Electronic Sound Monitor

FEATURES

Measurement free from interference, no influence from other mills or machines, which are located in the same area.
Enhanced Accuracy of measurement
Reduced wear-out of balls and liners
Enhanced efficiency of the mill
Easy to connect to any automation or control system
4-20 mA output proportionate to amplitude.

INTRODUCTION

Ball Mills are the work horses of cement and minerals industry. The ball mills emit high pitch and low pitch sound depending on the material bed level in the grinding mill. Accurate measurement of filling levels and its communication in the form of a digital display helps utilize the ball mill more efficiently.

Jayashree Electron has introduced a Ball Mill Operation Sensor series **ESM428** to display and control ball mill filling level which is a very useful device for cement industry for control of Ball Mills.

CONSTRUCTION

Series ESM428 Ball Mill Sensor / Controller consists of two sub parts- viz Sound Sensor and Controller Unit. The Sound sensor is mounted on a robust and adjustable Cast Aluminium stand for firm and easy mounting near the ball mill. The adjustable stand makes it possible to adjust the height and orientation of the sound sensor.

The Control Unit is housed inside a sturdy Cast Aluminium enclosure having IP-65 grade of protection. On the front, it shows mill filling level in % from 0 to 100%.

All the control knobs and switches are mounted on the PCB housed inside the enclosure. The set of switches and knobs make it possible to set cut off points for High Grinding Noise and Low Grinding Noise.

PRINCIPLE OF OPERATION

The sound emitted from the Ball Mill varies in intensity as the quantity and average size of the material in the mill changes. This sound is caused by the grinding ball hitting the mill lining and the material in the mill. A high noise level indicates an under-loaded mill and a low noise level indicates an overloaded mill. Both these conditions result in reduced grinding efficiency.

The sound sensor, mounted near the ball mill, gives an AC signal proportional to the Grinding noise which is a function of material bed level in the mill. This signal is routed through a shielded cable, integrated with the sensor unit. The controller amplifies the signal from sound sensor and converts in to a well defined signal for the microchip based control circuit.

The control unit has two set points-viz High Grinding Noise level and Low Grinding Noise level. The unit also has a digital display which indicates mill filling level in %. When the grinding noise crosses the High Grinding Noise level, the built-in relay R1 gets energized. When the grinding noise drops below Low Grinding Noise set point, built-in relay R2 gets energized.

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SPECIFICATIONS

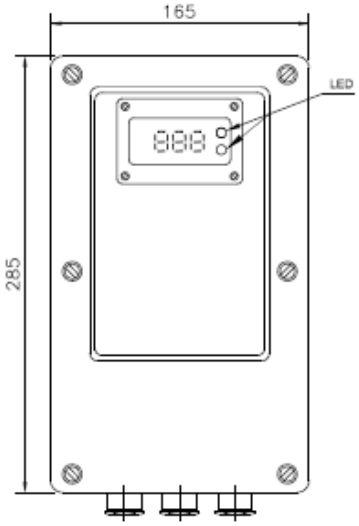
Model No.	: ESM 4281
Control Supply	: 110V AC / 240V AC, 50 Hz
Display	: 4-Digit, 7-segment LED of size 1/2”
Indications	: 2 LED Indications (One Green LED for High Grinding Noise status, One Red LED Low Grinding Noise status)
Outputs	: Potential free relay contacts 1 C/O each for High & Low noise cut-off.
Special Feature	: Synchronization facility is available to avoid cross talk in case of two adjacent ball mills working close to each other.

CAUTION-NOTES:

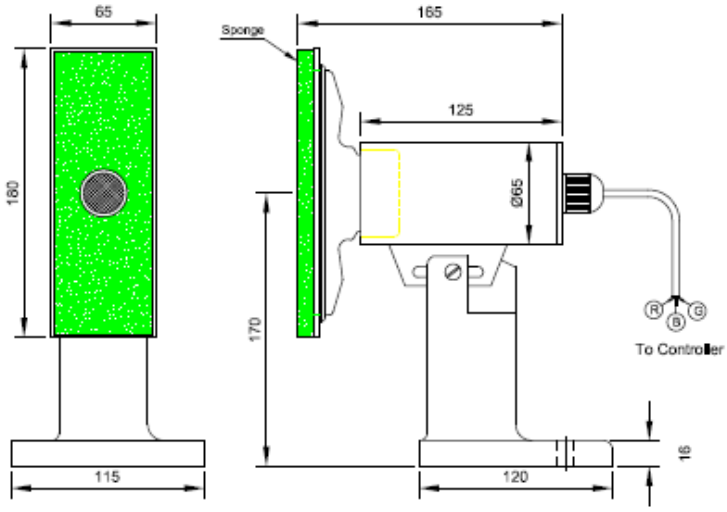
- Mount the Sound Sensor strictly as per our G A Drawing at specified distance from the outer wall of the Ball Mill.
- Tighten all the screws properly.
- The cable length between sensor and controller shall not exceed 5 m.
- Strictly refer attached G.A. Drawing for installation and connection guide-lines.

DIMENSIONAL DRAWING:

CONTROL UNIT



SENSOR UNIT



ORDERING INFORMATION

- Output Contacts / Output Requirements.
- Dimensional Requirements.
- Details of Indications and readout requirements.

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