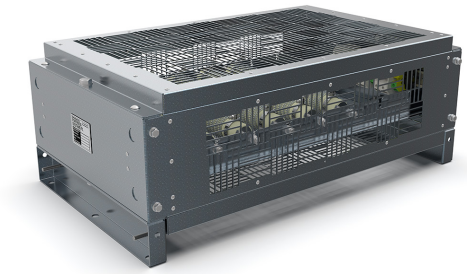
MOTOR CONTROL RESISTOR
DATA SHEET

Fortress' resistors make it possible to start and stop extremely powerful electric motors-such as those on cranes, compressors, and pumps-with safety and precision.

The resistor functions to control the torque and/or speed of an electrical motor or limit the initial current inrush to an acceptable level. This is accomplished through the use of manual or magnetic controls, or with solid-state controls.

In harsh environments, such as foundries and steel mills, motors and resistors must be able to withstand "plugging"-a type of motor braking provided by reversing the voltage polarity or phase sequence so that the motor develops a counter-torque and brakes the load.

They must also withstand dynamic braking, fast acceleration of heavy loads, large amounts of dust and dirt, and occasional operator abuse. In these instances, Fortress' stainless steel stamped grid resistors offer excellent service and cost efficiency. The most popular uses of Fortress' resistors are control of AC wound rotor induction motors (slip ring motors), DC series wound motors, and AC squirrel cage induction motors. Fortress' resistors are also commonly used for wye-delta closed-transition starting applications.



AC WOUND ROTOR INDUCTION

The resistor is wired into the motor secondary slip rings, where it dissipates torque energy in the form of heat. It also provides "soft starting" as resistance is removed in steps.

DC SERIES WOUND MOTOR

The resistor limits torque by limiting current flow into the motor. It is used for starting and stopping the motor.

AC SQUIRREL CAGE INDUCTION MOTOR

Commonly known as a "reduced-voltage" or "ballast" resistor, this acts as a voltage divider for soft starting of the motor.

WYE-DELTA CLOSED TRANSITION STARTING

Wye-delta is a reduced-inrush starting method in which 3-phase motor stator coils are initially connected in a wye configuration and switched to delta as the motor's speed increases. The resistor works as a reduced voltage starting resistor by starting a motor at 58% reduced voltage.

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FORTRESS RESISTORS

CRANE CONTROL

When overhead cranes are used in industrial facilities, resistor banks are frequently used for control of hoisting and lowering speeds, as well as positioning the crane itself. Resistors are usually mounted in, or on top of, the bridge structure.

Many steel mills use DC motors because, in the past, DC power was the best way to hoist heavy loads. Newer plants are increasingly utilizing more readily available three-phase power, and wound rotor motors are often employed.

In hoisting and lowering operations, some special considerations are involved. Hoisting is straightforward-the load is resisting the motor, and positive torque against gravity is required. In lowering an empty hook, it may be necessary to drive the hook down, since gravity may be insufficient to lower it at the desired speed.

But, when the hook is loaded, the load may tend to overhaul the motor, which then may have to apply a retarding torque as if it were hoisting. Dynamic braking ensures the load won't run away and crash instead of making a soft landing.

A resistor bank is the practical device available for the purpose. Operators effect changes in motor speed with various loads and operate a bank of magnetic contactors to achieve the desired operation. The contactors change taps on the resistor banks as required in order to maintain appropriate rotor circuit resistance.

Fortress' stainless steel grid resistors are an excellent choice for heavy industrial applications because of their durability and dependability in severe environments.