Electronic starter for single phase induction motors with starting capacitor or double capacitor

Description

To generate a rotating field to start the single phase induction motors type EAS and EDS from EMG, an auxiliary winding with start capacitor is used. This causes a higher starting torque for these types of motors. After the start of the motor the starting capacitor is cut off. Due to the motor type, the auxiliary winding may be energized by a running capacitor in steady-state (type EDS).

Compared to the former starter electronic from EMG, the new one has digital data processing. Additional the maximum starting time is limited to 5s according to the recommended starting time of EAS and EDS motors.

Running the new electronic starter:

During switch-on the motor, the circuit of auxiliary winding and starting capacitor is closed by a wear less electronic power switch. This switch opens if the voltage at the auxiliary winding reaches a level which is typical for a started motor. The start-up time depends on the load. Due to the thermal capacities of the motor and the electronic starter, the maximum start-up time is limited. To protect motor and electronic starter the switch opens after 5s. If there is no safe starting possible a motor with a higher starting torque is needed. The auxiliary windings of EMG-motors and of the electronic starter are matched for best performance. After starting, the electronic starter is blocked until restart.

Pros by using the electronic starter:

- Wear less electronic switch for a long life
- Common device for all EMG motors up to 3kW
- Assembly in terminal box possible
- Blocked electronic during steady state
- The load or the maximum start-up time of 5s define the cut-off point
- Safe function in complicated power grids

Caution:

The electronic starter is matched and tested with EMG motors type EAS and EDS. These motors are used in applications that need a short but high peak of starting torque. For the case of heavy duty starting longer than 5 seconds, these motors are not suitable. With employment of the electronic starter at unknown engines it must be guaranteed that the split field achieves the necessary cut-off voltage at the correct number of revolutions. Further compellingly the permissible switching cycles per hour must be considered. Frequent starting within a short time interval (e.g. inching operation, short test cycles) leads to an inadmissibly high heating up of engine and the construction units of the electronic starter.

Data:

- Working voltage $U_n$: 230V +10% to 10% (115V on request)
- Frequency: 45Hz to 66Hz
- Cut-off voltage ($U_{Hi}$): 300V
- Max auxiliary current: 25A
- Max motor power: 3 kW
- Supported motor types: Single phase induction motors with starting capacitor or double capacitor
- Cycling: 20 cycles per hour
- Max start-up time: 5s
- Ambient temperature: -40 to +85 °C

Security

The electronic starter doesn’t provide any security functions and it does not replace the function of the protective motor switch. During overload condition the auxiliary phase is not automatically connected again. Perhaps with an enterprise with under voltage (isolated plant, strongly loaded construction site nets) the necessary starting current cannot be achieved and the motor does not start.

Dimensions