TRUE COMPREHENSIVE SOLUTIONS
FOR SWITCHING & DISCONNECTING

SDCEM is a historical and worldwide recognized brand for performance and high value. Since 1947, SDCEM has developed a renowned know-how in designing and manufacturing of switching solutions, offering the widest range of Medium Voltage (MV), High Voltage (HV) & Very High Voltage (VHV) disconnectors & switches, and associated services to fit end users’ needs.

Strongly focused on excellence, we are aiming to be the reference partner for all stakeholders on 3 main activities: Railway electrification, Transmission & Distribution and Power Generation market.

Our challenge is to design and manufacture switching solutions for tomorrow: more safety, more reliability, more flexibility, longer lifecycle (up to 50 years), and lower operation and maintenance costs.

Our goal is to introduce more intelligence for installation, operation and maintenance, and more communication to increase electrical network performance, thanks to our equipment designed and manufactured at the cutting edge of technology.

Our expertise is the true assurance of high performance equipment.

This is the key for the future electrical networks: get the best from each component. It will be also the key of our future joint successes.

More than 68,000 product references
VHV & HV & MV from 12.5 kV to 550 kV in 140 countries.

Products and services approved by major customers and key utilities worldwide:
EDF, Infrabel, Network Rail, National Grid of Saudi Arabia, ONCF, RTE, SNCF, State Grid Corporation of China...
3 CORE VALUES

QUALITY
• ISO 9001 & 14001.
• Periodic audit from customers (Alstom, General Electric, Saudi Aramco, Deutsche Bahn...).
• Strict Quality procedures at each manufacturing stage.
• 100% routine test with dedicated quality control team.

INNOVATION & DESIGN
• 5% of our sales are spent in R&D with international patents.
• In-house testing: heating tests, mechanical tests, dielectric tests, climatic tests. Trial assembly platform.
• 70 years of in-house manufacturing: full control of product quality, higher flexibility in design.
• 6900 arrangements designed: we have adapted our designs to almost all the possible application!

CUSTOMER PROXIMITY
• International sales and experts network in 17 countries.
• Continuous customer support and joint developments (upstream lead studies, co-design, pilot programs) with dedicated experts team responding to existing or future site needs and challenges.
• Worldwide autonomous service team, 100% SDCEM, for expertise and excellence.
• Customer certifications:
  • RTE - France, SNCF - France, Deutsche Bahn - Germany, AFER - Romania, ONCF - Morocco, ONEE - Morocco, Red Eléctrica - Spain, ADIF - Spain, Infrabel - Belgium, Network Rail - United Kingdom, CFL - Luxembourg, National Grid and Saudi Aramco - Saudi Arabia.

3 COMMITMENTS

CUSTOMER SATISFACTION
SDCEM is customer-oriented; this is the strength of a human-scale company.
We always find technical solutions to meet projects constraints (100% technical compliance as per annual customer survey).

“The cooperation between us was really impressive and pleasant experience for us. Thank you very much for all of your support for us” MITSUBISHI - Japan.

OPERATIONAL EFFECTIVENESS
Delivery time is a key issue to SDCEM. We constantly invest in our production and assembly workshops, using renowned industrial methods and we follow up compliance issues on a weekly basis.
The key of excellence is also in the daily dynamic management of our teams with the emphasis of operational performance.

CONTINUOUS IMPROVEMENT
SDCEM aims to go beyond the existing, in all areas: manufacturing, management, design, reactivity.
Internal and external surveys are regularly undertaken: SDCEM maintains its strengths, and works hard on improvement whenever it is possible.
PROJECT ENGINEERING AND OFFER BENEFITS

Switching specialist for high technical requirement markets (power generation, transmission & distribution, railways electrification), SDCEM provides innovative solutions to optimize disconnectors and switches management and guides you to find the optimal solution throughout your projects.

RELIABLE PRODUCTS WITH VARIOUS CONFIGURATIONS

SDCEM’s aim is to facilitate the installation of equipment, increase service life with the best ratio competitiveness / performance.

SDCEM’s material is renowned by end-users for its quality and robust design and full compliance to international IEC and EN standards.

Responding to the highest technical requirements worldwide (severe operating conditions, harsh environment…) by competitive “off the shelf” solutions, we adapt standard products to numerous configurations and options to fit your needs.

FACILITATE INSTALLATION OF YOUR EQUIPMENT

Configuration adaptations
• Installations positions fitting multiple needs (vertical, horizontal, back-to-back, on the side, reversed...)
• Flexible drive rods for adaptation to tunnel
• Common frame for easy on-site installation
• Enclosures / cubicles: segregated, non segregated.
• Extended life cycle: up to 10 000 cycles.
• Range of grease free products to decrease maintenance downtimes
• Integrated self-diagnostic
• Gang-operated or non gang-operated devices.
• 3 positions disconnectors and load-break switches.
• Personalized painting...

Switching and accessories
• Optimized maintenance solutions
• Associated earthing switch (1, 2), automatic earthing switch or stand alone earthing switches.
• Interchangeability kits
• Breaking capacity for capacitive and inductive currents (> 6A) for disconnectors.
• Making and breaking capacity for bus-transfer currents (CEI 62271-102 Annexe B).
• Breaking capacity for capacitive and inductive currents for associated earthing disconnectors switch (CEI 62271-102 Annexe C).
• Small current breaking capacity (arching horns).

Vertical back-to-back vacuum break switches IT25N, SEA France
Vertical break DS tunnel installation and voltage detector. Brazil
Air breaking DS for catenary installation. Luxembourg
Braking disconnectors, painted cubicle, quick closing device. Austria
WE HELP YOU TO TARGET THE BEST

With 70 years of integrated manufacturing of disconnectors and switches, SDCEM team accompanies its customers at each step of their project step through its expertise and know-how.

A technical interlocutor, a sales contact, and a dedicated team for sustainable After Sales Service and On-Site Services.

Our committed teams:
• Analyze your project specifications,
• Listen to your needs and
• Guide you through product and service offering,

in order to select the most relevant and most competitive solution for you.

TO FACE THE TECHNICAL CHALLENGES OF TOMORROW...

Mixing strong field experience, mechanical & electronic know-how and integrated R&D, SDCEM is at the cutting edge of IED technology (Intelligent Electronic Devices). Thanks to close collaboration with operators to test, optimize and approve « plug & play » solutions, SDCEM brings you:

• Improved reliability and allows cost effective installation and maintenance, with increased features based on multi-market feedback:
  - remote control,
  - optic fiber secured communication,
  - condition monitoring (90 points of measure on each assembly)...

• Major advances with added value for operators:
  - increase profitability with sustainable and competitive investments,
  - enhance performances at constant quality,
  - transition from preventive to predictive maintenance,
  - insure tomorrow’s interchangeability...

Center break DS, integrated self-diagnostic, special painting. Germany
Rocking disconnector catenary installation Spain
Upside-down selector switch 3kV feeder arrangement. Morocco
Braking DS SB250 in cubicle, quick closing device. China
Double break 245kV, silicone insulators, double earthing switch. Saudi Arabia
OFFER PORTFOLIO

Presentation of our standard range.
You can also consult us for other products than those presented.

| Range          | Technology                                | Product                          | Indoor | Outdoor (and Indoor) | MV/HV Substations | VHV Substations | Mobile substations | Railway Electrification | Power Generation | Network Voltage - Ur (kV) | Max Rated Current - Ir (A) | Max Short circuit withstand current - Ik (kA) | Fast Break Contact withstand - Ip (kA) |
|----------------|-------------------------------------------|-----------------------------------|--------|----------------------|-------------------|------------------|-------------------|---------------------|----------------------|-----------------|-----------------------------|-----------------------------|---------------------------------|------------------------|
| Transmission & Distribution | Transmission & Distribution | Indoor | Outdoor (and Indoor) | MV/HV Substations | VHV Substations | Mobile substations | Railway Electrification | Power Generation | Network Voltage - Ur (kV) | Max Rated Current - Ir (A) | Max Short circuit withstand current - Ik (kA) | Fast Break Contact withstand - Ip (kA) |
| Railway Electrification | Railway Electrification | Indoor | Outdoor (and Indoor) | MV/HV Substations | VHV Substations | Mobile substations | Railway Electrification | Power Generation | Network Voltage - Ur (kV) | Max Rated Current - Ir (A) | Max Short circuit withstand current - Ik (kA) | Fast Break Contact withstand - Ip (kA) |
| Power Generation | Power Generation | Indoor | Outdoor (and Indoor) | MV/HV Substations | VHV Substations | Mobile substations | Railway Electrification | Power Generation | Network Voltage - Ur (kV) | Max Rated Current - Ir (A) | Max Short circuit withstand current - Ik (kA) | Fast Break Contact withstand - Ip (kA) |

| Disconnector Switches (DS) | Disconnector Switches (DS) | Indoor | Outdoor (and Indoor) | MV/HV Substations | VHV Substations | Mobile substations | Railway Electrification | Power Generation | Network Voltage - Ur (kV) | Max Rated Current - Ir (A) | Max Short circuit withstand current - Ik (kA) | Fast Break Contact withstand - Ip (kA) |
|---------------------------|---------------------------|--------|----------------------|-------------------|------------------|-------------------|---------------------|----------------------|-----------------|-----------------|-----------------------------|-----------------------------|---------------------------------|------------------------|
| Center break              | Center break              | SR16200 | SR16201H             | SR250 / SR250FB   |                  |                   |                     |                      |                 |                 |                            |                            |                                |                        |
| Double break              | Double break              | SST25  | SR16201B             | SR16201H          |                  |                   |                     |                      |                 |                 |                            |                            |                                |                        |
| Vertical break            | Vertical break            | SF6    | SR16201H             | SR16201H          |                  |                   |                     |                      |                 |                 |                            |                            |                                |                        |
| Pantograph                | Pantograph                | SP16700 |                   |                   |                  |                   |                     |                      |                 |                 |                            |                            |                                |                        |
| Coastal sliding           | Coastal sliding           | SC300  | SC300                 |                   |                  |                   |                     |                      |                 |                 |                            |                            |                                |                        |
| Rocking                   | Rocking                   | SRK     | SR16201B             | SR16201H          |                  |                   |                     |                      |                 |                 |                            |                            |                                |                        |
| Side break                | Side break                | SP16201H |                   |                   |                  |                   |                     |                      |                 |                 |                            |                            |                                |                        |
| Selector switch / Change-over switch | Selector switch / Change-over switch | DBV |                   |                   |                  |                   |                     |                      |                 |                 |                            |                            |                                |                        |
| Wall bushing DS           | Wall bushing DS           | SR2020B |                   |                   |                  |                   |                     |                      |                 |                 |                            |                            |                                |                        |
| Fuse holder               | Fuse holder               | CC2115S |                   |                   |                  |                   |                     |                      |                 |                 |                            |                            |                                |                        |

| Air breaking switch       | Air breaking switch       | IT4000  |                   |                   |                  |                   |                     |                      |                 |                 |                            |                            |                                |                        |
| Vacuum breaking switch    | Vacuum breaking switch    | IT25H   |                   |                   |                  |                   |                     |                      |                 |                 |                            |                            |                                |                        |
| Electrical Operating Mechanism | Electrical Operating Mechanism | M4A1E , M4A4E (Universal Smart Drives) |                   |                   |                  |                   |                     |                      |                 |                 |                            |                            |                                |                        |
| Manual Operating Mechanism | Manual Operating Mechanism | R77E    |                   |                   |                  |                   |                     |                      |                 |                 |                            |                            |                                |                        |

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<tr>
<th>Operating Mechanism</th>
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<th>S-Solutions</th>
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<th>Improved Reliability</th>
<th>Cost-effective Operation &amp; Maintenance</th>
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<td>Improved Reliability</td>
<td>Cost-effective Operation &amp; Maintenance</td>
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<td>Remote control board</td>
<td>Remote control board</td>
<td>Improved Reliability</td>
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<td>Portable diagnostic tool</td>
<td>Portable diagnostic tool</td>
<td>Improved Reliability</td>
<td>Cost-effective Operation &amp; Maintenance</td>
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<tr>
<td>DS Position indicator / detector</td>
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<td>Improved Reliability</td>
<td>Cost-effective Operation &amp; Maintenance</td>
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<td>Voltage detector for Railway DS/LBS</td>
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<td>Improved Reliability</td>
<td>Cost-effective Operation &amp; Maintenance</td>
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<td>Light alarm / information status</td>
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<td>Improved Reliability</td>
<td>Cost-effective Operation &amp; Maintenance</td>
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* : Standard value. Other values available upon request.
1: Derating is applied for metal enclosures.
BENEFITS FOR OPERATION AND MAINTENANCE TEAMS

Maintain the network security, availability and reliability is the essence of TSOs operation and maintenance departments. TSO operators have to implement long lasting technical solutions to ensure the availability of VHV, HV & MV network equipment. SDCEM products integrate in the most efficient manner a variety of solutions designed and developed with and for electrical network operators.

SDCEM has integrated IED (Intelligent Electronic Devices) with native intelligence to switching and disconnecting function to optimize Life Cycle Cost Management, reducing the TOTAL COST OF OWNERSHIP.

SWITCHING AND MUCH MORE ....

More than disconnectors, we offer you full comprehensive solutions, integrating a range of optimised switching solutions for :

- Increased safety level for equipment and teams
- Increased network reliability and availability.
- Cost effective operation and maintenance.

SDCEM brings you priceless benefits at a competitive cost.

RELIABLE PRODUCTS FOR LONG-LIFE INSTALLATIONS

SDCEM products are known as reliable and robust products, adapted to various and harsh environments. We have installed more than 68 000 disconnectors and switches in MV and HV networks in 140 countries:

- Cold climate: up to -40°C as for Kazakhstan, north of China (Harbin - Dalian railway), ...
- Hot climate: more than 50°C as in Algeria or in Saudi Arabia (more than 100 substations and SVC equipped with SDCEM products),
- Hot and humid: Brasil, Myanmar, India, ...

With in house design, manufacturing and testing facilities, we continuously improved with our worldwide experience, high quality of HV components manufacturing and equipment performances.

REDUCE YOUR INSTALLATION TIME

SDCEM disconnectors & switches require few adjustments and can be installed by 3rd parts teams. The operating drives MR41E and MR164E are designed for modular and quick integration in your electrical network. There are flexible operating mechanisms fitting all configurations (multi-voltage, interchangeability, high torque up to 1000 Nm...).

With fiber optics, S-COM embedded control card drastically reduces wiring cost (no more copper wiring for control) and installation time (replaces multiple installation wiring).

CONTROL REMOTELY AND SAFELY YOUR DISCONNECTORS AND SWITCHES

Electrical networks operators need to be 100% sure of the right operation of the HV and MV disconnectors and switches. SDCEM developed various devices to ensure local and remote safe operations.

SDCEM operating drives detect precisely the right operation. They are real IED with native intelligence which continuously check the information coming from embedded sensors: position, torque, voltage, current, operating time... With such redundancy of information, SDCEM remove the need of visual / local check of the right operation.

The secured protocols (IEC 61850, Modbus ...) used in substation process bus guarantee safe and reliable control and monitoring of the disconnector and switches. S-COM embedded communication card is compatible with the majority of those protocols and doesn’t require external RTU.
MONITOR EASILY YOUR DISCONNECTORS AND SWITCHES

Continuous real time condition monitoring of the switches, disconnectors and operating mechanisms improves the grid safety. SDCEM products are smart grid ready and help you to monitor your operations.

SDCEM motor drives are IEDs equipped with sensors and self-monitoring functions.

Since 2007, more than 5 000 SDCEM intelligent operating mechanisms are operating successfully worldwide and bring safety and flexibility to grid operators. Monitoring more than 90 operating parameters, the control & monitoring of SDCEM equipment can be enhanced with S-COM embedded communication board, giving the operation and maintenance team a remote access up to 20 parameters of the disconnectors and switches, when a classical operating drive copper wired or connected to a RTU brings you less than 5 information.

REDUCE YOUR INSPECTION & MAINTENANCE COSTS WITH CONDITION BASED MAINTENANCE

Time based inspection tasks of SDCEM products are drastically reduced with the condition monitoring of the disconnector and its operating mechanism.

Since the integrated self-diagnostic is controlling continuously the conditions of the equipment, time based inspections are almost not anymore needed. When inspection is needed, integrated digital display and S-OFT portable diagnostic tool allows immediate access to many equipment parameters, providing a full report and reducing inspection periodic time.

SDCEM products allow performing condition-based maintenance (CBM) instead of time-based maintenance (TBM), leading to disconnector higher availability and reliability within lower maintenance costs. Warning and alarm levels (such as over torque or under torque) can be set easily to fit with your maintenance needs.

SDCEM advanced self-monitoring of disconnectors and switches enables new asset management programs, including Return of Experience processing, predictive maintenance and equipment life extension.

RETROFIT EASILY YOUR EXISTING EQUIPMENT AND INCREASE THEIR LIFETIME

Many TSOs consider that 40 to 50 years is acceptable lifetime for a disconnector. Nevertheless, their reliability decreases strongly after 15 to 20 years of operation. On the other hand, operating mechanisms use to become obsolete, less reliable and costly to maintain 15 years after commissioning.

To increase the lifetime and reliability of your assets, you can upgrade your “old” disconnectors just by replacing the existing operating mechanisms with a universal smart drive MR41E at a very competitive cost, in order to:

- Reduce the number of obsolete equipment,
- Reduce stock references,
- Reduce maintenance and spare parts costs
- Ensure standardisation and interoperability of your assets.

The embedded condition monitoring functions of SDCEM operating drives also monitor “old” HV parts, to control their reliability and availability.

INCREASED GRID SAFETY & RELIABILITY

| Universal smart drives MR41E / MR164E | ++ | + | + | + | + | + | + | ++ |
| S-TORQUE | ++ | + | ++ | ++ | + | + | + | + |
| S-COM | ++ | + | + | + | + | + | + | + |
| S-OFT | + | + | + | + | + | + | + | + |
| S-LUX | + | + | + | + | + | + | + | + |

COST EFFECTIVE OPERATION AND MAINTENANCE

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<tr>
<th>Grid safety</th>
<th>Grid availability</th>
<th>Default prevention &amp; detection</th>
<th>Real time condition monitoring</th>
<th>Asset ageing management</th>
<th>Automated inspection task</th>
<th>Reduction of maintenance time and costs</th>
<th>Asset lifetime increase</th>
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<td>Universal smart drives MR41E / MR164E</td>
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SERVICES DEPARTMENT
DISCONNECTORS AND SWITCHES ARE ESSENTIAL SECURITY

From project design through commissioning and after sales customer service, SDCEM specialists provide worldwide customer services to maintain quality and reliability throughout equipment’s service life.

INSTALL
- Assembly / Installation.
- Adjustment
- Commissioning.
- Supervision.
- Technical training on site or in factory.

TRAIN & MAINTAIN
- Standard maintenance.
- Advanced maintenance.
- Repair service.
- Genuine or interchangeable Spare parts.
- Trouble shooting.
- Technical training on site or in factory.
SERVICES DEPARTMENT

DISCONNECTORS AND SWITCHES ARE ESSENTIAL SECURITY EQUIPMENT WHICH REQUIRE THE HIGHEST CARE

MONITOR & OPTIMIZE

• Real-time condition monitoring.
• Self-diagnosis equipment supply.
• Equipment condition assessment.
• Diagnostic and recommendation of future actions.
• Diagnostic software training.

UPGRADE & RETROFIT

• Technical consulting for equipment retrofit.
• Risk management recommendations.
• Extending equipment life.
• Upgrading disconnectors, switches and operating drives performances.
• Motorization or re-motorization for all disconnector brands.
• Updrading “old” equipment (Soulé, Merlin Gerin...)

EQUIPMENT WHICH REQUIRE THE HIGHEST CARE
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