps.
COOLURICATOR OPERATING INSTRUCTIONS
For Single, Double, Triple and Quad Systems

SYSTEM INSTALLATION

Step 1
Before mounting COOLURICATOR to application equipment - Determine position and method of attachment- either directly or with optional magnets See Figure 1. Check for any obstructions that may pinch or kink liquid or air feed lines.

Mount COOLURICATOR in close proximity to machine application by:

a. Mounting directly to machine.
b. Mounting optional magnets to right and left flanges of COOLURICATOR case or bottom of case.

Step 1.1
Mount and position nozzles as desired.

Step 2
Attach air supply line (Full line pressure) to 1/4" FPT inlet on air filter supplied with steel enclosure See Figure 2. For non-enclosed units - attach directly to top manifold block See Figure 2-1.

Step 3 (optional)
Reservoir or remote tank Low Level Switch should be hardwired prior to step 4. See Figure 14 - Page 4 for wiring diagram.
Step 3.1
Wire solenoid valve See Figure 15 or connect air pilot valve See Figure 8.1

Step 4
Fill gravity feed reservoir See Figure 4 or (Air Trap if so equipped See Figure 5)
Loosen Drain Plug See Figure 6 until liquid flows free of air. Tighten Drain Plug and cycle unit.
On units supplied with fluid from pressurized supply tank - Set supply tank pressure at 5-10 PSI. Depress air vent cap until trap is 75% full. See Figure 5

Step 5
Turn brass adjustment knob to maximum output setting and begin operating unit by turning air supply on and off with optional manual on/off valve or by manually depressing override cap.
See Figure 7.1 - 7.1
Or start machine tool with remote switch installed to energize optional electric solenoid on unit. See Figure 8
Or activate air signal to air pilot valve. See Figure 8.1

Step 6
Adjust Pulse Generator to 6-8 pulses per minute. See Figure 9

Step 7
Close air metering screw when fluid is seen coming out of nozzle supply tube with each cycle, open the air metering screw to the desired degree of atomization. See Figure 11
NOTE: Use minimum amount of air atomization to spread lubricant and deliver it to application area.

Step 8
Use the Pulse Generator as the Primary Fluid Adjustment. See Figure 9

LIQUID OUTPUT ADJUSTMENT
Begin Operation and adjustment by:
Rotating brass adjustment knobs on meters for correct liquid output. See Figure 10
NOTE: Meters are factory preset for maximum fluid delivery.

RED PLASTIC TIP
1 Drop Meter Output (cc/stroke)
0.000cc - 0.0015cc. Low Range
0.002cc - 0.0035cc High Range

For low range adjustment, E-Clip must be in groove that produces shortest stroke. See Figure 12
To decrease fluid flow, turn knob counterclockwise.
To completely shut off meter, rotate knob counterclockwise until knob is against E-clip. See Figure 10

BLACK PLASTIC TIP
3 Drop Meter Output (cc/stroke)
0.000cc - 0.0035cc. Low Range
0.002cc - 0.100cc High Range

For maximum range adjustment, E-Clip must be in groove that produces longest stroke. See Figure 13
**Figure 12. 1-Drop Output Meter**

- **RED CAP**
- **Snap Ring**
- **2nd Slot**

**Minimal Piston Travel**

**Output Per Cycle, 1- Drop Meter (Unist Part No. 94-6811)**

- **MILILITERS**
  - 0.01
  - 0.02
  - 0.03
  - 0.04

**360° Counterclockwise Turns Out From Stop**

- **NOTE:** 1-Drop is approx. 0.033 ml - Test conducted under standard conditions with Coolube 2210 (Viscosity 16cs @ 25° C) at a cycling rate of 120 cycles/minute. Results may vary with the use of other fluids and higher cycling rates.

---

**Figure 13. 3-Drop Output Meter**

- **BLACK CAP**
- **Snap Ring**
- **1st Slot**

**Maximum Piston Travel**

**Output Per Cycle, 3 - Drop Meter (Unist Part No. 94-6813)**

- **MILILITERS**
  - 0.01
  - 0.02
  - 0.03
  - 0.04

**360° Counterclockwise Turns Out From Stop**

**NOTE:** 1-Drop is approx. 0.033 ml - Test conducted under standard conditions with Coolube 2210 (Viscosity 16cs @ 25° C) at a cycling rate of 120 cycles/minute. Results may vary with the use of other fluids and higher cycling rates.

---

**Figure 14. LOW LEVEL SWITCH**

- **SPST**
- **Normally Closed - Dry**

**Wiring Diagram**

- **Black**
- **Blue**

**Actuation Point is approximately midway of travel in liquid with a specific gravity of 1.9.**

**Brass Stem**

**Temperature:** -40°C to +225°F, 180°F max in water

**SPST Switch, Logic Can be Changed from N.C. to N.O. by Inverting Float on Stem. Reference (2) Dots One End of Float.**

**Switch Rated 20 VA**

**Max Pressure:** 150 PSI

**Use Blue and Black Wires, Cut Brown and White Wires**

---

**Figure 15. SOLENOID VALVES**

**Customer Supplied Contact**

- **Power**
  - **Brown**
  - **Blue**
  - **Yellow/Green**

**Solenoid**

**Power**

- **24V**
  - **Brown**
  - **Blue**
  - **Yellow/Green**

**Neutral**

**Ground**

**Figure A**

**Figure B**
### STANDARD COMPONENTS

**PULSE GENERATOR (60-6393)**

- **MANIFOLD** (94-6900-1)
- **INTERMEDIATE METERING PUMP(S)**
  - (94-6811 - ONE DROP)
  - (94-6813 - THREE DROP)
- **BOTTOM METERING PUMP**
  - (94-6821 - ONE DROP)
  - (94-6823 - THREE DROP)

### EXPLODED VIEW OF INTERNAL KIT PARTS - ORDER BY KIT NUMBER ONLY -

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| No fluid output (Manual output moves freely) often following reservoir evacuation. | 1. Check reservoir level.  
2. Check for stroking of meter (set to max)-use full air line inlet pressure.  
3. Check for fluid movement in capillary tubing at each meter stroke.  
4. Loosen 5/16" brass hex bleed screw 2 revolutions until only fluid comes out -close screw tightly.  
-recheck meter output by manually or automatically cycling.  
5. Pulse generator cycle rate is set too fast or too slow.  
6. Check inlet air - Set to maximum available |
| Reduced fluid output                                                  | 1. Check air inlet pressure (maximum available) so that meters operate "crisply".  
2. Non-Lubricating fluids such as water and solvents could cause premature wear of internal parts. Consult factory for rebuild kit. |
| Pulse Generator not functioning (Coolubricator only)                  | 1. Remove pulse generator and check air inlet screen for particulate matter.  
2. If none found, replace pulse generator.                                                                                                                                 |
| Slow (sluggish) meter operation                                        | Be sure air inlet pressure is maximum available. A slow or incomplete return could be caused by a broken spring on inadequate lubrication of U-Cup. Rebuild meter. |
| Meter depressed and not returning.                                    | A piece of debris in the fluid could cause the liquid pin to "jam". Disassemble and reassemble, checking for foreign particles. If a return spring is broken, rebuild meter. |
| Fluid flowing continuously out of the nozzle or reservoir emptying without system running. | The check valve seal is not properly functioning. Check the seat for cleanliness (or turn it over). Also, examine the check seal spring. |
| Fluid accumulation in outer tubing.                                   | This can result in Coolubricator systems due to insufficient atomizing air exiting the nozzle.  
1. Increase atomizing air flow or  
2. Direct nozzle coupler outlet downward to encourage excess fluid to exit nozzle. |
| Air bubbling upward into fluid reservoir.                             | Check the valve seat (check seal) for possible leakage (turn over seat). A static sealing o-ring may need replacement. Use a rebuild kit. |