



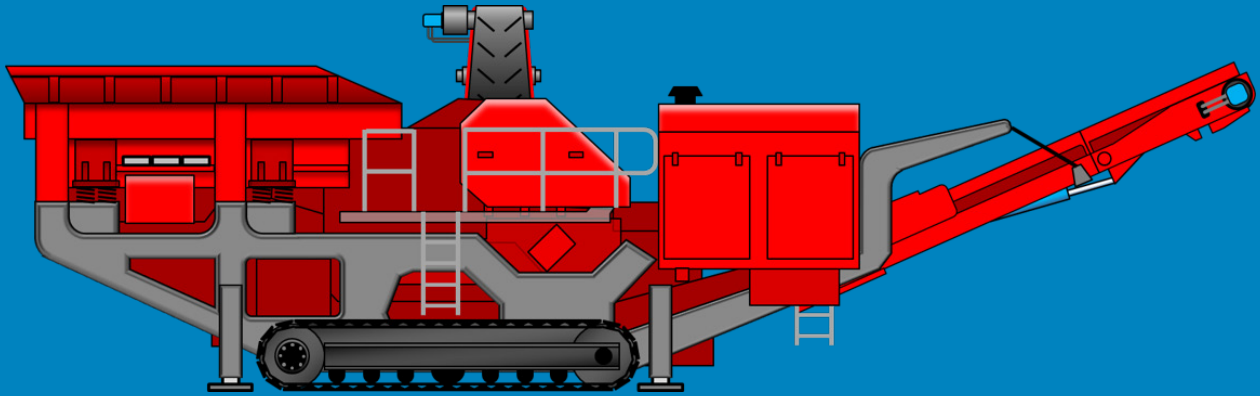
HYDRAULIC MEASUREMENT AND CONTROL

APPLICATION CASE STUDY

WEBTEC PRODUCTS IN THE CRUSHING AND SCREENING INDUSTRY



APPLICATION CASE STUDY



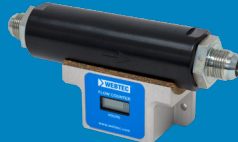
VARIABLE PRIORITY
FLOW DIVIDERS



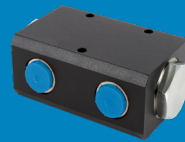
VARIABLE FLOW
PRESSURE COMPENSATED
CONTROL VALVES



FLOW HOURS
COUNTER



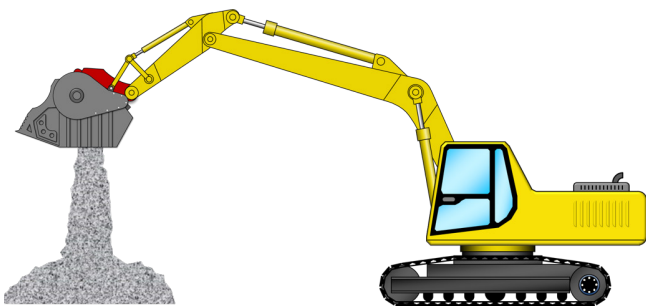
HIGH-FLOW
DIVIDER COMBINER



COMBINATION VALVE - VARIABLE
PRIORITY FLOW DIVIDER WITH
DIRECTIONAL CONTROL



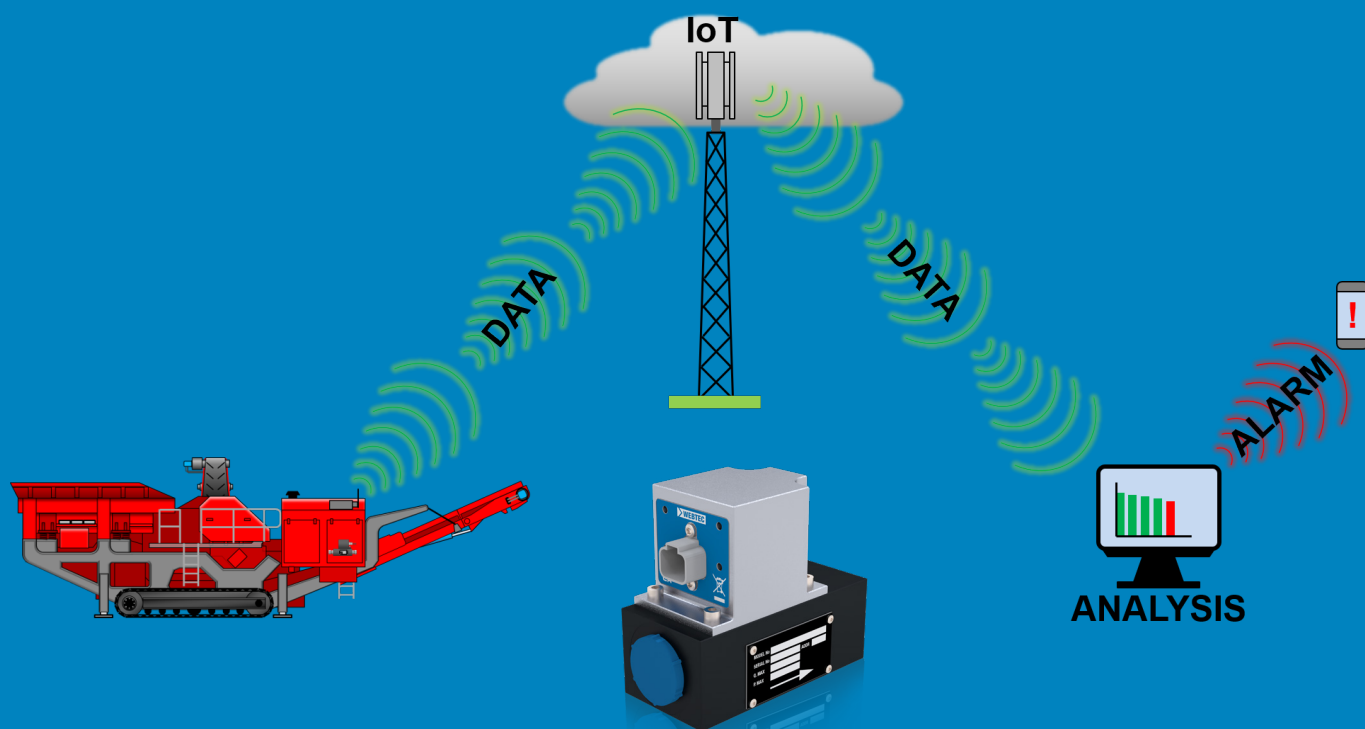
WEBTEC PRODUCTS IN THE CRUSHING AND SCREENING INDUSTRY



Crushing and screening basically involves taking large pieces of material, crushing it into smaller pieces and then sorting it into similar sized fragments. The starting material is typically freshly quarried or excavated rock, or demolition material such as concrete, brick, stonework etc. Different types of crushing mechanisms are employed depending mainly upon the type of materials involved and the input and output material sizes.

Where a considerable reduction in material size is required, the output of one crusher can be used to feed the input of a second. In some cases even, a third stage may also be necessary. Traditionally, material crushing has been carried out in permanent locations with the material being transported to the crushing plant by heavy duty tipping trucks. In recent times however, mobile crushing plant has often proved to be more cost effective. Such equipment can be transported to its required location and then moved by means of wheels or caterpillar tracks to any convenient position. This is especially beneficial for short-term tasks such as demolition work. Where the task involved does not warrant the use of a dedicated machine, crushing attachments are available which can be mounted onto an excavator boom and used to process smaller quantities of material. Some of the functions found on crushers may also apply to machinery used to shred tree trunks, domestic appliances, furniture or motor cars.

Mobile crushing plant may use either electro-mechanical or hydraulic drive for the main crushing mechanism but auxiliary functions are most often carried out by means of hydraulic actuators (cylinders and motors), which are ideally suited to operation in harsh operating environments. Auxiliary functions



can include such things as track and conveyor drives, conveyor folding and positioning, screen and deflector plate operation etc.

For speed control of actuators with varying loads, (such as conveyor drive motors), the Webtec VFC Series of pressure compensated flow control valves will ensure that the actuator speed remains virtually constant over all load conditions. Once set, the weather-proof adjusting knob can be locked in position to avoid any inadvertent adjustment. When using a fixed displacement pump, the excess flow not required by a conveyor drive can be diverted to another machine function while maintaining a constant flow to the conveyor. This can be achieved by using a VFD priority flow divider from the Webtec range. Alternatively, the excess pump flow can be directed to tank at a pressure only slightly higher than the conveyor drive pressure, rather than full relief valve pressure. This ensures maximum system efficiency with simpler, fixed displacement pump arrangements. If remote speed adjustment is required a proportional version of the priority flow divider enables an electronic signal to be used to vary the priority flow. The flow divider can also be combined with a directional valve to enable the priority flow to be switched between two conveyor drives.

When the movement of two unequally loaded actuators needs to be synchronised, for example with track drives or conveyor positioning, the FDC Series flow divider/combiners can be used to ensure equal flows to or from each actuator, irrespective of load. Certain functions on mobile crushers need to be interlocked to prevent dangerous or damaging situations. For example, operation of the track drive may need to be prevented unless a conveyor is moved to a transport position. The mechanically operated SV/DV 80 diverter valve can thus be used to prevent flow to a certain function unless mechanically

actuated by the appropriate section of the machine.

For pumps and motors which operate for long periods of time, continuously monitoring their performance can provide an early warning of a potentially costly failure. The CTA flow monitor can be installed in the pump outlet line to monitor pump flow rate and/or in the supply line to a conveyor motor for example. By comparing the pump or motor flow rate with its rotational speed a rapid assessment can be made of the component's state of wear and action taken before a catastrophic failure occurs. In addition, the CTA flow monitor can be observed remotely via the machine's telematic system.

The RFS 200 flow hours counter is a new device which can be used as part of a preventive maintenance programme. Installed in the feed line to critical hydraulic components, it monitors their actual usage time thus enabling routine maintenance to take place when the component is approaching the end of its useful life.

The DHM Series hydraulic multimeter can be an invaluable tool, not only for system troubleshooting but also for optimising the set-up of attachments such as crusher buckets. It enables the measurement of flow, pressure, peak pressure and temperature and the unit can then transfer data wirelessly for automatic calculation of hydraulic power and volumetric efficiency. Also useful for system troubleshooting is the HPM7000 Series portable data logger. This unit has a variety of different modes with the ability to log up to 16 million measured values per test at a variable interval from 1 ms.

Many of the leading OEMs in the crushing and screening industry have therefore come to rely on Webtec products owing to their performance and reliability while operating under the harsh conditions found in this industry.

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