CLAIMS

1. An inverter control device comprising:

a current command generator that generates a current command value;

a current detector that detects a current value of an alternating current to be outputted from an inverter circuit to an electric motor;

a gate command generator that generates a gate command to the inverter circuit such that the current command value and the current value detected by the current detector match, and obtains an output voltage target vector of the inverter circuit based on the gate command;

a rotary phase angle estimator that obtains a rotary phase angle estimated value of the electric motor based on the current value detected by the current detector and the output voltage target vector; and

a polarity determination part that, with supply of a current in synchronism with a rotor frequency of the electric motor, performs determination of a magnet magnetic pole of the electric motor using a generated magnetic flux or voltage in synchronism with the generated rotor frequency or both of the magnetic flux and the voltage, and outputs a correction value for the rotary phase angle estimated value based on a result of the determination.

2. The inverter control device according to claim 1, wherein the polarity determination part performs the determination of the magnet magnetic pole of the electric motor based on difference between an actual value of the magnetic flux and a set value of the magnetic flux or based on difference between an actual value of the voltage or a set value of the voltage.

3. The inverter control device according to claim 2, wherein the polarity determination part obtains a set value of the magnetic flux or a set value of the voltage using an inductance set value set within a range between an inductance value when a d-axis current in a positive direction is supplied to the electric motor and an inductance value when a d-axis current in a negative direction is supplied to the electric motor.

4. A drive system having magnetic saliency comprising:
the inverter control device according to claim 2;
a host controller that controls an operation of the inverter control device;
the inverter circuit; and
the electric motor, wherein the electric motor includes a rotor formed of a magnet or a rotor in which a magnet is embedded.

5. The inverter control device according to claim 1, wherein the polarity determination part performs the determination of the magnet magnetic pole of the electric motor based on a comparison result between a q-axis voltage value of the electric motor obtained by adding 0° to the rotary phase angle estimated value and a q-axis voltage value of the electric motor obtained by adding 180° to the rotary phase angle estimated value.

6. A drive system having magnetic saliency comprising:
the inverter control device according to claim 5;
a host controller that controls an operation of the inverter control device;
the inverter circuit; and
the electric motor, wherein the electric motor includes a rotor formed of a magnet or a rotor in which a magnet is embedded.

7. The inverter control device according to claim 1, wherein the polarity determination part performs the determination of the magnet magnetic pole of the electric motor based on a comparison result between a q-axis voltage value of the electric motor when a current is supplied aiming at a -d-axis direction and a q-axis voltage value of the electric motor when the current is supplied aiming at a +d-axis direction.

8. A drive system having magnetic saliency comprising:
the inverter control device according to claim 7;
a host controller that controls an operation of the inverter control device;

the inverter circuit; and

the electric motor, wherein the electric motor includes a rotor formed of a magnet or a rotor in which a magnet is embedded.

9. The inverter control device according to claim 1, wherein calculation of a rotary phase angle estimated value by the rotary phase angle estimator and the determination of the magnet magnetic pole by the polarity determination part are performed in response to an activation command of the inverter circuit.

10. A drive system having magnetic saliency comprising:

the inverter control device according to claim 9;

a host controller that controls an operation of the inverter control device;

the inverter circuit; and

the electric motor, wherein the electric motor includes a rotor formed of a magnet or a rotor in which a magnet is embedded.

11. A drive system having magnetic saliency comprising:

the inverter control device according to claim 1;

a host controller that controls an operation of the inverter control device;

the inverter circuit; and

the electric motor, wherein the electric motor includes a rotor formed of a magnet or a rotor in which a magnet is embedded.