

**An Apparatus For Detecting A Step-Out In A Synchronous Motor,
A Method For Detecting The Step-Out In The Synchronous Motor, A
Drive of A Closed Compressor, And A Drive Of A Fan Motor**

Abstract

This invention provides an apparatus for detecting a step-out in a synchronous motor (6). In an inverter apparatus (2) for driving the synchronous motor (6) without using a positioning sensor for detecting a position of a rotor, a current detector (7) for detecting current supplied to the synchronous motor (6), a d-q coordinate converter (11) for converting a current signal obtained by the current detector (7) into an exciting current component (d axis current) and a torque current component (q axis current), an alternating current component detector (15) for obtaining alternating current components of d-q axes currents obtained by the d-q coordinate converter (11), and a step-out detector (16) for detecting the step-out by comparing at least one of the alternating current components of the d-q axes currents obtained by the alternating current component detector (15) with a predetermined step-out level signal are provided.

Fig. 1