Services

Peace of mind throughout your installation’s lifecycle

www.schneider-electric.com.eg
Based on this experience as world leader, Schneider Electric has developed a large and comprehensive range of innovative devices & services with one of the world leaders, you take benefit of a global leader experience and know-how in electric distribution, automation and power & control.

All the services included in this overview have been designed and manufactured to incorporate the benefits of this extensive experience.

Contents

Introduction 5-8
Installation Assessment 9-14
  > Electric Distribution Network Assessment 10-12
  > Energy Management Consultation Services 13-14
Modernisation 15-24
  > Panel Upgrade, Adaptation & Extension 16
  > Renovation & Revamping 16
  > ECOFIT 17-24
Services Maintenance Contracts 25-38
  > ED Advantage Service Plans 26
  > Corrective Maintenance 27
  > Preventive Maintenance 28
  > Predictive Maintenance 29
  > Spare Parts 30-34
  > MV Transformers Maintenance 35-37
On-Demand Maintenance 39
Installation & Commissioning 40
  > Installed Base Assessment Form 41-42
Technical Training 43-46
  > Customer Training Center (CTC) 44-45
  > E-Learning Training 46
Automation Services 48-49
IT - Critical Power & Cooling Services 50-51
Building Management Systems Services 52-53
Energy Efficiency Solutions 54-68
  > Power Management System 57-58
  > Power Factor Correction & Harmonics Mitigation Solutions 59-62
  > Motor Control Solutions 63-65
  > Lighting Control Solutions 66-67
  > ISO50001 68
  > Energy Savings Assessment Form 69
Services for your installation’s entire life cycle

Reduce expensive downtime risk and increase operational efficiency.

Optimize: Our Solution Experts give you the proactive and tailored recommendations you need to reduce risk and improve solution performance and reliability.
> Maintenance and modernization consulting
> On-site reliability and safety/security assessment
> Remote Monitoring Services

Operate: We help you maximize your solution uptime and performance, with capital expenditure control through a proactive set of actions.
> Technical support
> Software update and support
> Operators training
> Warranty extensions
> Multilevel Service Plans
> Preventative, predictive maintenance
> Vendor management/facility operations/managed maintenance/spare parts management

> Serving all segments

Airport  Automotive  Buildings  Datacenter  Energy infrastructure  Food & Beverages
Plan: Schneider Electric experts help you plan, define, and design the right solution for your needs.

- Technical feasibility studies
- Architecture and design studies
- Facility assessments

Install: We help you convert your plans into an efficient, reliable, and safe solution.

- Assembly/start-up
- Commissioning
- Project management
- Site coordination
- Software install and setup

Renew: We help you define and implement the best solution evolution, increasing performance and flexibility, while controlling aging infrastructure-associated costs.

- Custom “green” disposal
- Infrastructure enhancement to comply with the latest regulations
- Solutions retrofit/modernization

What are my options?

How do I install and commission?

How do I operate and maintain?

Set Management Cycle

Hotels  IT  MMM  Oil & Gas  Wastewater  Water
Why services are vital for your installed base

How can you cut costs and improve performance at the same time? When it comes to your electrical distribution infrastructure, the answer is straightforward – get professional expertise.

Installed Base Services from Schneider Electric™ enable you to achieve your goals. Whether you’re preparing to install brand new equipment, looking to extend the life of an existing installation, or planning to decommission an outdated facility, we have the experience and the service specialists to support you.

Doing business in today’s economic environment is challenging enough. Let us handle your electrical distribution installation for your peace of mind.

When it comes to your electrical distribution installation, we can help you:

> Increase productivity, reliability, and safety
> Mitigate risk and limit downtime
> Keep equipment up to date and extend its lifespan
> Cut costs and increase savings
> Improve your return on investment
Installation Assessment

> Electrical Distribution Network Assessment
> Energy Management Consultation Services
Electrical Distribution Network Assessment

MP4 Methodology

> Partnered by your teams and our electrical consultants
> Supported by professional software embedding Schneider Electric Know-how

Step 1
Specify your electrical energy needs and assess your current capabilities

• Understand your process & quantify your risks
• Identify the critical points in your process
• Make the link with the electrical network, and pinpoint the devices or busbars that could trigger these high-risk events
• Locate the main energy consumption points
• Understand your current and future operations & maintenance organisation and capabilities

Step 2
Assess equipment and evaluate network robustness

• For each set of equipment, build a stress indicator based on:
  - environmental conditions (humidity, temperature, salinity, etc.)
  - operating conditions (load rate, number of operations, etc.)
  - equipment ageing
• Carry out a reliability study to evaluate the robustness of network design with regards to the critical points identified in Step 1
  Classify each set of equipment according to its contribution to the probability of occurrence of the unwanted events

MP4 assessments are delivered in 1 to 2 weeks by electrical experts
Step 3
Rate criticality levels

Combine stress and reliability levels to rate the criticality of each set of equipment and define the appropriate service policy:

• Critical equipment (predictive maintenance, emergency recovery plan, upgrading action, etc.)
• Major equipment (preventive maintenance, etc.)
• Minor equipment (periodic inspection, etc.)

Step 4
Draw up plans and share conclusions

Based on the outputs of Step 3, the following deliverables are consolidated:

• **List of critical safety issues**
  • Upgrading actions necessary to restore nominal installation performance
  • 4 plans to:
    o Optimise your operating expenditure (Maintenance Plan)
    o Improve your performance (Modernisation and Monitoring Plans)
    o Track the implementation of actions including training, spare parts management, recovery plan, etc. (Management Plan). The priority of each recommendation and its economic balance sheet are assessed
  • Formal presentation of conclusions and recommendations to ensure good understanding and buy-in by all parties involved

**MP4 improvement plans help you master your electrical installation**
MP4 deliverables

4 improvement plans including critical safety issues

**Maintenance Plan**
- A description of the level of maintenance to be performed
- The stress and reliability levels of critical devices
- A strategy for the maintenance plan schedule

**Modernisation Plan**
- A list of equipment at the end of its service life and proposals of available retrofit solutions
- Advice on improving installation performance
- Suggestions on how to adapt your installation to meet your new business requirements

**Monitoring Plan**
- A predictive approach to anticipate potential device failure
- Energy quality and availability indicators
- Opportunities for energy savings in relation to the various solutions deployed

**Management Plan**
The plan outlines recommendations targeting:
- The safety of people working on the equipment
- Service contracts with respect to your subcontracting policy
- Management of spare parts
- Competency management including expertise and training
- Data management through direct access to the Schneider Electric expert system

The MP4 report allows you to identify critical safety issues such as:
- Incorrect breaking capacity
- Absence of interlocking devices
- Inappropriate protection of people
- Unprotected access to live parts, etc.
Energy Management Consultation Services

Energy Efficiency Audit

Our Energy Efficiency Audit is a comprehensive energy savings program that delivers a competitive edge through reduced operating costs, improved process performance and environments.

Energy Management Services

Energy assessment

We compare your utility bills to similar facilities in the region to determine energy conservation opportunity.

Preliminary report

A high-level site survey to identify potential Energy Conservation Measures (ECM) and align your energy profile with business objectives.

> Our method
- Calculate and compare against Benchmarks
- Conduct an energy efficiency workshop
- Demonstrate potential energy savings

> Our method
- Conduct walk-through audit
- Determine feasibility of project
- Calculate estimated cost savings and ROI
- Present preliminary report
Comprehensive analysis
Through a detailed energy analysis of your facility by a Certified Energy Manager, we create a program and plan to improve building operation and meet energy targets.

Program implementation
We’ll work closely with you throughout the implementation process ensuring milestones are met and providing detailed reports.

Sustained performance
We regularly review the project and results, ensure performance goals are met, and fine-tune to sustain continued energy efficiency and savings.

Energy Efficiency is on your doorstep thanks to our energy experts
Modernisation

➢ Panel Upgrade, Adaptation & Extension
➢ Renovation & Revamping
➢ ECOFIT™
Panel upgrade, Adaptation & Extension

Schneider provide panel upgrade, adaptation & extension for your existing switchgear in addition to protection upgrade. The replacement of electro-mechanical and / or electronic protection and measuring devices with the latest technology in micro-processor based integrated relays and communication options.

Renovation & Revamping

Modernization of medium voltage & low voltage switchgears, bus duct and transformers with modern devices for your old range installation is will formulate optimum renovation solutions.

Discover our Capabilities in doing related Civil work as Schneider Electric Egypt is a certified contractor from the Egyptian Union for Construction and Building Contractors
ECOFIT™
What does this mean?
ECOFIT™ solutions are tested, validated, and certified by Schneider Electric. They allow replacing only the core devices of the switchgear with new circuit breaker or protection relay, thanks to standardized solutions with plug and play concept.

Benefits

> Prolongs your switchgear’s lifetime by more than 50%.
> Enhances availability and operational dependability.
> Optimizes service and infrastructure costs by 30% to 70%.
> Maintains compliance with evolving industry standards and legislation.
> Ensures the safety of your personnel and surrounding equipment by using the latest technology.
> Access to Energy Management.

Economical winning card
Life time extension for existing switchgear. Less downtime than with full panel replacement. Reduces infrastructure downtime from days to minutes.

Ecological winning card
Limited parts’ replacement need. Optimized service and infrastructure costs. Reduction in recycling costs.

Peace of mind
Engineered solution with manufacturer’s warranty. Less risk because no cable changes and no civil footprint changes. Technology benefits thanks to a solution using dependable latest technology. Safety of people and surrounding equipment. Enhances availability and dependability by reducing CB failures.

« Green is our colour » - ECOFIT™ is the most economical means of reducing your network’s environmental footprint without buying a whole new system

Schneider Electric is helping you get the most of your equipment and installations
ECOFIT™ Cost benefits?

Optimisation with minimal shutdown.

- Saves money
- Saves time
- Simplicity

For many ECOFIT™ solutions, Schneider Electric replaces original equipment tracks without shutdown of the busbar.

Minimal panel shutdown period

Our main legacies and responsibilities for ECOFIT

Other Brands

- Cost of process downtime (Z = from a few minutes to one hour)
- Material cost
- Site work cost
## Medium Voltage ECOFIT™ solutions

<table>
<thead>
<tr>
<th>Original Brand</th>
<th>Panel type</th>
<th>Original device type</th>
<th>New device type</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Brands</td>
<td>All</td>
<td>SF6 CB</td>
<td>LF1 - LF3 / LF2 - LF3, SF1 - SF2</td>
</tr>
<tr>
<td>AEG</td>
<td>All</td>
<td>Vacuum CB</td>
<td>Evolis</td>
</tr>
<tr>
<td>AEG</td>
<td>D-12</td>
<td>BAL, VAA, VA</td>
<td>VA - VAA</td>
</tr>
<tr>
<td>AEG</td>
<td>D-24</td>
<td>BAL, VAA</td>
<td>VAA</td>
</tr>
<tr>
<td>AEG</td>
<td>GS-10</td>
<td>GE</td>
<td>VA - VAA</td>
</tr>
<tr>
<td>AEG</td>
<td>L</td>
<td>D-E</td>
<td>HVX</td>
</tr>
<tr>
<td>AEG</td>
<td>R</td>
<td>E-M-MC</td>
<td>VA - VAA</td>
</tr>
<tr>
<td>AEG</td>
<td>WAK</td>
<td>D-E</td>
<td>HVX</td>
</tr>
<tr>
<td>AEG</td>
<td>WBA</td>
<td>VAA, VAA, ECA, BAL, AL</td>
<td>VA, VAA, Contactor</td>
</tr>
<tr>
<td>AEG</td>
<td>WBB</td>
<td>VAA, VAA, ECA, BAL, AL</td>
<td>VA, VAA, Contactor</td>
</tr>
<tr>
<td>AEG</td>
<td>WK</td>
<td>WKC/ WKE/ WKB types</td>
<td>WKC/ WKE/ WKB cubicles</td>
</tr>
<tr>
<td>AEI, GEC Alsthom</td>
<td>BVP 17</td>
<td>BVP 17</td>
<td>VMX</td>
</tr>
<tr>
<td>Alsthom</td>
<td>DNF4-2E</td>
<td>FP, GFA</td>
<td>FP, HVX, CVX</td>
</tr>
<tr>
<td>Alsthom</td>
<td>DNF4 M&amp;FI</td>
<td>FP</td>
<td>FP, HVX</td>
</tr>
<tr>
<td>Alsthom</td>
<td>DNF5/DNF5-2B</td>
<td>FP</td>
<td>FP, HVX</td>
</tr>
<tr>
<td>Alsthom</td>
<td>DNF6</td>
<td>FP</td>
<td>FP, HVX</td>
</tr>
<tr>
<td>Alsthom</td>
<td>DNF7</td>
<td>FP</td>
<td>FP, HVX-O2</td>
</tr>
<tr>
<td>Ansaldo</td>
<td>Sclad</td>
<td>MAG II</td>
<td>LF2</td>
</tr>
<tr>
<td>CEM</td>
<td>CEMABLOC-C23mc 15 &amp; 27</td>
<td>CB</td>
<td>FP</td>
</tr>
<tr>
<td>CEM</td>
<td>CEMABLOC-C23mc 15 &amp; 27</td>
<td>CB</td>
<td>HVX</td>
</tr>
<tr>
<td>CEM</td>
<td>CEMAFLUOR-C26.0</td>
<td>CS</td>
<td>FPR</td>
</tr>
<tr>
<td>CEM</td>
<td>KIT 25-PGDx</td>
<td>CC</td>
<td>FP</td>
</tr>
<tr>
<td>CEM</td>
<td>KIT 27.2-PGHt</td>
<td>HF4K</td>
<td>FP</td>
</tr>
<tr>
<td>Concordia Sprecher</td>
<td>All AEG cubicles</td>
<td>TG</td>
<td>TG</td>
</tr>
<tr>
<td>Concordia Sprecher</td>
<td>HP</td>
<td>HP-W-TW-TM</td>
<td>HVX</td>
</tr>
<tr>
<td>Delle Alsthom</td>
<td>FLUOMATIC F540</td>
<td>FR62</td>
<td>FP82</td>
</tr>
<tr>
<td>Delle Alsthom</td>
<td>FLUOMATIC F943</td>
<td>FR62</td>
<td>BLV</td>
</tr>
<tr>
<td>Delle Alsthom</td>
<td>NORMABLOC N1347</td>
<td>HL</td>
<td>HVX - FPX</td>
</tr>
<tr>
<td>Delle Alsthom</td>
<td>NORMASEPT N743</td>
<td>HL</td>
<td>FP</td>
</tr>
<tr>
<td>Federal Pioneer</td>
<td>Metalclad switchgear</td>
<td>DST 2 &amp; 5</td>
<td>DST 2V &amp; 5V</td>
</tr>
</tbody>
</table>

**ECOFIT™ = tested, validated, and certified by Schneider Electric**
## Medium Voltage ECOFIT™ solutions

<table>
<thead>
<tr>
<th>Original Brand</th>
<th>Panel type</th>
<th>Original device type</th>
<th>New device type</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEC Alstom</td>
<td>HMC 400 &amp; HMC 410</td>
<td>HMC 400 - HMC 410</td>
<td>HMC 400 - HMC 410</td>
</tr>
<tr>
<td>GEC Alstom</td>
<td>HMC 1072</td>
<td>HMC 1072</td>
<td>HMC 1072</td>
</tr>
<tr>
<td>GEC Alstom</td>
<td>HMC 1172</td>
<td>HMC 1172</td>
<td>HMC 1172</td>
</tr>
<tr>
<td>GEC Alstom</td>
<td>HMX 36</td>
<td>HMX 36</td>
<td>HMX 36</td>
</tr>
<tr>
<td>GEC Alstom</td>
<td>MX 51 &amp; MX 81</td>
<td>MX 51 - MX 81</td>
<td>MX 51 - MX 81</td>
</tr>
<tr>
<td>GEC, GEC Alstom, Alstom</td>
<td>VMX</td>
<td>VMX</td>
<td>VMX</td>
</tr>
<tr>
<td>Merlin Gerin</td>
<td>Belledonne B200-B400</td>
<td>DSE22 to DSE78</td>
<td>LF2 - LF3 - SF1 - Evolis</td>
</tr>
<tr>
<td>Merlin Gerin</td>
<td>Belledonne B200G</td>
<td>DSE22K-DSE23K</td>
<td>LF1 - Evolis</td>
</tr>
<tr>
<td>Merlin Gerin</td>
<td>Belledonne B650</td>
<td>DIS</td>
<td>LF1 - R400 - R400D - Evolis</td>
</tr>
<tr>
<td>Merlin Gerin</td>
<td>Belledonne B900</td>
<td>DIS</td>
<td>SF1</td>
</tr>
<tr>
<td>Merlin Gerin</td>
<td>Chamrousse</td>
<td>DIS</td>
<td>LF2 - R400 - R400D</td>
</tr>
<tr>
<td>Merlin Gerin</td>
<td>Fluair F100-F200</td>
<td>FG1-FG2</td>
<td>LF2 - LF3 - Evolis</td>
</tr>
<tr>
<td>Merlin Gerin</td>
<td>Fluair F100C</td>
<td>R400-R400D</td>
<td>R400 - R400D</td>
</tr>
<tr>
<td>Merlin Gerin</td>
<td>Fluair F300</td>
<td>FG3</td>
<td>SF1 - SF2</td>
</tr>
<tr>
<td>Merlin Gerin</td>
<td>Fluair F400C</td>
<td>FC4</td>
<td>SF2</td>
</tr>
<tr>
<td>Merlin Gerin</td>
<td>Fluair F400G</td>
<td>FG4</td>
<td>SF1 - SF2</td>
</tr>
<tr>
<td>Merlin Gerin</td>
<td>Motorstart P12D-P30D</td>
<td>KA-KDA</td>
<td>R400 - R400D</td>
</tr>
<tr>
<td>Merlin Gerin</td>
<td>Motorstart P50D</td>
<td>C-CD</td>
<td>R400 - R400D - CTV1</td>
</tr>
<tr>
<td>Merlin Gerin</td>
<td>Motorstart P500D</td>
<td>C1-CD1</td>
<td>R400 - R400D - CTV1</td>
</tr>
<tr>
<td>Merlin Gerin</td>
<td>Taillefer T900-T1080</td>
<td>DST</td>
<td>LF3</td>
</tr>
<tr>
<td>Merlin Gerin</td>
<td>VM6 DM12</td>
<td>FB4</td>
<td>SF1</td>
</tr>
<tr>
<td>Merlin Gerin</td>
<td>VM6 DM22-DM23</td>
<td>FB4</td>
<td>SF1</td>
</tr>
<tr>
<td>Nuova Magrini Galileo</td>
<td>Composit</td>
<td>MG</td>
<td>SF1</td>
</tr>
<tr>
<td>Nuova Magrini Galileo</td>
<td>Epoclad</td>
<td>DHF-F</td>
<td>LF1 - LF2 - LF3 - SF1</td>
</tr>
<tr>
<td>Nuova Magrini Galileo</td>
<td>Venus</td>
<td>GL-GL</td>
<td>LF1-LF3</td>
</tr>
<tr>
<td>Square D</td>
<td>5-15 kV MC switchgear</td>
<td>VAD2-3</td>
<td>Magnum CB</td>
</tr>
<tr>
<td>Square D</td>
<td>Solenarc DSE Metal-Clad switchgear</td>
<td>DSE</td>
<td>Magnum CB</td>
</tr>
<tr>
<td>VEB Otto Buchwitz</td>
<td>CSIM 1-12</td>
<td>SCI-4</td>
<td>VEIVACUUM F</td>
</tr>
<tr>
<td>VEB Otto Buchwitz</td>
<td>CSIM 3-12</td>
<td>SCI-4</td>
<td>VEIVACUUM F, VA10031</td>
</tr>
<tr>
<td>Yorkshire Switchgear</td>
<td>YSF6</td>
<td>YSF6</td>
<td>YSF6 Evolis</td>
</tr>
</tbody>
</table>

ECOFIT™ is the economical complement to maintenance operations.
### Low Voltage ECOFIT™ solutions

<table>
<thead>
<tr>
<th>Original Brand</th>
<th>Panel type</th>
<th>Original device type</th>
<th>New device type</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Brands</td>
<td>All</td>
<td>Air CB</td>
<td>Masterpact NT - NW</td>
</tr>
<tr>
<td>All Brands</td>
<td>All</td>
<td>MCCB</td>
<td>Compact NS</td>
</tr>
<tr>
<td>Federal Pioneer</td>
<td>All</td>
<td>H series</td>
<td>Masterpact NT - NW</td>
</tr>
<tr>
<td>Merlin Gerin</td>
<td>All</td>
<td>Compact C801-C1251</td>
<td>Compact NS</td>
</tr>
<tr>
<td>Merlin Gerin</td>
<td>All</td>
<td>DA</td>
<td>Masterpact NW</td>
</tr>
<tr>
<td>Merlin Gerin</td>
<td>All</td>
<td>Masterpact M</td>
<td>Masterpact NW</td>
</tr>
<tr>
<td>Merlin Gerin</td>
<td>All</td>
<td>Selpact</td>
<td>Masterpact NT - NW</td>
</tr>
<tr>
<td>Merlin Gerin</td>
<td>All</td>
<td>Visucompact CM</td>
<td>Masterpact NW</td>
</tr>
<tr>
<td>Nuova Magrini</td>
<td>All</td>
<td>B Control</td>
<td>Masterpact NW</td>
</tr>
<tr>
<td>Square D</td>
<td>All</td>
<td>DS</td>
<td>Masterpact NW</td>
</tr>
<tr>
<td>Square D, Westinghouse</td>
<td>All</td>
<td>SE</td>
<td>Masterpact NW</td>
</tr>
<tr>
<td>Unelec-Areva</td>
<td>Normabloc 660</td>
<td>Unelec CNP</td>
<td>Masterpact NW</td>
</tr>
</tbody>
</table>

### Protection relays ECOFIT™ solutions

<table>
<thead>
<tr>
<th>Original Brand</th>
<th>Panel type</th>
<th>Original device type</th>
<th>New device type</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>All</td>
<td>All</td>
<td>MICOM - Sepam</td>
</tr>
<tr>
<td>Areva or older</td>
<td>All / draw out</td>
<td>M range - MCGG 11, 21 &amp; 22</td>
<td>MICOM P120H</td>
</tr>
<tr>
<td>Areva or older</td>
<td>All / draw out</td>
<td>M range - MCTI 39-40</td>
<td>MICOM P821MF</td>
</tr>
<tr>
<td>GEC Alstom, Areva</td>
<td>All</td>
<td>KCGG 122 &amp; 142</td>
<td>MICOM P123R</td>
</tr>
<tr>
<td>Merlin Gerin</td>
<td>All</td>
<td>Sepam 2000</td>
<td>Sepam series 40 - 60 - 80</td>
</tr>
<tr>
<td>Merlin Gerin</td>
<td>RM6+</td>
<td>VIP11R &amp; VIP12R</td>
<td>ECOFIT™ VIP11-12R</td>
</tr>
</tbody>
</table>

Our common values: • Quality • Safety • Professionalism
Example of MV CB or Contactor or Disconnector
Fluair F100-F200 Circuit Breaker

To give a new life to your installations

FG1 / FG2

Main technical characteristics

<table>
<thead>
<tr>
<th>FG1 / FG2</th>
<th>Rated Voltage Un (50/60 Hz)</th>
<th>7.2 kV</th>
<th>12 kV</th>
<th>17.5 kV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>630 A to 3150 A</td>
<td>25 to 50 kA*</td>
<td>25 to 31.5 kA*</td>
<td></td>
</tr>
</tbody>
</table>

Rated Current (Ir)

* Intensity short circuit (Isc)

<table>
<thead>
<tr>
<th>FG1 / FG2</th>
<th>Rated Voltage Un (50/60 Hz)</th>
<th>7.2 kV</th>
<th>12 kV</th>
<th>17.5 kV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>630 A to 3150 A</td>
<td>LF2/LF3 (25 to 50 kA*)</td>
<td>LF2/LF3 (29 to 31.5 kA*)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Evolis (40 kA* - 2500 A max)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Rated Current (Ir)

* Intensity short circuit (Isc)

A true extended life time

<table>
<thead>
<tr>
<th>Commercialisation</th>
<th>End of commercialisation</th>
<th>End of spare parts</th>
<th>End of life</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>1998</td>
<td>2011</td>
<td></td>
</tr>
</tbody>
</table>

1999 ECOFIT Ongoing LF2, LF3 Evolis

Offer extension

MiCOM P series 10 - 20 - 30 - 40
Sepam series 10 - 20 - 40 - 60 - 80
Example of MV CB or Contactor or Disconnector
YSF6 Circuit Breaker

To give a new life to your installations

YSF6 (SF6) → YSF6 Evolis (Vacuum)

Main technical characteristics

<table>
<thead>
<tr>
<th>YSF6</th>
<th>YSF6 Evolis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rated Voltage Un (50/60Hz)</strong></td>
<td>12 kV</td>
</tr>
<tr>
<td>630 A to 1250 A</td>
<td>Up to 25 kA*</td>
</tr>
<tr>
<td><strong>Rated Current (Ir)</strong></td>
<td>* Intensity short circuit (Isc)</td>
</tr>
</tbody>
</table>

A true extended life time

<table>
<thead>
<tr>
<th>Commercialisation</th>
<th>End of commercialisation</th>
<th>End of spare parts</th>
<th>End of life</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>2001</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2004 ECOFIT Ongoing YSF6 YSF6 Evolis

Offer extension

MiCOM P series 10 - 20 - 30 - 40
Sepam series 10 - 20 - 40 - 60 - 80
To give a new life to your installations

**Example of LV CB or Contactor**

**Masterpact M Circuit Breaker**

Original brand: Merlin Gerin
Version type: fixed and withdrawable device compatible with all LV switchboard

---

**Main technical characteristics**

**M08 to M63** → **Masterpact NW**

**Rated Voltage Un (50/60Hz)**

- 220 V
- 415 V
- 440 V
- 500 V
- 525 V
- 600 V
- 660 V
- 690 V

**Rated Current (Ir)**

- 800 A to 6300 A
  - 40 to 150 kA*
  - 40 to 85 kA*

---

**Masterpact NW**

**Rated Voltage Un (50/60Hz)**

- 220 V
- 415 V
- 440 V
- 500 V
- 525 V
- 600 V
- 660 V
- 690 V

**Rated Current (Ir)**

- 800 A to 6300 A
  - 42 to 150 kA*
  - 42 to 130 kA*
  - 42 to 100 kA*

---

### A true extended life time

<table>
<thead>
<tr>
<th>Commercialisation</th>
<th>End of commercialisation</th>
<th>End of spare parts</th>
<th>End of life</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td>2003</td>
<td></td>
<td>2013</td>
</tr>
</tbody>
</table>

---

The **ECOFIT™ Masterkit** solution enables to benefit from all the enhanced features of Masterpact NW circuit breakers and accessories. It requires total shutdown of the installation to access the busbars. Solution available for fixed and withdrawable types, 3P & 4P, 800A to 6300A.
Services Maintenance Contracts

> ED Advantage Service Plans
  Corrective Maintenance
  Preventive Maintenance
  Predictive Maintenance

> Spare Parts

> MV Transformers Maintenance
Advantage Service Plans

Tailored maintenance service plans improve asset management

Unexpected downtime can cause significant financial losses. The problem is often compounded by slow-to-respond repair personnel or equipment that under-performs after it’s repaired.

Our maintenance services contracts were created to prevent such issues. By focusing on predictive and preventive maintenance that’s tailored specifically to your site and processes, you can keep control over your budget and ensure a prompt response in the case of any failure.

<table>
<thead>
<tr>
<th>Advantage Service Plans</th>
<th>Advantage Plus</th>
<th>Advantage Prime</th>
<th>Advantage Ultra</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preventive Maintenance</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Predictive Maintenance</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Corrective Maintenance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24/7 Hotline</td>
<td>—</td>
<td>—</td>
<td>✔️</td>
</tr>
<tr>
<td>Emergency on-site intervention</td>
<td>Available at preferred rates</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Emergency on-site intervention</td>
<td>Cost of Parts</td>
<td>Available at preferred rates</td>
<td>Available at preferred rates</td>
</tr>
<tr>
<td>Emergency on-site intervention</td>
<td>Labour &amp; Travel cost</td>
<td>Available at preferred rates</td>
<td>✔️</td>
</tr>
<tr>
<td>Additional Services</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer Training</td>
<td>Optional</td>
<td>Optional</td>
<td>Optional</td>
</tr>
<tr>
<td>Asset On-line</td>
<td>Optional</td>
<td>Optional</td>
<td>✔️</td>
</tr>
</tbody>
</table>

Service Plans can be customized as per request

Advantage service plans optimize equipment safety, lower your total cost of ownership and give you peace of mind, so you can focus on your core business.
Corrective Maintenance

The reactivity you need

When unexpected downtime occurs, every second counts. In order to safeguard your business and speed up restart time you need the assurance of timely reactivity by an experienced, well-trained field service team as well as the guarantee of spare part availability.

Corrective maintenance from Schneider Electric gives you the reactivity you need in the event of a technical issue.

Emergency on-site intervention

When a speedy intervention is necessary, we dispatch a field service expert to your site so that repairs are made as quickly as possible. A response is guaranteed within a period of time specified in the service plan.

Spare-part delivery

Includes priority access to spare parts. We deliver spare parts that are best suited to your installation’s needs, so that you don’t have to keep bulky, expensive equipment on-site at all times.

Intervention and spare-part cost coverage

Certain Advantage service plans include partial or full cost coverage for emergency on-site interventions and emergency spare-part deliveries. This reduces the threat of unexpected costs and increases control over your maintenance budget.
Preventive Maintenance

Continuity of service

- Maintain your electrical equipment regularly in order to retain its original operational level,
- Entrust your installations to a professional in electrical distribution who is competent to handle the various technical grades of your equipment.

Various levels of preventive maintenance

<table>
<thead>
<tr>
<th>Level</th>
<th>Operation</th>
<th>Performed by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>Replacement of consumable components that may be accessed with minimal safety risks. Simple activities such as visual/audible inspection.</td>
<td>Technicians from the manufacturer</td>
</tr>
<tr>
<td>Level 2</td>
<td>Checking of basic equipment operation. Trouble-shooting by standard replacement. Minor preventive maintenance operations such as cleaning, lubrication etc...</td>
<td>Specialist technicians from the manufacturer</td>
</tr>
<tr>
<td>Level 3</td>
<td>Failure identification and diagnostics. Complex maintenance operations.</td>
<td>Specialist technicians from the manufacturer</td>
</tr>
<tr>
<td>Level 4</td>
<td>Major preventive maintenance work. Major corrective maintenance work</td>
<td>Highly specialist technicians from the manufacturer</td>
</tr>
</tbody>
</table>

77% of breakdown causes can be avoided by Maintenance

- 34% Contacts of faulty parts
- 17% Work incorrectly carried out
- 8% Environment
- 9% Faulty equipment
- 9% Humidity
Predictive Maintenance
Anticipate future equipment failure

The undesirable phenomena in electrical distribution are:

- **Electrical**
  - Short-circuit
  - Current overload
  - Overheating
  - Partial discharge, etc

- **Mechanical**
  - Effect of wear on the operating system
  - Effect of wear on the breaking system, etc

- **Environmental**
  - Humidity/ventilation
  - Pollution, etc

Specific diagnosis tools and consumables

- Schneider Electric has developed specific proprietary tools required for diagnostic work on electrical distribution equipment.
- Feedback from maintenance missions and the problems encountered allow us to develop and evolve these tools at crucial places in the electrical distribution:

Plan for the future of your electrical distribution installation
ProDiag Breaker
Diagnosis of MV and LV Circuit Breakers

What is ProDiag Breaker?

ProDiag Breaker compares the mechanical and electrical parameters measured during the full operation of circuit breakers with the data collected from our production facilities. This allows detecting possible failure in advance.

It measures, records and displays on a screen the key electrical parameters in MV and LV circuit breakers, relating to opening, closing and spring-loading operations.

All this data is automatically compared with the criteria for the circuit breaker designated in the software, which indicates which values are within the acceptable range, which are on the limit and which are outside it.

Two tests are always performed on each circuit breakers, one at minimum voltage and one at nominal voltage.

A written report is generated and provided by Schneider Electric so that the customer can use it as a tool to define the necessary corrective action (maintenance, repair or replacement).

ProDiag Breaker provides a report of the complete nature of the circuit breaker, detailing:
- closing / opening time, contact simultaneity, bounce and resistance, mechanical closing and opening forces.
-

Measurements taken on de-energized equipment:
1. Charging time of control mechanism
2. Opening and closing times
3. Opening and closing speeds
4. Simultaneousness of contacts at opening and closing
5. Check safety to close (overtravel and stabilisation)
6. Check safety to open (overtravel and stabilisation)
7. Wear of arcing contacts
8. Contact and insulator resistance
9. Check / adjustment of condition of the damper and / or stop device
ProDiag Corona
Diagnosis of partial discharges

What is ProDiag Corona?

ProDiag Corona detects partial discharges in Medium Voltage cubicles.  
> Partial Discharge occurs across part of the insulation between two conducting electrodes, without completely bridging the gap.
> Partial discharge can happen under normal working conditions as a result of insulation breakdown due to premature aging caused by thermal or electrical over-stressing of the high voltage system.

ProDiag Corona analyses the primary electrical signal through VIS (Voltage Indicator System) fixed on the switchboards. Measurements are taken by an electronic sensor and the data is transmitted to the ProDiag Corona software in order to evaluate the level of criticality of the controlled equipment.

ProDiag Corona is not a certification tool.

ProDiag Corona executes the assessment of the energized equipment, without any shutdown and then without disruption for the users

A written report is generated, which will be handed over by Schneider Electric so that the customer can use it as a tool to define the necessary corrective action, whether maintenance, repair or replacement.

ProDiag Corona provides a report of the complete electrical room, detailing: ventilation, air filtration, due point calculation, level of criticality of each set of equipment, constructor recommendations on any potential maintenance, repair & rehabilitation.

---

**3 different types of partial discharge**

1. **Internal discharge**
   - Dielectric breakdown
   - Internal breakdown

2. **Surface discharge**
   - Dielectric breakdown
   - Surface breakdown

3. **Corona discharge**
   - Dielectric breakdown
   - Surface breakdown

---

1. Electrical room observation (Air con., dust, humidity, thanks dedicated device)
2. Equipment identification
3. Collect and measure data through VIS thanks to dedicated sensors
4. Analyse of the results by ProDiag Corona
5. Soft handle by SE expert
6. Provide Recommendations
7. Incident anticipation & efficiency improvement

Report on ProDiag Corona diagnosis
ProDiag Transfo Relay
Diagnosis of oil Distribution Transformer Protection Relay

What is ProDiag Transfo Relay?

ProDiag Transfo Relay protects your oil immersed transformer against internal faults by detecting: temperature, pressure, and gas.
The ProDiag Transfo Relay solution validates the proper functioning of the Transformer Protection Relay and avoids the risk of overheating.
Correct operations tested on DGPT2, DMCR and RIS relays of any Oil distribution transformer

> Checking all 3 relay functions
1. Temperature (alarm and tripping)
2. Pressure
3. Release of gas
ProDiag Fuse
Diagnosis of MV fuses

Description of test
Measure the resistance of an MV fuse using a milliohmeter
Checking of this measurement with the ProDiag Fuse software

Operating principle:

![Image](1 filament destroyed - Resistance - Heating)

Advantages:
Avoid thermal runaway of fuses
Avoid fuse blowing following an overload

ProDiag Thermography

Description of test
Checking installations using a thermal imaging camera
Checking measured temperatures with respect to normal operating temperatures

Operating principle:
Thermal imaging cameras provide an image of what is happening in the form of a temperature gradient. These images allow installation hot spots to be identified.

Advantages:
Detect hot spots in a live electrical installation (due to a bad connection, harmonics, overloads, unbalancing etc.)
Foresee risks of a fire and any other malfunction that could endanger people and equipment

![Image](Downstream switchgear connection)
ProDiag Trip Unit
Diagnosis of LV Circuit Breakers

What is ProDiag Trip Unit?

ProDiag Trip Unit is a software tool used to check the selected protection relay functionalities on de-energized Low Voltage Circuit Breakers according to the customers’ real protection settings.

The expert measures the protection tripping times by carrying out secondary injection testing and enters the test results in the software tool.

The tripping times are highlighted on the tripping curve and give a clear indication of whether or not they are within the specified parameters. ProDiag Trip Unit can also be used to check the discrimination between upstream and downstream devices.

ProDiag Trip Unit is not a certification tool.

A written report is generated, which will be handed over by Schneider Electric so that the customer can use it as a tool to define the necessary corrective action, whether maintenance, repair or replacement.

> Typical curves analyzed by ProSelect LV™

Date: 25/02/2014
Customer: EQI test 1
Site: EHI
Substation: Dekhela port
Switchboard: MV01
Function: feeder
Engineer: M. Sadek
Type of device: Masterpact NW16N1
Serial number: Control unit: Micrologic 5.0P
CT rated current: In = 1600 A
Breaking capacity (415 V): 42 kA
Settings:
Long Time
Ir = 1520 A
Tr(6Ir) = 1 s
Idmtl = IT
Short Time
Isd = 9120 A
Tsd = 0.3 s
Option I t = ON
Instantaneous
Inst = 24000 A

> Injection measurements

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Current (A)</th>
<th>Guaranteed no-tripping time (s)</th>
<th>Time measured (s)</th>
<th>Guaranteed tripping time (s)</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3700</td>
<td>5.3</td>
<td>6.1</td>
<td>8.65</td>
<td>valid</td>
</tr>
<tr>
<td>2</td>
<td>15000</td>
<td>0.23</td>
<td>0.272</td>
<td>0.48</td>
<td>valid</td>
</tr>
<tr>
<td>3</td>
<td>36000</td>
<td>0.02</td>
<td>0.03</td>
<td>0.05</td>
<td>valid</td>
</tr>
</tbody>
</table>

1. De-energise the circuit breaker to be tested
2. Enter circuit breaker, relay type and protection settings in ProDiag Trip Unit
3. Test relay with the dedicated Test Tool
4. Enter results in ProDiag Trip Unit software
5. Recommendations according to the tripping curve
6. Conformity of the relay or relay replacement
7. Give peace of mind to protect your installation

Report on ProDiag Trip Unit Test

™
Spare Parts

Having a service plan with Schneider Electric guarantees to you:

> Original manufacturer, design & quality
> Guarantee of Spare Parts Availability
> Key Contributor to Customers’ Satisfaction

Provide to you the most relevant information, such as obsolescence

Examples of parts that must be installed by the manufacturer

> **MV Circuit Breaker - Switch Cubicle**

<table>
<thead>
<tr>
<th><strong>Recommended Spare Parts</strong></th>
<th><strong>Secure: Parts commonly used in corrective maintenance interventions</strong></th>
<th><strong>Prevent: Parts whose condition are checked in preventive maintenance interventions</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Relay, LV Fuse</td>
<td>Light maintenance</td>
<td></td>
</tr>
<tr>
<td>Auxiliary Contact</td>
<td>Light maintenance</td>
<td></td>
</tr>
<tr>
<td>Tripping coil</td>
<td>Light maintenance</td>
<td></td>
</tr>
<tr>
<td>Mitop for switch</td>
<td>Light maintenance</td>
<td></td>
</tr>
<tr>
<td>Undervoltage coil</td>
<td>Advanced maintenance</td>
<td></td>
</tr>
<tr>
<td>Motor</td>
<td>Advanced maintenance</td>
<td></td>
</tr>
<tr>
<td>Gears motor</td>
<td>Exclusive maintenance</td>
<td></td>
</tr>
<tr>
<td>Operating mechanism</td>
<td>Exclusive maintenance</td>
<td></td>
</tr>
<tr>
<td>Capacitive insulator</td>
<td>Advanced maintenance</td>
<td></td>
</tr>
<tr>
<td>Earthing cluster</td>
<td>Advanced maintenance</td>
<td></td>
</tr>
</tbody>
</table>

**Exclusions**

- Exclusive maintenance conducted by ED equipment manufacturer only
- Advanced maintenance, preferably conducted by ED equipment manufacturer or manufacturer certified partner
- Light maintenance, conducted by ED equipment manufacturer or customer competent technician

Higher availability of critical spare parts
## MV Transformers Services Range

### Oil Immersed Transformers
- Visual inspection:
  - Cleanliness.
  - Surface coating damage.
  - Checks for leakage.
  - Checks on tightening.
  - Oil level.
  - Connections and setting of protection relays.
- Accessories:
  - Installation of surge arresters.
  - Locking devices on connections and housing.
  - Retention tank.
  - Cable boxes.
  - Silica gel replacement, etc.
- Maintenance on OLTC (On Load Tap Changer)

### Cast Resin Transformers
- Visual inspection:
  - Cleanliness.
  - Surface coating damage.
  - Checks on tightening.
  - Winding status.
  - Connections and setting of protection relays.
- Accessories:
  - Installation of surge arresters.
  - IP housing.
  - Locking devices on connections and housing.
  - Cable boxes, etc.

### Preventive
<table>
<thead>
<tr>
<th>Predictive</th>
<th>Corrective</th>
</tr>
</thead>
</table>
| **Diagnosis** | • Oil treatment:  
| • Oil sampling and analysis | • Particle filtration.  
| • Check on hot spots:  
| | • Cleanup and depollution.  
| | • Oil replacement, oil recycling, PCB decontamination.  
| | • On-site repairs  
| | • Leakages.  
| | • Painting.  
| | • Gasket replacements.  
| | • In-house repairs  
| | • Gasket replacements, re-painting, replacement of protection devices, inspection and cleaning of bushings, complete electrical testing, etc.  
| | • Fan installation  
| | • Spare parts  
| • Dielectric measurements:  
| | • On-site repairs  
| | • Painting.  
| | • Winding wedging.  
| | • In-house repairs  
| | • Re-painting, replacement of protection devices, inspection and cleaning of bushings, complete electrical testing, etc.  
| | • Fan installation  
| | • Spare parts  
| • Accessories:  
| | • Check on hot spots:  
| | • IR thermography.  
| | • Measurement of contact resistance.  
| | • Interpretation of results.  
| | • In-house repairs  
| | • Gasket replacements, re-painting, replacement of protection devices, inspection and cleaning of bushings, complete electrical testing, etc.  
| | • Fan installation  
| | • Spare parts  
| • Check on hot spots:  
| | • IR thermography.  
| | • Measurement of contact resistance.  
| | • Interpretation of results.  
| | • In-house repairs  
| | • Gasket replacements, re-painting, replacement of protection devices, inspection and cleaning of bushings, complete electrical testing, etc.  
| | • Fan installation  
| | • Spare parts  
| • Dielectric measurements:  
| | • Check on hot spots:  
| | • IR thermography.  
| | • Measurement of contact resistance.  
| | • Interpretation of results.  
| | • In-house repairs  
| | • Gasket replacements, re-painting, replacement of protection devices, inspection and cleaning of bushings, complete electrical testing, etc.  
| | • Fan installation  
| | • Spare parts  
| • Accessories:  
| | • Check on hot spots:  
| | • IR thermography.  
| | • Measurement of contact resistance.  
| | • Interpretation of results.  
| | • In-house repairs  
| | • Gasket replacements, re-painting, replacement of protection devices, inspection and cleaning of bushings, complete electrical testing, etc.  
| | • Fan installation  
| | • Spare parts  
| • Check on hot spots:  
| | • IR thermography.  
| | • Measurement of contact resistance.  
| | • Interpretation of results.  
| | • In-house repairs  
| | • Gasket replacements, re-painting, replacement of protection devices, inspection and cleaning of bushings, complete electrical testing, etc.  
| | • Fan installation  
| | • Spare parts  

Risk assessment according to environment, conditions of use, criticality.
On-Demand Maintenance

Schneider Electric’s policy has always been to provide its customers with very close support in their daily activities to enable them to achieve operational excellence.

> limit down time by relying on our knowledge of our products and your business,
> inspected or commissioned equipment will meet requirements to ensure optimal production quality,
> in case of a fault, get operations started again as quickly as possible to limit losses and risks,
> equipment is started up as recommended by the manufacturer

Combining technical know-how and fast response
Precision, proven tools and procedures, expert knowledge, and experience – that’s what it takes to start up an electrical distribution installation the right way.

Without these, you increase the risk of start-up delays and premature equipment failure.

Schneider Electric installation & commissioning services were created specifically to improve the launch phase of MV/LV electrical distribution installations.

We give you an extra level of assurance that your equipment will function optimally after start-up and we offer expert advice on how to keep it running for a long time.

> Reduced risk of delays
> Reduced risk of premature failure
> On-site recommendations for set-up, operation, and maintenance
> Traceability of Schneider Electric interventions

Minimize risk of warranty issues with correct equipment start-up
# Installed Base Assessment Form

## End User data

| Project: | |
| Customer: | |
| Address: | |
| Contact person: | |
| Job Title: | |
| Phone: | |
| Email: | |

## Electrical Distribution

## MV / LV switchgear data

| Brand: | |
| Type: | |
| Manufacturing year: | |
| Rated Voltage: | |
| Rated Busbar current In(A): | |
| No. of cubicles of switchboard: | |

## C.B data

| Brand: | |
| Installation Mode: Qty Fixed (-----------------) , Qty Withdrawable (-----------------) | |
| Qty | Type | Rating (V & I) |

## Protection Relay data

| Brand: | |
| Qty | Type |

## Power Transformer data

| Brand: | |
| Qty | Type | Rating (KVA) |

Please hand it to Schneider Electric services representative or send it on [customer.care@eg.schneider-electric.com](mailto:customer.care@eg.schneider-electric.com) in order to provide you with the recommendations for your Maintenance plan.
# Installed Base Assessment Form

## End User data

<table>
<thead>
<tr>
<th>Project:</th>
<th>Customer:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td>Contact person:</td>
</tr>
<tr>
<td>Job Title:</td>
<td>Phone:</td>
</tr>
<tr>
<td>Email:</td>
<td></td>
</tr>
</tbody>
</table>

## Automation

<table>
<thead>
<tr>
<th>PLC</th>
<th>SCADA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brand:</td>
<td>Brand:</td>
</tr>
<tr>
<td>Type:</td>
<td>Type:</td>
</tr>
<tr>
<td>Qty:</td>
<td>Qty:</td>
</tr>
<tr>
<td>Year of Installation:</td>
<td>Year of Installation:</td>
</tr>
</tbody>
</table>

## Human Machine Interface (HMI) & Drives & Soft Starters

| Brand: | Brand: |
| Type: | Type: |
| Qty: | Qty: |
| Year of Installation: | Year of Installation: |

## Critical Power & Cooling

<table>
<thead>
<tr>
<th>UPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brand:</td>
</tr>
<tr>
<td>Model:</td>
</tr>
<tr>
<td>Serial #:</td>
</tr>
<tr>
<td>Rating:</td>
</tr>
<tr>
<td>Qty:</td>
</tr>
<tr>
<td>Year of Installation:</td>
</tr>
</tbody>
</table>

## Cooling Products

| Brand: |
| Model: |
| Serial #: |
| Qty: |
| Year of Installation: |

## Building Management Systems

| Brand: |
| Year of Installation: |

Please hand it to Schneider Electric services representative or send it on [customer.care@eg.schneider-electric.com](mailto:customer.care@eg.schneider-electric.com) in order to provide you with the recommendations for your Maintenance plan.
Technical Training
Technical Training

Customer Training Center (CTC)

As the global leader in energy management, we at Schneider Electric understand the importance of knowledge in making electrical energy safer, reliable and available to everyone.

We also understand your needs for making your workplace safer and your utilization of electrical energy more efficient, therefore we have invested heavily in building our training center.

We have equipped it with very modern educational equipment and designed the training courses to meet your training needs and answer your questions.

Our trainers at CTC come with solid hands-on field experience and academic knowledge and are enthusiastic to share with you their expertise that will make you use the best of your electrical energy.

Lab and Training Kits

> 3D Simulator Training Kit  > Ecostruxure Training Demo Room

> Training Kits

Technical Training ... a profitable investment
<table>
<thead>
<tr>
<th>Course name</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Technical Training</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Electrical Power &amp; Distribution</strong></td>
<td></td>
</tr>
<tr>
<td>• Wiring And Troubleshooting Of The Electrical &amp; Control Circuits For Technicians</td>
<td>TECH01</td>
</tr>
<tr>
<td>• Design, Maintenance &amp; Testing of LV switchgear</td>
<td>LVD 01</td>
</tr>
<tr>
<td>• Design of LV switchboards using Ecodial Software</td>
<td>LVD 02</td>
</tr>
<tr>
<td>• Design, Testing and Certification of LV Electrical Installation</td>
<td>LVD 03</td>
</tr>
<tr>
<td>• Safety &amp; Earthing Arrangements For Electrical Networks</td>
<td>LVD 04</td>
</tr>
<tr>
<td>• Design, Maintenance &amp; Testing of MV switchgear</td>
<td>MVD 01</td>
</tr>
<tr>
<td><strong>Protection Relays</strong></td>
<td></td>
</tr>
<tr>
<td>• Implementing and using SEPAM products</td>
<td>MVD 02</td>
</tr>
<tr>
<td>• Electrical Network Protection Diploma Level : I</td>
<td>PR 01</td>
</tr>
<tr>
<td>• Electrical Network Protection Diploma Level : II</td>
<td>PR 02</td>
</tr>
<tr>
<td><strong>Power Quality &amp; Green Energy</strong></td>
<td></td>
</tr>
<tr>
<td>• Power Quality Improvement in the electrical distribution networks</td>
<td>PQ 01</td>
</tr>
<tr>
<td>• Design of Photovoltaic Systems (Grid-tie type)</td>
<td>PV 01</td>
</tr>
<tr>
<td><strong>Motor Starters &amp; Drives</strong></td>
<td></td>
</tr>
<tr>
<td>• Motor starting, operation and protection (LV)</td>
<td>IC 01</td>
</tr>
<tr>
<td>• LV Soft Starters for electrical motors</td>
<td>IC 02</td>
</tr>
<tr>
<td>• LV Variable Speed Drives for electrical motors</td>
<td>IC 03</td>
</tr>
<tr>
<td><strong>Automation &amp; Scada</strong></td>
<td></td>
</tr>
<tr>
<td>• Design and Management of Smart Homes Using KNX System</td>
<td>KNX 01</td>
</tr>
<tr>
<td>• Basics of PLC</td>
<td>AUT 01</td>
</tr>
<tr>
<td>• Advanced PLC</td>
<td>AUT 02</td>
</tr>
<tr>
<td>• Control of Industrial Processes- Applications using 2D and 3D simulators</td>
<td>AUT 03</td>
</tr>
<tr>
<td>• Basics of Vijeo Citect SCADA</td>
<td>AUT 04</td>
</tr>
<tr>
<td>• Advanced of Vijeo Citect SCADA</td>
<td>AUT 05</td>
</tr>
<tr>
<td>• Human Machine Interface (HMI)</td>
<td>AUT 06</td>
</tr>
<tr>
<td>• Industrial Communication</td>
<td>AUT 07</td>
</tr>
</tbody>
</table>
Become a champion of energy efficiency with Energy University

Your energy education begins here

Energy University is a free, Web-based learning program focused on improving energy efficiency and conservation in any organization. Developed by Schneider Electric, The Global Specialist in Energy Management, Energy University delivers timely, unbiased information from energy experts across multiple industries.

Designed to fit your schedule and meet your needs

On demand courses are designed in convenient thirty-minute modules. Courses qualify for professional education credits from numerous associations as well.

Energy University is approved or endorsed by many professional organizations:

- The U.S. Green Building Council (USGBC)
- The Institute of Electrical and Electronic Engineers (IEEE)
- The Italian Federation for the Rational use of Energy (FIRE)
- The Renewable Energy & Energy Efficiency Partnership (REEEP)
- BOMI International
- The chartered Institution of Building Services Engineers (CIBSE)
- The American Council On Renewable Energy (ACORE)
- The American Hotel & Lodging Educational Institute (AH&LEI)
- Engineers Ireland
- The Association for Facilities Engineering (AFE)

Visit www.myenergyuniversity.com and enroll now for free. For more information call our Customer Care Center 19775.
Automation Services

IT - Critical Power & Cooling Services

Building Management Systems Services
Automation Services

A dedicated services offer for your installed base

Schneider Electric, with its experts, products and dedicated tools, provides services such as system design, consultancy, maintenance contracts, modernisation of facilities or delivering projects.

Maintenance and support services

Spare parts, exchanges and repairs

Everything you need to get equipment working again as quickly as possible

Solutions to respond very quickly to requests for spare parts, exchanges and repairs to your installed automation equipment (automation platforms, Human Machine Interfaces, drives, distributed I/O):

Spare parts management:
> Identification of critical parts
> Stock of spare parts: a Schneider Electric owned stock of spare parts, on your site or in one of our warehouses
> Testing of spare parts stored on site

Repairs:
> Broken down products are repaired in a network of worldwide repair centers. For each repaired product, our experts provide a detailed report.

On-site repair:
> Our experts’ knowledge and expertise
> Monitoring of specific repair procedures

Exchanges:
> With standard replacements, receive a new or reconditioned product before the broken down product has even been sent back

Preventive maintenance

Improving and guaranteeing the long-term reliability and performance of your installations

Schneider Electric’s preventive maintenance expert assesses your site, the equipment to be managed and sets up a maintenance program to accommodate specific requirements.

Extended warranty

An additional manufacturer warranty covering replacement or repair of the equipment

The extended warranty offers the option to take out a 3-year warranty.

Online support

Access to dedicated experts

Priority access to experts who can answer technical questions promptly concerning equipment and software both on sale and no longer commercially available.

Software subscription

Access to software upgrades and new features

Unscheduled downtime is expensive. The global process industry loses $20 billion, or five percent of annual production, due to unscheduled downtime and poor quality. ARC estimates that almost 80 percent of these losses are preventable...»

ARC Advisory Group, 2010
Consultancy services

M2C (Maintenance and Modernization Consultancy)

Professional tools and methods, proven experience of managing obsolescence and updating installed bases, to reduce downtimes and improve performance

With our maintenance and modernization consultancy offer, Schneider Electric will help you check the state of your installed base by:
> Defining the scope and depth of the analysis in collaboration with you
> Collecting the technical data without shutting down production
> Analyzing and identifying avenues for improvement
> Producing a recommendation plan

Customer benefits:
> Learning about the components that make up the installed base and how up-to-date they are
> Better downtime anticipation
> Expert advice designed to improve performance

Modernization solutions

Migration to PlantStruxure

Proven expertise, tools and methods to give you a clear vision of the improvement opportunities and guide you toward a successful modernization project

Schneider Electric offers a gradual program of modernization through a series of products, tools and services that allow you to upgrade to newer technology. There are several stages in this gradual modernization program:
> Partial program: replacement of an old component with a new one
> Staggered program: gradual incorporation of new offers in the system
> Total program: total renovation of the system

The table below lists our various migration offers:

<table>
<thead>
<tr>
<th>Solution</th>
<th>Change the CPU</th>
<th>Keep the I/O racks &amp; wiring</th>
<th>Change the I/O racks &amp; keep the wiring</th>
<th>Migrate your application</th>
<th>Manage your project</th>
<th>Execute your project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platform (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TSX47 to TSX107</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>April series 1000</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Modicon p84, Compact</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>April SMC</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Merlin Gerin PB</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>AEG</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Symax</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Rockwell SLC500</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
</tbody>
</table>

(1) Service available

Customer benefits:

Schneider Electric is able to meet your specific requirements and provide you with adapted products:
> Protective coating for Human Machine Interfaces, automation platforms and distributed I/O modules for use in harsh environments
> Customized cable lengths to match your specific needs
> Customized front panels for Human Machine Interfaces

To find out more about PlantStruxure architectures, please visit our website www.schneider-electric.com/PlantStruxure

Wide range of migration offers

<table>
<thead>
<tr>
<th>Platform (1)</th>
<th>Change the CPU</th>
<th>Keep the I/O racks &amp; wiring</th>
<th>Change the I/O racks &amp; keep the wiring</th>
<th>Migrate your application</th>
<th>Manage your project</th>
<th>Execute your project</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSX47 to TSX107</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>April series 1000</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Modicon p84, Compact</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>April SMC</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Merlin Gerin PB</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>AEG</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Symax</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Rockwell SLC500</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
</tbody>
</table>

Service available

(1) Our migration service offer also includes SCADA, Human Machine Interfaces, drives, communication networks and distributed I/O.
IT - Critical Power & Cooling Services

Expertise, service, and support for building, industry, power, and data center infrastructure

Benefits of regular service

<table>
<thead>
<tr>
<th>Benefit</th>
<th>✔</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevents potential problems, reducing or even eliminating costly downtime</td>
<td>✔</td>
</tr>
<tr>
<td>Makes equipment more energy efficient</td>
<td>✔</td>
</tr>
<tr>
<td>Ensures peak system performance — much like regular oil changes or tune-ups will improve your car’s performance</td>
<td>✔</td>
</tr>
<tr>
<td>Protects your investment and can prolong the life of your system</td>
<td>✔</td>
</tr>
<tr>
<td>Frees you to focus on your core competencies</td>
<td>✔</td>
</tr>
</tbody>
</table>

Integration Services

Plan

Planning is the strong foundation of any data center project. Utilizing CPCS expertise in planning and design will ensure a successful outcome in the later stages.

- Data center assessments
- Design and planning consultation

Build

When the planning stage is complete, CPCS provides the services that can take your data center project from acquisition through implementation to ensure an efficiently operational system.

- Data center assessments
- Project services
- Integration services
- Installation services
- Testing and training

Operate

CPCS offers a portfolio of services designed to ensure your critical application receives the care it needs for optimal performance and maximum availability.

- Data center assessments
- Maintenance services
- Service plans
Modernization Services

Complete renovation for data center & its infrastructure

Installation Services

Assembly and Start-up
Start service by a certified FSE ensures full factory warranty coverage

Testing and Training Services

Testing
Witness your product in a testing environment before hooking it up to a critical load

Training
Skill-building and learning opportunities to help you efficiently operate your equipment

Maintenance Services

Preventive Maintenance Services
An on-site examination of your system that ensures optimal performance and prevents problems before they occur

On-Site Warranty Extension
Delivers the on-site support you need to bring your business back up and running in a time frame compatible with your business requirements

IT services include
> Service contracts
> SWAP centers
> Battery replacement
> UPS (single & 3 ph.) and Cooling systems services
Building Management Systems Services

Improve the efficiency, occupant comfort, and financial well-being of your building

Preventative maintenance

Traditional services

BMS are critical to day-to-day facility operation and occupant comfort. Preventative maintenance services keep your BMS running in top condition and ensure they provide the foundation for effective implementation of all other services offers.

Commissioning

Restore designed operations

Re- and retro-commissioning services restore building operations to their designed state by looking at the engineered design parameters and considering the interaction of all system components. Engineers calibrate, tune, and repair components to restore working order to the entire facility.

Building Analytics

Reduce facility operating costs over time by targeting maintenance efforts.

Identify: Stakeholders can access automated diagnostic results for instant visibility into the most costly issues for their facility and can direct maintenance resources accordingly.

Expert review: Remote expert engineering analysts aggregate diagnostic results, track progress, and consult with stakeholders on harder to solve problems.

Execute: Schneider Electric service, internal team members, or external vendors are directed to address mechanical issues and cost-saving opportunities.

Validate: The data validates if problems were effectively resolved or require further attention.
Building Optimization

Ensure optimal HVAC operation automatically

By continually optimizing the HVAC system’s energy consumption and pre-planning its operations, Building Optimization enables you to:

- Reduce energy expense
- Free up resources through automated, real-time monitoring of HVAC operations
- Improve your property’s valuation by increasing net operating income
- Automate demand response events and avoid peak day pricing penalties
- Lower your carbon footprint
- Contribute to your building’s ENERGY STAR®, LEED®, NABERS, and other green building ratings

Lower HVAC energy costs up to 25%, which reduces total energy use up to 8%, with Building Optimization
Energy Efficiency Solutions
EnergySTEP (Energy Sustainability Tiered Efficiency Program)

Schneider Electric has developed a life cycle solution to illustrate the process.

Energy Efficiency Solutions

Schneider Electric has developed a life cycle solution to illustrate the process.

EnergySTEP (Energy Sustainability Tiered Efficiency Program)

Our EnergySTEP™ program is designed to help you to spot opportunities for energy saving and take action.

Our Energy Efficiency Power Consultants conduct energy efficiency and process audits on your premises to identify energy saving areas and equipment. They work to a methodology that is carefully structured to match your specific production-related energy needs.

<table>
<thead>
<tr>
<th>What our EnergySTEP teams do</th>
<th>The benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benchmark major energy processes and items</td>
<td>Clearer view and understanding of your electricity use</td>
</tr>
<tr>
<td>Draw up energy balance sheet showing how site and its workshop perform, and define medium-term and long-term energy efficiency action plans</td>
<td>You are given energy saving solutions with their estimated ROI</td>
</tr>
<tr>
<td>Identify areas where energy savings can be made and their potential ROI</td>
<td>You can decide which action in your energy efficiency to prioritize</td>
</tr>
<tr>
<td>Recommend electricity deals and rates that will reduce your electricity bill</td>
<td>You use your energy more cost-efficiently</td>
</tr>
</tbody>
</table>
Power availability and reliability
Verify the reliable operation of power equipment
> Ensure and indicate that operations are normal
> Proactively optimise electrical distribution network
> Monitor breaker status, trip counting, real-time voltage, transformers, ATS, generators, capacitor banks, and tap changers
> Stay alert to adverse trends; take corrective action when necessary

Improve response to power-related problems
> Verify normal activities and provide information to help proactively assess issues
> Quickly review events, trends, and load status before, during, and after a problem

Validate that power quality complies with the energy contract
> Analyze and verify metrics to ensure compliance with agreed-upon levels of quality

Billing and cost allocation
Produce accurate tenant energy bills
> Automatically collect meter energy consumption data (AMR)
> Calculate the cost for energy (WAGES) usage based on tiered rates, coincidence demand, Time of Use (TOU), Power Factor penalties, taxes, and other charges
> Totalize metering points for accurate energy usage allocation
> Account for changing tenants at any time

Identify billing discrepancies
> Validate utility bills, document errors, and measure energy contract compliance
> Identify false penalty charges and validate benefits of on-site generation

Allocate costs to departments or processes
> Collect, calculate, and report costs for buildings, departments, processes, shifts, lines, or equipment
> Reduce expenses, enable best practices, and validate all your conservation initiatives

See, measure, and manage critical energy data like never before
Energy efficiency
Measure efficiency, reveal opportunities and verify savings
> Measure and compare consumption across departments, processes, and industry KPIs to identify the optimal places for improvement or adjustment
> Confirm ROI for system improvements with advanced reporting and analysis
Reduce peak demand, power factor penalties
> Identify locations of poor power factor and justify power factor improvement measures
> Automatically monitor capacitor banks, load tap changers
> Alert on demand levels, analyze trends to identify demand reduction and load shifting opportunities

Electrical distribution monitoring
Leverage existing infrastructure capacity and avoid over-building
> Reveal historical and current load patterns and hidden capacity
> Determine if existing infrastructure will accommodate new equipment
Support proactive maintenance to prolong asset life
> Real-time and historical data reveals relationships between equipment and the conditions affecting system stability

What you cannot measure, you cannot control
> Power Factor Correction & Harmonics Mitigation Solutions

Schneider Electric power quality correction products are part of the solution.

Most utilities charge for peak electrical demand on each month’s electrical bill. The demand charge is to allow the utilities to recoup part of their capital investment in the distribution network they operate. Each customer pays a demand charge for its peak operating load. Often inherent in the structure of these demand charges is an allowance for some inefficiency but most utilities will offer an incentive to their customers to keep electrical efficiency (measured by power factor) high. Power factor correction devices improve overall electrical efficiency upstream of their point of connection in the electrical network and can be used to minimize utility kVA demand charges.

Harmonics may disrupt normal operation of other devices and increase operating costs. Symptoms of problematic harmonic levels include overheating of transformers, motors and cables, thermal tripping of protective devices, logic faults of digital devices and drives. Harmonics can cause vibrations and noise in electrical machines (motors, transformers, reactors). The life span of many devices can be reduced by elevated operating temperature.

Other benefits include:

> **Transformer and distribution network offloading.** Improving power factor reduces kVA loading of the distribution network such that additional process equipment may be added without the need for incremental investment in transformers and distribution equipment.

> **Ensuring compliance with harmonic standards.** Standards limiting a customer’s harmonic pollution of the utility grid exist and can be enforced by the utility.

> **Improving reliability of the distribution network and process equipment.** Harmonics generated by non-linear loads can cause problems, such as logic faults of digital devices with sensitive process equipment leading to downtime and scrap.

> **Reducing overheating** of transformers, motors and cables to prolong the life span of these components.
Power factor correction

Power factor basics

AC Power flow has three components:

> **Active Power (P)** is the power needed for useful work such as turning a lathe, providing light or pumping water. It is expressed in Watt or KiloWatt (kW).

> **Reactive Power (Q)** is a measure of the stored energy reflected to the source. It is expressed in var or Kilovar (kVAR).

> **Apparent Power (S)** is the vector sum of both the active and the reactive components. It is expressed in Volt Amperes or in KiloVolt Amperes (kVA).

Power triangle

The relations between the various power components are illustrated in the power triangle shown in f.1.

From f.1, it is apparent that the active power component is in phase with the applied voltage while the reactive component occurs 90° out of phase with the voltage.

The equation that defines this relationship is:

\[(\text{kW})^2 + (\text{kVAR})^2 = (\text{kVA})^2\]

**Power factor (PF)** is, in fact, a measure of efficiency. When the PF reaches unity (as measured at the utility power meter), it can be said that the electrical system in the plant is operating at maximum efficiency. Depending on the local utility rate structure, a PF below target PF may result in higher utility power bills than are necessary.

There are two commonly used definitions of power factor:

> **PF** = Cosine of phase displacement between current and voltage.

> **PF** = Cosine of angle between active power and apparent power.
Harmonic mitigation provides several benefits that could be translated into financial savings for the investor and for the user. We propose solutions which maximize the savings when balanced with the cost of the harmonic mitigation equipment to get a reasonable Return On Investment (ROI).

In order to illustrate the benefits, we will take the example of the following installation with two different situations.

**AC drives standard type**
- Line current waveform (6 pulses):
  - Maximum line r.m.s. current = 60A

**Altivar ATV212**
- Line current waveform with C-Less technology:
  - Total harmonic distortion: THDi = 35%
  - Line r.m.s. current = 38A

In both cases, the transformer is chosen to keep the Total Harmonic Voltage Distortion THDu below 5%.

Usage and simultaneity factors have been taken into account for convenient sizing of equipment.

- Up to 25% Capex and Opex reduction commonly achievable,
- Improved business performance: downtime significantly reduced, increased equipment lifetime.
Reduction of the capital expenditures (Capex)

Saving on Capex is the permanent concern of the investor. Harmonic management gives the opportunity of significant savings. We will focus on the cost of equipment and will not quote other savings such as space savings or labour costs.

Harmonic mitigation reduces the r.m.s. value of the current and so reduces the size of cables, the rating of circuit breakers and contactors, as summarized in the following table.

<table>
<thead>
<tr>
<th></th>
<th>Without mitigation</th>
<th>With mitigation</th>
<th>Capex difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive line current</td>
<td>60A</td>
<td>38A</td>
<td></td>
</tr>
<tr>
<td>Transformer</td>
<td>800 kVA</td>
<td>630 kVA</td>
<td>-11%</td>
</tr>
<tr>
<td>Cables</td>
<td>16 mm²</td>
<td>10 mm²</td>
<td>-43%</td>
</tr>
<tr>
<td>Circuit breakers</td>
<td>NSX80HMA80</td>
<td>NSX80HMA50</td>
<td>-9%</td>
</tr>
<tr>
<td>Contactors</td>
<td>TeSys D50</td>
<td>TeSys D32</td>
<td>-40%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>-15%</td>
</tr>
</tbody>
</table>

Reduction of the operating expenses (Opex)

Opex will be impacted in different ways:

> Harmonic mitigation generally contributes to reduced power losses in transformers, cables, switchgear... The maximum savings should be obtained considering the same equipment ratings. In the example given here, the energy savings are less significant compared to the annual power consumption, because the advantage of lower currents has been counterbalanced by higher impedance of the selected smaller transformer and cables.

> Harmonic mitigation allows reducing the subscribed power to the energy supplier. This saving depends on the energy supplier. In most of the cases, savings could be up to 10% of the electricity bill.

Distorted sinewave

Pure sinewave
> Motor Control Solutions

The highest potential energy savings are to be found on pumps, fans and compressors, by using Variable Speed Drives.

Benefits

> Higher efficiency and better performance than traditional mechanical solutions
> Eco friendly
> More reliable, low maintenance equipment
> Greater comfort

Motors consume:

- 30% of the energy of a building
- 60% of the energy of industries and infrastructures

i.e. 25% of the world’s energy

$ A rapid return on investment (generally less than 24 months)
Measurable savings

Two fluid control techniques are applied to pumps, fans and compressors.

**Conventional pump solution with valve**

- The motor constantly runs at full power, supplied directly by the line supply
- The flow is controlled by the position of the valve
- The poor efficiency of the valves amplifies the losses

**Increased productivity with variable speed drive**

- Improved efficiency by doing away with the mechanical device
- Motor speed adjusted to demand, reducing energy consumption

At 80% flow, power consumption falls by 50% with the variable speed drive
Increase your productivity with the Altivar Variable Speed Drives range

Compressors: up to 30% energy savings
- The variable speed drive is recommended in particular for screw compressors (air or cooling)
  - Maintenance of a constant pressure
  - Increased service life of the compressor
  - Control of the current on starting
  - Reduction of pressure surges
  - Low maintenance

Pumps: up to 50% energy savings
- Reduction of mechanical stress due to elimination of pressure surges
- Precise control according to requirement (temperature, flow rate, pressure)
- Protection of the pump and your pipes
- Multi-pump management

Fans: up to 70% energy savings
- More precise control of the system
- Reduced noise level in installations
- Improved control of air quality (control of the speed according to CO2 emissions)
- Reduced maintenance costs on belts and bearings

Example of Altivar variable speed multi-pump control
Increasing energy costs and growing awareness of the environment now means that more innovative solutions for efficient energy use are required than ever before.

To keep your energy costs down you can count on Schneider Electric’s wide range of lighting control solutions for buildings, Public lighting and street lighting.

Presence detectors react to the smallest movements, so they are ideal for indoor use in rooms with a high proportion of daylight or prolonged use. Once the ambient light falls below a certain level, the light is also switched on if a movement is detected.

Unlike the normal movement detector, the presence detector has two different channels: the first operates the lights and the second controls other functions such as heating, air conditioning or ventilation. The first channel switches on according to daylight and movement, the second only for movement. So with sufficient light, no energy is wasted and all other functions work.

An example of energy saving

Using a simple example we want to show you the significant savings that are possible with Argus: In one office space, a ceiling Argus presence detector was installed for automatic lighting control in each of the 20 rooms. With the movement and brightness control of the light, energy savings compared to manual switching were up 42%!

In this case, this corresponds to 2,100 kWh or put another way: 1,300 kg CO2 reduction per year.

This is the amount of CO2 that a car produces over a distance of 7,828 km!
Twilight IC Astro is the optimal solution for optimizing outdoor lighting, it works without a photocell, it is used to switch lighting On/off automatically in accordance with sunrise and sunset times is set according to the place of installation.

Using Twilight IC Astro can avoid the problems normally associated with the photocells, such as malfunctioning due to different environmental conditions or misuse.

It is available to control two separated channels, and through time management, different scenarios could take place, increasing the efficiency of the system, for example decreasing the lighting consumption from 2 am to 5 am where traffic decreases, or according to the peak loading on the electrical network for instance.

The most efficient light is one that is turned off when not needed!
Introduction to ISO 50001: What is it and why do I want to comply?

ISO 50001 enables organizations to establish the systems and processes necessary to improve energy performance, including energy efficiency, use and consumption. The goal of this standard is to create an energy management system (EnMS) within an organization that will lead to a reduction in greenhouse gas emissions and other harmful environmental impacts while controlling energy costs.

This International Standard lays out the best practices for managing energy. Those who adopt ISO 50001 will experience cost savings, quality improvement and risk mitigation.

Schneider Electric: Your partner for ISO 50001 Compliance

At Schneider Electric, our goal is to provide our customers with the solutions required to ensure ISO 50001 compliance. Additional benefits from compliance include greater visibility and control of energy resources, positive return on investment and reduced energy consumption and related costs.

Schneider Electric provides technology and integrated solutions to optimise energy usage. With a unique portfolio in energy management, energy procurement, global data management, electrical distribution, industrial automation, critical power & cooling, building management and security.

Schneider Electric’s world headquarters «The Hive» was the first site to receive ISO 50001 certification

Also Schneider Electric Egypt, Badr Plant is now officially Certified with The Energy Management ISO 50001 by Bureau Veritas to become the first site in Africa & Middle East Certified with the ISO 50001.
# Energy Savings Assessment Form

## End User data

<table>
<thead>
<tr>
<th>Facility name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Contact person:</td>
<td></td>
</tr>
<tr>
<td>Job Title:</td>
<td></td>
</tr>
<tr>
<td>Phone:</td>
<td></td>
</tr>
<tr>
<td>Email:</td>
<td></td>
</tr>
</tbody>
</table>

## Electrical Bill data

<table>
<thead>
<tr>
<th>Total installed power transformers (KVA):</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual consumption (KWhr):</td>
<td></td>
</tr>
<tr>
<td>KWhr tariff (LE):</td>
<td></td>
</tr>
<tr>
<td>Peak demand (KW):</td>
<td></td>
</tr>
<tr>
<td>KW tariff (LE):</td>
<td></td>
</tr>
<tr>
<td>Yearly average Power factor:</td>
<td>Bonus</td>
</tr>
<tr>
<td>Location of the Electricity Meter:</td>
<td>MV</td>
</tr>
</tbody>
</table>

## Pumps

<table>
<thead>
<tr>
<th>Pumps application:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of pumps used in this application on same head:</td>
<td></td>
</tr>
<tr>
<td>Rating of pumps motors (KW):</td>
<td></td>
</tr>
<tr>
<td>Head pressure required (bar):</td>
<td></td>
</tr>
</tbody>
</table>

## Heating, Ventilating & Air Conditioning (HVAC)

<table>
<thead>
<tr>
<th>HVAC:</th>
<th>Central</th>
<th>Split</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chiller type:</td>
<td>Absorption</td>
<td>Water cooled</td>
</tr>
<tr>
<td>AHU:</td>
<td>Fixed speed</td>
<td>Variable speed</td>
</tr>
<tr>
<td>Fan coils:</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Room temperature controller:</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

## Indoor Lighting

<table>
<thead>
<tr>
<th>Room Area</th>
<th>Lighting total wattage/room (W)</th>
<th>Number of persons in room</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Outdoor Lighting

<table>
<thead>
<tr>
<th>Lighting total wattage (W):</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching method:</td>
<td>Automatic</td>
</tr>
<tr>
<td>Control method:</td>
<td>Lux</td>
</tr>
</tbody>
</table>

Please hand it to Schneider Electric services representative or send it* on customer.care@eg.schneider-electric.com in order to provide you with the recommendations for Energy Savings Solutions.

*For more details please attach your electricity bills and annual settlement bill.
We have services to meet your equipment’s needs throughout its life cycle

Discover more about Schneider Electric electrical distribution services.
Log on to www.schneider-electric.com/electricaldistributionservices today!