SERIES 1|L

USER MANUAL



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GKD

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SERIES 1-L INTRODUCTION

The GKD Series 1-L Total Moment Indicator is designed to be fitted to excavators, wheel loaders, or plant and machinery used for lifting with a hydraulically operated primary boom, which changes angle when lifting. The Series 1-L will give an indication of load status of the machine against the maximum load the machine is permitted to lift, and will warn the machine operator on approach to overload.

Where indication of two lift different configurations are required (for instance, lifting over front and over side of an excavator, or stabilisers raised or lowered where external stabilisers are fitted) the Series 1-L can be configured with two lift duties, to be switched automatically or manually by an external switch or relay.

Principles of Operation

The Series 1-L monitors the angle of the machine's primary boom and the hydraulic pressure in the boom lift circuit. Using these two inputs, the Series 1-L is able to calculate the load on the machine's boom at all working heights, which it compares against the pre-programmed maximum permitted load for the machine as determined at initial calibration.

Machine load status is displayed to the operator by means of a series of coloured LEDs on the display at the operator station. An integral audible alarm will sound when the machine load exceeds 100% of the programmed maximum.

Optionally, the Series 1-L alarm relay output may be connected to an additional, external alarm or a hydraulic solenoid valve to motion cut a hydraulic function and prevent further movement into overload.

Specifications

- Power supply: 10 - 30 V DC
- Ambient Temperature Operating Range: -20 to +60 °C
- Angle sensor: gravity referenced, accuracy +/- 0.2°.
- Pressure Transducer: 400 bar, 0 - 5 volt output.
- Relay output, switched on overload, max current 1 amp.

PRACTICAL OPERATION OF THE SERIES 1-L

The Series 1-L is designed to be switched on with the vehicle ignition and to operate without the need for input from the machine operator.

As a load is lifted by the machine, the Series 1-L will indicate the load status against the maximum permitted load for the machine by progressively lighting up the column of LEDs on the front panel.

LEDs will progressively light up at 50%, 75% and 100% of the maximum permitted load, and when 100% of load is exceeded.

At over 100% of the maximum permitted load the Series 1-L's internal audible alarm will sound, and the internal relay will switch to change the state of any external devices connected to it (external alarms, hydraulic solenoid valves etc.)

SERIES 1-L INDICATORS AND CONTROLS



The indicators on the Series 1-L display consist of five coloured LED lamps, which operate as follows:

On lights up green at all times whilst the unit is powered.

50 lights up green when the machine reaches 50% of it's maximum load.

75 lights up amber when the machine reaches 75% of it's maximum load.

100 lights up red when the machine reaches 100% of it's maximum load.

! lights up red when the machine exceeds 100% of it's permitted maximum load.

Test Button

A Test button is provided on the display front panel. When this button is pressed and held, the front panel LEDs will cycle through the load sequence and the alarm will sound as >100% load is reached in the test sequence. Any external devices connected through the Series 1-L relay should operate with the internal alarm at overload load simulation. Releasing the "test" button will cause the test func-tion to cease and the unit will return to normal operation.

Audible Alarm

when the Series 1-L exceeds 100% or more of the machine's maximum permitted load the internal audible alarm will sound.

Motion Cut

Where the output of the Series 1-L has been connected to a hydraulic valve to motion cut a machine function on overload (option), at 100% or more of the machine's maximum permitted load the hydraulic function will be cut, and will remain disabled until the load is brought back under 100% of the maximum permitted load.

Fault Diagnosis

Should a fault occur on the Series 1-L system the machine should not be used for lifting purposes until the fault has been rectified and the system tested for correct operation.

The most likely cause of a communication error between a sensor and the display would be damage to a cable, either between the Series 1-L display and the boom mounted angle sensor, or between the angle sensor and the hydraulic pressure transducer monitoring pressure in the lift cylinders.

A green LED is provided on the boom mounted angle sensor adjacent to the 12mm CAN connector. This green LED should be flashing intermittently during normal operation as data is transmitted between the angle sensor and the Series 1-L display. If this green LED is not flashing it would indicate either that the angle sensor has failed, or that the CAN cable between the angle sensor and the Series 1-L display has been damaged. If the green LED on the boom angle sensor is flashing as normal, the cable to the pressure transducer and the pressure transducer itself should be checked for faults or damage.

Relay Operation

The Series 1-L contains an internal relay, which can be used to operate external devices. The relay has one input and two outputs, being normally open and normally closed. The state of the relay should change when the 100% alarm is triggered, either during normal operation or when the "test" button is pressed and held.

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GKD Technologies reserve the right to change these instructions in line with the policy of continuous improvement.

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