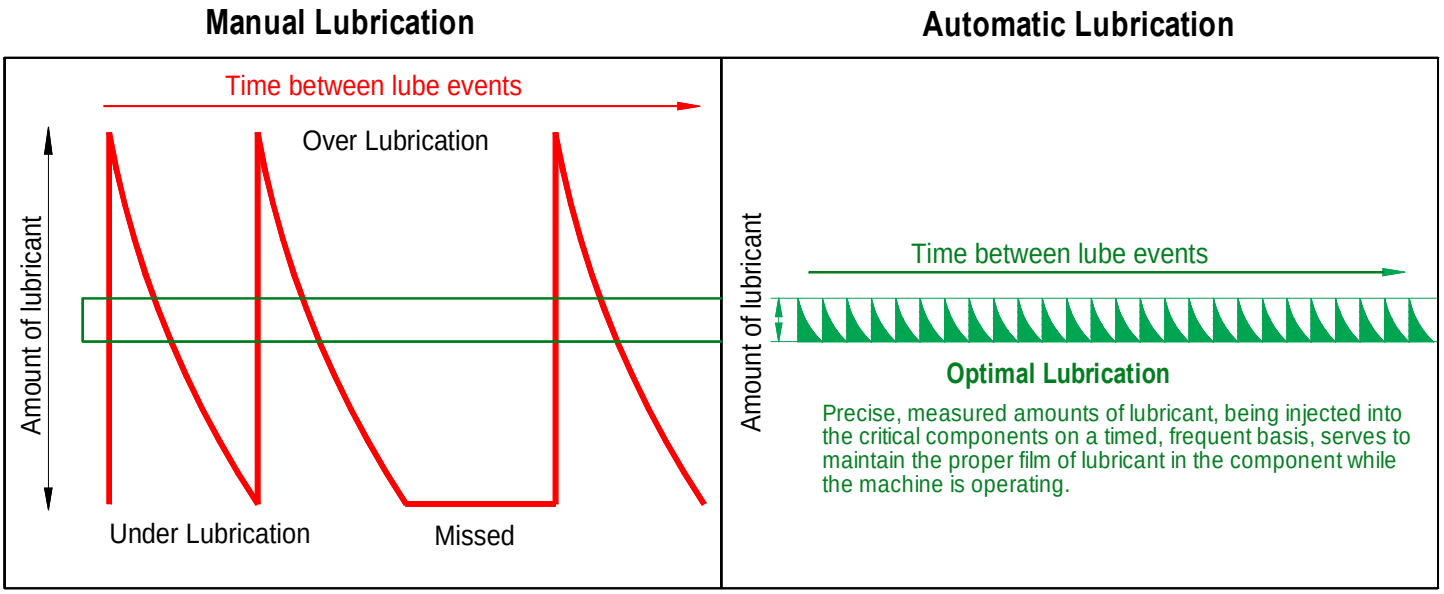
Automated Lubrication Systems
Optimal Lubrication

Bearing failure is a major cause of equipment downtime most often resulting from improper lubrication. Automated Lubrication Systems enhance the safe operation and extend the service life of your equipment. Automated lubrication systems maintain a proper film of lubricant in the critical components while the equipment is operating.



- Longer life of lubricated components
- Helps to keep contaminants and moisture out of the bearings.
- Reduced lubricant consumption and operating costs
- Programmed and precise dosing of the lubricant at each point to be lubricated

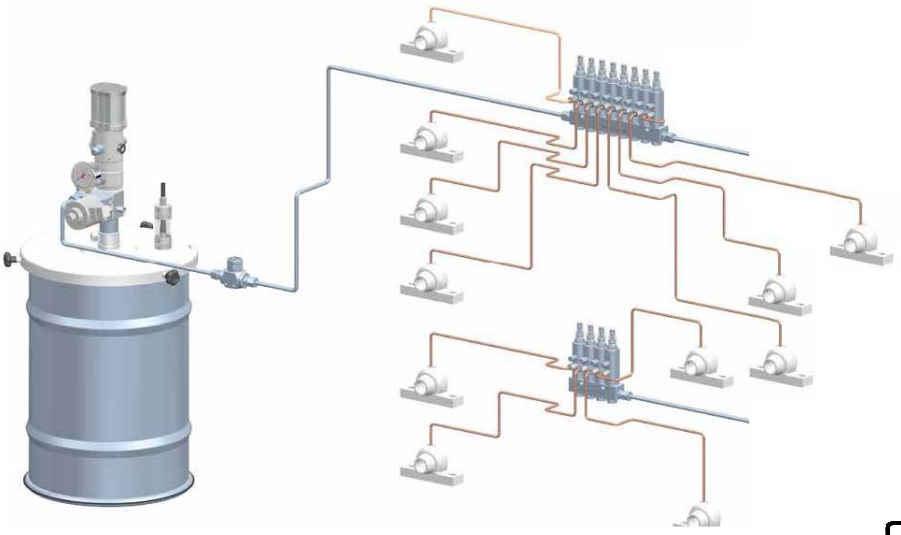
RAASM USA · BIJUR DELIMON INTERNATIONAL · FARVAL Lubrication Systems · GRACO · Trabon® · perma

Applied Lubrication Technology Inc.

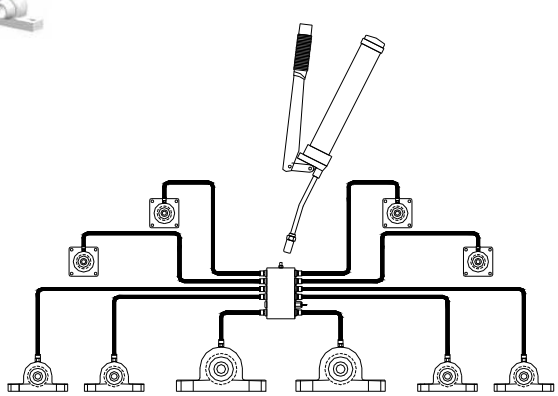
System Design ● Installation ● Integration ● Service

12 French Drive, Mono, ON L9W 5W1 Technical Sales: Bob Lewis Cell 519 658-3204 E-Mail: bob@appliedlubrication.com

Automated Lubrication Systems
Optimal Lubrication



Fully automated and monitored systems
Large or small systems for all applications.
Comprehensive offering of pumps, controls, valves &measuring devices, etc. to satisfy all applications.



Economical manual systems.
Single point lubrication to several lube points.
Controlled measured amounts to each bearing.
Visual monitoring of the system.

Comprehensive offering of industry proven equipment.
Series progressive, Injector Parallel, Orifice Control, Circulating Systems, Spray Systems, Gravity Systems, Chain & Conveyor Lube, Etc.

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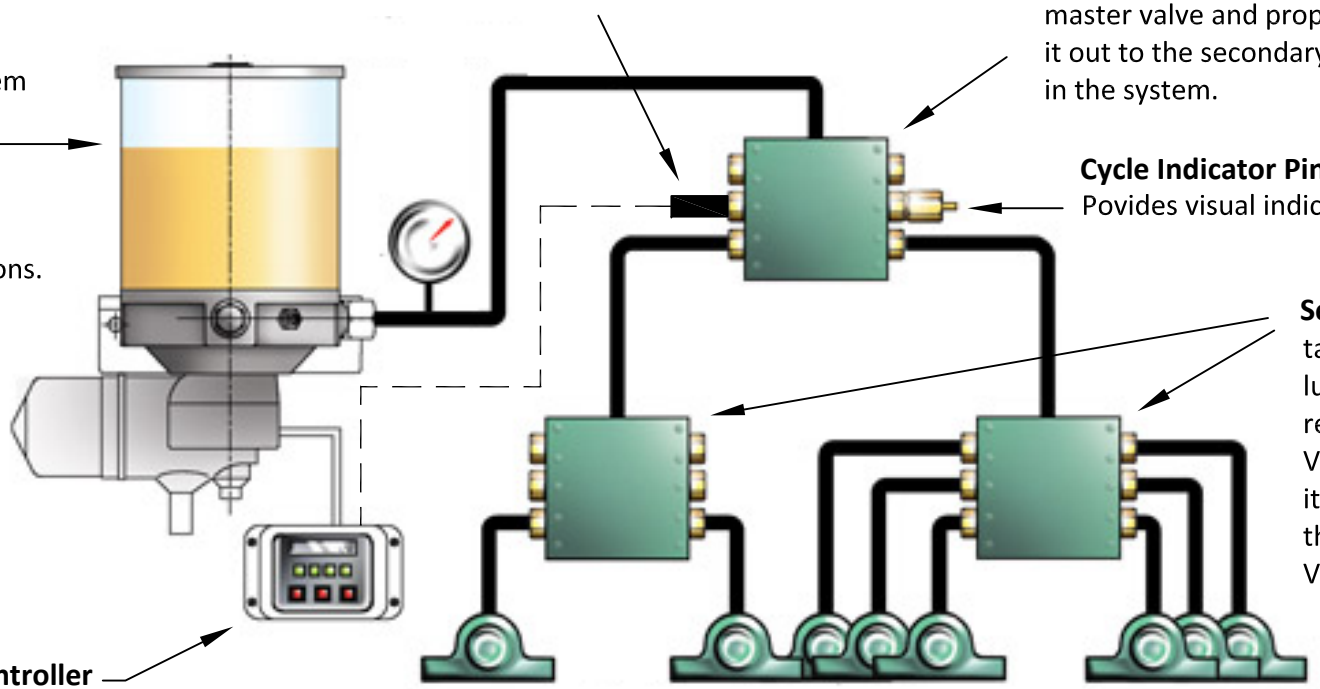
Series Progressive (Divider Valve) System Operation

System Cycle Sensor
Senses the movement of one of the Divder Valve pistons.
Because the pistons in the valve move in a progressive sequence, monitoring of one piston, monitors the operation of the entire valve.

Master Divider Valve
Takes the volume of lubricant that it receives from the master valve and proportions it out to the secondary valves in the system.

Pump
The pump delivers lubricant to the system at timed intervals. Various sizes and types of pumps are available to satisfy a diversity of applications.



Cycle Indicator Pin
Povides visual indication of valve operation

Secondary Divider Valves
take the volume of lubricant that they receive from the Master Valve and proportion it out to the lube points that the Secondary Valve services.

System Controller
Systems can be operated directly from the machine PLC or through a controller that is supplied with the system. The controller programs the frequency and timing of lube events and monitors over all system operation and low lubricant level in the pump reservoir.

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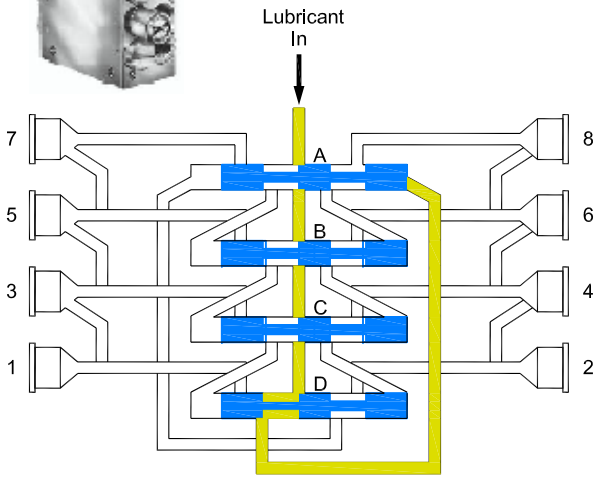
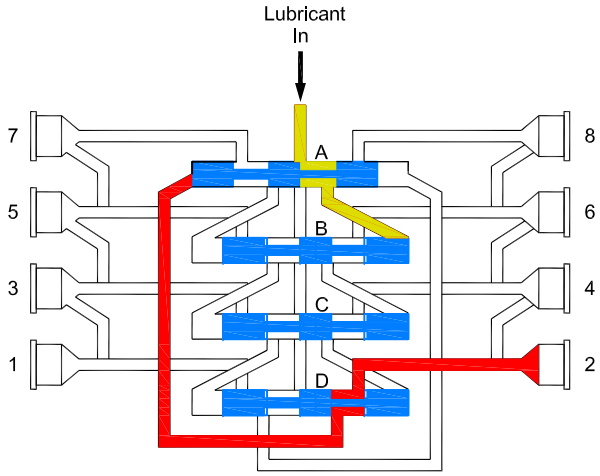
Applied Lubrication Technology Inc.

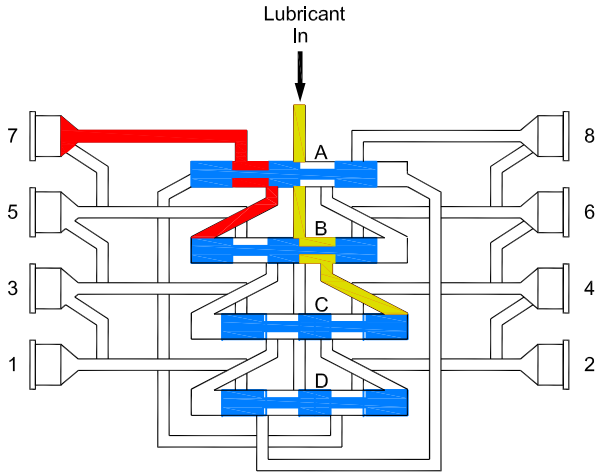
Series Progressive Divider Valve Operation



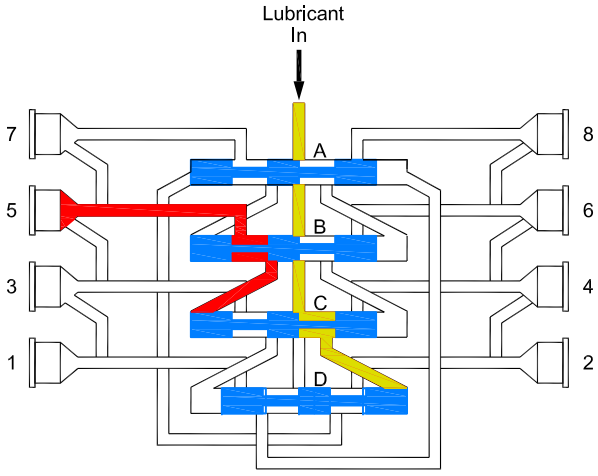
Lubricant enters the system and applies pressure to the right side of Piston A



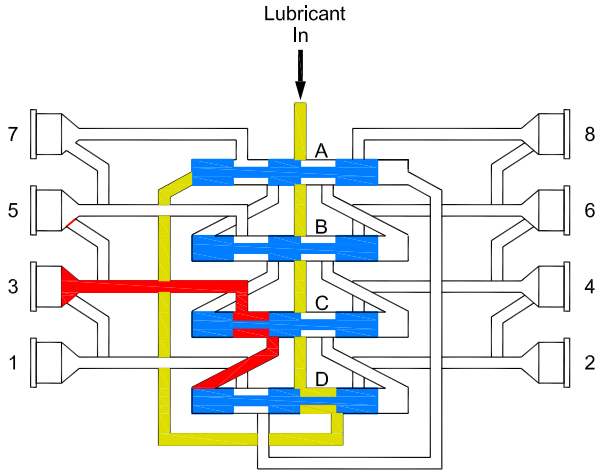
Piston A has moved and displaced lubricant to Port 2
Incoming lubricant pressure is applied to right side of Piston B.



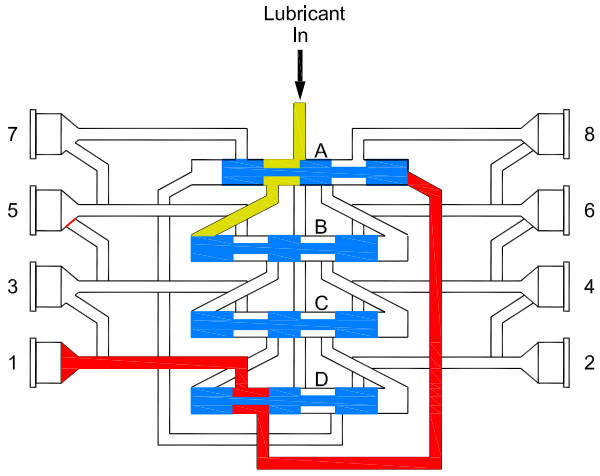
Piston B has moved and displaced lubricant to Port 7
Incoming lubricant pressure is applied to right side of Piston C.



Piston C has moved and displaced lubricant to Port 5
Incoming lubricant pressure is applied to right side of Piston D.



Piston D has moved and displaced lubricant to Port 3
Incoming lubricant pressure is applied to left side of Piston A.



Piston A has moved and displaced lubricant to Port 1
Incoming lubricant pressure is applied to left side of Piston B.

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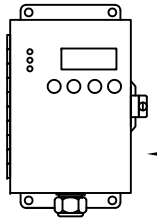
Applied Lubrication Technology Inc.

Parallel Injector Systems

In parallel Injector Systems, the pump builds pressure in system until adequate pressure has been developed to cycle the pistons in all of the lubricant injectors. When the operating pressure has been achieved, a pressure switch signals the controller that the cycle has been completed. The relief valve then opens, allowing pressure in the system to relieve back to reservoir, the controller is reset and begins timing to the next lube cycle.

Pump
The pump delivers lubricant to the system at timed intervals.
Varios sizes of pumps are available to satisfy a diversity of applications.



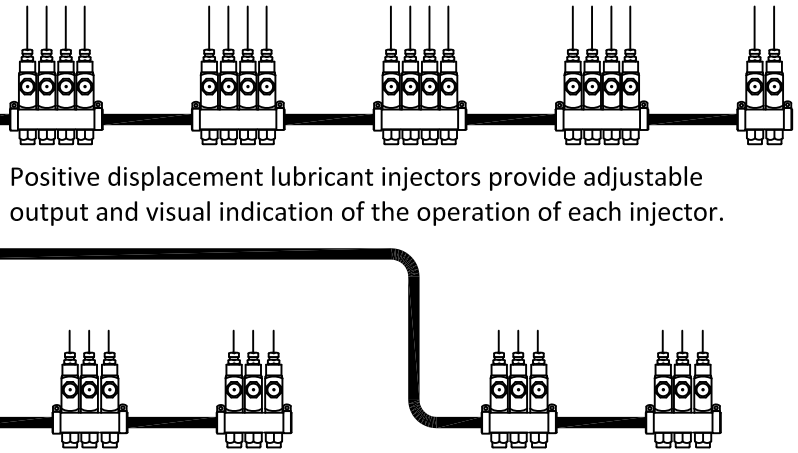
Remote Controller

System Controller
Systems can be operated directly from the machine PLC or through a controller supplied with the system. The controller programs the freqency and timing of lube events and monitors over all system operations and lubricant level in the pump reservoir.

Pressure control, gauge and relief valve.

Integrated Contoller

Feed lines to lube points



Positive displacement lubricant injectors provide adjustable output and visual indication of the operation of each injector.

Lubricant supply line.

Vent Valve Assembly
Allows pressure to vent back to reservoir for vent phase of the lubrication cycle.

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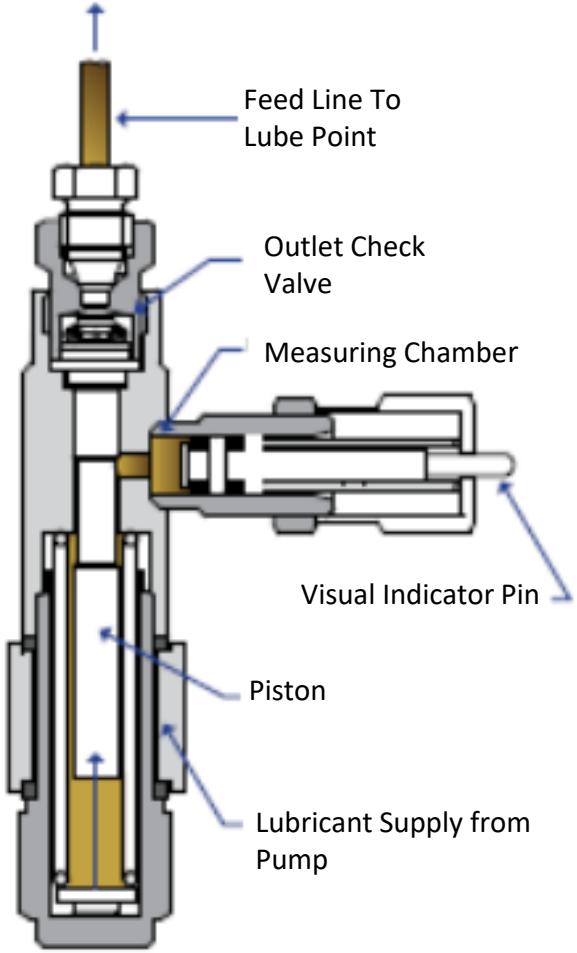
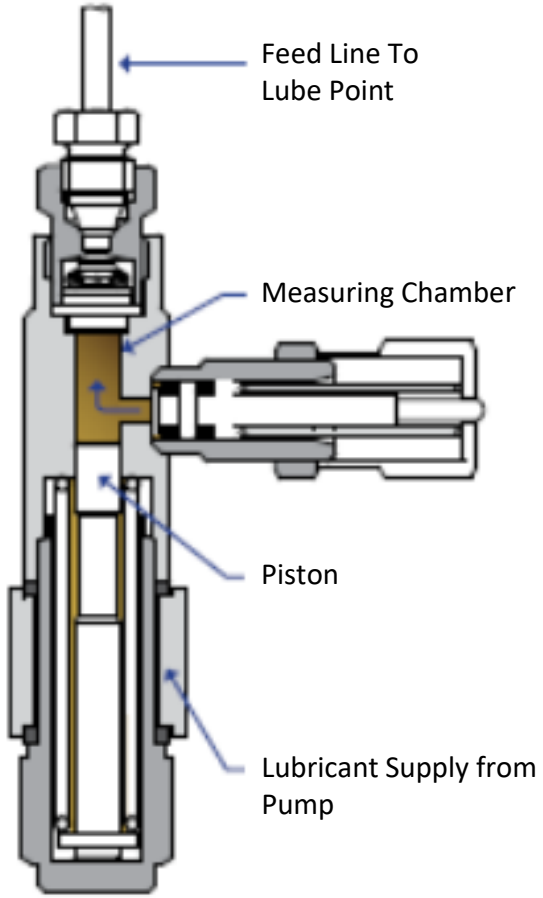
Applied Lubrication Technology Inc.

Lubricant Injector Operation – FL32, FL33 and CXL Injectors





Pressure Stage
Pressure from the supply line moves the injector piston forward. The injector piston displaces a measured amount of lubricant through the outlet of the injector. At the same time, lubricant flows into the measuring chamber, forcing the measuring piston to move to it's stop location and extend the indicator pin.

Vent Stage
Once the pressure stage has been completed, pressure in the system is relieved back to the pump reservoir. The displacement piston returns to it's rest position and the measuring piston moves forward and fills the measuring chamber for the next cycle. The indicator pin returns with the measuring piston.

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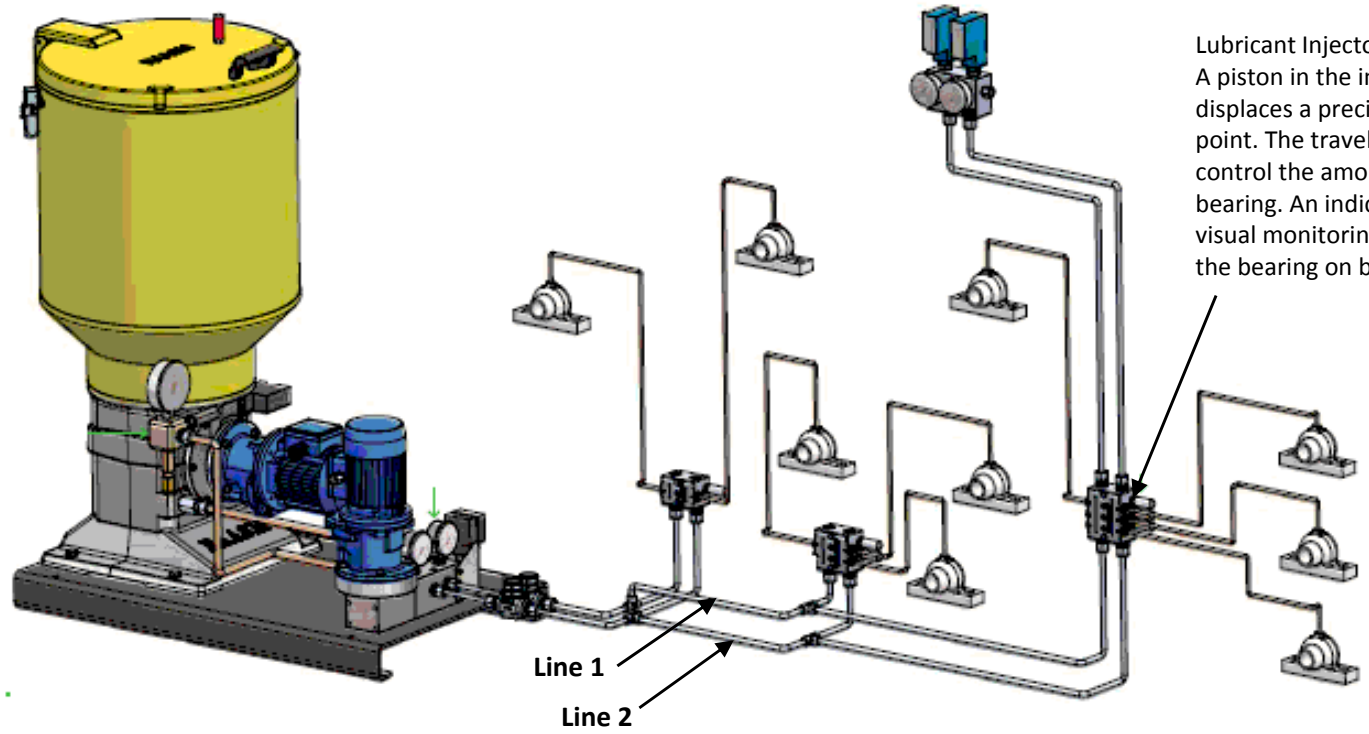
Applied Lubrication Technology Inc.

Parallel Dual Line Lubrication System

Pump delivers lubricant to the system at timed intervals. A diversity of pump are available of various sizes and capacities.

Pressure Switches



Lubricant Injectors
A piston in the injector shifts under pressure and displaces a precise amount of lubricant to the lube point. The travel of the injector piston is adjustable to control the amount of lubricant displaced to the bearing. An indicator pin on each injector provides for visual monitoring. The pistons displace lubricant to the bearing on both sides of the stroke.

In a parallel, dual line system, the pump is typically cycled at timed intervals. The pump will first deliver lubricant through Line 1. Once the pump develops enough pressure in Line 1, the pistons in each of the injectors move and displace a precise amount of lubricant to the lube point. A pressure switch, usually installed of the end of Line 1, will signal the system controller that the Line 1 side of the lube event has been completed. The reversing valve will now change positions and will now direct flow from the pump to Line 2. The porting in the reversing valve will at the same time allow pressure in Line 1 to relieve back to the reservoir. The pump will build pressure in Line 2 until all of the injector pistons have moved in the opposite direction to the Line 1 cycle. The injectors, once again will displace lubricant out to the bearing point. The pistons deliver lubricant to the bearing on both stokes. Injector travel can be adjusted to control the amount of lubricant displaced to each bearing. The advantages of parallel system are that they can deliver heavy lubricants, long distances in cold environments.

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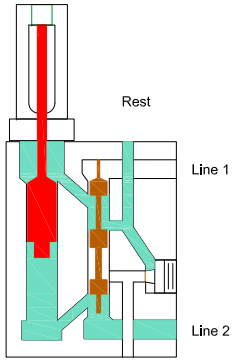
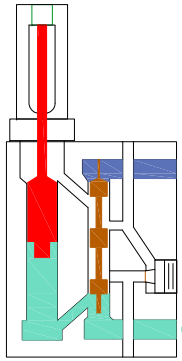
Dual Line Valve Operation

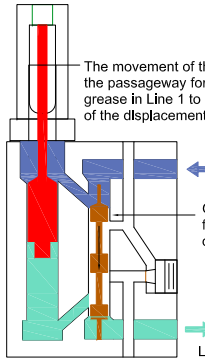


Valve is fully charged with grease



Pump starts and pressuizes Line 1

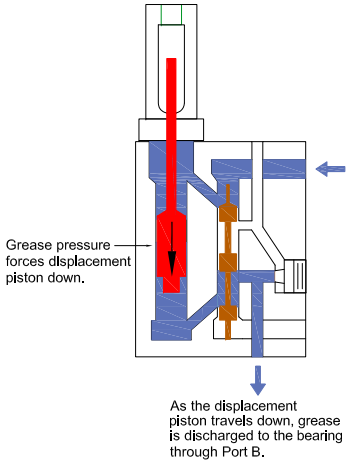
Line 2 Is open to the pump reservoir.



The movement of the pilot piston opens the passageway for the pressurized grease in Line 1 to access the top of the displacement piston.

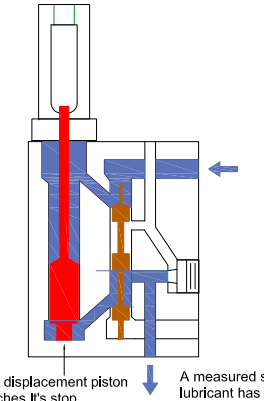
Grease pressure forces pilot piston down.

Lubricant In Line 2 is relieved to reservoir allowing the pilot piston to shift.



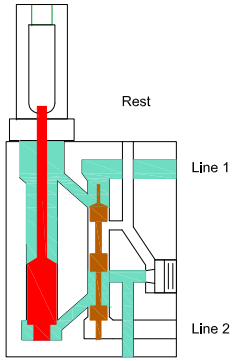
Grease pressure forces displacement piston down.

As the displacement piston travels down, grease is discharged to the bearing through Port B.

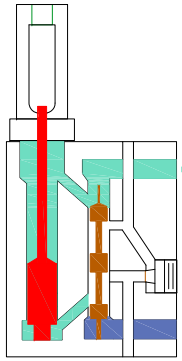


The displacement piston reaches It's stop.

A measured shot of lubricant has been displaced to the bearing.

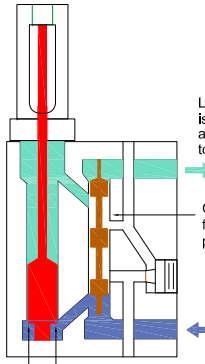


Valve is fully charged with grease



Line 1 is open to the pump reservoir.

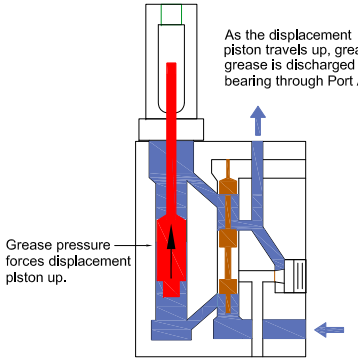
Pump starts and pressuizes Line 2



Lubricant in Line 1 is relieved to reservoir allowing the pilot piston to shift.

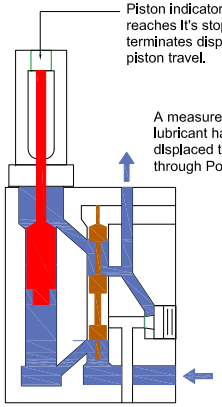
Grease pressure forces pilot piston up.

The movement of the pilot piston opens the passageway for the pressurized grease in Line 2 to access the underside of the displacement piston.



As the displacement piston travels up, grease grease is discharged to the bearing through Port A.

Grease pressure forces displacement piston up.



Piston indicator pin reaches It's stop and terminates displacement piston travel.

A measured shot of lubricant has been displaced to the bearing through Port A.

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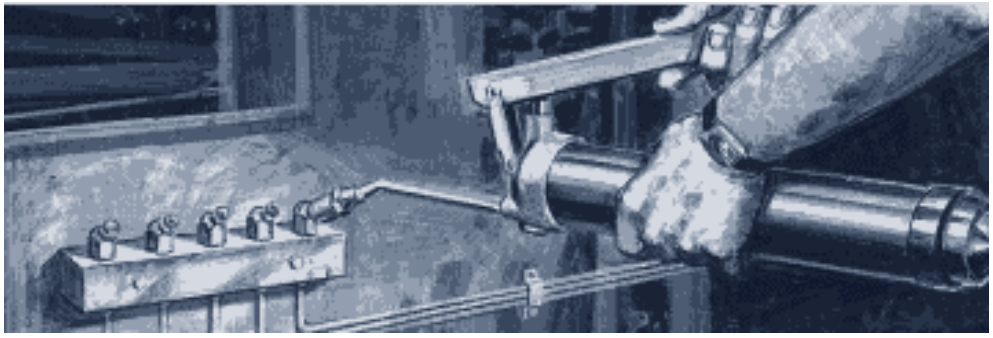
Remote Manual Lubrication

REMOTE LUBE FITTING SYSTEMS

To easily reach hidden, inaccessible or hazardous bearings



Hard to reach lubrication fittings present a major maintenance problem on all types of machinery.

Hidden or guarded lubrication fittings are often the cause production down time.

High maintenance and operating costs are often directly traceable to poor lubrication fitting access.

Remote Manual Lubrication Systems

* **Easy access to lubrication fittings.**
* **Quicker, Safer lubrication**
* **Assurance that all bearings are lubricated.**
* **Bearings can be lubricated while the machine is operating**.
* **Reach hidden, inaccessible or hazardous bearings.**

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Air / Oil Lubrication

Delivers high efficiency lubrication for applications requiring precise oil delivery in combination with air flow.

Some Applications;

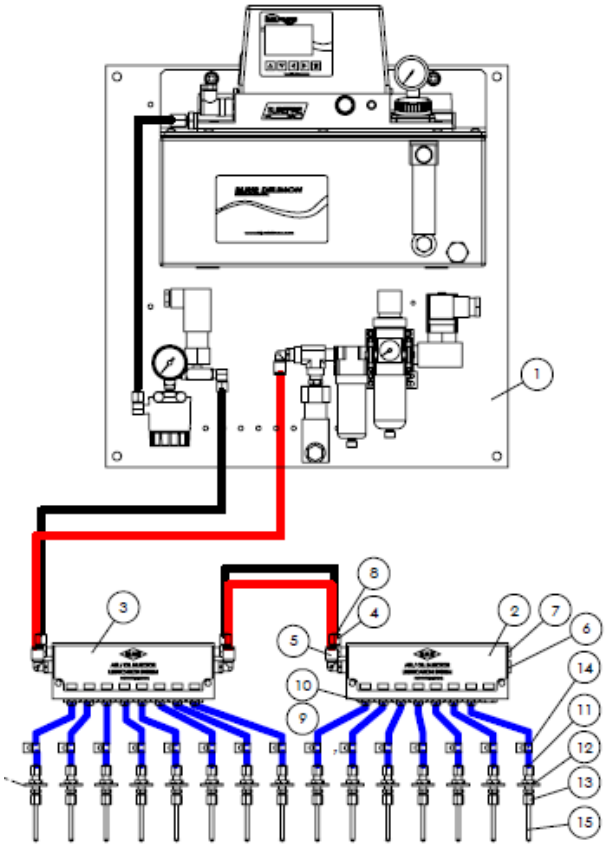
- Chain and conveyor lubrication.
- High speed spindle lubrication.
- Bearing lubrication.
- Production assembly operations.
- Lift cylinders on beverage fillers.
- Applications where a precise continuous flow of clean lubrication is required.
- Can be configured for cyclic or continuous flow operation.
- Reduced oil consumption.

Features

- Minimizes or eliminates airborne mist.
- Improved workplace environment when compared to oil mist systems.
- Keeps contaminants from entering bearings.
- Finite adjustability and control.
- Combines cooling effect with lubricant delivery.
- Versatile - systems can be configured to satisfy a diversity of maintenance and production applications.

Air/Oil Lubrication Systems deliver high-efficiency lubrication and cooling for applications requiring accurate and precise oil deliveries. The advanced design delivers precise amounts of lubricant and eliminates residual drift of oil fog or mist during operation.

Air-Oil systems are versatile and can be configured to satisfy diversities of maintenance and production applications. Air/oil lubrication allows for minimal lubricant delivery on a continuous or cyclic basis, reducing oil consumption and keeping the surface clean and free of contaminants.



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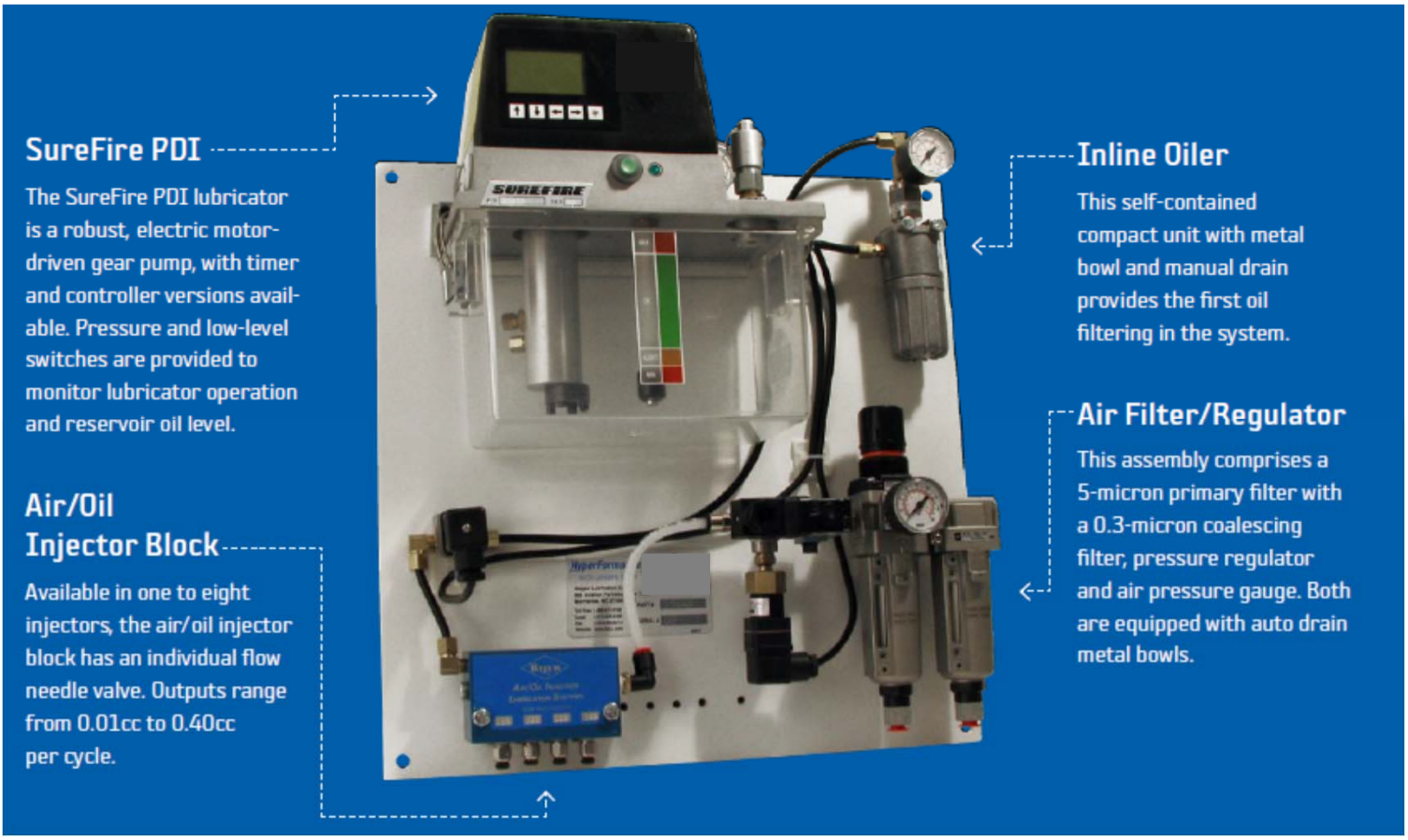
Air / Oil Lubrication

The Air/Oil system utilizes a specially-designed positive displacement injector (PDI) with oil outputs to a close tolerance level down to 0.01cc/cycle. This permits exact oil volumes to be discharged into an air mixing valve. Controlled air and oil is then discharged through clear plastic tubing to critical bearing points.
A small intermittent discharge from injectors flows along the inside tube wall and stretches out along the length of the tube. Air expansion at the nozzle tip delivers controlled spray (not mist) to bearing for optimum performance.



Injector Block
Displaces positive and precise amounts of lubricant into the air/oil stream.

Streak Sensing Monitor

The Streak Sensing Unit system detects and monitors the continuity of oil flow in Air/Oil systems. Monitoring takes place between the injector block and the application nozzle.
The Streak Sensors are interfaced with the system controller to indicate when no oil is present.

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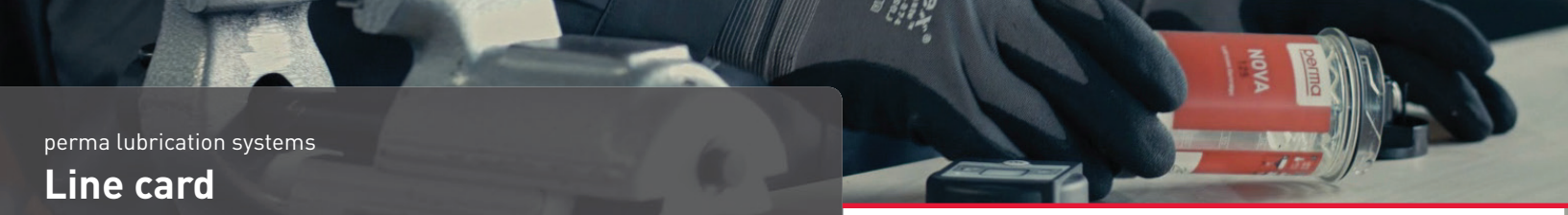

perma lubrication systems

Line card

Product		Lubricants	Discharge period	Mode	Max. lube-points	Max. pressure [bar/psi]	Operating temperature [°F]	Operating temperature [°C]	Volume [cc]	Drive / Power supply	Activation / Setting	Machine elements							Certifications
Single-point lubrication systems, electrochemical																			
	**CLASSIC / FUTURA**	Grease up to NLGI 2 / Oil	1, 3, 6, 12 months (1)	Time	1	4 / 65	32 to 104	0 to +40	120	Electro-chemical	Activator screw	✓	✓	-	✓	✓	✓	✓	Ex
	**FLEX**		1, 2, 3, ... , 12 months (1)			5 / 73	-4 to 140	-20 to +60	60 125	Electro-chemical / Integrated battery	Dial / Rotary switch	✓	✓		✓	✓	✓	✓	Ex IECEx TIIS FM APPROVED
	**NOVA**		1, 2, 3, ... , 12 months (2)			6 / 87	-4 to 140	-20 to +60	65 125	Gas gene-rating cell / Integrated battery	Push button control and display	✓	✓		✓	✓	✓	✓	Ex IECEx ANZEx
Single-point lubrication systems, electromechanical																			
	**STAR VARIO**	Grease up to NLGI 2 / Oil	1, 2, 3, ... , 12 months	Time	1	6 / 87	14 to 140	-10 to +60	60, 120, 250	Drive motor / Battery	Push button control and display	✓	✓	-	✓	✓	✓	✓	c UL us LISTED
	**STAR CONTROL**		Customized	Time / Impulse			-4 to 140	-20 to +60		Drive motor / 9-30 V DC		✓	✓		✓	✓	✓	✓	
Multi-point lubrication systems, electromechanical																			
	**PRO MP-6**	Grease up to NLGI 2	1 day to 24 months	Time / Amount	6	25 / 360	-4 to 140	-20 to +60	250, 500	Drive motor / Pump / Battery	Display with menu navigation	✓	✓	✓	✓	✓	✓	-	c UL us LISTED

(1) depending on ambient temperature and counter-pressure
(2) depending on counter pressure

All perma products are approved according to CE directives

Roller bearings | Sliding bearings / Sliding guides | Linear guides | Open gears / Gear racks | Spindles | Shaft seals | Chains

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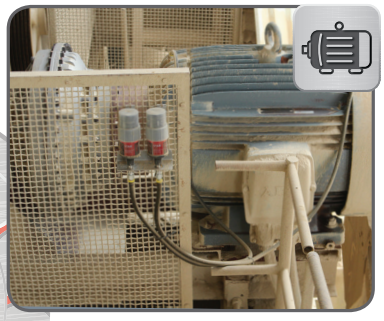
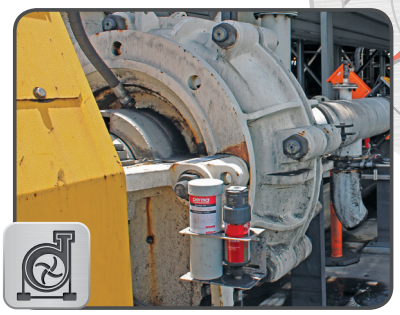
perma lubrication systems

Applications and software

Conveyors

Electric Motors





Pumps

Blowers / Fans

HINT

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perma SELECT APP

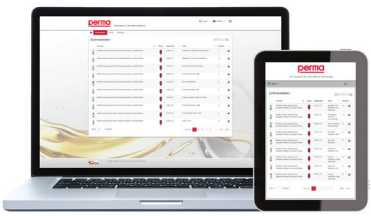
NEW

perma SELECT APP calculates the required amount and discharge setting for your perma lubrication system based on your entry of existing operating conditions. The software can be easily installed on all common iOS and Android mobile devices and is also available in a browser version. Use your mobile system as a platform for optimized lubrication with perma lubrication systems.

Visit online:
→ http://select.perma-tec.com

perma MLP (Maintenance Lubrication Program)

With the perma MLP you always have an up-to-date overview of your lubrication points and maintenance tasks. The online system can be used from any smartphone, tablet or PC with an Internet connection. Manage your lubrication points, get automatic reminders for upcoming maintenance tasks and print lubrication schedules and material lists for individual production or plant sections. Your perma contact will provide support in recording existing lubrication schedules.



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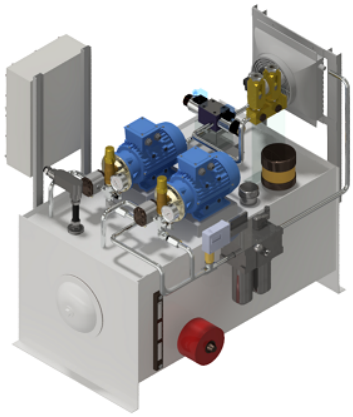
Applied Lubrication Technology Inc.

Oil Recirculation Systems

Cooling, Custom Designed, Lubricating

Applied Lubrication Technology Inc.

General



Oil Recirculation Systems are not only used to pump oil to bearings or gears to lubricate them but also to purge them of wear debris and, if necessary, to remove heat introduced into the oil by power losses due to friction.

Applied Lubrication has a multi-purpose range of small oil systems . However, the majority of recirculating oil systems are nearly always custom designed to suit the application.

Reservoir, pumps, filters, oil coolers, reservoir heating, pressure control and instrumentation are selected depending on the duty and the viscosity of the lubricant required to be pumped.

These can be fitted in our works on top of the oil reservoir or on a separate skid to form a compact unit but also, for larger systems, as individual items of equipment which are mounted on site and piped up to the plant being served.

Technical Data

Oil re-circulating system will include a selection of the following equipment.

Reservoirs	Most oil system reservoirs are of rectangular construction often forming the base onto which other items are mounted. The size of the reservoir depends on several factors. If the returning oil is likely to contain water or dirt contamination or entrapped air, the reservoir needs to have up to 40 minutes dwell period to allow time for these to separate from the oil. However, if the system is relatively clean, the dwell time could be less than 10 minutes. Another factor would be the need to dissipate heat. Having a larger reservoir could avoid having to fit an oil cooler and its associated control equipment.
Reservoir Heating	Unless low viscosity oil is being used, it is likely that some form of heating is required in the reservoir. The main reason for this is that most flow control devices in a lubrication system are simple needle valves or orifice plates and for a correct balance of the system, it is necessary to deliver oil at a constant viscosity. It is easier to control this at a temperature slightly higher than ambient. Other reasons for fitting heating are to be able to start pumping under cold start-up conditions and to assist air release from the returning oil. This heating would normally be electric but steam heating can be fitted. Either method will require thermostatic and level control.
Pumps	Positive displacement pumps (gear or screw) are generally used although centrifugal pumps are used on some low viscosity applications (such as turbine oil systems) and piston pumps on high pressure applications (jacking systems). Normally two pumps (main and standby) are fitted to give automatic changeover to continue the operation should a fault occur. Pumps are usually driven by an electric motor but on some systems, the main pump is driven directly by the plant being served.
Filters	The type of filter fitted depends on the acceptable degree of filtration of the equipment being served. If considerable contamination is expected and the bearings etc., are reasonably tolerant, duplex re-cleanable filters are used. The lowest limit of filtration of this type of filter is 25 micron. If the oil returning is relatively clean, disposable element filters with much lower filtration levels are used, considerably extending the life of the oil and the bearings etc.
Cooling	This is only required when heat is introduced into the oil from the process due to friction power losses etc. and this cannot be removed by natural convection hence raising the oil temperature above its desired control level. Oil/water coolers (shell and tube or plate) or air blast coolers are used.
Control & Instrumentation	All the above operations require a full range of pressure, temperature and flow control valves and instrumentation to operate the lubrication system at its design constant pressure and flow parameters. These are selected to control and monitor the system providing interlocks with the plant so that, providing routine maintenance such as filter cleaning or oil changes are carried out, the lubrication system can operation totally automatic as a servant to plant.

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