

Lead-free energy-saving momentary voltage sag compensator

Features

- A momentary voltage sag compensator using electric double layer capacitors in the storage unit reduces environmental impact.
- The electric storage unit is maintenance-free for 15 years, and no replacement is required different from lead storage battery.
- The system constantly maintains a high operation efficiency (98-99%), while reducing running costs.



Compensator appearance

Table: Specifications

Rated capacity		50~200kVA	
Switching time		2 msec. or less	
Comprehensive efficiency		98~99%	
Minimum compensation time		1 sec. (~60 sec.: optional)	
Electric storage method		Electric double layer capacitors (rolled-up type)	
AC input	Rated voltage	200V AC ±10%※1	420V AC ±10%※2
	Rated frequency	50/60 Hz ±5%	
	Phase/Wire	3-phase 3-wire system	
AC output	Rated voltage	200V AC ±5%	420V AC ±5%
	Rated frequency	50/60 Hz ±5%	
	Phase/Wire	3-phase 3-wire system	
Dimensions		W1200xD800xH1950 (50 kVA)	W1800xD1000xH2150 (200 kVA)
Weight		600 Kg(50 kVA)	1500 Kg(200 kVA)

※1 220V products are also available. ※2 400V/440V products are also available.

Overview

(Technical principles, actions, etc.)

Background

Factory production lines, especially at precision machining factories, require top-quality power supply because those facilities could be seriously damaged by momentary voltage sags and power outages due to lightning, wind, snow and other causes. Nichicon's momentary voltage sag compensator focuses on momentary or short-time power failures, and is equipped with an eco-friendly electric double layer capacitor in the storage unit instead of lead battery to reduce environmental impact.

Mechanism

As shown in the system configuration below, the system works on utility power. If a momentary voltage sag occurs in utility power, the system detects the voltage sag and releases the semiconductor switch to supply stable and quality power through a two-way inverter and electric double layer capacitor.

Product features

The electric double layer capacitors do not need replacing every five to eight years like lead batteries. You are free from maintenance

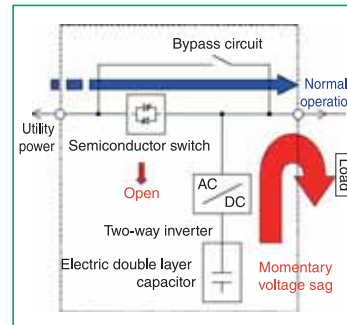
for 15 years (*). Constant utility power supply always guarantees 98-99% operation efficiency resulting in lower running costs.

A semiconductor switching time of 2 milliseconds or less is suitable even for power electronics applications, which are sensitive to momentary voltage sag. Semiconductor switches, equipped with thyristors or IGBTs, are designed with startup overcurrent capability for relevant equipment in use. Default compensation time is 1 second, which is customized up to 60 seconds.

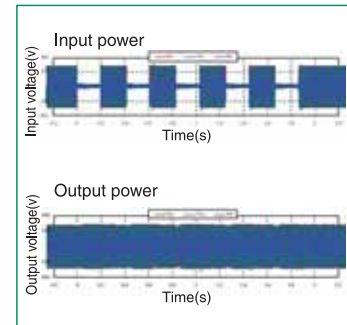
This super responsive compensator can withstand repeated momentary voltage sags. The waveform chart below proves that output voltage would be consistent and stable even after 0.2 second voltage sags occur five times in 0.2 second intervals.

Field tests were conducted on this product from July 2006 to March 2007 at a precision machining factory in Hokuriku to confirm performance.

*The cooling fan and other parts than the capacitor should be checked annually at least.



System configuration



Waveform examples at repeated momentary voltage sags

Effects

- ◎ The lead-free momentary voltage sag compensator using electric double layer capacitors in the storage unit is able to reduce environmental impact and can be disposed of as a general industrial waste.
- ◎ Momentary voltage sags and short-time power failures lead to force shut downs of production lines at precision machining factories as well as computers at offices, which will result in defective products, computer data loss, spending for data recovery, delays in finished product delivery time, and many other serious setbacks. The compensator will help prevent such damage and losses.
- ◎ An in-house developed semiconductor power converter and electric storage unit combined with our proprietary rolled-up capacitor manufacturing technology and rationalization of its collective structures realizes a small lightweight design that saves installation space.

Applicable field
Semiconductor plants/precision machining
factories/offices

Water

Energy saving/Energy recovery

Energy storage/Energy creation

New energy

Waste disposal/
Recycling/
Resource saving

Air

Soil

Other

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*Note: This publication introduces examples of technologies and products believed useful towards solving environmental and energy issues. In no way does it constitute guarantees concerning their transfer or sale.