# **Retrofit Solutions** for LV and MV Switchgears

Increase reliability and performance in a cost-effective way

**siemens.com/electricalservices**

SIEMENS

# Siemens Distribution Systems, we are where our customers are

We offer the full range of energy distribution systems and solutions for all markets and through all sales channels. Our comprehensive portfolio meets the growing technical requirements of today's and tomorrow's power grid.

Based on modular platform concepts all our systems are individually customized to meet customer specifications. With global competence we provide integrated solutions.

Our unique engineering and solution expertise makes us a trusted partner who ensures our customers' lasting success. Together we shape power infrastructures in a sustainable, profitable, and socially responsible way.

# Contents

# Overview

Each day, the demand for increased performance and reliability of our electrical systems grows in every market, sector and company worldwide.

Even the most reliable and rugged distribution assets are subject to wear and aging as they can be in operation for decades. To avoid expensive failures and downtime, your low and medium-voltage equipment needs excellent care and ongoing service. That's why Siemens can support you throughout the entire lifecycle of your equipment.

Our **team** of dedicated and highly experienced professionals are able to work closely with you to develop service packages tailored to your specific need.

Our comprehensive, first class **portfolio** offers you innovative smart service solutions to help you achieve a more reliable, economic and efficient

## Our comprehensive service portfolio is strictly driven by the customer value proposition

Secure your system to guarantee productivity

Expand your product lifecycle and ensure reliability

Lead Digital Transformation for higher efficiency

Drive safe and sustainable growth (EHS)

## Understanding the industry requirements and listening to our customers strengthens our solution-oriented mindset

Whether in industrial companies, public or private power supply, or infrastructure – power distribution plants must be available continuously and provide the highest degree of operational safety. Switchgears must handle the steadily increasing demand for electrical energy; but aging and wear can significantly impact their performance and reliability.

Electrical equipment, including switchgears and circuit breakers, degrade over time which poses risks for the availability of the system and operations, potential safety issues, and equipment damage and/or downtime.

A plan to replace or upgrade these aging electrical assets is crucial to ensure continuity of operations and avoid irremediable consequences.

Naturally, system operators cannot update equipment at the same pace that technology changes. However**, Siemens modification, upgrade, and extension capabilities offer many opportunities for optimization so customers can benefit from the latest technical improvements.**

Together with our customers, our group of experts evaluate this cost-effective solution so system operators can invest capital wisely and take full advantage of the experience offered by Siemens in adapting older systems to new technical standards, resulting in reduced lifecycle cost.

## Flexible application in industry and infrastructure

- Utilities
- Oil and gas industry
- Mining
- Metal industry
- Marine and offshore plants
- Water and sewage industry
- Renewables
- Data Centers

# Customer Benefits

## Roll in Retrofit Solution
## Your financial benefits

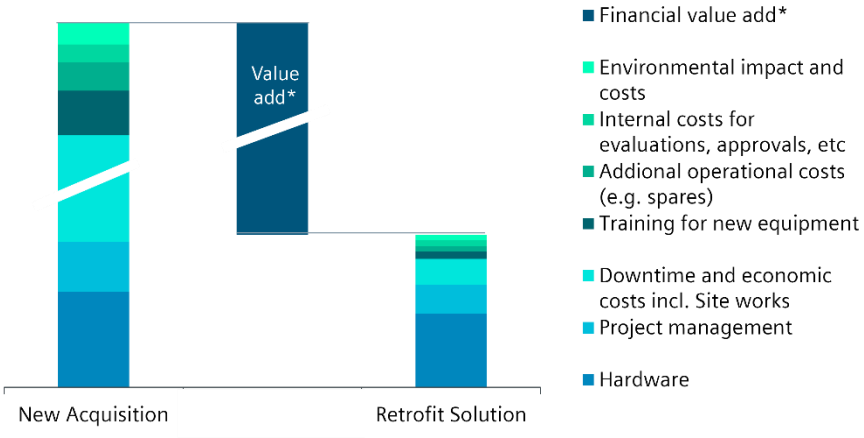
When your current situation prefers to avoid high investments, then our plug and play retrofit is the right solution for your needs that also comes with reduced costs for on-site works, project management, civil works and recycling.

Furthermore, reduced outage times are an important factor while modernizing the system in industrial, manufacturing and processing facilities.

Contact us to evaluate different scenarios considering your technical and financial conditions.

Your financial benefits at a glance

- Reduce downtime to a minimum to reduce economical costs
- Operating concept remains the same which reduces the training costs
- Less engineering and onsite works due to use of the existing infrastructure
- Increased performance reliability of existing switchgear to ensure reliability of assets
- Save costly spares for phased out products and availability of spare parts for circuit breakers
- Less internal and external processes for e.g. project management and approvals processes
- Reduced logistics and disposal costs
- Increased grade of environmental impact




Up to 80% savings

Your value add while investing in a Retrofit Solution

*Financial value add and cost savings calculated on an example project for an industry company in Asia.

Reduced CAPEX and increased long-term reliability in a cost-effective way

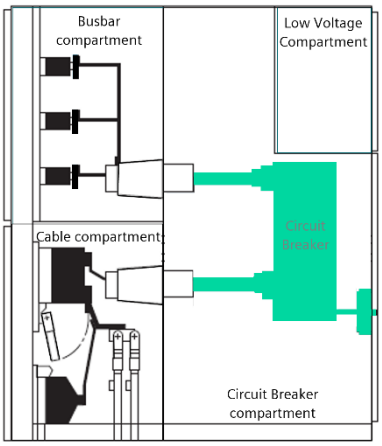
## Roll in Retrofit Solution
## Your technical benefits

A retrofit consists of the technical upgrade of an existing switchgear by replacing the obsolete circuit breaker with a new one which meets current standards.

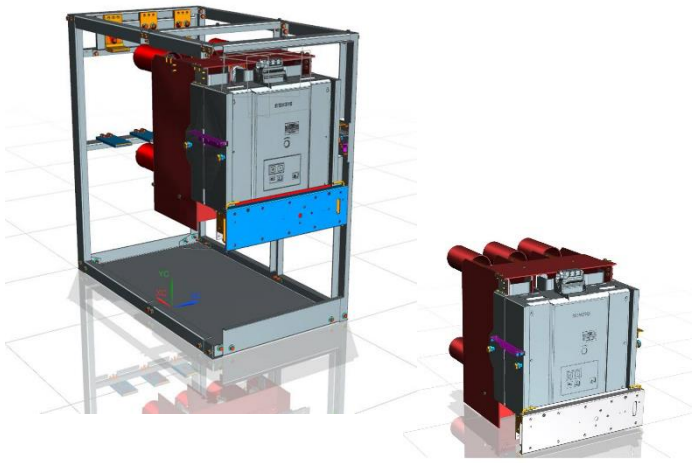
The retrofit solution comprises a new Siemens circuit breaker, its withdrawable unit and contact arms. Additionally, the necessary preparations make your switchgear ready-to-use in a safe and reliable way again.

Your technical benefits at a glance:

- Extended product lifetime in special environments e.g. off-shore, nuclear power, oil industry.
- Upgrade your circuit breaker to state-of-the-art technology
- Most of the solutions are type tested
- Minimal site works due to its plug-play functionality
- Increased system reliability
- Cost-effective spare parts availability
- Increased operational safety
- Higher environmental impact




General retrofit solution scheme

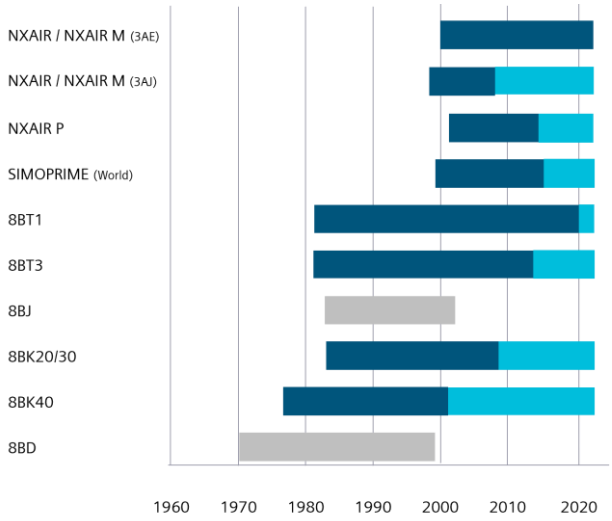


Concrete retrofit solution for 8BK20 MV Switchgear

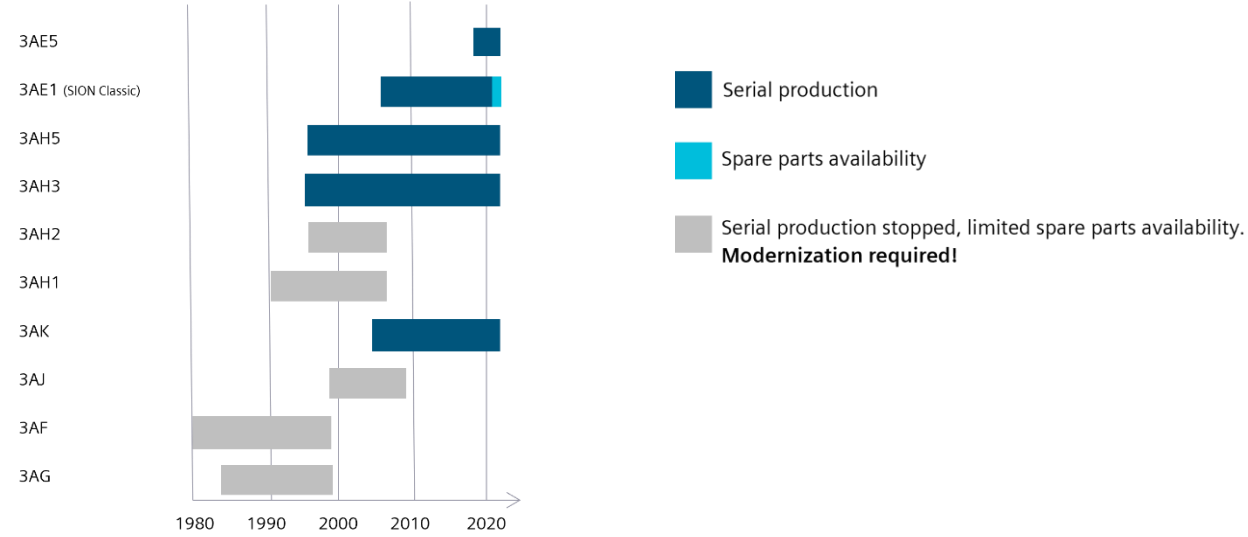
Renew the heart of your switchgear in a safe and reliable way with Siemens retrofit solutions

# Lifecycle Information

## Production overview for some Siemens MV switchgears




## Production overview for Siemens MV circuit breakers

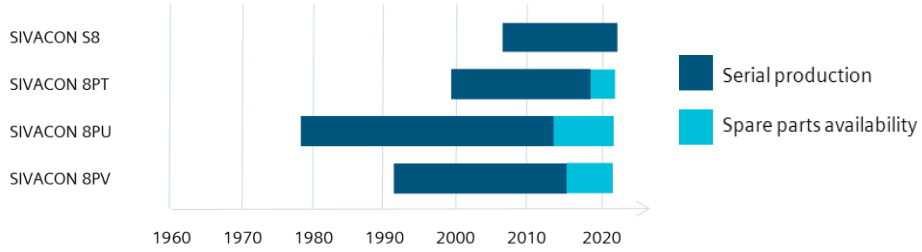



Upgrade your MV switchgear with:

### State of the art medium voltage SION M vacuum circuit breaker

SION vacuum circuit breakers control all switching operations in medium-voltage distribution systems and are suitable for installation in established and new air-insulated medium-voltage switchgear.

## Production overview for Siemens LV switchboards




## Serial production overview for Siemens LV circuit breakers

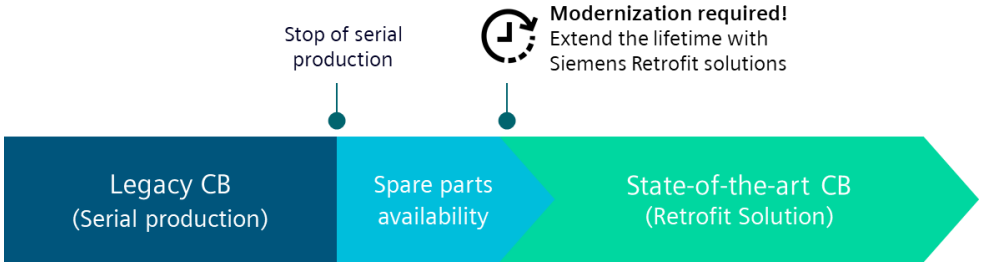

Upgrade your LV switchboard with:

### State-of-the-art low voltage 3AW air circuit breaker

3AW air circuit breakers meet high requirements and are flexible enough for any application.
The long service life offers you long-term reliability

### When is the right time to modernize your asset?

Independent of the condition of the electrical assets, proactive measures to improve the performance and avoid unplanned outages must be defined by the system operators in a timely manner.
An adequate strategy to achieve this needs to be evaluated in a frequent and comprehensive basis.
Lifecycle knowledge of the switchgears and the circuit breakers plays an important role in the asset management plans.
At the end of the serial production the OEM spare parts availability is offered for a limited time. At that moment it is crucial to start the lifetime extension.



# Approach

## Our comprehensive approach

Retrofit is an overall concept that includes technical upgrading and adaptation to standards. Wrong investments are avoided through the individual analysis and evaluation of the framework conditions.

Our worldwide Siemens network of experts is by your side to offer advice and provide you with the right answers, from the early stages of your project until you are completely satisfied with the results.

**Our offer includes:**

- Analysis and evaluation of all necessary technical information. The switchgear to be retrofitted remains in operation on site
- Metrological determination and development of the most suitable solution, testing and verification with the most modern software
- Diligent prototype testing: series production only begins when all tests have been successfully completed
- Transport of the ready-to-use solution to the customer's system, installation and commissioning

**Additional offer:**

Further value added along with conventional circuit breaker retrofit:

- Relays retrofit
- Safety interlocks upgrade
- Digitalization
- Care plan (Service contracts incl. extended warranty)

**Why Siemens?**

- OEM-expertise and experience to ensure best customer solutions also for modernization and retrofit.
- The continuous Siemens-internal collaboration of after-sales-service, production line and R&D ensures that offered solutions are always up-to-date and ensures the compatibility of new and old designs.
- OEM product knowledge.
- Compliance with strict quality procedures.
- Worldwide footprint to serve our customers wherever they are.


Our comprehensive approach

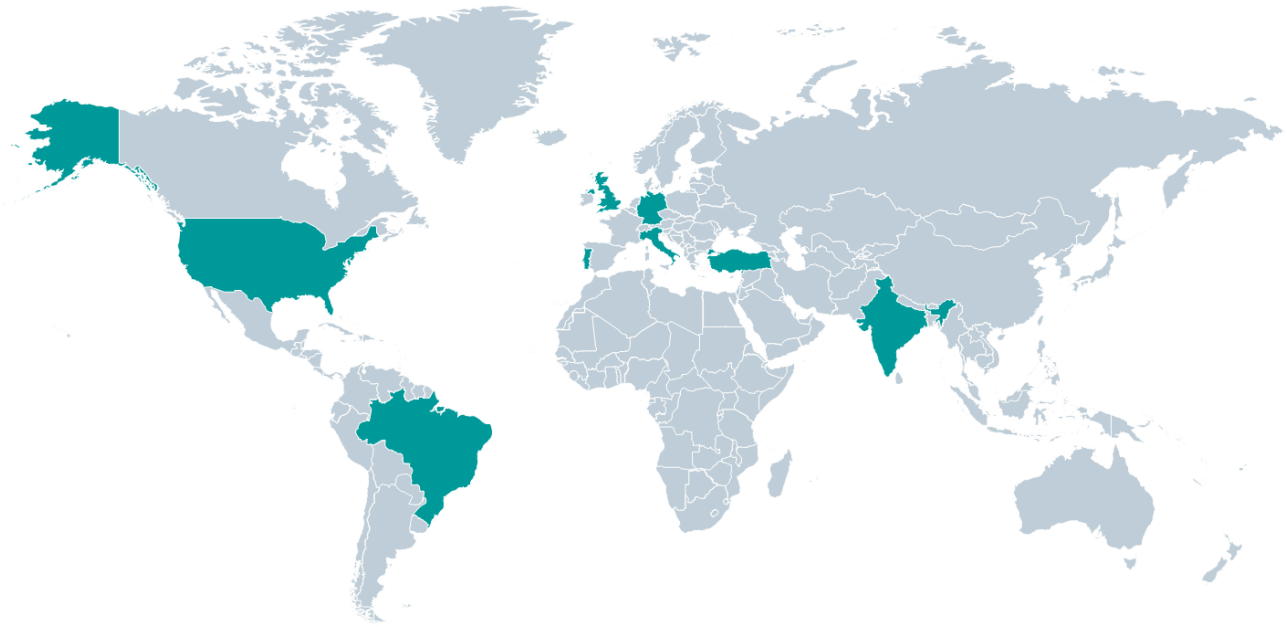
# Locations

## Retrofit development and production centers

Your customized solution is built at cost and on time according to the defined technical specification with the best-suitable products and components.

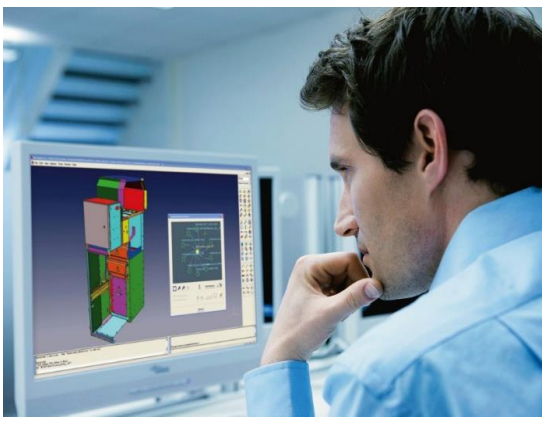
All performance measures are implemented as defined.

Compliance with all relevant health and safety, quality, environmental and approval aspects is ensured as part of the applied Siemens project management processes.



Retrofit development and production centers

*Leverage best-in-class domain knowledge and expertise to drive modernization initiatives and develop customized solutions that enable effective, profitable business outcomes.*



# Retrofit solutions for Siemens and non-Siemens switchgears

The following circuit breakers are some of our available pre-engineered designs. Other manufacturers, models, and ratings can be engineered by Siemens.

## Siemens 8BK20

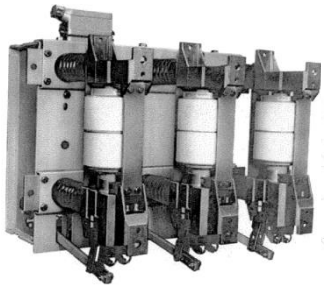
## VCB types 3AG, 3AF, 3AH1, 3AH

Our solution

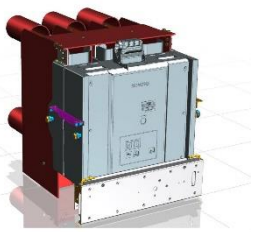
- Upgrade to the state-of-the-art SION M vacuum circuit breaker
- Short installation time due to our “Plug and Play” solution
- Type tested solution according to IEC 62271-1 and IEC 62271-200 standards
- Type-tests: Dielectric, resistance of circuit, short-time withstand current and peak withstand current, making and breaking as well as mechanical test
- Arc fault test remains valid according to IEC 60298

**Siemens 8BK20**

| Existing Circuit Breaker | Upgrade to | Technical Data |
|---|---|---|
| 3AG, 3AF<br>3AH1, 3AH5 | SION M<br>(3AE5) | 7.2 to 17.5 kV<br>Up to 31.5 kA<br>1,250 A to 2500 A |



Siemens 3AG



Siemens SION M

## Siemens 8BK30 / NXAIR M / NXAIR P

## VCB types 3TL6 / 3TL8

Our solution

- Upgrade to the state-of-the-art 3TM fuse-vacuum contactor
- The solution comprises the complete racking unit and its components
- Partial type tested according to IEC 62271-1 / IEC 62271-200
- Internal arc tested according to IEC 60 298 Appendix AA (unchanged)
- No need of changes to the fixed part of the switchgear
- Factory assembled and routine tested acc. IEC 62271-1 / IEC 62271-200

**Siemens 8BK30, NXAIR M, NXAIR P**

| Existing switching device | Upgrade to | Technical data |
|---|---|---|
| 3TL6 / 3TL8 | 3TM<br>With 1 or 2 fuse-links<br>SIBA type | 3.6 kV, 7.2 kV<br>16 - 50 kA<br>400 A |
| | | 12 kV (List 1)<br>16 - 50 kA<br>400 A |

Siemens 3TL6

Siemens 3TM

## Siemens 8BD

## VCB type 3AF, 3AG, 3AC, H515

Our solution

- Upgrade to the modern circuit breaker 3AH3, its extendible unit and the contact arms
- No need of changes to the fixed part of the switchgear
- Truck type tested according to IEC 62271-200 and the circuit breaker to IEC 62271-100
- Modernization of the 8BD2 (7.2 kV) fuse-contactor combination: Existing device can be overhauled and equipped with a new contactor.

**Siemens 8BD**

| Existing Circuit Breaker | Upgrade to | Technical Data |
|---|---|---|
| 3AF / 3AG<br>3AC / H515 | 3AH3 | <= 12 kV<br>25, 31.5, 40 kA<br>1.250, 2.500 A |
| | | <= 24 kV<br>25 kA<br>1.250, 2.000 A |

8BD Retrofit solution with 3AH3

8BD2 fuse-contactor combination

## Siemens Sivacon 8PV

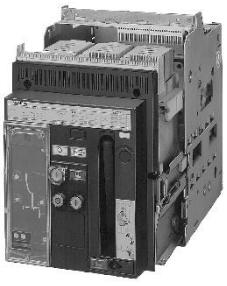
## CB Type 3WN1/6

Our solution

- The retrofit solution consists of the state-of-the-art 3WA Siemens air circuit breaker and its connection parts replacing the phased-out 3WN1 and 3WN6 circuit breakers
- Type tested solution according to IEC 61439 and the circuit breaker to IEC 60947
- A brand-new front door specially designed to fit the new circuit breaker

**Sivacon 8PV**

| Existing Circuit Breaker | Upgrade to | Technical Data |
|---|---|---|
| 3WN1 | 3WA | 1.600 A<br>3 & 4 pole<br>withdrawable |
| 3WN6 | | 2.000, 2.500 A<br>3 & 4 pole<br>withdrawable |



Siemens 3WN6

Siemens 3WA

## ABB HVA 125

## SF6 CB type HPA

Our solution

- All operations incl. VCB on/off, spring charging, rack in/out only possible with circuit breaker compartment door in closed position
- Built-in safety interlock in new drive box
- Effortless rack in/out operation
- Floor rolling retrofit solution makes easy handling at site
- Reduces interchangeability time drastically
- Maintenance is possible from front & rear side
- Improved safety standards

**ABB VHA 12S**

| Existing Circuit Breaker | Upgrade to | Technical Data |
|---|---|---|
| HPA<br>1,250, 1,600<br>2,500 A | 3AE | 12 kV<br>40 kA<br>1,250, 2,000,2,500 A |

ABB HPA

Siemens 3AE

## ALIND

## MOCB HL Series

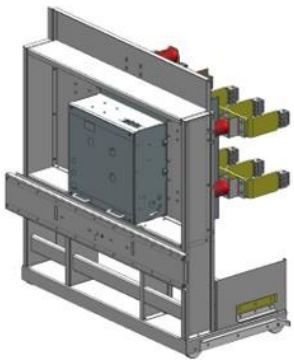
Our solution

- All operations incl. VCB on/off, Spring charging, Rack in/out only possible with circuit breaker compartment door in closed position.
- Built-in safety interlock in new drive box.
- Effortless rack in/out operation.
- Improve substation safety standards.
- Interchangeability with old circuit breaker.
- No modification inside existing panel.
- Guarantee of services & spares parts for the next decades

**ALIND**

| Existing Circuit Breaker | Upgrade to | Technical Data |
|---|---|---|
| HL430<br>HL436 | 3AK6 | Up to 12 kV<br>40 kA<br>1,250, 2,500 A |

Alind HL



Siemens 3AK6

## Allis Chalmers and Westinghouse CB types MSV, FSV, DPR

Our Solution

- Closed-door, remote racking for roll-in replacement circuit breakers
- All operations incl. VCB on/off, spring charging, rack in/out only possible with circuit breaker compartment door in closed position
- Functions with existing safety interlocks on circuit breakers
- Effortless rack in/out operation
- Floor rolling retrofit solution makes easy handling at site
- Reduce interchangeability time drastically
- Improved safety standards

**Allis Chalmers & Westinghouse**

| Existing Circuit Breaker | Upgrade to | Technical Data |
|---|---|---|
| Allis Chalmers D-gear MA, MB, MC | MSV | 5 kV 31.5, 50 kA 1,200, 2,000 A |
| Allis Chalmers F-gear FA, FB, FC | FSV | 15 kV 25,40, 50 kA 1,200, 2,000, 3,000A |
| Westinghouse DHP | DPR | 5,15 kV 25, 31.5, 40, 50 kA 1,200, 2,000, 3,000 A |

Siemens DPR
(replacement for Westinghouse DHP)

## Crompton Greaves UniVAC / jVAC VCB 12V20

Our solution

- All operations incl. VCB On/Off, Spring charging, Rack in/out only possible with circuit breaker compartment door in closed position.
- Built-in safety interlock in new drive box.
- Effortless rack in/out operation.
- Improve substation safety standards.
- Interchangeability with old circuit breaker.
- No modification inside existing Panel.
- Guarantee of services & spares parts for the next decades

**Crompton Greaves UniVAC / jVAC**

| Existing Circuit Breaker | Upgrade to | Technical Data |
|---|---|---|
| 12V20 | 3AH 3AE5 | Up to 12 kV 25,31.5 kA 1,250, 1,600 A |

CG 12V20

Siemens 3AH

## Jyoti PA1/PB3/CP3/PA3/ZK4/PB2
## MOCB types MS1/2/3, MT1, OD1, OZ2

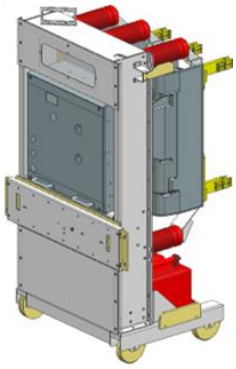
Our Solution

- Closed door featured one to one Retrofit solution for existing JYOTI minimum oil circuit breaker
- All operations incl. VCB on/off, spring charging, rack in/out only possible with circuit breaker compartment door in closed position
- Built-in safety interlock in new drive box
- Effortless rack in/out operation
- Interchangeability with old breaker
- No modification inside existing panel
- Guarantee of service & spare parts for the next decades
- Improved safety standards

**JYOTI PA1/PB3/PC3/PA3/ZK4/PB2**

| Existing Circuit Breaker | Upgrade to | Technical Data |
|---|---|---|
| Oil CB MS1, MS2, MS3, MT1, OD1, OZ2 | 3AH 3AK6 | 12 kV 25/31,5/40 kA 1,250, 2,000, 2,500 A |

Jyoti MOCB



Siemens 3AK6

## Kirloskar SF6
## CB types FP63D, FP63G

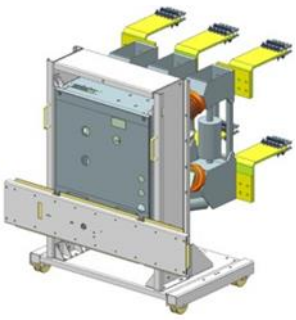
Our solution

- Closed door featured one to one Retrofit solution for existing Kirloskar make SF6 Gas Circuit Breaker type FP63D / FP63G
- All operations incl. VCB On/Off, Spring charging, Rack in/out only possible with circuit breaker compartment door in closed position.
- Built-in safety interlock in new drive box.
- Effortless rack in/out operation.
- Improve substation safety standards
- Interchangeability with old circuit breaker.
- No modification inside existing Panel.
- Guarantee of services & spares parts for the next decades

**Kirloskar SF6 CB Panel**

| Existing Circuit Breaker | Upgrade to | Technical Data |
|---|---|---|
| FP63D FP63G | 3AH 3AH3 | Up to 12 kV 25, 31.5, 40, 44 kA 1,250, 1,600, 2,000, 2,500, 3,150 A |

Kirloskar FP63



Siemens 3AH3

## Megawin PARAS
## CB types MHVCB

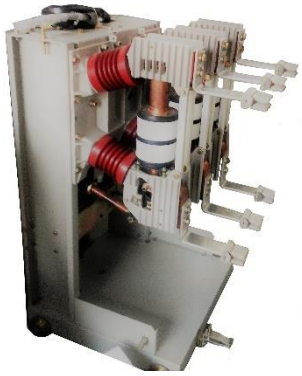
Our solution

- Closed door featured one to one Retrofit solution for existing MEGAWIN make Vacuum Circuit Breaker type MHVCB
- All operations incl. VCB On/Off, Spring charging, Rack in/out only possible with circuit breaker compartment door in closed position.
- Built-in safety interlock in new drive box.
- Effortless rack in/out operation.
- Improve substation safety standards.
- Interchangeability with old circuit breaker.
- No modification inside existing Panel.
- Guarantee of services & spares parts for the next Decades

**Megawin PARAS Panel**

| Existing Circuit Breaker | Upgrade to | Technical Data |
|---|---|---|
| MHVCB | 3AH3 | Up to 12 kV<br>40 kA<br>1,250, 2,500 A |

Megawin MHVCB



Siemens 3AH3

## NGEF
## MOCB types E, EKU

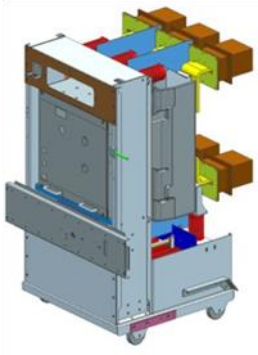
Our solution

- Closed door featured one to one Retrofit solution for existing NGF make MOCB type E / EKU
- All operations incl. VCB on/off, spring charging, rack in/out only possible with circuit breaker compartment door in closed position
- Built-in safety interlock in new drive box
- Effortless rack in/out operation
- Interchangeability with old breaker
- Guarantee of services & spare parts for the next decades
- No modification inside existing panel
- Improved safety standards

**NGEF**

| Existing Circuit Breaker | Upgrade to | Technical Data |
|---|---|---|
| MOCB<br>E-7512, 7516,<br>7525 / 7531 /<br>7540<br>EKU-5012 / 5016 /<br>5052 / 5031 | 3AH<br>3AK6 | Up to 12 kV<br>25 31.5 40 44 kA<br>1,200, 1,600, 2,000,<br>2,500, 3,150 A |

NGEF MOCB



Siemens 3AK

## Russian MOCHB

## CB types BMTT-06, BMTT-10

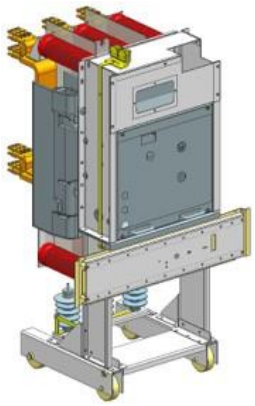
Our solution

- Closed door featured one to one Retrofit solution for existing RUSSIAN make MOCB type BMTT Series
- All operations incl. VCB On/Off, Spring charging, Rack in/out only possible with circuit breaker compartment door in closed position.
- Built-in safety interlock in new drive box.
- Effortless rack in/out operation.
- Improve Substation Safety Standards.
- Interchangeability with Old Circuit Breaker.
- No Modification inside existing Panel.
- Guarantee of Services & Spares Parts for the next Decades

**Russian MOCB Panel**

| Existing Circuit Breaker | Upgrade to | Technical Data |
|---|---|---|
| BMTT-06<br>BMTT-10 | 3AH3<br>3AK6 | Up to 12 kV<br>25, 31.5, 40 kA<br>1,250, 1,600,<br>2,000, 2,500 A |

Russian MOCB



Siemens 3AK6

## Schneider Electric

## MOCB type HWX

Our solution

- Closed door featured one to one Retrofit solution for existing Schneider Electric / Areva / GEC ALSTOM make Vacuum Circuit Breaker type HWX
- All operations incl. VCB On/Off, Spring charging, Rack in/out only possible with circuit breaker compartment door in closed position.
- Built-in safety interlock in new drive box.
- Effortless rack in/out operation.
- Improve substation safety standards.
- Interchangeability with Old Breaker.
- No Modification inside existing Panel.
- Guarantee of Services & Spares Parts for the next Decades

**Schneider Electric HWX860/660**

| Existing Circuit Breaker | Upgrade to | Technical Data |
|---|---|---|
| HWX | 3AE5<br>3AK6 | Up to 12 kV<br>31.5, 40 kA<br>1,250, 2,500, 3,150 A |

Schneider Electric HWX

Siemens 3AE5

# Voltas Belledone
# SF6 CB types FG2, FB4, GMH

Our solution

- Closed door featured one to one Retrofit solution for existing Voltas make SF6 breaker type FG2, FB4
- All operations incl. VCB on/off, spring charging, rack in/out only possible with circuit breaker compartment door in closed position
- Built-in safety interlock in new drive box
- Effortless rack in/out operation.
- Improve substation safety standards.
- Interchangeability with old breaker
- No modification inside existing panel
- Guarantee of services & spares parts for the next decades

**Voltas Belledone**

| Existing Circuit Breaker | Upgrade to | Technical Data |
|---|---|---|
| SF6 CB FluArc Type FG2, FB4, GMH | 3AK6 3AE | Up to 12 kV 25, 31.5, 40, 44 kA 1,250, 2,000, 2,500, 3,150 A |

Voltas MOCB

Siemens 3AK

# List of retrofit solutions for medium voltage switchgears with IEC standard

| Existing Device | | | Upgrade to | Technical Data | | |
|---|---|---|---|---|---|---|
| **Brand** | **Switchgear type** | **Circuit Breaker type** | **Circuit Breaker type** | **kV** | **kA** | **A** |
| Siemens | 8BD | 3AF, 3AG | 3AH3 | <=12 | 25, 31.5, 40 | 1,250, 2,500 |
| | | 3AC, H515 | 3AH3 | <=24 | 25 | 1,250, 2,000 |
| | 8BD2, 8BD3 | 3TL5 | 3TL6 | 7,2 | 40 | 400 |
| | 8BJ20, 8BJ50 | 3AG | 3AH | <=24 | <=40 | 1,250, 2,500 |
| | | 3AF | 3AH3 | <=24 | <=40 | 1,250, 2,500 |
| | 8BK20 | 3AF, 3AG, 3AH1, 3AH5 | 3AE5 (SION M) | <17,5 | 31,5 | 1,250, 2,500 |
| | | 3AC, 3AF, 3AG | 3AH/3AH3 | 12 | 25, 31.5, 40 | 1,250, 2,500 |
| | | 3AF | 3AH3 | 24 | 25, 31.5 | 1,250, 2,500 |
| | | 3AF, 3AG, 3AH1, 3AH5 | 3AE5 | <17.5 | 31,5 | 1,250, 2,500 |
| | | 3CG (Automotiv) | 3AH | 24 | 25 | 800 |
| | | 3AF | 3AH3 | 36 | 25 | 1,250 |
| | 8BK30 NXAIR M NXAIR P | Fuse-vacuum contactor 3TL6, 3TL8 | 3TM | 3.6, 7.2, 12 | 16 - 50 | 400 |
| | 8BK21 | 3AF, 3AG, 3AH1, 3AH5 | 3AE5 | <17.5 | 31,5 | 1,250, 2,500 |
| | 8BK71 | 3AG | 3AH | 12 | 25 | 1250 |
| | 8BK80 | 3AF | 3AH, 3AH3, 3AK, 3AE | 12 | 25, 31.5, 40 | 1,250, 2500, 3150 |
| | | 3AF | 3AH3 | 24 | 25, 31.5 | 1,250, 2,000, 2,500 |
| | | 3AF | 3AH3 | 36 | 31,5 | 1,250, 2,000, 2,500 |
| | | 3AF, 3AH3 | 3AH4 | 12 | 31.5, 40 | 1,250, 2,500, 3,150 |
| | | 3AF, 3AH3 | 3AH4 | 36 | 31,5 | 1,250, 2,500 |
| | 8BM80 | 3AF | 3AH, 3AH3, 3AK, 3AE | 12 | 25, 31.5, 40 | 1,250, 2,500, 3,150 |
| | SIMOPRIME World | 3AE1/3AH5 | 3AE5 (SION M) | <17.5 | 25, 31.5, 40 | 1,250, 2,500, 3,150, 3,600 |
| ABB | UNIARC | D | 3AH3 | 7,2 | 50 | 1,250, 2,500 |
| | SAFESIX | HPA | 3AE | 12 | 25 | 1,250 |
| | - | DR17 | 3AE | 17 | 25 | 1,250 |
| | - | DR7 | 3AE | 7,2 | 20 | 1,250 |
| ABB – CALOR EMAG | ZE4 | OD3M | 3AH3 | 36 | 31,5 | 1,600 |
| ASEA / ABB | VHA12S | HPA | 3AE | 12 | 40 | 1,250, 2,500 |
| | VHE800, 950 | HKK, HKM | 3AK6 | 12 | 40, 44 | 1,250, 2,500, 3,150 |
| | VHE800, 950 | HPA-CF | 3AK6 | 12 | 40, 44 | 1,250, 2,500, 3,150 |
| Alind | - | HL430, HL436 | 3AK6 | 12 | 40 | 1,250, 2,500 |
| ANSALDO | SICLAD | MAG II medio | 3AE | 12 | 40 | 2,000 |
| Allis Chalmers | D-gear | MA | MSV | 5 | 31.5-50 | 1,200, 2,000 |
| | F-gear | FA, FB | FSV | 7-15 | 25-50 | 1,200, 2,000, 3,000 |
| | AM | AM | AMR | 5 | 31.5 | 1,200, 2,000 |
| Alstom | - | VAA, In 1200A | 3AE5 | < 24 | 25 | 1,250 |
| | - | VAA, In 2000A | 3AE5 | < 24 | 25 | 2,000 |

| Existing Device | | | Upgrade to | Technical Data | | |
|---|---|---|---|---|---|---|
| **Brand** | **Switchgear type** | **Circuit Breaker type** | **Circuit Breaker type** | **kV** | **kA** | **A** |
| JYOTI | PA1 | OZ2 | 3AK6 | 12 | 31.5 | 1,250 |
| | PB3, PB3-M | MS2, MS3 | 3AK6 | 12 | 25, 40 | 1,250, 2,500 |
| | PC3, PC3-1 | MS1, MS2, MS3 | 3AK6 | 12 | 40 | 2,000, 2,500 |
| | PA3-1,PA-3/M | MT1 | 3AH | 12 | 25, 31.5 | 1,250 |
| | ZK4, PB2 | OZ2, OD1 | 3AH | 12 | 25, 31.5 | 1,250, 1,600 |
| | PA3, PA3-1 | OZ2, MT1 | 3AH | 12 | 25 | 1,250 |
| Crompton Greaves | UniVAC, jVAC | 12V20 | 3AH | 12 | 31,5 | 1,250 |
| Kirloskar | A 12 62D | FP62D | 3AH, 3AH3 | 12 | 25, 31.5 | 1,250, 1,600 |
| | A12 63G | FP63G | 3AH3, 3AK6 | 12 | 40 | 1,250, 2,500, 3,150 |
| MEGAWIN | - | MHVCB | 3AH3 | 12 | 40 | 1,250 |
| MAGRINI | EP7 | DHF - F | 3AE | 7,2 | 31.5 | 1,250 |
| | EP12 | DHF - F | 3AE | 12 | 31.5 | 1,250 |
| | EP17 | DHF - F - GL - VO | 3AE | 17 | 40 | 2,000 |
| | VENUS 600mm | GI - VO | 3AE | 12 | 31,5 | 1,250 |
| | VENUS 750mm | GI - VO | 3AE | 12 | 40 | 1,250, 2,000 |
| NGEF | - | EKU-5012, 5016, 5025, 5031 | 3AH, 3AH3 | 12 | 25, 31.5 | 1,250, 2,000, 2,500 |
| | - | E7512, E7516, E7525, E7531, E7540 | 3AH3, 3AK6 | 12 | 40 | 1,250, 2,000, 2,500, 3,150, 4,000 |
| | SACE Italy | SFAsg | 3AH3, 3AK6 | 12 | 40, 44 | 1,250, 2,500 |
| | 8BD | 3AC | 3AH | 12 | 25, 31.5 | 1,250 |
| Reyrolle | - | SMS36 | 3AH3 | 36 | 25 | 1,250 |
| | SMS | 3AH | 3AH | 33 | 25 | 1,250, 2,000 |
| | LMT | LMT | LMT-SION | 11 | 25 | 630, 1,250, 2,000 |
| | C-Gear | C-Gear | C-Gear SION | 11 | 25 | 630, 1,250 |
| | S14 | S14 | S14V | 3,3 | 25 | 2,000 |
| | S36 | S36 | S36-SION | 11 | 25 | 2,000 |
| RITHHAL | FURNACE | 3AH4 | 24 | 31,5 | 2500 | 2,500 |
| Russian | - | BMTT-06, BMTT-10 | 3AH, 3AH3 | 12 | 25, 31.5, 40 | 1,250, 2,500 |
| SACE | - | RMSI | 3AE5 | <24 | 25 | 1,250, 2,000 |
| Schneider Electric | HWX860 | HWX | 3AE5 | 12 | 31,5 | 1,250 |
| SPRECHER & SCHUH | - | HPTW-306, in 1,200A | 3AE5 | <24 | 25 | 1,250 |
| | - | HPTW-306, in 2,000A | 3AE5 | <24 | 25 | 2,000 |
| VOLTAS | Belledonne | FG2, FB4, GMH | 3AK6 | 12 | 40, 44 | 1,250, 2,500, 3,150 |
| Westing-house | - | 150 DHP 500, in 1,200A | 3AE5 | <17,5 | 31.5 | 1,250 |
| | - | 150 DHP 500, in 2,000A | 3AE5 | <17,5 | 31.5 | 2,000 |
| | - | 150 DHP 750, in 1,200A | 3AE5 | <17,5 | 31.5 | 1,250 |
| | - | 150 DHP 750, in 2,000A | 3AE5 | <17,5 | 31.5 | 2,000 |

## List of Retrofit solutions for medium voltage switchgears with ANSI standard

| Existing Device | | | Upgrade to | Technical Data | | |
|---|---|---|---|---|---|---|
| **Brand** | **Switchgear type** | **Circuit Breaker type** | **Circuit Breaker type** | **kV** | **kA** | **A** |
| Siemens | 8BK20 | 3AF | 3AH3 | 5-15 | 25-50 | 1,200, 2,000 |
| | GM | GMI | GMI | 5, 7, 15 | 25-50 | 1,200, 2,000, 3,000 |
| | 2-HI | 3AF | 3AH3 | 5, 7, 15 | 25-50 | 1,200, 2,000, 3,000 |
| Allis Chalmers | D-gear | MA, MB/MBV, MC/MCV | MSV, MBR, MCR | 5, 7, 15 | 31.5-50 | 1,200, 2,000 |
| | F-gear | FA, FB, FC/FCV | FSV | 5, 7, 15 | 25-50 | 1,200, 2,000, 3,000 |
| | AM | AM | AMR | 5 | 31,5 | 1,200, 2,000 |
| Federal Pacific | DST-2 | DST-2 | DTR-2 | 5, 7, 15 | 25-50 | 1,200, 2,000 |
| GE | Magnet-Blast | Magnetblast (AM) | GEHR, GER | 3, 5, 7, 15 | 25-50 | 600, 1,200, 2,000, 3,000 |
| | Horizontal | Horizontal | GEHR | 5, 7, 15 | 25-50 | 1,200, 2,000, 3,000 |
| | PowerVAC | PowerVAC | PVR | 5, 7, 15 | 25-50 | 1,200 |
| ITE | HV | HV | HVR | 15 | 25 | 600, 1,200 |
| ITE/ABB | HK | HK | HKR | 5, 7, 15 | 25-50 | 1,200, 2,000 |
| McGraw Edison | PSD | PSD | PSR | 7, 15 | 25-50 | 1,200, 2,000 |
| Westing-house | DHP | DHP | DPR | 5, 7, 15 | 25-50 | 1,200, 2,000, 3,000 |
| | DH | DH | DHR | 5, 7, 15 | 25-50 | 1,200, 2,000, 3,000 |

## List of Retrofit solutions for low voltage switchboards with IEC standard

| Existing Device | | Upgrade to | Technical Data |
|---|---|---|---|
| **Brand** | **Circuit Breaker type** | **Circuit Breaker type** | **A** |
| Siemens SIVACON 8PV | 3WN 1/6 | 3WA | 1,600, 2,000, 2,500 |

## List of Retrofit solutions for low voltage switchboards with ANSI standard

| Existing Device | | Upgrade to | Technical Data |
|---|---|---|---|
| **Brand** | **Circuit Breaker type** | **Circuit Breaker type** | **A** |
| Siemens / Allis-Chalmers | SBA | SBW, SBWF | 1,200, 2,000, 3,200, 5,000 |
| | SBS | SBW, SBWF | 1,200, 2,000, 3,200, 5,000 |
| | SBH | SBW, SBWF | 1,200, 2,000, 3,200, 5,000 |
| | RL | RLW | 800, 1,600, 2,000, 3,200, 4,000, 5,000 |
| | RLE | RLW | 800, 1,600, 2,000, 3,200, 4,000 |
| | RLF | RLFW | 800, 1,600, 2,000 |
| | LA | LAW | 600, 800, 1,600, 3,000, 4,000 |
| | LAF | LAFW | 600, 800, 1,600 |

| Existing Device | | Upgrade to | Technical Data |
|---|---|---|---|
| **Brand** | **Circuit Breaker type** | **Circuit Breaker type** | **A** |
| ITE/ABB | K Line | KLW | 800, 1,600, 2,000, 3,000, 4,000 |
| | K Don | KLFW | 800, 1,600 |
| | OTOMAX P3C | 3WL | 2,000 |
| General Electric | AK-15/25 | AKW | 800 |
| | AKR-30/H | AKW | 800 |
| | AK/AKR-50/H | AKW | 1,600 |
| | AKRT-50/H | AKW | 2,000 |
| | AKR-A75 | AKRW | 3,200 |
| | AKR-100 | AKRW | 4,000 |
| | AK-75 | AKW | 3,200 |
| | AK-100 | AKW | 4,000 |
| | AKU-25 | AKFW | 800 |
| | AKRU-30 | AKFW | 800 |
| | AKRU-50 | AKFW | 1,600 |
| Pringle/Eaton | QA | QAW | 1,200, 3,000, 4,000 |
| | CBC | CBCW | 1,200, 3,000, 4,000 |
| Westinghouse | DB-15 | DBW | 225 |
| | DB-25 | DBW | 600 |
| | DB-50 | DBW | 1,600 |
| | DB-75 | DBW | 3,000 |
| | DB-100 | DBW | 4,000 |
| | DS-206 | DSW | 800 |
| | DS-206S | DSW | 800 |
| | DS-416 | DSW | 1,600 |
| | DS-416S | DSW | 1,600 |
| | DS-420 | DSW | 2,000 |
| | DS-632 | DSW | 3,200 |
| | DS-840 | DSW | 4,000 |
| | DSL-206 | DSFW | 800 |
| | DSL-416 | DSFW | 1,600 |

## You could not find your device listed?

No problem, retrofitting comprises a wide range of solutions, our specialists are continuously evaluating the market requirements and developing more solutions.
Contact us to evaluate your particular needs and joint define the best option according to your system and requirements.

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