
**Condition monitoring and diagnostics
of machine systems — Electrical
signature analysis of three-phase
induction motors**

*Surveillance et diagnostic des systèmes de machines — Analyse de la
signature électrique des moteurs triphasés à induction*



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Foreword

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The committee responsible for this document is ISO/TC 108, *Mechanical vibration, shock and condition monitoring*, Subcommittee SC 5, *Condition monitoring and diagnostics of machine systems*.

Introduction

This International Standard provides guidance for online condition monitoring and diagnostics of machines in the field of electrical signature analysis of three-phase induction motors.

In order to clarify the situation and direct attention towards the latest developments in this field, this International Standard presents an overview of well-established condition monitoring techniques, together with an indication of some which are expected to be less well known.

Condition monitoring and diagnostics of machine systems — Electrical signature analysis of three-phase induction motors

1 Scope

This International Standard sets out guidelines for the online techniques recommended for the purposes of condition monitoring and diagnostics of machines, based on electrical signature analysis. This International Standard is applicable to three-phase induction motors.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 13372, *Condition monitoring and diagnostics of machines — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 13372 and the following apply.

3.1

current analysis

analysis of the three supply currents to a motor for magnitude, balance, and harmonic content

3.2

current signature analysis

spectral analysis performed on the line current to the motor to determine if there are currents at specific frequencies that can indicate component defects

Note 1 to entry: Traditionally, this has been focused on a single phase, but newer techniques such as Park's vector and voltage and current systems that analyse all three phases simultaneously can provide additional information.

3.3

induction motor

asynchronous AC machine that comprises a magnetic circuit interlinked with two electric circuits or sets of circuits rotating with respect to each other and in which power is transferred from one circuit to another by electromagnetic induction

Note 1 to entry: There are two basic types: squirrel-cage (SCI) and wound-rotor induction motors.

3.4

squirrel-cage induction motor

induction motor in which the secondary circuit consists of usually un-insulated rotor bars in core slots shorted together by end rings connected to both ends of each bar

Note 1 to entry: The most common bar and end ring materials are copper, aluminium, or alloys of these materials.