

Relay protection for frequency converters

Article Overview

Frequency converters can influence relay protection but are not a direct substitute for protective relays; careful coordination and specific relay types are required.

Interaction with Relay Protection

Frequency converters, such as variable frequency drives (VFDs) or grid-forming converters, modify the voltage and current waveforms supplied to motors or the grid. This can affect the operation of traditional protective relays, including overcurrent, short-circuit, and differential relays, because the fault currents may be distorted or delayed compared to conventional AC systems . For example, in systems where only a converter feeds a fault, relays may experience delayed tripping or fail to trip due to altered current characteristics .

Motor Protection Considerations

When using bimetal-referenced motor protection switches or overload relays on the load side of frequency converters, thermal and short-circuit response values must be adjusted. Harmonics generated by the converter can increase thermal loading, and the response of short-circuit release switches changes with frequency deviations from the nominal 50/60 Hz . Additional measures, such as chokes or sinusoidal filters, may be required to prevent nuisance tripping and overheating.

Grid-Forming Converters and System Protection

Grid-forming converters, which emulate synchronous generator behavior, can supp...

Article Content

Jun 10, 2026

Numerical relay

Numerical relay Protective relay In utility and industrial electric power transmission and distribution systems, a numerical relay is a

Dec 15, 2025

Frequency Relay

3 Application The frequency relay SPAF 140 C is designed to be used for the protection of power genera-tors and

Feb 21, 2026

Overview of Protection Relay Designs in Power Systems that Integrate ...

Thus, this article aims to explore the impact of GFMCs on relay protection in transmission grids and provide insights for designing

Jun 06, 2026

Transformer Protection: Types, Relays & FAQs Explained

Learn why transformer protection is critical. Explore types of faults, Buchholz & differential

Jun 22, 2026

Voltage protection and control

In addition to basic voltage protection ABB also provides enhanced voltage protection functions, for example, automatic voltage

Jan 05, 2026

Surge protection for frequency converters

Surge protection for frequency converters White Paper A frequency converter typically consists of a rectifier, d.c. link, inverter and

Feb 09, 2026

Overview of Protection Relay Designs in Power Systems that Integrate ...

This paper explores protection relay designs in power systems integrating grid-forming converters, addressing challenges and

Jun 27, 2026

Residual current protection

Protective equipment designed to protect installations where there is a risk of DC current earth leakage or a combination of AC and

Aug 26, 2025

Voltage and Frequency Protection | Schneider Electric USA

Voltage and Frequency Protection Ranges PowerLogic™ P3 Protection Relays
Compact medium voltage protection relays From

Feb 08, 2026

Societal and technology trend report

Fundamental frequency-based incremental distance protection, which relies on post-fault voltage variation patterns, also becomes

Jan 04, 2026

Frequency relay SPAF 140 C

The frequency relay SPAF 140 C is used for the protection of power generators and other AC equipment against overfrequency and

Sep 29, 2025

SEL-700G Generator Protection Relay | Schweitzer

The SEL-700G is the right solution for utility and industrial generator protection, with autosynchronizer,

Mar 09, 2026

SIPROTEC Protection Relays | Siemens

Does Siemens offer universal protection relays? Siemens' universal protection relays portfolio includes products such as SIPROTEC

Jul 17, 2026

Protection relays

Protection relays Numerical relays are based on the use of microprocessors. The first numerical relays were released in 1985. A big

Sep 04, 2025

Fundamentals of Modern Protective Relaying

A primary motor protective element of the motor protection relay is the thermal overload element and this is accomplished through

Sep 11, 2025

Protective Relays: Types, Working Principle & Uses

Protective relays are power system protection devices that monitor current, voltage,

Apr 23, 2026

Protection and Control Device Numbers and Functions

Description The protection and control devices in electrical equipment can be referred to by numbers, with appropriate suffix letters

May 14, 2026

Frequency Protection Explained: Variants and Rationale

Frequency protection monitors the power system frequency, and signals when the frequency departs from normal. In this article, we

May 13, 2026

Protection Relays | Medium & high voltage power system protection

Discover protection relays for generators, motors, transformers, feeders and busbars, designed for reliable and efficient power

Jul 22, 2026

IEEE Guide for Protective Relay Applications to Power Transformers

Types of transformer failures This guide deals primarily with the application of electrical relays and over-current protective devices to

Oct 02, 2025

Five protection relay types used to detect grid

The following protection relays are used to detect grid disturbances, its severity and isolate

Jul 31, 2025

SEL-751A Feeder Protection Relay | Schweitzer

The SEL-751A Feeder Protection Relay is for industrial and utility feeder protection with flexible I/O options,

Aug 07, 2025

Grid-Forming Converter Fault Control Strategy and Its Impact on Relay ...

In traditional relay protection, the number of samples per cycle at the fundamental frequency is N, and the sampling

Dec 18, 2025

Frequency/Voltage Protection GRF100□Protection relay

GRF100 is a voltage measuring relay which can be applied for under / over voltage protection, under / over frequency protection and

Feb 02, 2026

Frequency Relay

The frequency relay is configured to measure system frequency, i.e., it is connected to the VT at the 18 kV terminals of the generator

Apr 19, 2026

Grid-Forming Converter Fault Control Strategy and Its

Focusing on grid-forming converters, this paper dissects the influence of their fault control

Contact Us

For more information, pricing, or custom solutions, please contact us:

Website: <https://iiss.co.za>

Email: sales@iiss.co.za

Phone: +27 63 174 2895

Address: Unit 8, Innovation Park, 15 Rivonia Road, Sandton, Johannesburg, 2196, South Africa

This document is for informational purposes only. Specifications subject to change without notice.

