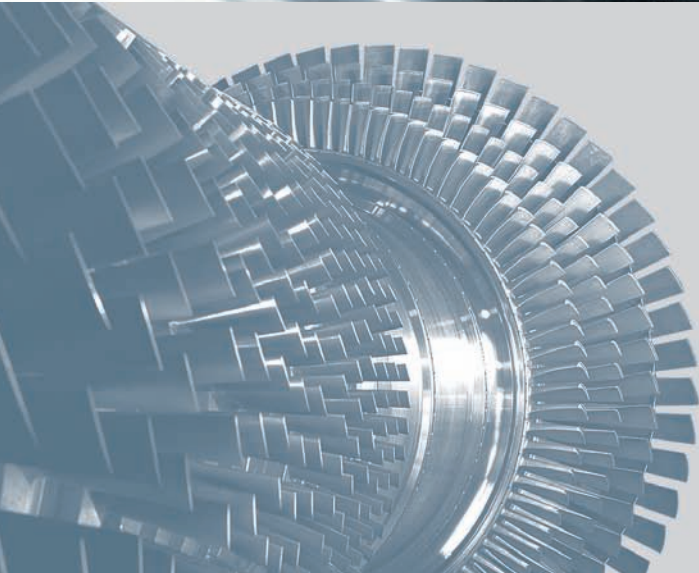
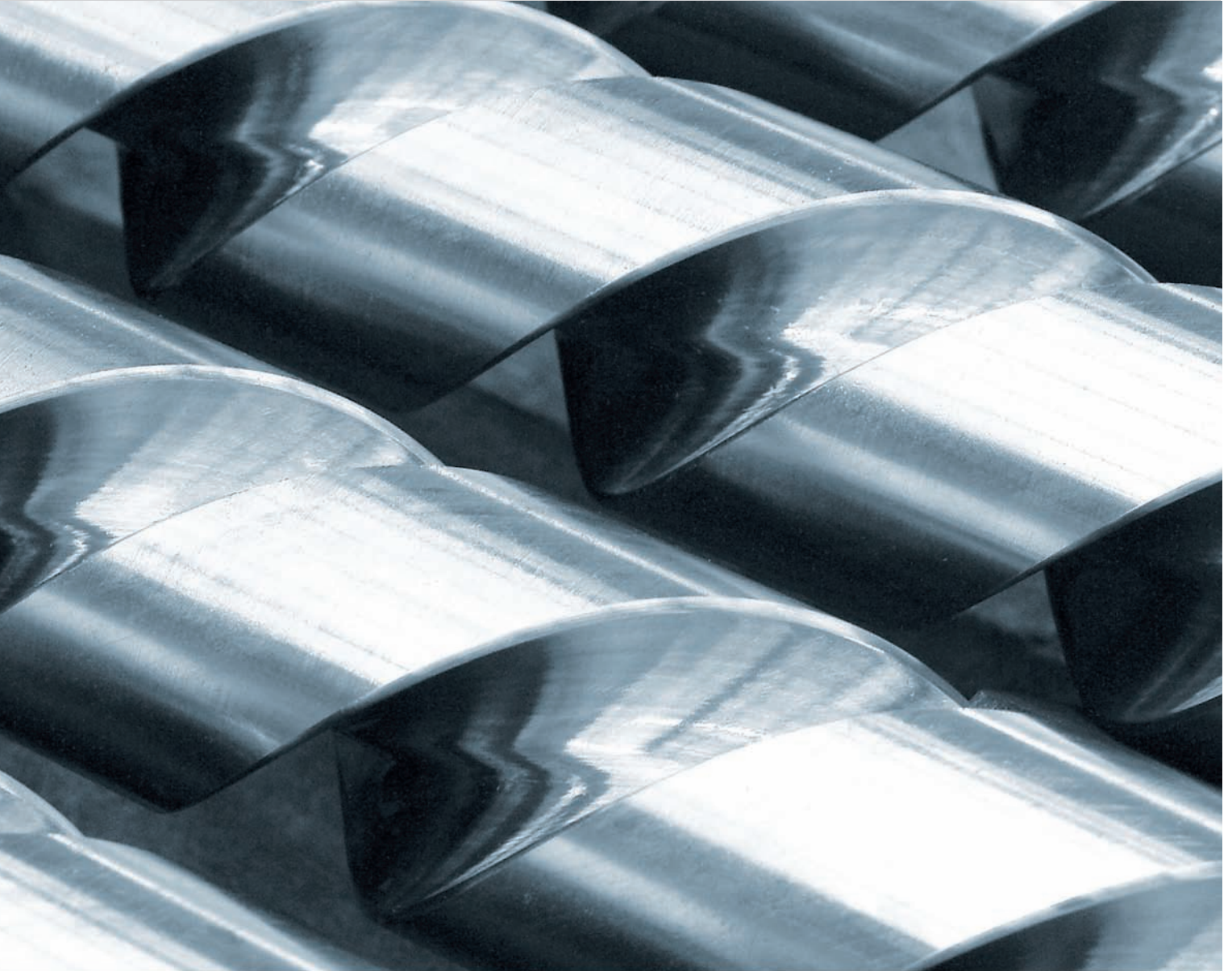


# Screw Pumps & Systems



**Power  
Generation**



# Leistriz Screw Pumps and Systems

Leistriz Pumpen GmbH, with its headquarters in Nuremberg/Germany, has been producing Screw Pumps since 1924.

The first Leistriz Screw Pumps were developed by Paul Leistriz as Main Lube Oil Pumps for bearings of steam turbine generator sets.

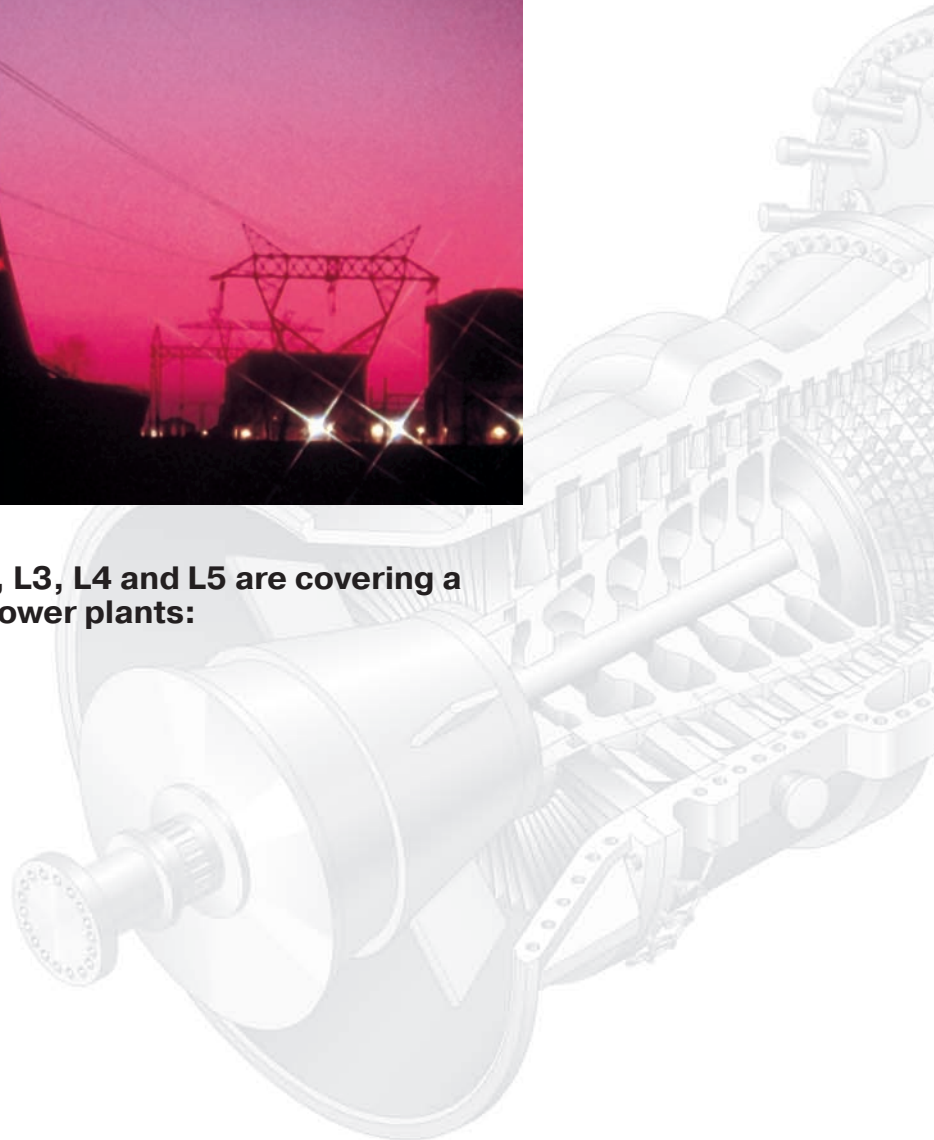
With the widest product range of Screw Pumps, Leistriz offers complete pump packages, being a perfect partner in the Power Generation sector.

Latest technology in combination with strictly controlled quality is the basis for the world-wide known Leistriz Screw Pump reliability and efficiency.



**LEISTRITZ Screw Pumps of series L2, L3, L4 and L5 are covering a wide range of application for use in power plants:**

- Unloading / Transfer of Fuel Oil
- Lubrication
- Injection of Fuel Oil
- Rotor Lifting
- Hydraulics
- Fuel Oil Separation



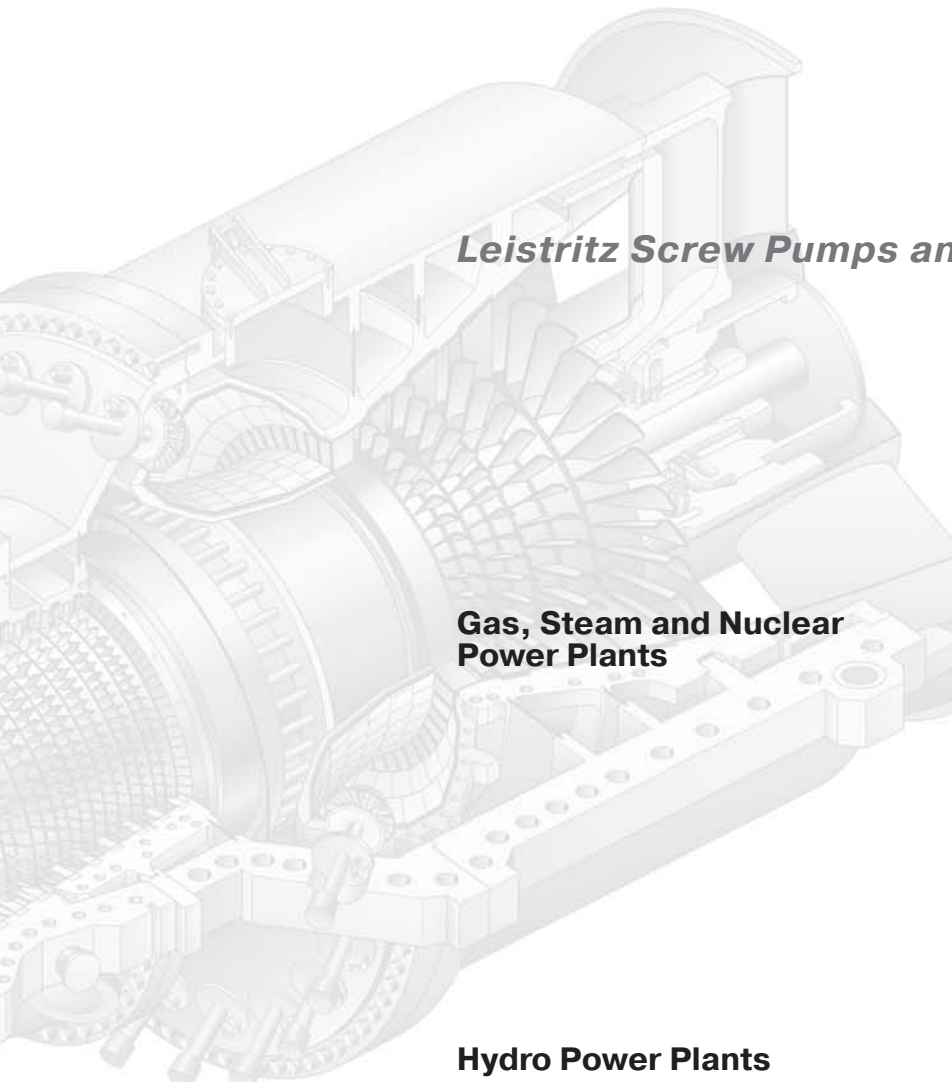


## Power Generation

The importance of dependable generation, transmission and distribution of electricity was revealed when it became apparent that electricity was useful for powering human technologies from various sources of potential energy.

The first power plants were run on wood, while today most of them use petroleum, natural gas, coal, hydroelectric or nuclear power.

The forecast for the world electricity consumption is considerable, reaching almost 30 billion kWh in the year 2020.



**Leistritz Screw Pumps and Systems are operating in:**

**Gas, Steam and Nuclear Power Plants**

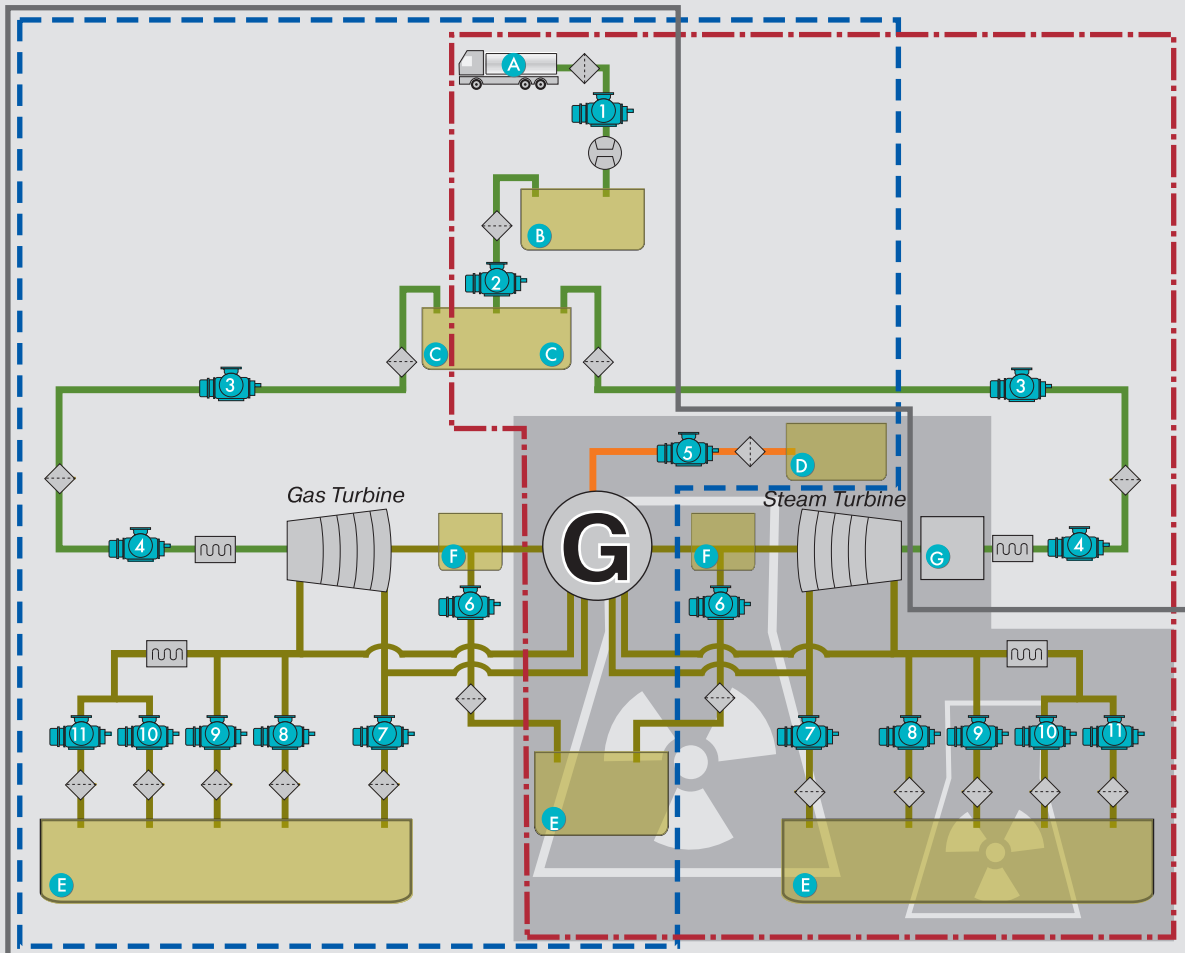
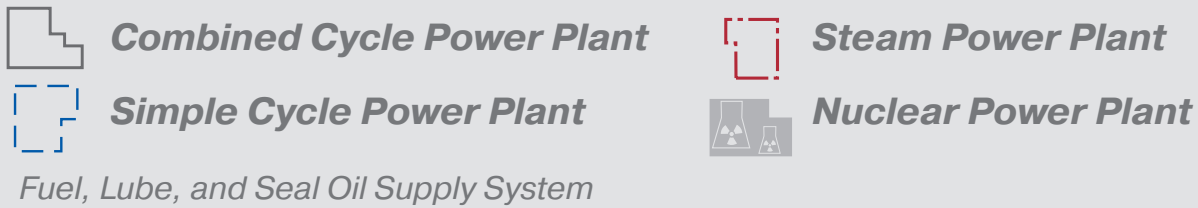
**Hydro Power Plants**

**Engine Driven Power Plants**





# Gas, Steam and Nuclear Power Plants



oversimplified illustration

- |   |   |   |   |
|---|---|---|---|
| <ul style="list-style-type: none"> <li><span style="color: green;">■</span> Lube Oil [LO]</li> <li><span style="color: green;">■</span> Fuel Oil [FO]</li> <li><span style="color: orange;">■</span> Seal Oil [SO]</li> <li> Heat Exchanger</li> <li> Flowmeter</li> <li> Filter</li> <li> Generator</li> </ul> | <ul style="list-style-type: none"> <li><b>1</b> Leistritz FO Unloading Pump</li> <li><b>2</b> Leistritz FO Transfer Pump</li> <li><b>3</b> Leistritz FO Forwarding Pump</li> <li><b>4</b> Leistritz FO Injection Pump</li> <li><b>5</b> Leistritz SO Pump</li> <li><b>6</b> Leistritz Reduction Gear LO Pump</li> </ul> | <ul style="list-style-type: none"> <li><b>7</b> Leistritz Jacking Pump</li> <li><b>8</b> Leistritz Control Oil Pump</li> <li><b>9</b> Leistritz Emergency LO Pump</li> <li><b>10</b> Leistritz Auxiliary LO Pump</li> <li><b>11</b> Leistritz Main LO Pump</li> </ul> | <ul style="list-style-type: none"> <li><b>A</b> Truck /Railway Wagon</li> <li><b>B</b> Storage Tank</li> <li><b>C</b> FO Day Tank</li> <li><b>D</b> SO Tank</li> <li><b>E</b> LO Tank</li> <li><b>F</b> Reduction Gear with LO reservoir</li> <li><b>G</b> Burner/Boiler Section</li> </ul> |
|---|---|---|---|

## Leistritz Fuel Oil Unloading Pump

The unloading of various kinds of fuel oil from truck or railway wagons is handled by Leistritz Screw Pumps, all series. However, Leistritz Twin Screw Pumps, series L2 (mono flow type) and L4 (double flow type), are the preferred choice because of their ability to run dry (L2 with time limitation), to prime more effectively and to accept bigger sizes of solid product particles.



1 FO Unloading Pump L4NG

## Leistritz Fuel Oil Transfer and Forwarding Pump

Leistritz Triple Screw Pumps, series L3, are used for fuel oil transfer through different storage facilities and cleaning filters. Furthermore, Leistritz Triple Screw Pumps, series L3, act also as Forwarding Pumps for feeding the following Injection Pumps.



2 3 FO Transfer and Forwarding Pump L3NG

## Leistritz Fuel Oil Injection Pump

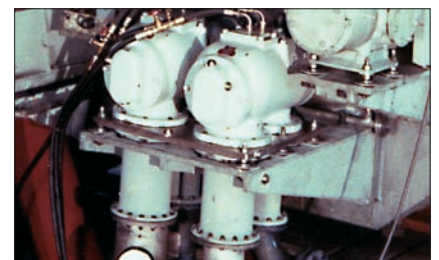
The injection of fuel oil into burners (steam power plant) or into gas turbines (simple/combined cycle power plant) is realized by Leistritz medium or high pressure Screw Pumps, series L3M/H/V/U, which are designed to withstand high differential pressures even in combination with very light fuels.



4 FO Injection Pump L3MG

## Leistritz Reduction Gear Lube Oil Pump

Reduction gears are installed to adapt the speed between the gas/steam turbines and the generators. Leistritz Triple Screw Pumps, series L3N/M, and Leistritz Twin Screw Pumps, series L2, are used for lubrication of the reduction gears.



6 Reduction Gear LO Pump L2NG

## Leistritz Jacking-, Control Oil-, Main Lube Oil-, Auxiliary Lube Oil- and Emergency Lube Oil Pump

Gas/steam turbines need constantly proper lubrication. Leistritz Triple Screw Pumps, series L3N/M/H/V, and Leistritz Twin Screw Pumps, series L2, are used for turbine lubrication. Semi-submersible pump designs or dry mounted versions on common lube oil consoles are available.

## Leistritz Seal Oil Pump Generator

Hydrogen cooled generators require seal oil for their rotating shafts. Leistritz Triple Screw Pumps, series L3N/M, are responsible for the seal oil supply.



10 Auxiliary LO Pump L3MF (tank submerged version)

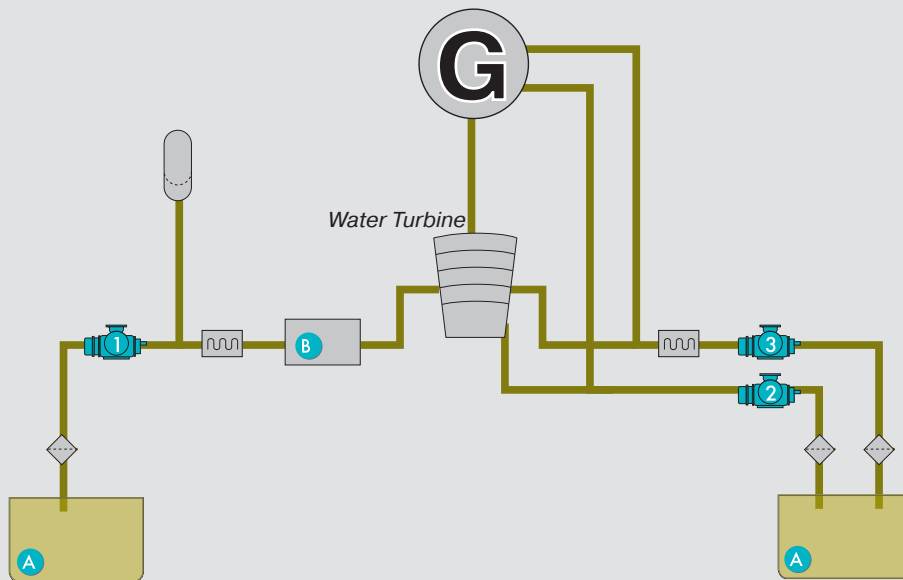




# Hydro Power Plants



## Lube Oil Supply System (Francis Turbine)



oversimplified illustration

- Lube Oil [LO]
- Heat Exchanger
- Accumulator
- Filter
- Generator
- 1 Leistritz Hydraulic Pump
- 2 Leistritz Jacking Pump
- 3 Leistritz LO Pump
- A LO Tank
- B Control Block (Servo Motor Wicket Gates Adjustment)



Francis Turbine\*



Kaplan Turbine\*



Pelton Turbine\*

\* Source: Voith Siemens Hydro Power Generation

## Leistritz Hydraulic Pump

To allow efficient water turbine operation for a wide range of water flow conditions, the water inlet into a Francis turbine has to be adjusted by wicket gates. These wicket gates are hydraulically adjustable via a hydraulic control block. The corresponding hydraulic system is properly fed by Leistritz Screw Pumps, series L3M, to maintain a system pressure of 40 to 70bar.



1 Hydraulic Pump L3MF

## Leistritz Jacking Pump

For rotor and generator shaft lifting during start up of a turbine, Leistritz Jacking Pumps, series L3H/V, are used. These Leistritz Screw Pumps are capable to a fast pressure rise up to 180bar. Dry mounted or semi-submersible pump designs are used alternatively.



2 Jacking Pump L3HF  
(semi-submersible design)

## Leistritz Lube Oil Pump for Generator/Water Turbine Bearings

The bearings of a turbine and a generator are lubricated by Leistritz Lube Oil Pumps (main/emergency), series L3N and series L2, which are usually operating below 16bar. For this application Leistritz Screw Pumps have standard design to accept a high percentage of dissolved air in the pumped lube oil.



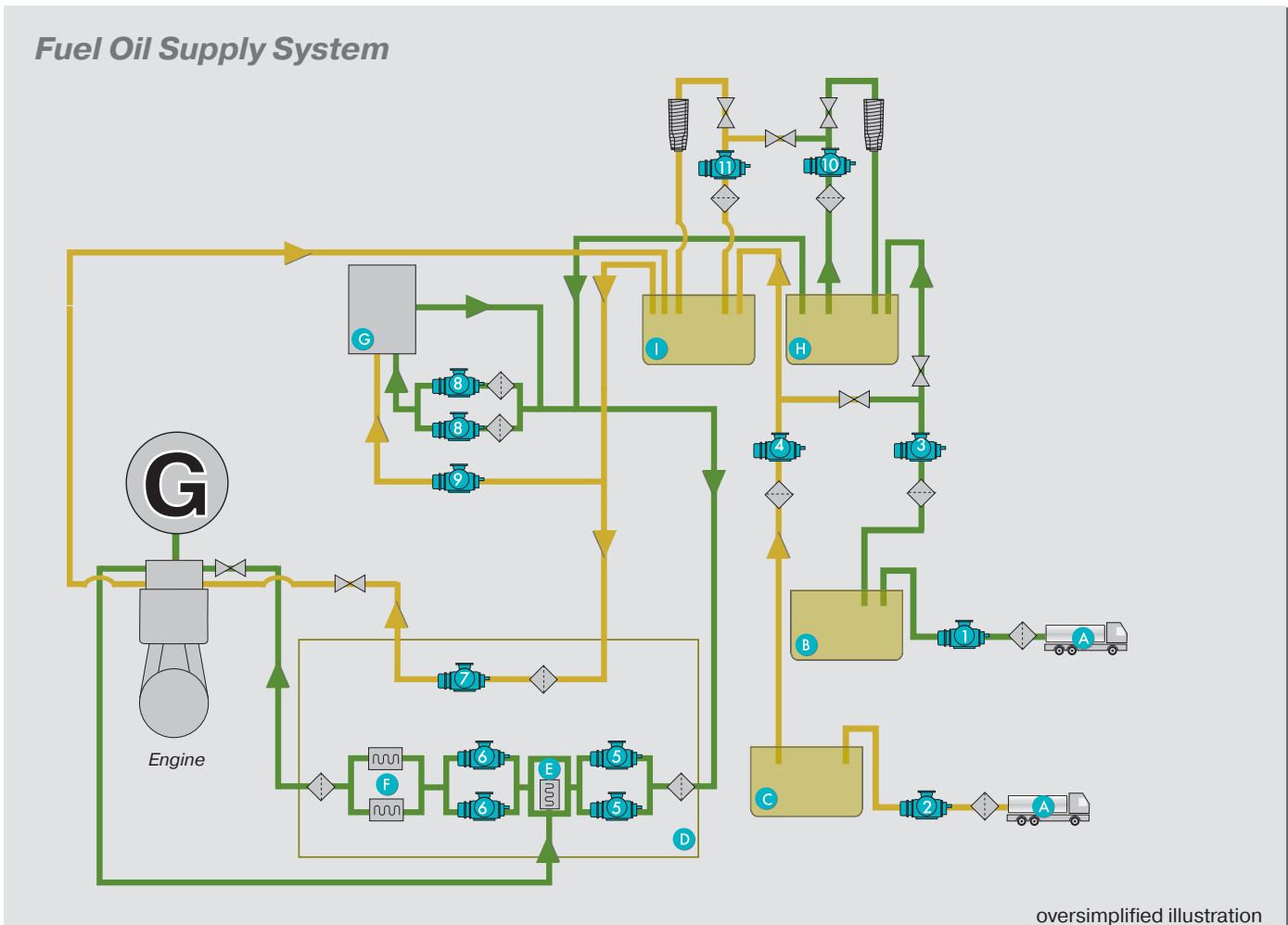
3 Main LO Pump L2NG



# Engine Driven Power Plants



## Fuel Oil Supply System



- |   |   |   |
|---|---|---|
| <ul style="list-style-type: none"> <li><span style="color: yellow;">—</span> Diesel Oil [DO]</li> <li><span style="color: green;">—</span> Fuel Oil [FO]</li> <li> Filter</li> <li> Separator</li> <li> Heater</li> <li> Valve</li> <li> Generator</li> </ul> | <ul style="list-style-type: none"> <li><b>1</b> Leistrizt FO Unloading Pump</li> <li><b>2</b> Leistrizt DO Unloading Pump</li> <li><b>3</b> Leistrizt FO Transfer Pump</li> <li><b>4</b> Leistrizt DO Transfer Pump</li> <li><b>5</b> Leistrizt FO Feeder Pump</li> <li><b>6</b> Leistrizt FO Booster Pump</li> <li><b>7</b> Leistrizt DO Booster Pump</li> <li><b>8</b> Leistrizt FO Boiler Supply Pump</li> <li><b>9</b> Leistrizt DO Boiler Supply Pump</li> <li><b>10</b> Leistrizt FO Separator Supply Pump</li> <li><b>11</b> Leistrizt DO Separator Supply Pump</li> </ul> | <ul style="list-style-type: none"> <li><b>A</b> Truck / Railway Wagon</li> <li><b>B</b> FO Storage Tank</li> <li><b>C</b> DO Storage Tank</li> <li><b>D</b> FO Module</li> <li><b>E</b> Mixing Unit, heated and insulated</li> <li><b>F</b> FO End Heater</li> <li><b>G</b> Boiler</li> <li><b>H</b> FO Day Tank</li> <li><b>I</b> DO Day Tank</li> </ul> |
|---|---|---|



## Leistritz Fuel Oil / Diesel Oil Unloading Pump

The unloading of various kinds of fuel oil from truck or railway wagons is handled by Leistritz Screw Pumps, all series. However, Leistritz Twin Screw Pumps, series L2 (mono flow type) and L4 (double flow type), are the preferred choice because of their ability to run dry (L2 with time limitation), to prime more effectively and to accept bigger sizes of solid product particles.



1 FO Unloading Pump L2NG

## Leistritz Fuel Oil / Diesel Oil Transfer and Separator Supply Pump

For transfer and separator supply of fuel and diesel oil Leistritz Screw Pumps, series L3N, in standard execution are operating against low pressure (up to 16bar) and with low fuel oil temperature. The pumps are available in foot, flange and pedestal mounting design for adaption to the individual system.



3 4 10 11 FO/DO Transfer and Separator Supply Pump

## Leistritz Feeder and Booster Pump for Fuel Oil Modules

Modules for engine fuel oil supply are operated by Leistritz Screw Pumps, series L3N, as Feeder and Booster Pumps. They are designed for product temperatures up to 180°C and available with mechanical shaft sealing or hermetically sealed by magnetic drives.



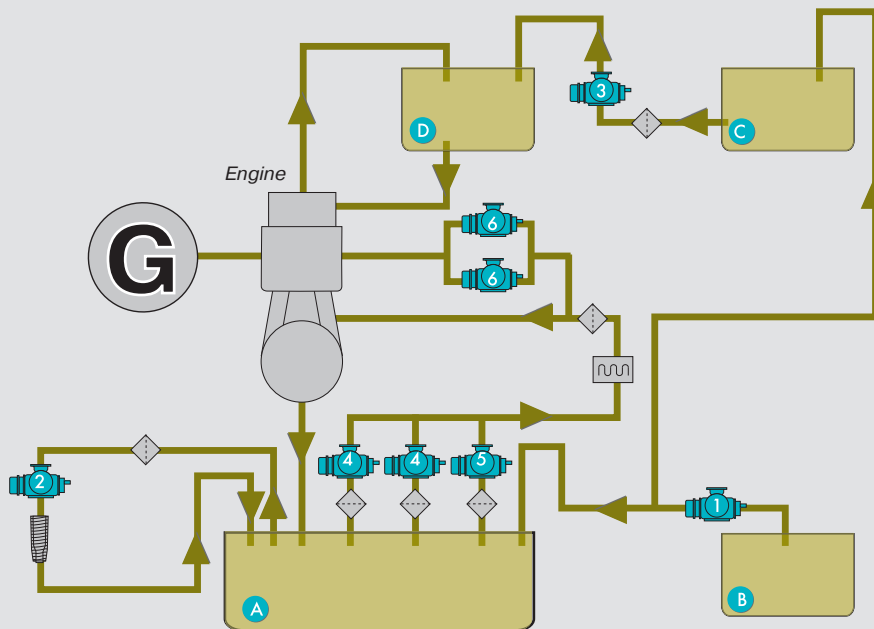
5 6 FO Feeder and Booster Pump L3NG



# Engine Driven Power Plants



## Lube Oil Supply System



oversimplified illustration

- Lube Oil [LO]
- Filter
- Separator
- Cooler
- Generator

- Leistriz LO Transfer Pump
- Leistriz LO Separator Supply Pump
- Leistriz Cylinder Oil Transfer Pump
- Leistriz Main LO Pump
- Leistriz Pre LO Pump
- Leistriz Crosshead LO Pump

- LO Circulation Tank
- LO Storage Tank
- Cylinder Oil Storage Tank
- Cylinder Oil Day Tank

## Leistritz Lube Oil Transfer and Separator Supply Pump

Leistritz Triple Screw Pumps, series L3NG, are applicable for lube oil transfer and separator supply around the engine. This series is used in foot, flange and pedestal version for horizontal or vertical installation. With one pump design but different seals all kind of lube oils can be handled.



1 2 LO Transfer and Separator Supply Pump L3NG

## Leistritz Main/Pre Lube Oil Pump

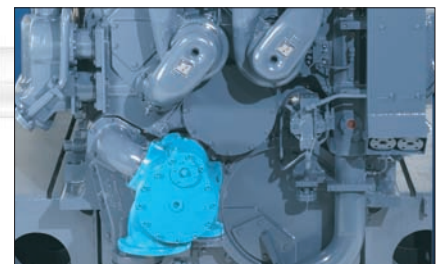
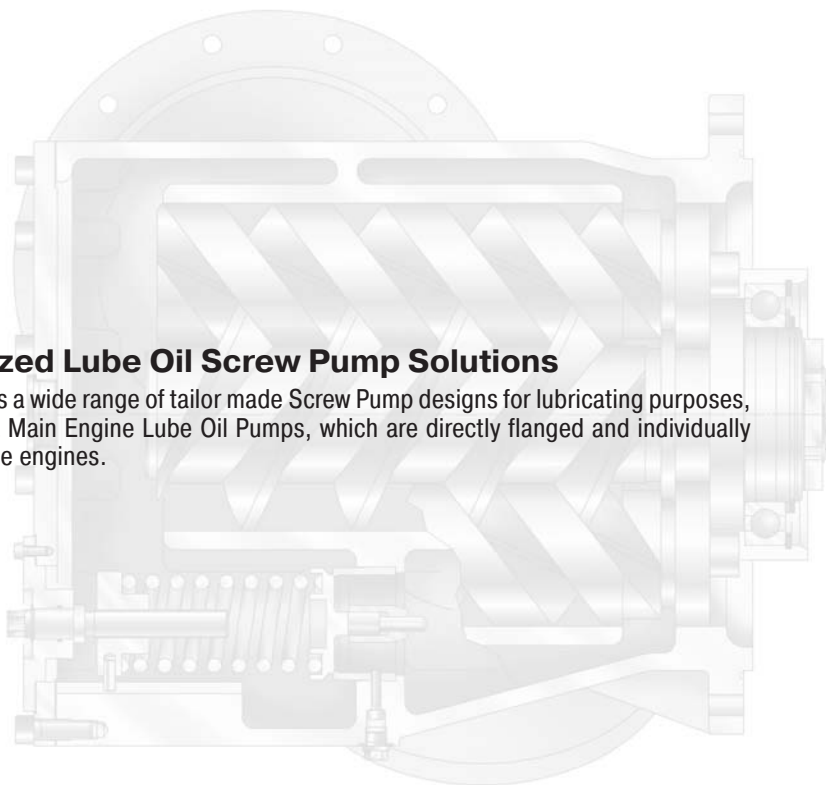
Leistritz Screw Pumps series L2, L3 and L5 are used as Main Lube Oil and Pre Lube Oil Pumps, accepting high percentages of dissolved air in the lube oil. Besides semi-submersible versions for tank installation (series L2NT, L3NT, L3MF, L5NT) and dry mounted versions for horizontal/vertical installation (foot/pedestal mounting), also flanged versions are available. These pumps are directly driven by the engine.



4 Main LO Pump L3NG

## Customized Lube Oil Screw Pump Solutions

Leistritz offers a wide range of tailor made Screw Pump designs for lubricating purposes, e. g. Leistritz Main Engine Lube Oil Pumps, which are directly flanged and individually adapted to the engines.

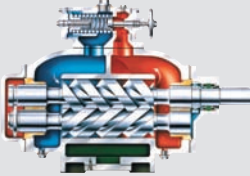
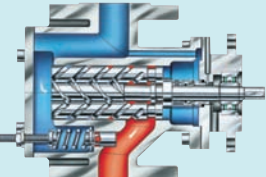
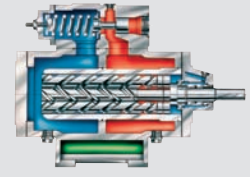
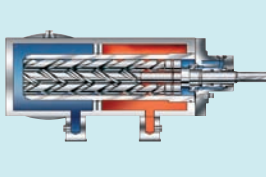
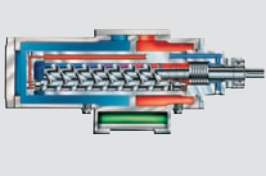
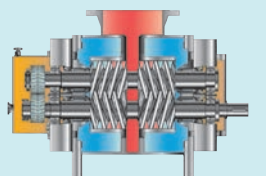
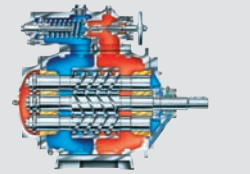


Engine driven Main LO Pump L3NG





# Leistritz Screw Pumps and Systems

Series	Use for	Leistritz Screw Pump	Maximal Performance Data			
			Capacity	Differential Pressure	Viscosity	Pumping Temperature
<b>L2</b>	Low pressure duty, suitable for transport of light abrasive and corrosive, high or low viscous fluids with poor or good lubricity.		900 m <sup>3</sup> /h [3,960 gpm]	16 bar [232 psi]	100,000 cSt	280°C [536°F]
<b>L3N</b>	Low pressure duty, suitable for transport of non abrasive lubricating fluids.		700 m <sup>3</sup> /h [3,100 gpm]	16 bar [232 psi]	15,000 cSt	180°C [356°F]
<b>L3M</b>	Medium pressure duty, suitable for transport of non abrasive lubricating fluids.		300 m <sup>3</sup> /h [1,320 gpm]	80 bar [1,160 psi]	10,000 cSt	280°C [536°F]
<b>L3H</b>	High pressure duty, suitable for transport of non abrasive lubricating fluids.		200 m <sup>3</sup> /h [880 gpm]	160 bar [2,320 psi]	10,000 cSt	280°C [536°F]
<b>L3V/U</b>	Ultra high pressure duty suitable for transport of light abrasive and corrosive, high or low viscous fluids with poor or good lubricity.		180 m <sup>3</sup> /h [792 gpm]	280 bar [4,060 psi]	1,000 cSt	280°C [536°F]
<b>L4</b>	Low, medium and high pressure duty, suitable for transport of abrasive/non abrasive, corrosive/non corrosive, lubricating/non lubricating, high or low viscous fluids.		5,000 m <sup>3</sup> /h [22,000 gpm]	150 bar [2,175 psi]	150,000 cSt	350°C [662°F]
<b>L5</b>	Low pressure duty, suitable for transport of light abrasive and corrosive, high or low viscous fluids with poor or good lubricity.		1,700 m <sup>3</sup> /h [7,500 gpm]	10 bar [145 psi]	100,000 cSt	280°C [536°F]

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