

# **ModuPro ModuCon**

**High Safety low voltage switchgears**

For maximum requirements far beyond all standards.



# High Safety solutions

## From the specialist for arc fault protection

For years, the names **ModuPro** and **ModuCon** have stood for the world's highest standard in regard to personal safety and system availability. Through extensive constructive measures and the use of materials of the best quality, KÖHL has transferred its high standard in medium voltage switchgears to its low voltage applications. The result is an uncompromising concept with type test results far beyond the known standards IEC 61439-2 and IEC/TR 61641.



Developed for primary use as energy distribution and motor control centre, the systems offer different designs and function units of varying dimensions and configurations, which all follow the same guiding principle: **SAFETY FIRST!**

With permanent development and innovative engineering skill, we have perfected the principle of passive arc fault protection for low voltage switch-gear systems.

### MASSIVE CONSTRUCTION

A self-supporting construction made of heavy steel plate and stainless steel with accordingly designed interlock technology guarantees absolute resistance against the energy that occurs in an accidental arc and conducts its energy upwards through pressure relief channels in a targeted manner.

### FAILURE PREVENTION

Analogously to medium voltage, the forced user guidance ensures the correct operation of the system, even in high-stress situations.

### PROTECTION CONCEPT

Perfect internal separation with multiple metallic bulkings and additional protective measures, such as the insulated design of **all** live areas up to the withdrawable units complete the personal protection concept and guarantee the highest system availability.

# Technical data

General characteristic values		ModuPro	ModuCon
Standards and requirements		IEC/EN 61439-1, IEC/EN 61439-2, IEC/TR 61641	
Ambient temperature	°C	-5 to +40; average value over 24 hours: +35	
Protection class		IP 31/41 according to IEC/EN 60529	
Internal separation		Form 1; 2b; 3a; 3b; 4a; 4b	
Connection type		Cable from below, cable from above, bus bar from below	
Bus bar position		Rear	Top
Panel widths	mm	400; 600; 800; 1000; 1200	
Internal arc resistance		According to IEC/EN 61439-2 Supplement 1 resp. IEC/TR 61641 for testing under internal arc conditions in low voltage switchgears: Max. 725V, max. 65kA <sub>eff</sub> , max. 300ms, criteria 1-7 resp. arc fault classes A, B, C  <b>Additional criteria:</b> <ul style="list-style-type: none"> <li>■ Testing at reduced distance</li> <li>■ Safe cable connection compartment</li> <li>■ Limitation of effects to failure area</li> </ul>	
Installation requirements		Shake test, vibration test	
Communication		Profibus, Profinet, Modbus	

Electrical characteristic values		ModuPro				ModuCon	
Rated insulation voltage Ui	V	1000~ / 1200 = according to IEC/EN 60947-1					
Rated operating voltage Ue	V	690 according to IEC 60038					
Rated frequency	Hz	40-60					
Rated bus bar current	A	1600	2000	3200	4000	1250	2500
Rated short-time withstand current Icw 1s	kA	65	80	100	100	65	80

Mechanical characteristic values		ModuPro	ModuCon
Material / plate thickness		Steel plate and stainless steel / 2 mm	
Surface treatment		Sendzimidised or structured powder coating on epoxy-polyester basis	
Colour / painted surface		According to DIN 43656 / lightweight structure, layer thickness ≥ 40 µm	
Gloss level		Glossy	
Chemical resistance		Against benzole and benzine according to MAK Diluted acid 10% and diluted lye 10% according to MAK	
Decontaminability		Decontaminable	



# ModuPro / ModuCon system overview and design



## POWER PANEL

- Incoming, outgoing, coupling
- Fixed mounted or withdrawable technology
- ACBs or MCCBs  
(Type ABB, EATON or SIEMENS)
- 3-pole or 4-pole circuit breakers
- Several circuit breakers per panel
- Installation of an **active arc fault protection**
- Individual panel dimensions



- The massive triple separation protects the user even when the door is open.



- Pressure relief and absorption on medium voltage level.



- Tested connection of bus bars with power adapted earthing and short-circuiting equipment.

# Proven safety

Far beyond the requirements acc. IEC 61439-2

## FUSE SWITCH DISCONNECTOR PANEL

- Outgoing cable circuits up to 630A
- Fixed mounted or plug-in technology
- Horizontal fuse switch disconnectors (Jean Müller SASIL plus)
- Defined gill covers for thermal relief
- High packing density
- Easy installation of additional units
- Arc fault safe cable connection compartment



- Fixed gill covers guarantee that the system is always operated within the approved temperature range.
- The double contacting of the used fuse switch disconnectors allow the non-energised exchange of the fuses.





# ModuPro / ModuCon system overview and design

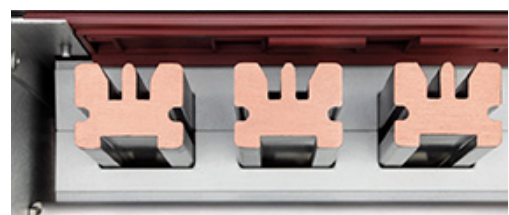


## MCC WITHDRAWABLE UNIT TECHNOLOGY PANEL

- Outgoing cable and motor circuits up to 630A (Type ABB, EATON, SIEMENS or Schneider Electric)
- Retention of the protection class in test and disconnected position
- Highest operational fail-safety through forced user guidance
- Standardized operating concept for all withdrawable unit sizes: Half and full drawer units
- Innovative contacting technology
- Arc fault safe cable connection compartment



- High personal protection due to metallic pressure relief flaps and shutters made of reinforced special plastic.



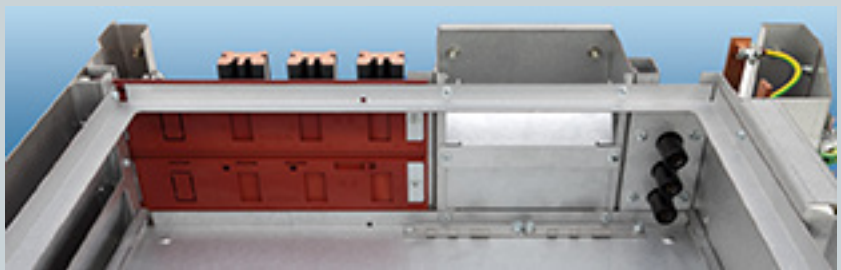
- Patented distribution bus bar with special W profile for the prevention of contact reduction in case of a short circuit.

# Proven safety

Far beyond the requirements acc. IEC 61439-2



- Type tested withdrawable unit for the earthing and short-circuiting of the bus bar during work on the system.



- Extensive pressure relief and functional space separation for the limitation of the effects of an accidental arc on the failure area.



- Massive planking for mastery of the forces.



- Standard design of Form 4b with metal separation.



- Innovative operating key for disconnected, test and operating positions.



- Up to 48 control and measurement contacts, including bus communication.



- The entire contact apparatus in isolated design is moved to contact to the distribution bus bar.









# ModuPro / ModuCon

## Premium-class power distribution

### SAFE

- **ModuPro/ModuCon** have passed the highest testing requirements from customer side and exceed the standards acc. IEC/DIN 61439-2 and IEC/TR 61641 by far.
- **ModuPro/ModuCon** limit the effects of the accidental arc on the failure area in the highest safety design. Maximum personal protection is thus guaranteed.
- Through the guidance of the accidental arc energy through special pressure relief channels (with automatically closing pressure relief flaps), **ModuPro/ModuCon** prevent the accidental arc from affecting adjacent functional areas.
- **ModuPro/ModuCon** have a withdrawable unit technology with a double moving contact system and special ModuKey tool. Any accident due to human failure while operating the withdrawable units is precluded. The withdrawable units themselves can be exchanged under both systems.

### FLEXIBLE

- **ModuPro/ModuCon** offer flexibly equippable functional units and are conceived for an internal separation in the standard design up to Form 4b.
- Due to their modular structure, **ModuPro/ModuCon** permit needs-based equipping. The individual panels are available in protection classes IP31-41 and can be used in any combination.
- **ModuPro/ModuCon** can be expanded to the right and left at any time. Exchanging individual panels is naturally possible without great effort.

### USER-FRIENDLY

- **ModuPro/ModuCon** convince through absolute control and operating safety. Inspection and maintenance tasks are uncomplicated.
- The innovative user guidance of **ModuPro/ModuCon** prevents accidents and malfunctions due to incorrect use.

### UPGRADE

- **TOR** – The innovative “Thermo-Observation RFID” monitors the system load status caused by heat stress. Retrofittable, **TOR** simplifies maintenance through permanent condition monitoring.
- **Active arc fault protection** – at actuation by the master unit, this add-on short-circuits the bus bar to de-energize the fault. This circumstance is triggered by light and current sensors and shortens the arc lifetime to just a few milliseconds.
- Insulation of all live conductors up to the outgoing circuits with resealable covers for areas, which are subject to cyclical checks.

## ModuPro / ModuCon in worldwide use



**ModuPro**  
**ModuCon**



### WHAT WE VALUE

Our systems are manufactured by experienced employees in optimized production processes and subjected to precise quality control – by both our own experts and external inspectors.

The production process of the **ModuPro/ModuCon** systems naturally fulfils the requirements of the DIN EN ISO 9001:2008 and is certified regularly.

KÖHL switchgears are the result of more than 45 years of lived experience in the manufacturing of energy distribution systems and our special customer service culture. Our motivated team of engineers de-

signs your individual, needs-based system according to special requirements. Due to the modular structure, the opportunities of this High Safety product series are unlimited.

Our service comprises the complete settlement of the project: From consulting, development, project management and documentation to manufacturing with functional testing, construction site management, on-site connection, commissioning and after-sales-service certified according to the SCC\*\* standard.





**UPGRADE.** YOUR SAFETY!

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