SafeEnergy MCC

Safest power distribution system with maximum mechanical design and constructive accidental arc fault protection.
ModuCon + TOR + Part = Safety³
ModuCon is the only low-voltage switchgear system worldwide which has passed accidental arc testing under strict conditions and with an open cable terminal compartment. The control indicators in the neighbours function and equipment installation rooms did not ignite during testing.

ModuCon has been designed to the highest customer standards. Our highest priority was the safety aspect. Our customer DuPont, one of the world’s largest chemical corporations and a pioneer when it comes to personal and occupational safety, was involved in the innovative development of the modular safety motor control center from the beginning.

ModuCon is a type-tested switchgear combination with the highest operating and operator safety.

Compared to conventional low-voltage distribution boards, ModuCon offers substantial improvements in regards to the safety of people. This results in high-availability for your permanent productivity.
First class energy distribution

SAFE.

- ModuCon has exceeded the highest test requirements according to customers’ and the new standard IEC/DIN 61439-2 and IEC/DIN 60439-1 part 2.
- In the highest safety version, ModuCon limits the effects of an accidental arc to the compartment in which it originated. This ensures maximum personal protection.
- By guiding the accidental arc through special pressure release ducts (with automatically closing pressure relief dampers), ModuCon prevents the accidental arc from affecting or jumping over to adjacent functional compartments.
- ModuCon has a withdrawable unit design equipped with a dual-movable contacting system and a special operating key. This excludes any accidents due to human error while inserting the withdrawable unit into the plant.

UPGRADE.

- TOR - the innovative “Thermo Observation via RFID” monitors the load condition of power distribution systems caused by heat stress. It facilitates maintenance measures and is designed to be retrofitted.
- PART - the new KÖHL arc fault protection system short-circuits the busbar if it is activated by the Multimaster detection and analysis unit. This is achieved by the light sensor technology and shortens the arc life to a few milliseconds.

FLEXIBLE.

- ModuCon offers flexibly equipped functional units and is designed for internal separation up to form 4b. ModuCon can be designed completely arc-base free.
- Thanks to its modular design, ModuCon can be equipped according to individual customer demands. The individual sections are available in degrees of protection IP 31-41 and can be combined in any way required.
- ModuCon can be extended to the right and left side and individual sections can be replaced without major cost or effort at any time.

USER-FRIENDLY.

- ModuCon convinces through its operator and operating safety. Inspection work and cleaning can be easily carried out.
ModuCon systems are produced in optimized production processes and run through precise quality control - performed by our own experts and external testers. Production of the patented ModuCon system also fulfills certification according to DIN EN ISO 9001:2008.

The ModuCon system is based on 20 years of active experience in the production of motor control centers and power distribution systems along with a strong customer service culture. Motivated engineering teams design customised systems to meet requirements set by customers. Thanks to the modular structure of the ModuCon, there are no limits to what can be achieved.

Our KÖHL service includes, of course, the complete project management:

From advice, development, project planning and documentation to production with functional testing through to construction site supervision, connection on site (SCC**), start-up and after sales services.

Use of ModuCon has been successfully tried and tested by our customers, such as, ExxonMobil, JT International Boehringer Ingelheim, Bitburger Brauerei, Arcelor, Dillinger Hütte and RWE. Join them and start your future with the safest power distribution.
SAFE EQUIPMENT INSTALLATION ROOM

High personal protection directly in front of the plant and during operations in the cable terminal compartment.

TESTING

Tests (heating, short-circuit, accidental arc ...) performed by independent accredited institutes (IPH-Berlin, AIT-Wien and I2PS-Bonn) have been successfully completed and passed even with substantially increased test requirements.

FUNCTIONAL COMPARTMENTS

With the internal separations to up form 4b and with further compartmentalisation mechanisms in the highest possible safety version, the accidental arc is limited to the compartment in which it originates if a fault occurs.
AVAILABILITY

Fast emergency operation thanks to a modular system and an insertion of the arc-tested bridge.

Shutdown of the outgoing load feeders of a section (in the event of a fault or modification measures) by fast dismantling of the multi-terminal busbar connection. Personal protection continues to exist in this case.

Modular design of the withdrawable sections means different withdrawable part sizes can be implemented.

Thanks to the favourable constructive and design position of the busbar at the top, switchgear extensions can be quickly added to the left or right.

The “main busbar” package remains as an independent functional unit.

Terminal cable compartment
- Control plug cover screwed from metal
- Coverage for free metal slots
**MECHANICAL SYSTEM**
- High stability in the mechanical components
- Door hinges, withdrawable part fasteners as well as CNC milled components made from specially selected metals
- Grease-free mechanical function

**COMPONENTS**
- Component selection independent from manufacturer
- Different switchgear manufacturers are used during tests
- Type verifications are available in different component configurations

**MAINTENANCE**
- Low-maintenance system (recommended maintenance cycles according to BGV A3 DA § 5 Abs. 1 Nr. 2)
- Visual inspections performed on main busbars, also possible with wall installations since busbars are located at the top of the plant

**FUSE BLOCK SECTION**
- Defined assembly specification through unalterable forced ventilation louvre plate adapter
WITHDRAWABLE PARTS
(identical in construction to ModuPro and interchangeable in both systems)

- User-friendly and smooth to handle
- Degree of protection maintained even during tests and in disconnected position
- Solid latch locking with two handles
- Mechanical coding options
- Control and main contacts can be moved separately or jointly
The new arc protection system PART short-circuits the busbar of a low-voltage distribution board if activated by the Multi-master detection and analysis unit. This is achieved by means of light sensor technology when the arc flash is created. Paired with the rapid current increase in the short-circuit case, the two parameters are rounded off and signalled to the short-circuiters.

The ARCON® arc fault extinction system or the DEHNshort K short circuiter especially developed by KÖHL shorten the arc life to a few milliseconds and as a result increase personal and plant protection.

UPGRADE YOUR SAFETY: with the new safety systems designed by the specialist for arc fault protection!

TOR

The innovative “Thermo Observation via RFID” monitors and supervises the load condition of the plant caused by heat stress. Furthermore, it facilitates maintenance measures, is designed to be retrofitted and essentially represents the most advanced solution for energy efficiency.

TOR has been successfully developed in cooperation with the Institute Fraunhofer IPMS. Designed as a TAG and equipped with an integrated high-performance chip as well as an appropriate reader and DiPoI antenna/aerial TOR sends accurate information regarding thermal energy and potential error sources occurring within the plant to the operator. This information can then be conveniently retrieved with the help of the KÖHL App by using a cell phone, for example.

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### GENERAL

|                           | IEC/DIN EN 60439-1:1997, Supplement 2  
|                           | IEC/DIN EN 60439-1:2009, Supplement 2  
|                           | IEC/DIN EN 61439-1:2009  
|                           | IEC/DIN EN 61439-2:2009  
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Rated operational voltage</td>
<td>$U_e$ 690 V AC</td>
</tr>
<tr>
<td>Rated insulation voltage</td>
<td>$U_i$ 1000 V</td>
</tr>
<tr>
<td>Rated surge voltage resistance</td>
<td>$U_{imp}$ 8 kV</td>
</tr>
<tr>
<td>Degree of contamination</td>
<td>3</td>
</tr>
<tr>
<td>Overvoltage category</td>
<td>III</td>
</tr>
</tbody>
</table>
| Protection type (in acc. w. IEC/EN 60529) | IP 31/41  
| Internal subdivision     | up to 4b                            |

### FAULT ARC TEST

| Test voltage | $U_p$ 725 V |
| Unaffected short circuit | AC $I_{cp}$ 65 kA |
| Configured test duration | $t_i$ 300 ms |

### MAIN BUS BAR

| Max. rated operating current main bus bar | $I_e$ 2500 A |
| Max. rated continuous current at 35°C with 24h median | $I_u$ 2500 A |
| Rated short-term current resistance main bus bar | $I_{cw}$ 80 kA/1s |
| Rated surge voltage resistance main bus bar | $I_{pk}$ 176 kA |
| Rated frequency | 50 Hz |

### DISTRIBUTION BAR INSERT FIELD

| Rated continuous current at 35°C with 24h median | $I_u$ 1500 A |
| Rated short-term current resistance | $I_{cw}$ 80 kA/1s |
| Rated frequency | 50 Hz |

### DISTRIBUTOR BAR FUSE TERMINAL FIELD

| Rated continuous current at 35°C with 24h median | $I_u$ 1700 A |
| Rated short-term current resistance | $I_{cw}$ 80 kA/1s |
| Rated frequency | 50 Hz |