TRION®
air purification systems

QUICK FACTS

Closed Loop Cleaning Systems

Industry: Metalworking/Machining

Contaminate: Petroleum based coolant/oil mist from various machining operations.

Equipment: Inertia impinger to remove heavy droplets (stage #1) followed by a heavy duty electronic air cleaner with an automatic wash system (stage #2).

Trion Models: Air Boss 12, 22 or 73 series with stand off, ceramic insulators or Venturi type.

Efficiency: 90% DOP, based on MIL Standard 282 (minimum)

Benefits:

(1) Machine tool fluids are generally characterized as hazardous materials. OSHA and AGGIH have adopted a current maximum concentration for these materials of 5 milligrams per cubic meter of air. EPA has adopted similar limitations for concentrations of these materials in sewer disposal, but the limitation for a particular disposer is set based on the total allowable for his district or water shed area. Using a closed loop cleaning system, with "oil" wash reduces disposal issues, thus lowering customers disposal costs and helps prevent environmental issues with the EPA and other local agencies.

(2) Reclamation of Machine Tool Fluids - customers can reclaim and reuse expensive machine tool fluids, thus providing a tangible ROI on our equipment.

(3) Fewer Agency Approvals - closed loop systems require fewer agency permits to operate.

(4) No competition - currently, there are no competitors offering a closed loop system.

System Design Parameters:

(1) Only Air Boss models 12, 22 and 73 series are approved for use with a closed loop cleaning system. The cabinet seams are continuously welded.

(2) Stand off, ceramic insulator or Venturi type insulators are required.

(3) Inertia impingers must be used as the pre-filters.

(4) Quenchall 100 with Exxon cleaner additive is the only approved wash medium.

(5) Minimum pressure at the manifold header must be 50 PSI.

(6) Wash tank reservoir must be in accordance with Trion design part number 448226 (attached). Tanks being supplied by others must be reviewed and approved by Trion for adequate capacity, pump, filtration device, means of sludge removal, solenoid valve and pipe size.

(7) Oil tank reservoirs must be equipped with an adequate oil heating device. The oil must be heated to at least 140° F prior to starting the wash cycle.

(8) The wash frequency shall be once a day, not once a week, or once a month, no exception without a written release of warranty liability from end user.

The wash control sequence shall be as follows:

(a) Wash cycle is activated.
(b) Oil temperature must meet 140° F before system shutdown.
(c) Power supply and fan are shut down, fan coast time 60 seconds.
(d) Quenchall + Exxon cleaner spray time 2 minutes.
(e) Soak time 2 minutes.
(f) Rinse time 2 minutes.
(g) Dry time 10 minutes minimum.
(h) Forced dry time 10 minutes.
(i) If there is no forced dry time the fan shall be turned on first for a minimum of 5 minutes before power supplies are turned on.

(9) Fire suppression system (by others) is recommended to customer as part of quote in writing to customer. If customer decides not to use fire suppression system, customer shall be aware of the risk factor involved and waive Trion from any fire liabilities in writing.

(10) The PWM power supply shall be used for all ESP systems offered with close loop oil wash system, including Air Boss/Models12, 22 and 73 series. Furthermore, when multiple PWM power supplies are used for powering their outputs shall be connected to respective tier of cells, i.e., power outputs shall be in parallel and isolated from each other, so that their discharge energy is limited. The air flow rate shall be adjusted to achieve required efficiency at PWM power supply's operation voltages.

(11) System outline drawing, electrical schematics, field wiring, and piping diagram must be provided for all closed loop cleaning systems. All above operation parameters shall be described in appropriate system drawings. Warning such as "Warranty is void if system deviates from this design" shall be printed in bold letters on drawings. Customer must acknowledge and approve all outline drawings before the project is started.

(12) Manual cleaning of the ionizer-collector cells is required every three months. The time can be extended only if proven not necessary by the actual installation.

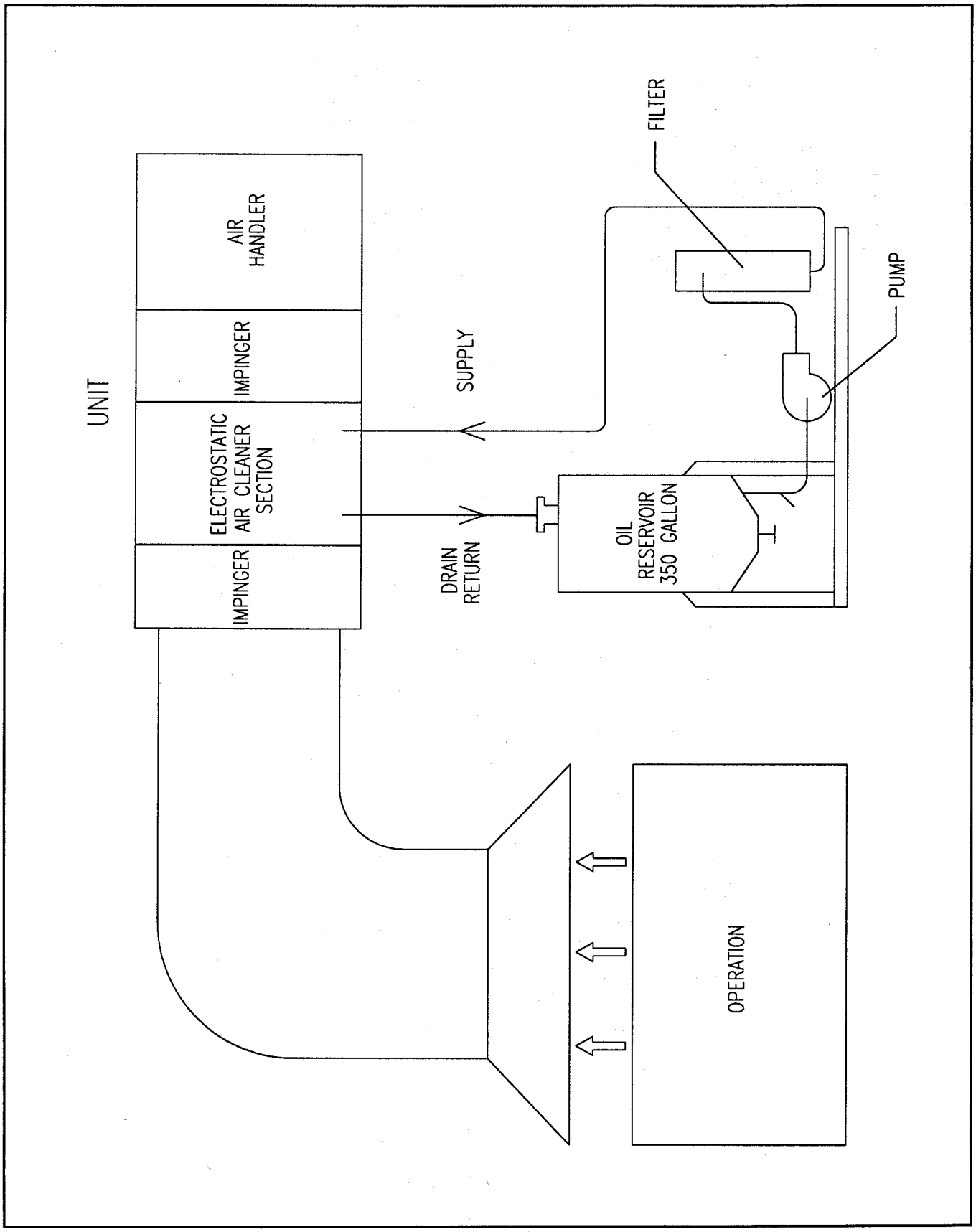
(13) Sample of machine tool fluid (oil) must be sent to Trion for evaluation prior to order acceptance.

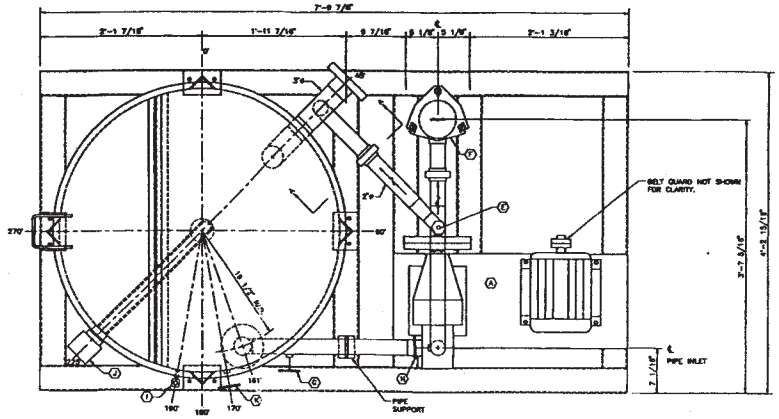
Special Considerations: (1) If metal fines are present in the airstream a mechanical pre-filtering system using high loft (low efficiency) polyester bag filters should be used.

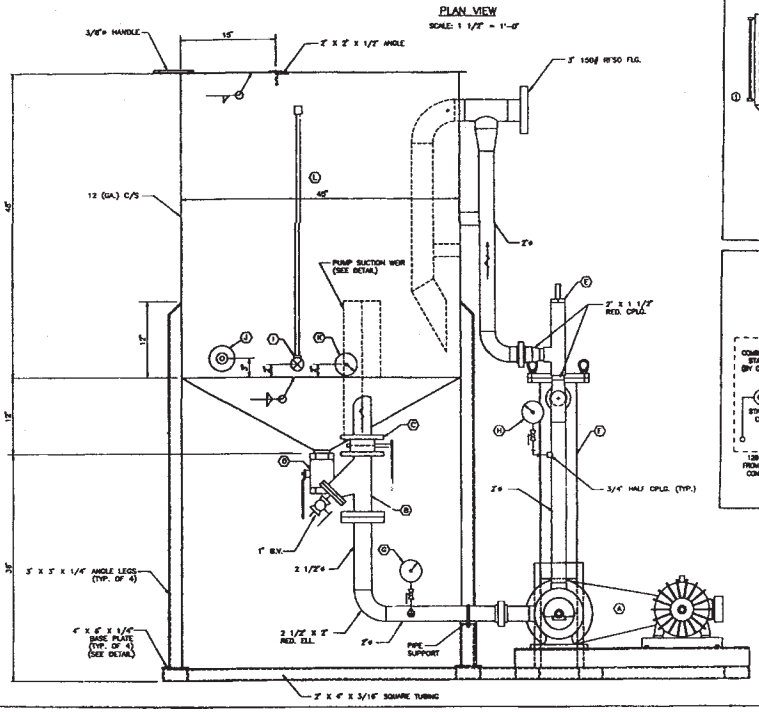
(2) In some cases, ambient (fugitive) capture systems can not use closed loop cleaning systems due to low inlet grain loading. Evaporation of the precipitated material causes a sticky, tenacious residue which will not wash off with the heated oil.

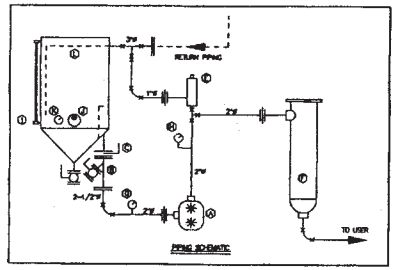
References: American Tool, Saegertown Manufacturing, 20th Century, Louca Mold

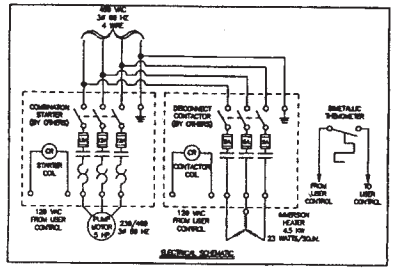
Typical System Arrangement:











EQUIPMENT SCHEDULE		
MARK	QTY.	DESCRIPTION
A	1	CAST IRON ROTARY GEAR PUMP, BUNA-N MECHANICAL SEAL AND INTEGRAL RELIEF VALVE, 5 (H.P.) 230-460/3/60 TEFC, 1800 (R.P.M.) MOTOR. PRODUCT : MINERAL OIL TEMPERATURE: 140° (F) VISCOSITY: 300 (S.S.U.) FLOW: 80 (G.P.M.) T.D.H.: 5 (H.P.) RATED TO 80 (P.S.I.G.)
B	1	2 1/2" CAST IRON "Y" STRAINER.
C	1	2 1/2" SEMI-LUG BUTTERFLY VALVE, NEOPRENE SEAL.
D	1	2" 150# BRONZE BALL VALVE.
E	1	PRESSURE RELIEF VALVE, 1 1/2" BRONZE. SET TO OPEN AT 85 (P.S.I.G.).
F	1	BASKET STRAINER 2" FPT SIDE INLET AND 2" FPT BOTTOM OUTLET. 3.4 SQUARE FT. BASKET SURFACE AREA . FILTER BAG POLYESTER FELT RATED FOR 10 MICRON.
G	1	PRESSURE/VACCUM GAGE
H	1	PRESSURE GAGE, 0-160 (P.S.I.G.)
I	1	5/8" DIA. SIGHT GLASS. APPROXIMATELY 40" CENTER TO CENTER.
J	1	2 1/2" NPT SCREW PLUG IMMERSION HEATER 4.5 KW, 23 WATTS/SQ. IN. WITH NEMA 1 INTEGRAL THERMOSTAT.
K	1	BIMETALLIC THERMOMETER WITH BRONZE WELL.
L	1	CARBON STEEL UNINSULATED TANK MATERIAL : 12 GA. CRS FULL CAPACITY : 353 (GALLONS) CAPACITY ABOVE WEIR : 264 (GALLONS)

NOTES:

1. SYSTEM TO SUPPLY 80 (G.P.M.) OF SPECIFIED PRODUCT AT 50 (P.S.I.G.) AT STRAINER DISCHARGE.
2. A 10 (P.S.I.G.) DIFFERENTIAL SHOULD BE MAINTAINED BETWEEN THE RELIEF VALVE SETTING AND THE OPERATING LINE PRESSURE.
3. IMMERSION HEATER CAPACITY IS BASED ON 140° (F) PRODUCT TEMPERATURE AND 70° (F) AMBIENT TEMPERATURE.
4. SYSTEM TO BE TEST RUN PRIOR TO SHIPMENT.
5. HYDRO TEST PIPING AT 100 (P.S.I.G.).
6. ALL PIPING TO BE A-53, SCHEDULE 40 C/S. FITTINGS 2" AND BELOW TO BE 150# MALL. IRON, THREADED. FITTINGS 2 1/2" AND LARGER TO BE SCHEDULE 40 BUTT WELD.
7. PAINT SKID, TANK AND PIPING WITH STANDARD TRION COLOR GREEN.
8. THE FOLLOWING EQUIPMENT TO REQUIRE TANK CONNECTIONS AS LISTED BELOW:
   D 2" NPT X 2" NIPPLE
   I 1/2" HALF CPLG. TOP AND BOTTOM. TOP FITTING TO VERIFIED WITH SIGHT GLASS.
   J 2 1/2" HALF CPLG.
   K 3/4" HALF CPLG.

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