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MARCH 2018

# PCS100 AVC-40 Active Voltage Conditioner

Product Overview

EPPC, Napier



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# PCS100 AVC-40, Active Voltage Conditioner

## Introduction

### Power quality problems

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The power supply has become very reliable

- Long interruptions and blackouts are rare

But even the modern power networks are not immune to unpredicted power quality events as sags and surges

Modern industry is becoming more automated

- Sensitivity of process to power quality events is increasing

Facilities do not get advance warnings of impending sags



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# PCS100 AVC-40, Active Voltage Conditioner

## Introduction

### Voltage sags

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Most common power quality events

- 92 percent of all PQ events

Normally caused by unpredictable system faults

- Weather events - lightning, trees on lines
- Urban construction – digging up lines
- Network failure – transformers, insulators, switchgear, lines

Events are inevitable even in modern networks

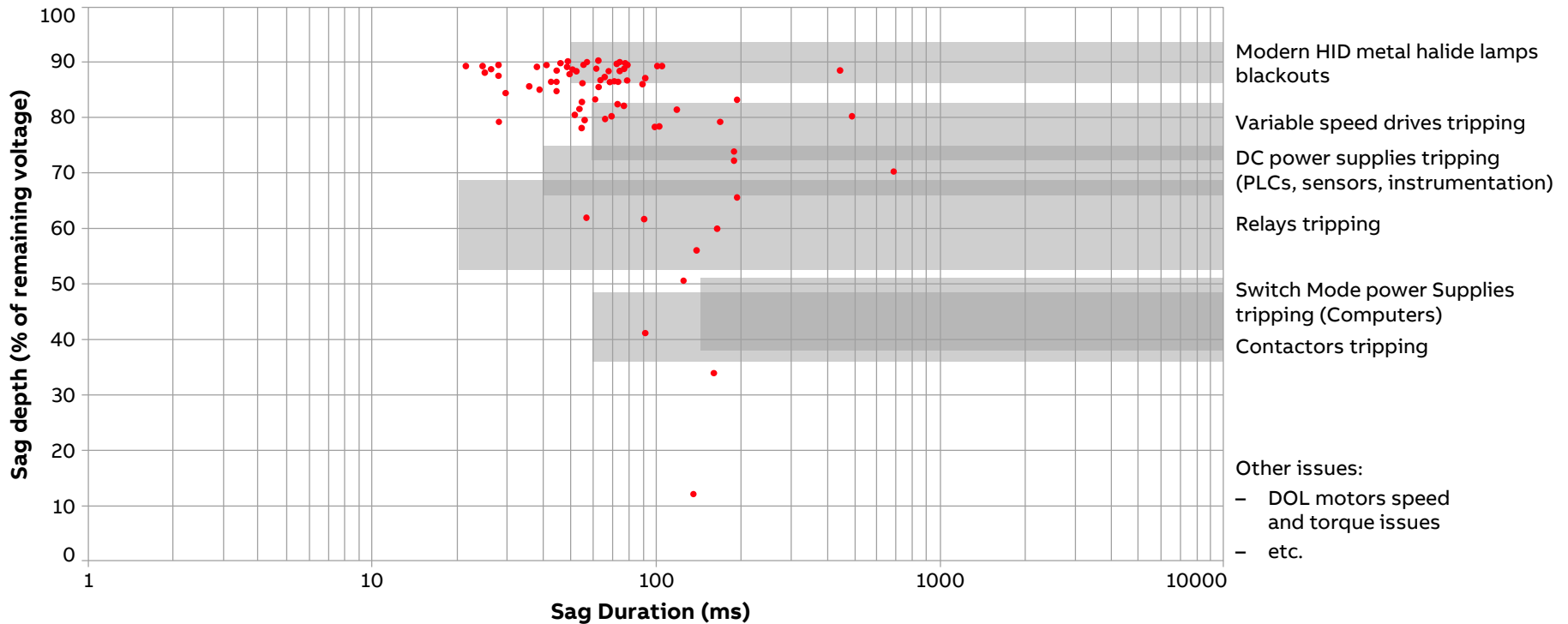




# PCS100 AVC-40, Active Voltage Conditioner

## Voltage sags

### Typical annual distribution network sag events



Only single phase to ground events shown as most common



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# PCS100 AVC-40, Active Voltage Conditioner

## Product introduction

### Product overview

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Unique product that regulates the voltage and protects the facility against sags and swells.

Ensuring that equipment receives a clean, continuous flow of power, even during grid disturbances

It takes the raw power from the electric utility and outputs regulated premium power for the factory

Does not have batteries, capacitors, or other energy storage elements



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# PCS100 AVC-40, Active Voltage Conditioner

## Product introduction

### Benefits

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Reduce the cost of sag events

- Designed to target voltage sag events while also providing protection against swells

Improve plant operation

- Removes voltage fluctuations which can cause process variation

Fast return on investment

- Low operation & maintenance cost

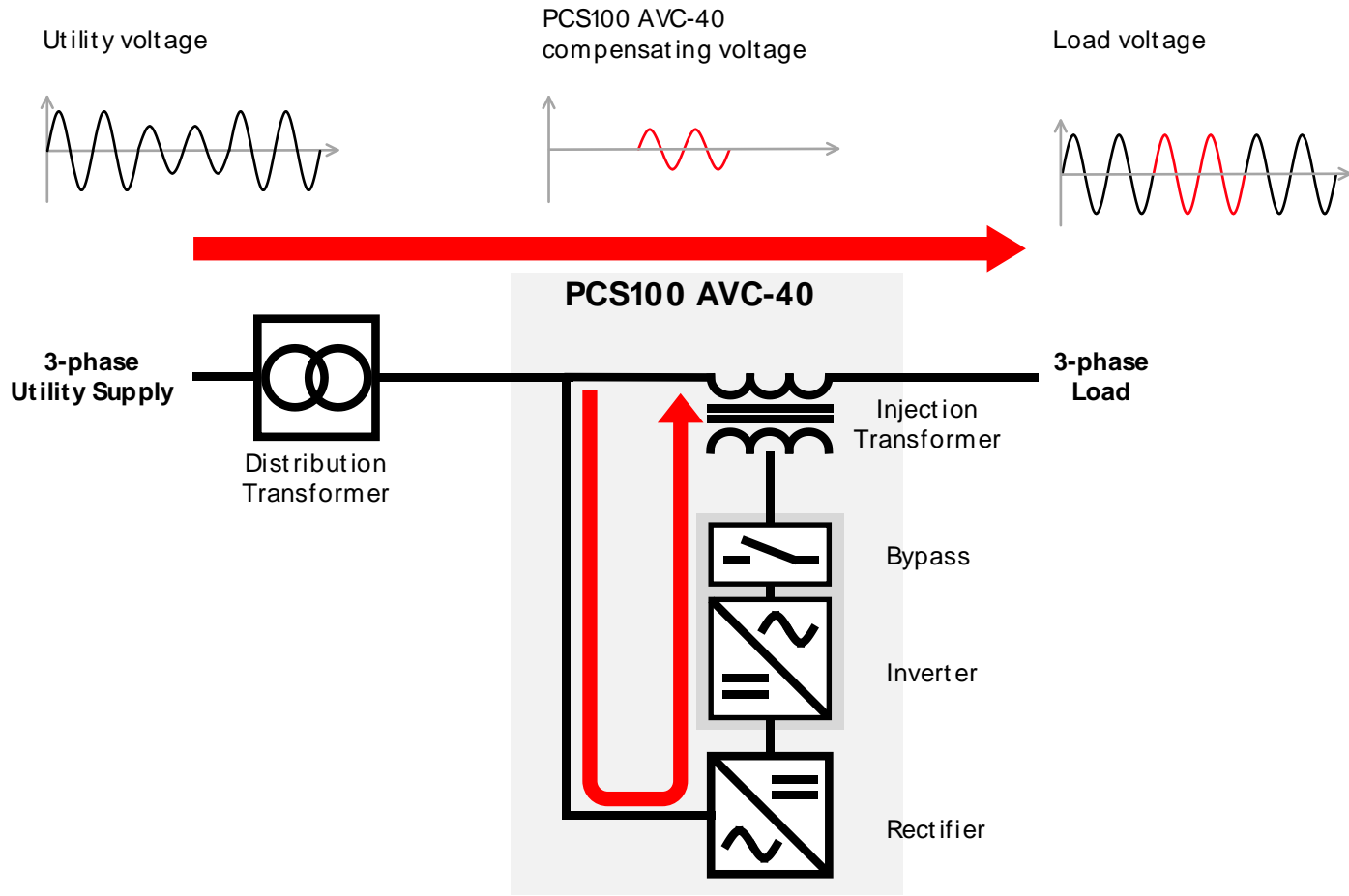
Reduce damage to equipment

- Regulate the voltage to minimize the undue stress



# PCS100 AVC-40, Active Voltage Conditioner

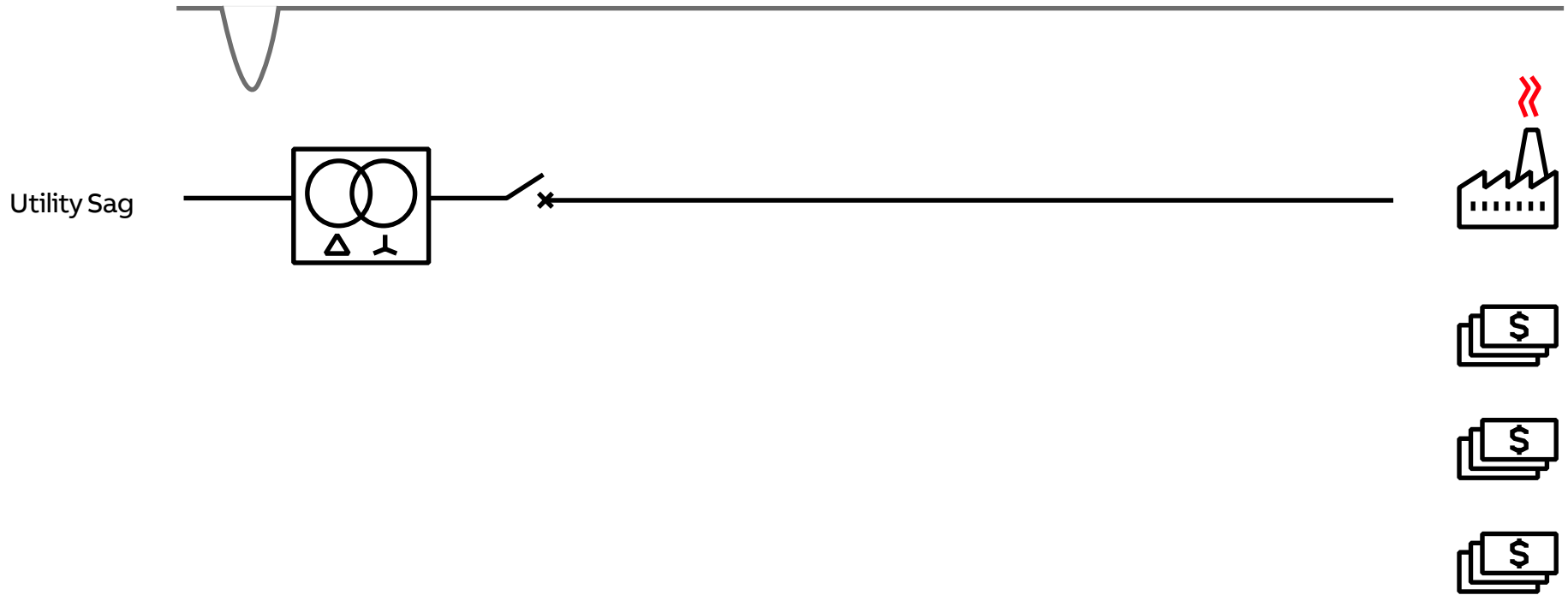
How does it work?





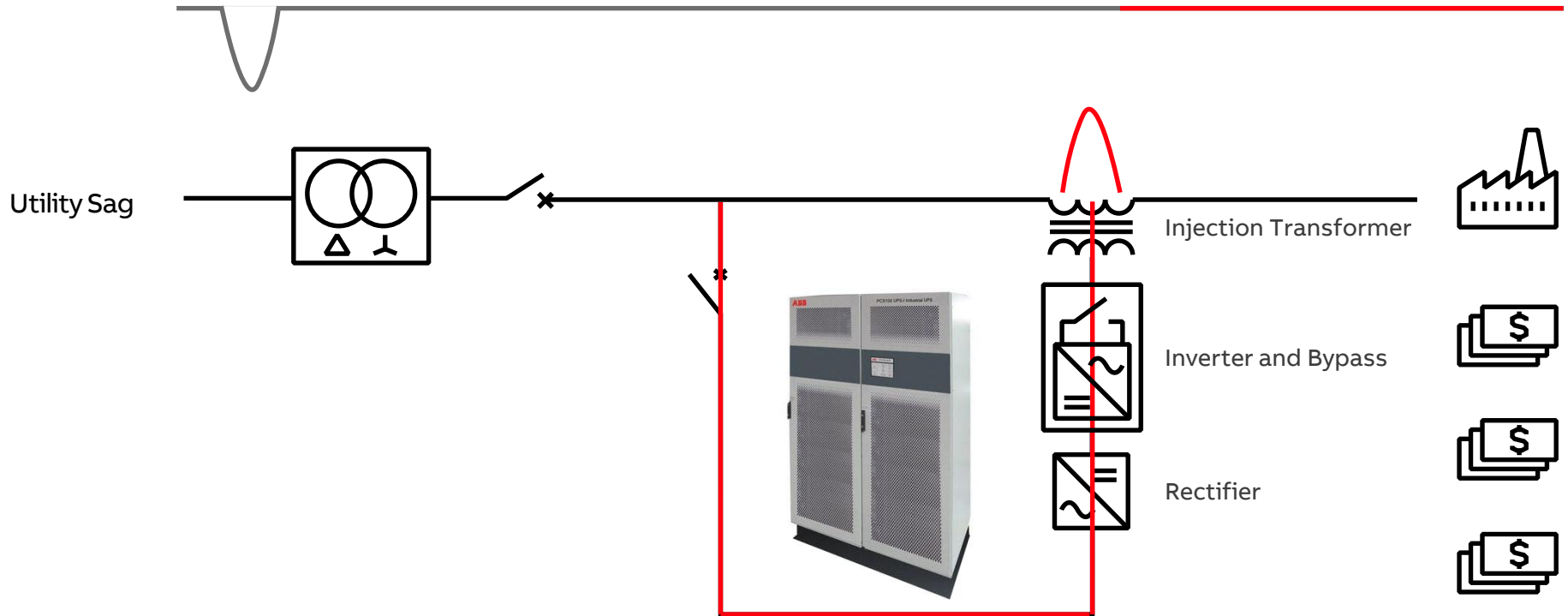
# PCS100 AVC, Active Voltage Conditioner

No protection against PQ events



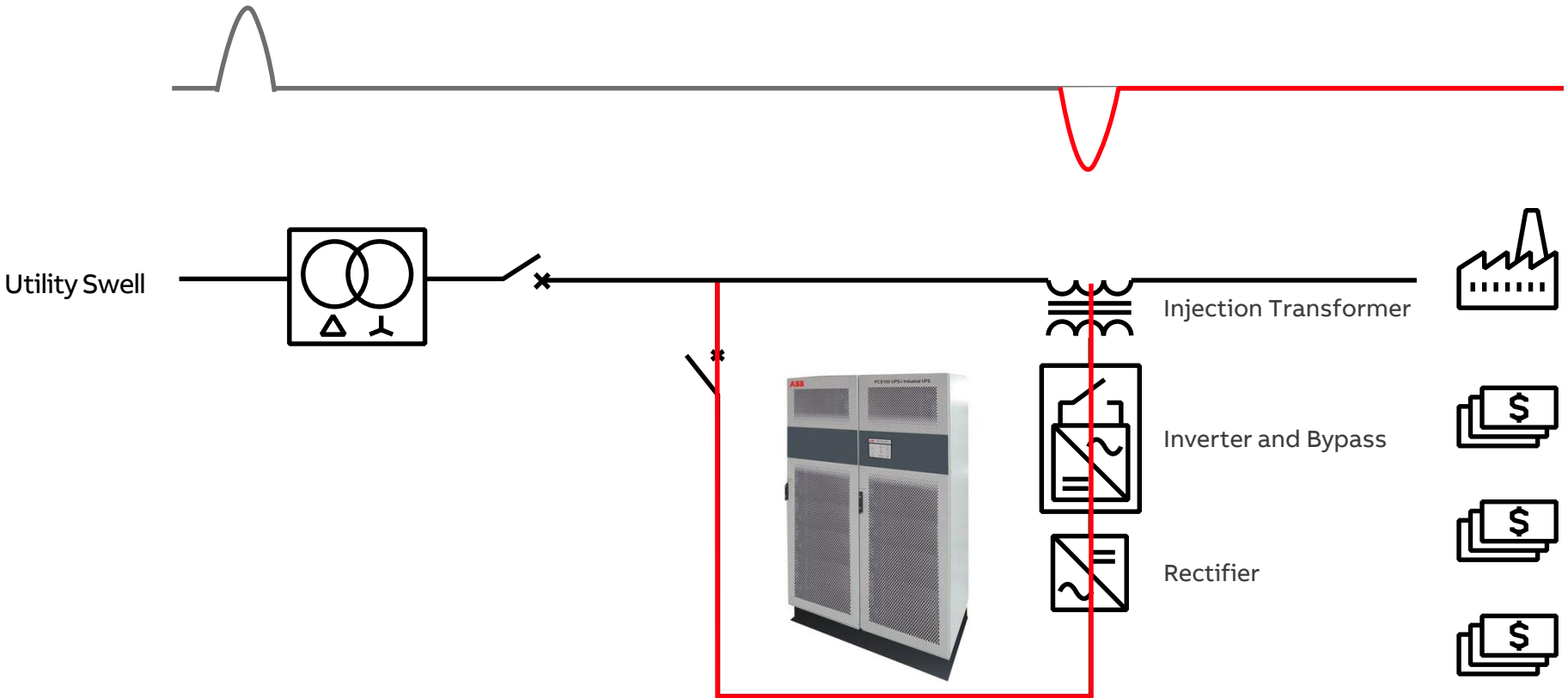
# PCS100 AVC, Active Voltage Conditioner

## Sag protection



# PCS100 AVC, Active Voltage Conditioner

## Swell protection



# PCS100 AVC-40, Active Voltage Conditioner

## Performance

### Product performance

Event correction: < 250 microseconds (initial)  
< ½ cycle (complete)

Full correction

- Three-phase sags down to 60 percent
- Single-phase sags down to 40 percent

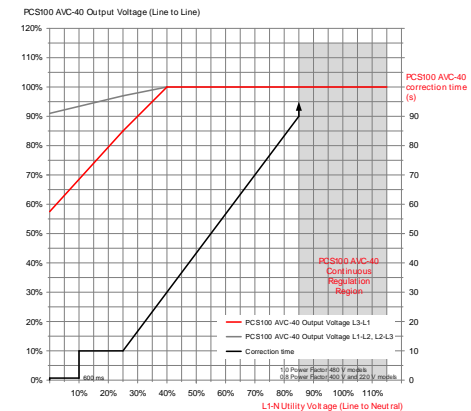
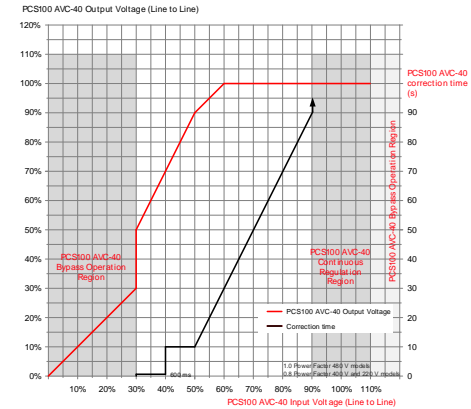
Partial correction

- Three-phase sags down to 30 percent
- Single-phase sags down to 0 percent

Continuous regulation of utility voltage between 90% and 100%

Voltage vector phase angle error correction

Correction of voltage imbalance from utility supply

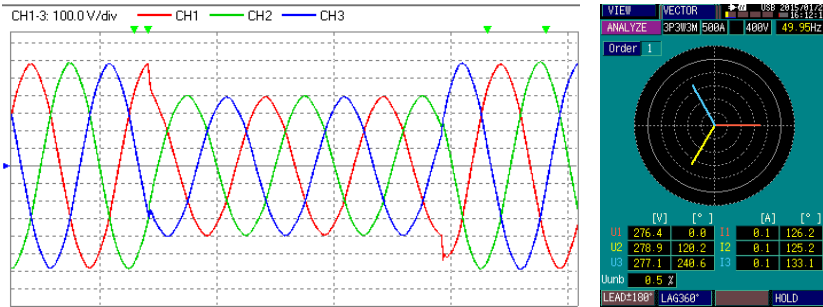


# PCS100 AVC-40, Active Voltage Conditioner

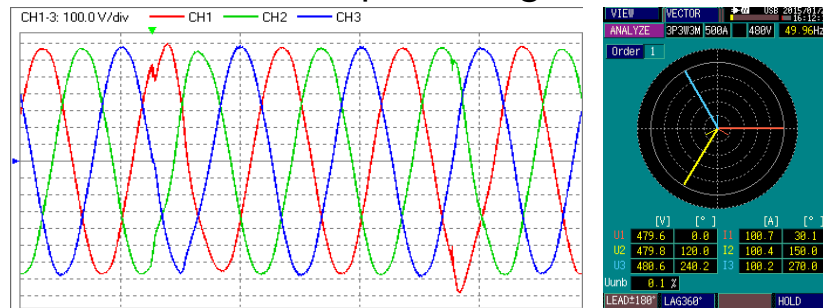
## Performance

### 70% three phase balanced sag

#### Utility voltage

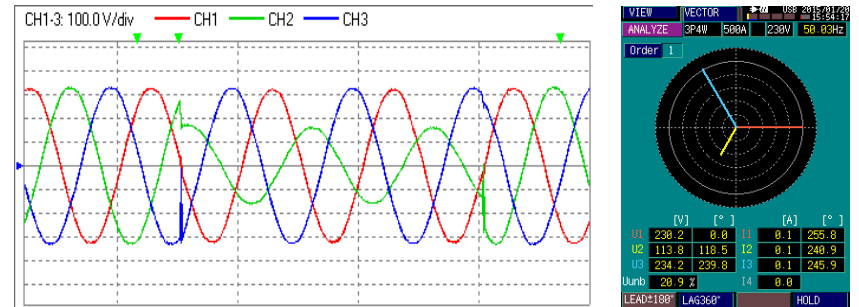


#### PCS100 AVC-40 output voltage

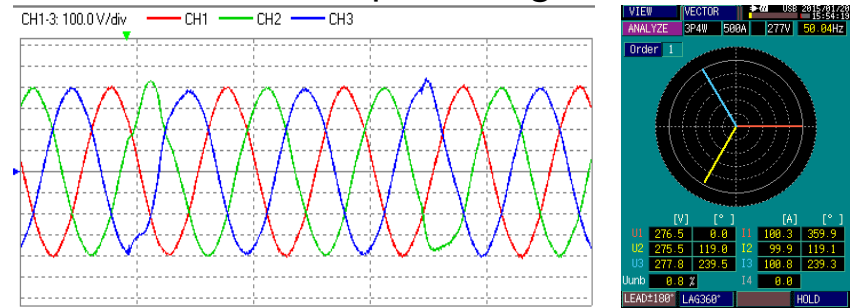


### 50% single phase to ground sag

#### Utility voltage



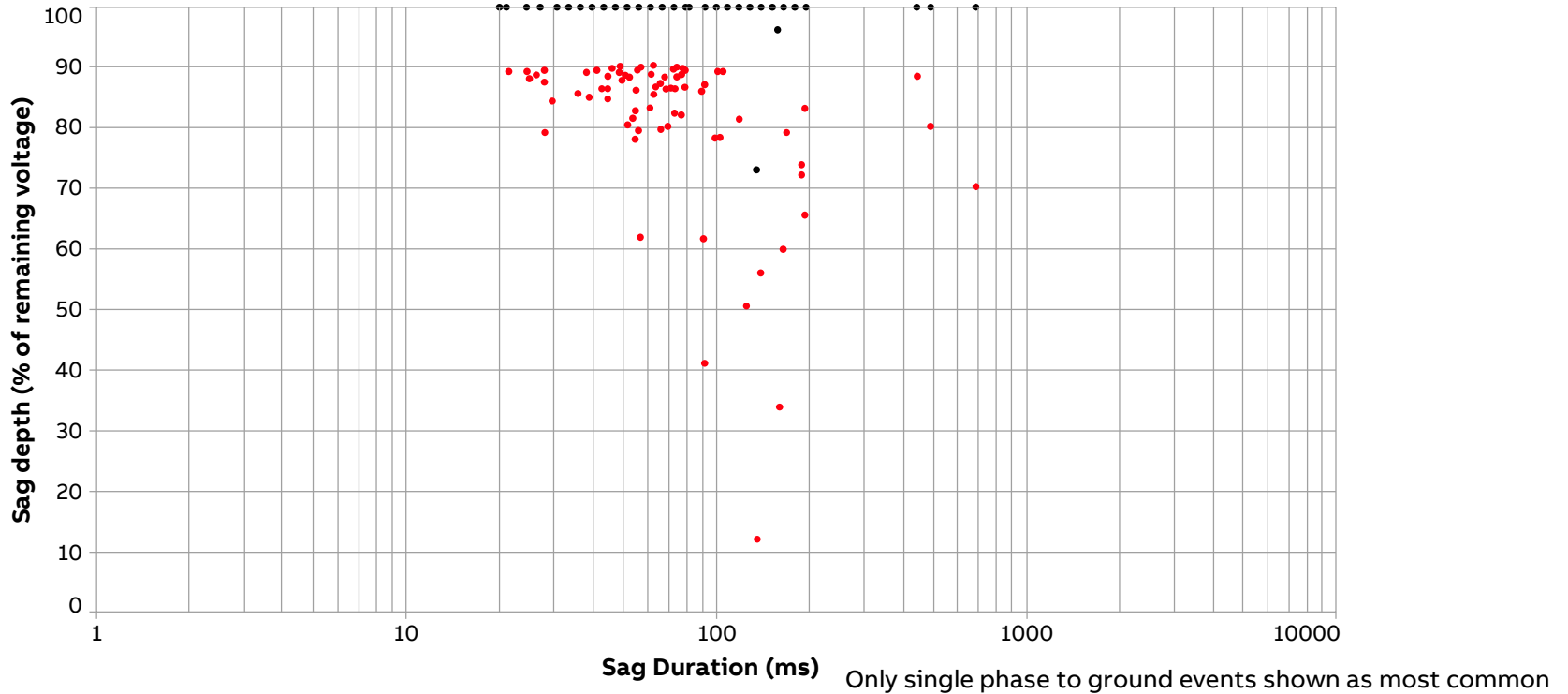
#### PCS100 AVC-40 output voltage



# PCS100 AVC-40, Active Voltage Conditioner

## Performance

> 95% of the most common power quality events solved with the PCS100 AVC-40





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# PCS100 AVC-40, Active Voltage Conditioner

Standard offering

## Product specifications

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Rated power

- 150 kVA – 3600 kVA

Rated Voltage

- 220 V, 400 V and 480 V models

Construction

- Modular power converters
- IP20 enclosure (optional IP21 available)

Designed for typical industrial environments

- Maximum operating temp. 50°C
- Industrial design and rugged overload capability means it can handle conditions that others cannot



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# PCS100 AVC-40, Active Voltage Conditioner

## Highlighted features

### Features

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Continuous protection from the most common utility voltage problems

- Instant response to sags and swells

Electrically robust design and rugged electrical overload capability

- Designed for commercial and industrial loads such as motors, transformers and medical equipment

High downstream fault clearing capacity

- Easy integration with existing fault protection schemes



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# PCS100 AVC-40, Active Voltage Conditioner

## Highlighted features

### Features

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#### Fail-safe operation

- In-built redundant bypass system
- Guaranteeing continuity of load supply in case of PCS100 AVC-40 fault

#### Low cost of ownership

- No energy storage
- Industry leading efficiency of more than 98%
- Low maintenance
- Small footprint



# PCS100 AVC-40, Active Voltage Conditioner

## Interface and connectivity

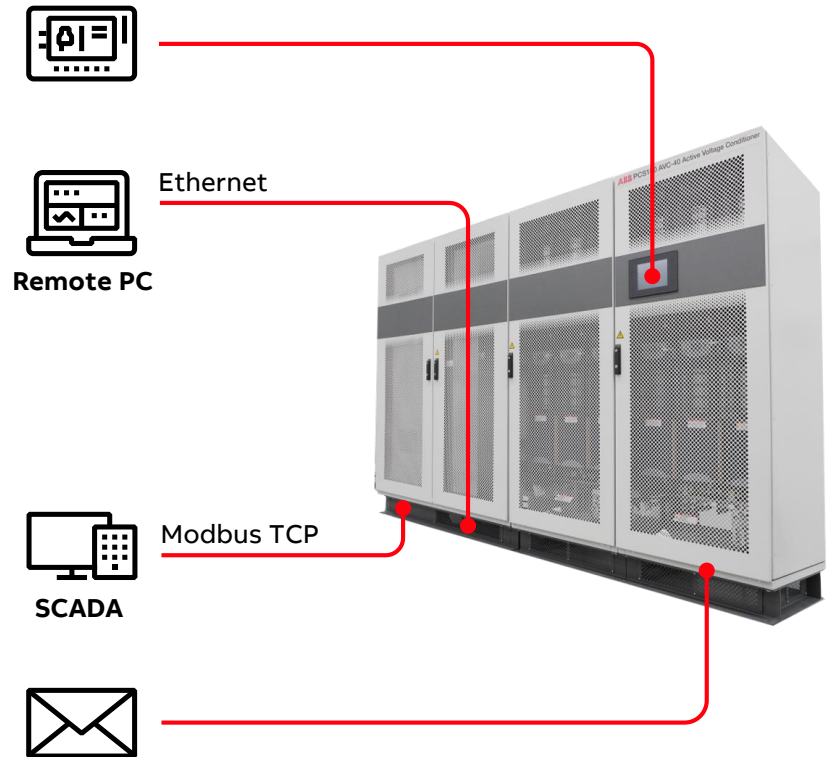
### User interface

Graphical touch screen interface (GDM)

- 8.4”, multilingual
- Simple user controls, easy to understand event log and voltage event data logging

Versatile connectivity

- Remote web pages
  - GDM functionality in web browser
- Modbus TCP
- E-mail
  - System and PQ event notifications
  - Service log to ABB Service



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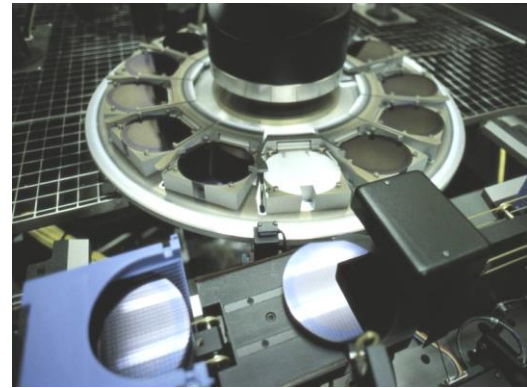
# PCS100 AVC-40, Active Voltage Conditioner

What value do we provide?

## Value proposition

The PCS100 AVC-40 protects process loads from power quality problems increasing yield, improving productivity and reducing product wastage

- A voltage sag or voltage swell can cost millions of dollars in lost production



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# PCS100 AVC-40, Active Voltage Conditioner

## Industries and applications



**Electronics industry**  
Sensitive machinery  
Clean room control



**Food and beverage**  
High speed bottling  
Packaging lines  
Dairy processing



**Automotive**  
Welding process  
Coating process  
Painting process



**Continuous process**  
Fibre production lines  
Film production lines  
Extrusion process



**Pharmaceutical**  
Batch process  
Climate control



**Medical**  
Sensitive medical  
imaging equipment



# PCS100 AVC-40, Active Voltage Conditioner

Case study: textile fiber manufacturing

Customer: PVTEX

Problem: Each sag causes the booster and spinning pump lines to stop suddenly resulting in a loss of production worth up to \$8,000. In one year alone, the factory lost more than \$200,000 due to power quality events

What PCS100 AVC-40 protects: Booster pumps and a spinning pump filament

Why PCS100 AVC-40 was chosen: “The initial investment cost and total cost of ownership are much more reasonable than those associated with a UPS solution”

Similar applications: Cellulose Fiber (tobacco filter), carbon fiber manufacturing



# PCS100 AVC-40, Active Voltage Conditioner

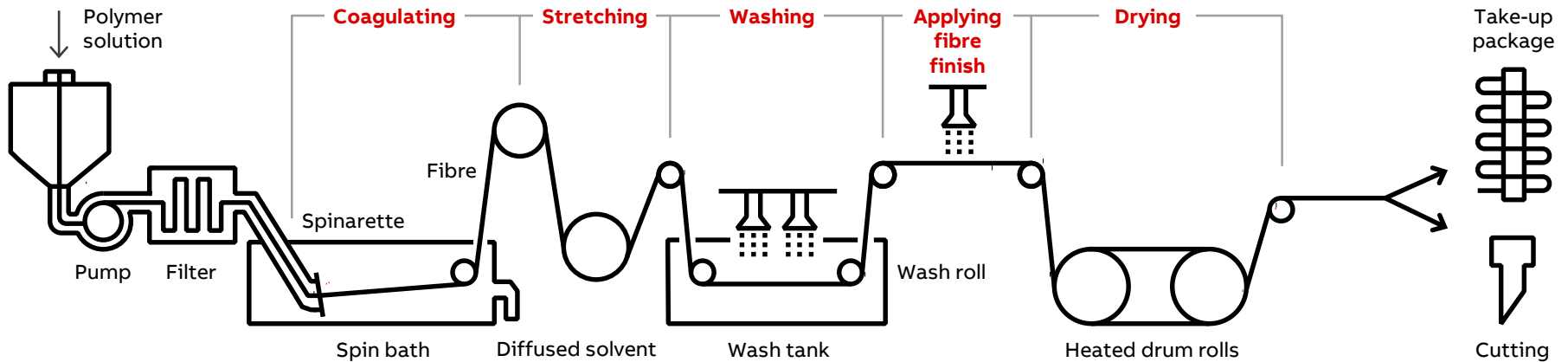
## Case study: carbon fibre manufacturing

Customer: Hexcel, USA produces carbon fiber used for composites in aerospace industry (e.g. A350)

Problem: Wet spinning process of high quality is required to manufacture products with required constructional strength. The process is very sensitive to voltage fluctuation

Benefit of PCS100 AVC-40: The PCS100 AVC-40 offers fast and accurate voltage sag and surge correction as well as continuous voltage regulation. The failsafe bypass allows the process to continue in the event of a overload or internal problem in the PCS100 AVC-40

Similar applications: Textile fiber (e.g. Lycra)



# PCS100 AVC-40, Active Voltage Conditioner

Case study: food & beverage

Customer: Fonterra Brands NZ (world number 1 dairy company), Takanini facility, UHT milk processing & packaging lines

Problem: 3-8 voltage sag events per year, that shut down production. 28 hours of downtime per event for sterilization and restart of production/packaging lines

Benefit of PCS100 AVC-40: A 1200 kVA system was installed and the investment amortized after 4 months of operation

Similar applications: High speed bottling, high speed packaging and high speed distribution (logistics)





# PCS100 AVC-40, Active Voltage Conditioner

## Case study: testing instrument protection

Customer: Commercial Aircraft Corporation of China (COMAC)

What PCS100 AVC-40 protects: Testing instruments that are very sensitive to fluctuations in the power supply

Why PCS100 AVC-40 was chosen: “The PCS100 AVC-40 is the ideal solution for us as it doesn’t rely on energy storage or batteries to operate, drawing the additional energy from the utility supply to correct the voltage. This means the system has low maintenance costs and a small footprint so it can be installed in confined spaces, allowing us to make the best use of our existing floor space. The cost of ownership for a PCS100 AVC-40 system is very low.”

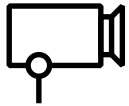
Similar applications: Research institutes, universities



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# PCS100 AVC-40, Active Voltage Conditioner

Product Video



ABB's PCS100 AVC-40 active voltage conditioner  
for sag correction

[Product video](#)

# PCS100 AVC-40, Active Voltage Conditioner

## Conclusion

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### PCS100 AVC-40

The PCS100 AVC-40 Active Voltage Conditioner is designed for sag correction in commercial and industrial applications. It is available in load capacities from 150 kVA to 3600 kVA with higher ratings available on request.

Continuous protection from the most common utility voltage problems found in modern power networks

Even the most modern power networks are not perfect and voltage sags are the most common cause of equipment malfunction in today's automated industry. The PCS100 AVC-40, built on a proven and dependable converter platform, provides instant voltage sag and surge correction, ensuring maximum productivity.

Failsafe worry free operation even in harsh electrical environments

The PCS100 AVC-40 is specifically designed for industrial and large commercial applications. It's industrial design and rugged overload capability means it can handle conditions that others cannot. Furthermore, it contains a redundant internal bypass system that ensures that the load continues to be supplied from the utility.

Are you looking for support or purchase information?  
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YouTube NZ ABB PCS100 AVC-20

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### Power conditioning products

ABB's PCS100 portfolio is a unique line up of low and medium voltage power conversion technology.

Within the PCS100 product portfolio, ABB offers efficient power conversion solutions that are specifically designed to solve power quality problems and stabilize networks - these power converters demonstrate highly reliable and cost-effective performance. Covering application data centers through to complete industrial plant protection, microgrid systems and shore-to-ship supply, ABB has the power conversion technology for every need. Starting from a few kVA to 1 MVA and a wide range of supply voltages.

**Our offering**

Product portfolio	Industry portfolio
PCS120 Medium Voltage UPS	PCS100 Industrial UPS
	PCS100 AVC-40 Active Voltage Conditioner
	PCS100 AVC-20 Voltage Conditioner





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