CLAIMS

1. Control system for electric motor applied to cyclical loads, the control system comprising:

- an electric motor (10);
- at least an electronic control unit (20);
- at least an electronic power unit (30);
- the electric motor (10) being electrically driven by the electronic power unit (30);
- an electronic power unit (30) being electrically commanded by the electronic control unit (20),

the system being **characterized by** comprising an average speed controller implemented by the electronic control unit (20), the average speed controller being arranged to monitor an instantaneous speed (V_i) of the electric motor (10) and provide an average speed value $RPM_{average}$ of the motor (10), the electronic control unit (20) being arranged to calculate an average voltage (V_m) based on the average speed obtained, the electronic power unit (30) being arranged to electrically drive the electric motor (10) by an instantaneous voltage value (V_{ins}), this instantaneous voltage value (V_{ins}) being calculated by multiplying the average voltage (V_m) by the result of the division between the instantaneous speed (V_i) and the average speed $RPM_{average}$

2. System according to claim 1, characterized wherein the electric motor (10) is of the Brushless DC type.

3. System according to claim 1, characterized wherein the electronic power unit (30) comprises a set of electronic power switches (SW2N) arranged to control a voltage in each phase of the electric motor (10).

4. System according to claim 1, characterized wherein the instantaneous voltage value (V_{ins}) is calculated so as to provide a current waveform of the electric motor (10) substantially aligned to a waveform of the induced voltage in the electric motor (10).

5. System according to claim 1, characterized by using a filter

arranged to optimize the speed reading of the electric motor (10).

6. Control method for electric motor (10) applied to cyclical loads, the method being characterized by comprising the following steps:

i) calculate an average speed $RPM_{average}$ of the electric motor (10) based on a reading of an instantaneous speed (V_i) of the motor

ii) calculate, based on the average speed $RPM_{average}$ of the prior step, an average voltage (V_m),

iii) monitor an instantaneous speed (V_i) of the electric motor (10),

iv) electrically drive the electric motor (10), by way of an instantaneous voltage value (V_{ins}), this instantaneous voltage value (V_{ins}) being calculated by multiplying the average voltage (V_m) by the result of the division between the instantaneous speed (V_i) and the average speed $RPM_{average}$

7. Control method for electric motor (10) according to claim 6, characterized wherein the steps are implemented by the control system defined in claims 1 to 5.

CLAIMS

1. Control system for electric motor applied to cyclical loads, the control system comprising:

an electric motor (10);

at least an electronic control unit (20);

at least an electronic power unit (30);

the electric motor (10) being electrically driven by the electronic power unit (30);

an electronic power unit (30) being electrically commanded by the electronic control unit (20),

the control system further comprising an average speed controller implemented by the electronic control unit (20), the average speed controller being arranged to monitor an instantaneous speed (V_i) of the electric motor (10) and provide an average speed value $RPM_{average}$ of the motor (10), the electronic control unit (20) being arranged to calculate an average voltage (V_m) based on the average speed obtained, the electronic power unit (30) being arranged to electrically drive the electric motor (10) by an instantaneous voltage value (V_{ins}), this instantaneous voltage value (V_{ins}) being calculated by multiplying the average voltage (V_m) by the result of the division between the instantaneous speed (V_i) and the average speed $RPM_{average}$.

2. System according to claim 1, wherein the electric motor (10) is of the Brushless DC type.

3. System according to claim 1, wherein the electronic power unit (30) comprises a set of electronic power switches (SW2N) arranged to control a voltage in each phase of the electric motor (10).

4. System according to claim 1, wherein the instantaneous voltage value (V_{ins}) is calculated so as to provide a current waveform of the electric motor (10) substantially aligned to a waveform of the induced voltage in the electric motor (10).

5. System according to claim 1, further comprising a filter arranged to optimize the speed reading of the electric motor (10).

6. Control method for electric motor (10) applied to cyclical loads, the method comprising the following steps:

i) calculating an average speed $RPM_{average}$ of the electric motor (10) based on a reading of an instantaneous speed (V_i) of the motor,

ii) calculating, based on the average speed $RPM_{average}$, an average voltage (V_m),

iii) monitoring an instantaneous speed (V_i) of the electric motor (10),

iv) electrically driving the electric motor (10), by way of an instantaneous voltage value (V_{ins}), this instantaneous voltage value (V_{ins}) being calculated by multiplying the average voltage (V_m) by the result of the division between the instantaneous speed (V_i) and the average speed $RPM_{average}$.

7. Control method for electric motor (10) according to claim 6, wherein the steps are implemented by a control system comprising:

an electric motor (10);

at least an electronic control unit (20);

at least an electronic power unit (30);

the electric motor (10) being electrically driven by the electronic power unit (30);

an electronic power unit (30) being electrically commanded by the electronic control unit (20);

the control system further comprising an average speed controller implemented by the electronic control unit (20), the average speed controller being arranged to monitor an instantaneous speed (V_i) of the electric motor (10) and provide an average speed value $RPM_{average}$ of the motor (10), the electronic control unit (20) being arranged to calculate an average voltage (V_m) based on the average seed obtained the electronic power unit (30) being arranged to electrically drive the electric motor (10) by an instantaneous voltage value (V_{ins}), this instantaneous voltage value (V_{ins}) being calculated by multiplying the average voltage (V_m) by the result of the division between the instantaneous speed (V_i) and the average speed $RPM_{average}$.