FCMA SOFT STARTER

HIGH Voltage

SOFT MOTOR START

Industrial demand to have a simple, efficient and reliable starting method for their high power motors without oversized power supplies or generators, led us to develop the starter FCMA (Flux Compensated Magnetic Amplifier).
Unique technology, developed by our company and we use our starters in the last twenty years successfully.

NSC1–8000-M-ER MC

Characteristics :

- Power range : 500KW to 50MW
- Voltage range : 3KV to 13.8KV
- Very low starting current, **down to 1,5 x In**
- Unique FCMA technology
- Current amplitude control, the current signal stay pure sinusoïdal, **zero harmonic**.
- Smoothl starting and acceleration.
- Bypassed after start without opening of power circuit.
- Rugged magnetic design, **no maintenance**.
- Suitable for extreme weather

LSC1–7600-M-DC

Advantages

. Possible start under reduced power.

. Possibility to reduce the starting current down to **1.5 x FLA** with ER MC (Energy Recovery and Magnetic Compensation) in option.

. Continious acceleration, less mechanical stress for the drive line.

. Higher electrical equipment life (motor, CB, transfo.,…) and mechanical equipment (motor, pump, compressor, bearings,…).

. Capital cost saving in power.

. Easy retrofit on existing

. No electronic, **ZERO HARMONIC**.

. Possible installation on motor neutral point.

. Maintenance and virtually zero risk of failure.

Standard

Build and test following IEC standards.

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FCMA SOFT STARTER

Operation

FCMA Soft Starter is controling a constant starting current during the acceleration period of the motor, voltage on the motor terminal box is continiously increasing. The goal is to have the biggest possible motor torque during starting time vs contant voltage starting system.

The FCMA ingenuity is to manage a constant starting current with variable voltage during all the motor starting period without any electronic and moving parts.

All our product are based on our company speciality which is the electromagnetism.

The FCMA is independant, no need of control current of voltage to manage the Module. His equivalent impedance, maximum at zero speed will reduce with motor speed increased to maintain a constant starting current. The cemf from the motor is only used to manage the module and reduce impedance with speed increase.

After motor start, FCMA Module is just bypassed with contactor or Circuit Breaker but stay under voltage, **Power circuit is never open.**

Identification

NSC1-12500-H-ERMC

NSC1 : starter type, **LSC1** or **NSC1.**

12500 : motor power kW

H : **H**igh / **M**edium / **L**ow

Options : ER MC or DC

10KV NSC1 Module

Options

The ER/MC models are designed to reduce the line current while keeping the motor current sufficiently large for the correct acceleration.

1- ER (Energy Recovery)

The FCMA main winding is in series with the motor and drops a voltage across itself to limit the motor voltage and motor current. The goal is to used the reactive power store in the FCMA and inject it in line.

The ER winding is magnetically linked with FCMA core and taps part of this energy stored is send back to the line. The fraction of energy that can be tapped is proportional to the voltage drop in the FCMA and the motor current. This current is in phase opposition to the motor current and hence will directly be deduct to the line current.

2- MC (Magnetic Compensation)

To further reduce the line current MC winding could be used. The MC winding is magnetically coupled to the Main winding and ER winding . Low voltage compensators are connected to the MC winding and this current is reflected

by the ER winding into the high voltage system. This current is in phase with the ER current and in opposition to the motor current.

The advantage is to have Low voltage compensators and they are in a close circuit with the MC winding so immediately discharge when not use.

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Connection

1- Neutral side connection NSC1

Complete panel with FCMA module and by-pass device, installed close to the motor.

Electrical room area saving.

Reduced starter price.

No Short Circuit Current problem.

2- Line side connection LSC1

For motor in classified area or impossibility to have electrical panel close to the motor.

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