

Torque simulator



ref. MECASIM

MECASIM is a current generator designed to drive a powder brake control circuit, for the purpose of generating different types of brake torque. Motors used in industrial environments must resist various types of counter-torque:

- constant torque (e.g. a motor connected to lifting equipment)
- torque proportional to speed (e.g. feed screw)
- torque proportional to speed squared (e.g. liquid mixing systems)
- torque inversely proportional to speed (e.g. cutting tool on a lathe)

To simulate torque dependent on rotation speed, a tachometric dynamo connected to the motor being tested transmits the speed information via a cable attached to the rear of the MECASIM. The generator is capable of producing the 5 types of torque described above. Parameters a and b are directly adjustable by means of two potentiometers on the front of the system.

- **Constant torque: $T = b$**
The moment of the resisting torque is constant (conveyor belt, crane motor)
- **Torque proportional to speed: $T = an + b$**
The moment of the torque is an affine function of speed (screw compressors, measuring pumps)
- **Torque proportional to speed squared: $T = an^2 + b$**
The moment depends on the speed squared (mixers, fans, centrifugal pumps)
- **Torque inversely proportional to speed: $T = a/n$**
The product $nT = \text{constant}$, giving constant motor power (uncoilers, saws, machine tools)
- **Oscillating torque: $T = b$ or $T = a + b$**
Torque oscillates between two values according to time. The cycle frequency is adjustable from 0 to 200s and the cyclic ratio from 0% to 100%

THE FOLLOWING FEATURES ARE ON THE FRONT OF THE APPARATUS

- Two potentiometers for adjusting parameters a and b
- 6-position push-button selector: five types of torque plus a manual position
- A LED display indicates which function has been selected
- Two switches to adjust frequency and cyclic ratio (if oscillating torque is selected)
- Potentiometer controlling manual braking
- Switch to cut off the power supply to the brake at the "brake activation" terminal. This switch does not cut off the output to the "braking signal copy" terminals, making it possible to adjust parameters a and b.

THE FOLLOWING FEATURES ARE ON THE REAR OF THE APPARATUS

- 4 speed information inputs (0-5V and 10 – 20 – 60 V/ rpm) from the tachometric dynamo
- 0 – 20V "brake activation" output: connected directly to the brake
- 0 – 5V "braking signal copy" output. On/Off switch.