APPLICATION NOTE: Positive Displacement Flow Meter Ensures Proper Lubrication to Rock Crushing Equipment

Quarry and aggregate operations typically include some type of crushing machine. These “crushers” are used to reduce large rocks into smaller pieces or rock dust, depending on the requirements of the operation and material being crushed.

Crusher machines come in four basic styles: cone, gyratory, impact, and jaw. All crushers require lubrication, for gear boxes or bearings. Due to the severe service and high particulate content of the environment, circulating lubrication systems that provide filtration, temperature control, and proper oil flow are often deployed.

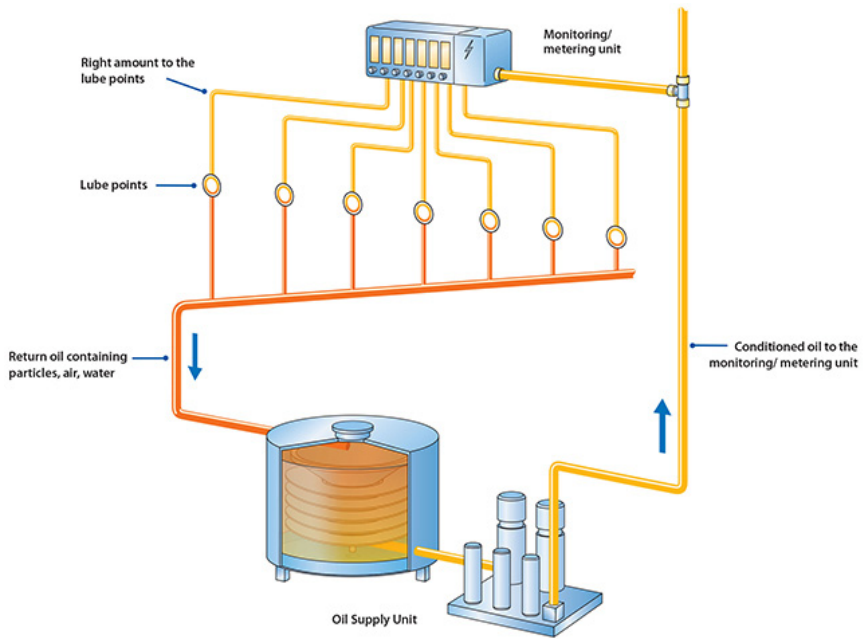

Diagram: Typical lubrication circulation system

To optimize the lubrication system circuit flow meters are often used to maintain the proper amount of lubricant to each lubrication point. They can be deployed on the main supply and return line as a comparison to determine if there are system leaks; if the return rate is lower than the supply rate there may be leaks within the system. Flow meters can also be used to monitor each lubrication point, to allow the operator to adjust the rate to meet the equipment lubrication specs and alarm if the flow stops or becomes too low for proper operation.

HIGHLIGHTS

Industry: Industrial
Service: Flow Rate/Total
Fluid: ISO VG 220 lubricant oil

Application

Measuring lubricant oil flow to rock crushing equipment

Problem

- Rock crushing equipment relies on proper lubrication to continue operating efficiently
- Need a robust, effective way to locally and remotely monitor lubricant oil flow rate
- Field technicians and control engineers can monitor and shut-down equipment in case of low or no flow condition

Solution

- DC-I Series Positive Displacement Flow Meter
- BR30 Rate/Totalizer Display
- Hall Effect Sensor

Customer Application and Solution

An aggregate material producer had to ensure their crushing equipment received the proper amount of lubricant oil to prevent equipment failure, premature wear of moving parts, and reduce contaminants in the circulation system. They also needed a simple way for their field technicians to visually confirm flow rate, and send an alarm signal back to their control system in case of a low or no flow condition and shut down the equipment. The oil used for this equipment had a fairly high viscosity of usually 200 cSt and above. In addition the outdoor environment and extremely rough nature of the operation required a flow meter that can handle these conditions.

Flow Technology recommended the DC-I Series positive displacement flow meter, with Hall Effect Sensor and BR3000 Rate/Total Display. The DC-I Series PD flow meter handles high viscosity fluid over a 1000:1 turndown to measure the overall flow rate and detect leaks as well. The simple design and robust construction of the flow meter make it an excellent choice to handle the quarry's unique environment.

The BR3000 display, supplied with explosion-proof housing, provides local indication of proper flow rate for the field crew. The loop-powered 4-20mA output sends information back to the control room for remote monitoring. The Hall Effect Sensor is a simple but versatile sensor for Flow Technology positive displacement flow meters that can handle a broad range of input frequencies and operating conditions. It transmits a square-wave pulse to any connected signal conditioner, monitoring device, or controller.

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