



Simplatroll Replacement Magneta Electromagnetic Clutches and Brakes

The original modern pole face design with unbeaten performance and quality.

Key Features

Stationary field without slip rings for easy installation and zero maintenance

Sophisticated friction material developed over

30 years, gives excellent stability with the lowest wear rate

Specially prepared friction surfaces eliminates the need for running in

Totally backlash-free without splines or pins to wear resulting in high reliability and long life



The pre-stressed spring

As part of the armature, a flat pre-stressed spring allows the armature plate to move across the airgap when the coil is energised.

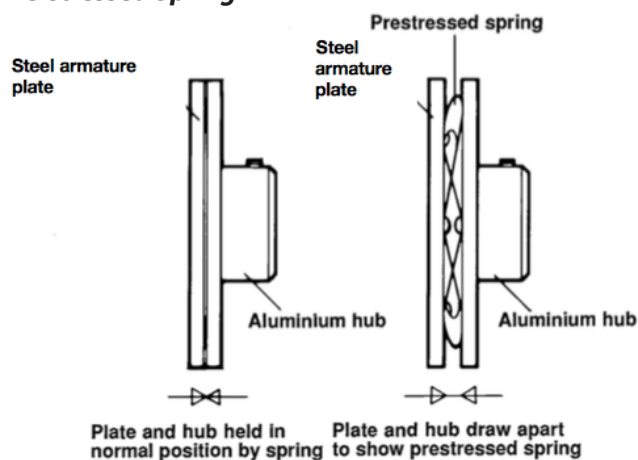
On de-energisation the plate is rapidly withdrawn by the spring allowing mounting in any position and ensuring there is no residual torque.

How they work

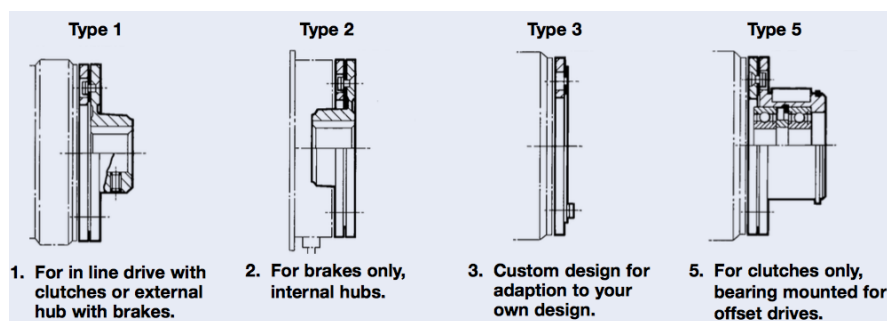
The brakes consist of two parts, the stator (coil part) and armature assembly. These two parts are mounted concentrically and fixed axially with the air gap set between them. When the coil is energised with a d.c. voltage, the armature plate is pulled onto the stator.

Plate axial movement is achieved by the pre-stressed spring. The clutch has a rotor fitted around the stator (stationary field coil). The rotor connects to the shaft. Stator, rotor and armature are fixed axially with the air gap set between rotor and armature. On energisation flux passes radially from stator to rotor and then pulls the armature through the airgap and onto the rotor by flexing of the pre-stressed spring.

Pre-stressed Spring



Armature Types



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Clutches		Torque Nm	Features
14.100.□□.3	Miniature bearing mounted	0.3 – 3.6	Easy mount, 1500 r/min max.
14.100.□□.1	Miniature flange mounted	0.6 – 3.6	For higher speeds, compact length
14.105.□□.3	Standard bearing mounted	7.5 – 480	Easy mount, general duty
14.105.□□.1	Standard flange mounted	7.5 – 480	Compact flange mounted

Brakes		Torque Nm	Features
14.110	Miniature	0.6 – 3.6	Energise to engage
14.115	Standard	7.5 – 480	Energise on, all purpose

Size Selection

1. Torque method – If fitting near a motor drive, it is often sufficient to size the clutch or brake on the motor torque, using a suitable factor, typically 1.5 to 2.0. Otherwise we recommend a factor of 2.0 minimum.

$$\text{Drive torque } T \text{ (Nm)} = \frac{9550}{\text{r/min}} \times \text{kW} \times \text{factor}$$

$$T \text{ (Nm)} = \frac{7124}{\text{r/min}} \times \text{hp} \times \text{factor}$$

2. Torque and inertia – If load inertia is significant, you must allow for additional torque to accelerate the load.

$$\text{Acceleration torque } T \text{ (Nm)} = \frac{J \times \text{r/min}}{9.55 \times t}$$

3. Work done – With significant inertia you must also check that the work done in starting or stopping does not exceed the thermal capacity of the clutch or brake selected.

$$\text{Work per operation } Q = \frac{J \times (\text{r/min})^2}{182.5}$$

$$\text{Where } Q = \text{Work per operation (joules)}$$

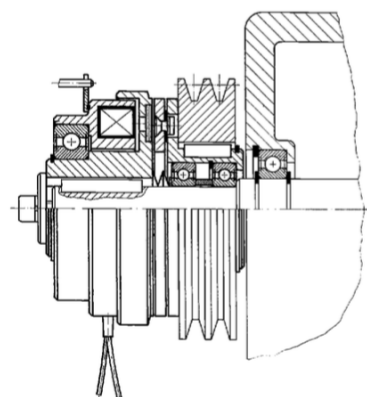
$$J = \text{Inertia (kgm}^2\text{)}$$

From the work per operation, the maximum frequency of operation can be calculated.

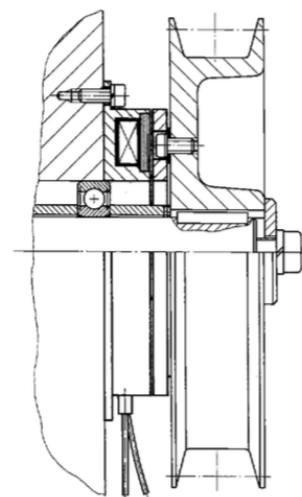
4. Stopping distances and times – If the total inertia to be stopped or started is known, it is often useful to calculate the time taken to achieve this mechanically by the clutch or brake.

$$t = \frac{J \times \text{r/min}}{9.55 \times T}$$

Where t = stopping time in seconds.



14.105.06.3.5 clutch driving V belt pulley



14.115.20.1.3 brake stops shaft & pulley

From the stopping time, the distance or number of revolutions can be calculated, remembering that the average speed during the stop is one half of the initial speed.



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