

# BLOKSET LV Equipment



A signature from  
**Schneider**  
Electric

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- Applications, Market and Customer values
- Blokset, the safety first
- Blokset, performances
- Blokset range Overview
- Communication tools
- Offer structure - International presence



# Applications, Markets and Customer values

# Blokset, low voltage equipment

- **Blokset** is an high power low voltage equipment. It is a system requiring an **high level of dependability**.
- It is a high **safety and reliability** equipment using Schneider Electric low voltage protection components and switchgear.
- It is a **modular switchboard** made up of a number of sections.



# Schneider product inside

- Blokset integrates the Schneider products which have been especially designed to offer the greatest performances and the highest reliability.



## **Power circuit protection and control**

### **Masterpact, Compact NS and Compact NSX**

A range of circuit-breakers for control and disconnection of circuits and loads.



## **Energy consumption and quality metering**

A range designed for management of your energy: metering, quality, availability.



## **Motor motion control**

A range of variable speed drives and progressive starters for very simple variable speed control, offering a wide choice of installation powers, applications and protection.



## **Motor protection and monitoring**

A broad range of relays, controllers and motor management systems covering all your needs, from the simplest to the most advanced.



## **Process automation**

A range of programmable logic controllers for process control, including communication, diagnostic and data storage functions.

# Application field

- Industry process

- Mine, metallurgy, cement industries.
- Food-processing.
- Automotive.
- Refinery, Chemical plants

- Infrastructure

- Tunnel.
- Water industry.
- Energy.
- Airport.
- Port.

- Energy

- Production
- Distribution

- Buildings

- Commercial buildings
- Sky crappers
- Data centers
- Health care



# Application field

- Industry process

- Mine, metallurgy, cement industry.

## Environment and safety

- Specific “anti-corrosion” treatment on conductive parts.
- Tightness ensured by IP54 guaranteed parts.
- Internal arc containment.

- Food-processing.
- Automotive

- Infrastructure

- Tunnel.
- Water industry.
- Energy.
- Airport.
- Refinery chemical plants.

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# Application field

- Industry process

- Mine, metallurgy, cement industry.
- Food-processing.

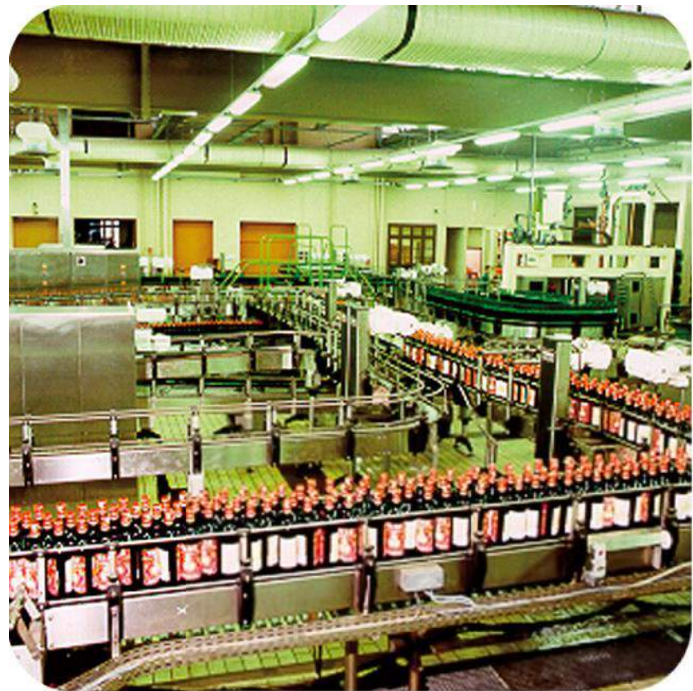
## Availability and performance

- Tightness ensured by IP54 elements.
- Fault prevention by intelligent motor control centers (iMCC).

- Automotive.

- Infrastructure

- Tunnel.
- Water industry.
- Energy.
- Airport.
- Refinery chemical plants.





# Application field

- Industry process

- Mine, metallurgy, cement industry.
- Food-processing.
- Automotive

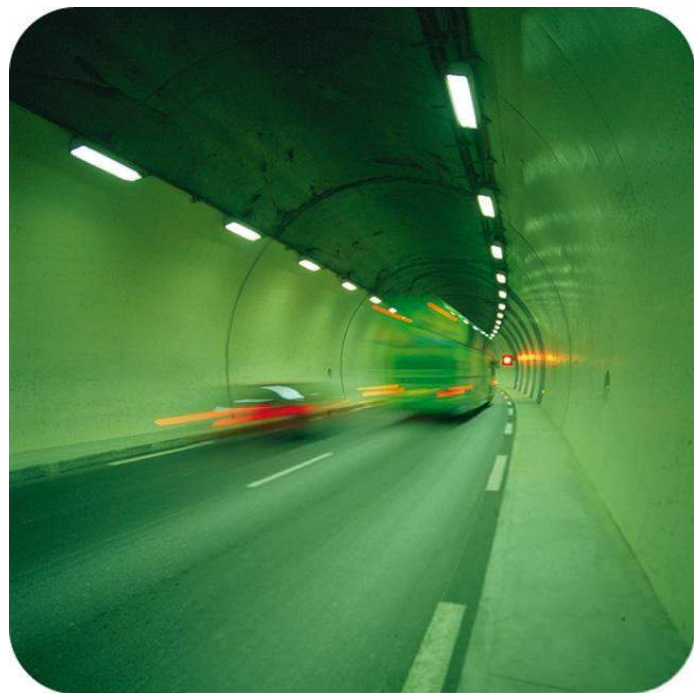
- Infrastructure

- Tunnel.

## Continuity of supply and safety

- Withdrawable solutions or in racks.

- Water industry.
- Energy.
- Airport.
- Refinery chemical plans.



# Application field

- Industry process

- Mine, metallurgy, cement industry.
- Food-processing.
- Automotive

- Infrastructure

- Tunnel.
- Water industry.

## Continuity of supply and environment

- Feeders on disconnectable and withdrawable systems.
- Specific “anti-corrosion” treatment on conductive parts.

- Energy.
- Airport.
- Refinery chemical plants.





Blokset,  
the safety first

# Blokset comply with IEC 61439-2

- Certified by independant labs:
  - LOVAG, ASEFA and CESI.
- As well as by a permanent control in Schneider Electric test laboratories.

- **12 type-tests** are carried out:

- Verification of construction**

- § 10.2 - Strength of material & parts : corrosion, insulating material, lifting
    - § 10.3 - Degree of protection.
    - § 10.4 - Clearance and creepage distances,
    - § 10.5 - Effectiveness of the protective circuit,
    - § 10.6 - Incorporating of switching devices & components
    - § 10.7 - Internal electrical circuit & connections
    - § 10.8 - Terminals of external conductors

- Verification of performance**

- § 10.9 - Dielectric properties,
    - § 10.10 - Temperature-rise limit,
    - § 10.11 - Short-circuit withstand strenght,
    - § 10.12 - Electro magnetic compatibility (EMC)
    - § 10.13 – Mechanical operation



# Blokset is fully arc-resistant

- **Human life** being very important, Schneider Electric have made **Blokset an offer with a very high level of safety.**
- Schneider Electric knows that **arcs never start at the same place**
- We also know that internal arcs in **switchboards up to IP54** (tightly closed) are **more critical** (higher pressure).
- So, Schneider Electric designs & tests **Blokset** switchboards **up to IP54**, for **any arc starting place**:
  - in horizontal & vertical busbars,
  - in outgoing cable compartments,
  - in fixed-type feeder units.

# Blokset reached top I.A.C performance

- **BLOKSET** proposes

- LV assembly **world's highest internal arc withstand performance:**
- successfully tested at **85 kA rms/0.4s**,
- in accordance with severe **IEC61641-V2** standard (all **7 criteria**).

- Compliance with **IEC61641-version 2** ensure the following to users:

- **Limit the risk of personnal injury** → 5 criteria,
- **Limit the risk of damage to assembly** → 2 criteria,



# Assessment of Blokset I.A.C performance

## People protection achieved with following criteria fulfilled

- **Criterion no. 1:** correctly secured doors, covers, etc., do not open.
- **Criterion no. 2:** parts (of the ASSEMBLY), which may cause a hazard, do not fly off. (This includes large parts or those with sharp edges, for example inspection windows, pressure relieved flaps, cover plates, etc. made of metal or plastic).
- **Criterion no. 3:** arcing does not cause holes to develop in the freely accessible external parts of the enclosure as a result of burning or other effects.
- **Criterion no. 4:** the indicators arranged vertically do not ignite (indicators ignited as a result of paint or stickers burning are excluded from this assessment).
- **Criterion no. 5:** the equipotential bonding arrangement for accessible parts of the enclosure is still effective.

### Blokset tested solution

Operator & room protection against parts flames



Operator protection against parts high speed projection.



Switchboard live parts remain un-accessible after the arc.



No flames go out of the panel during test: no risk of burns.



No risk of electrical shock during or after the arc.



## Assembly protection achieved with following criteria fulfilled

- **Criterion no. 6:** The assembly is capable of confining the arc to the defined area where it ignited, and there is no propagation of the arc to other areas of the assembly
- **Criterion no. 7:** After clearing the fault or after isolation or disassembly of the affected functional unit in the defined area, emergency operation of the remaining assembly is possible.

No arc propagation. Equipment is secured for continuity of service



Dielectric verification after clearing/cleaning



Verified by a dielectric test 1.5 rated voltage during 1mn

# Blokset fits in environmental requirements

- When **dusty & humid environments** require high ingress protection:
  - designed with high quality metals and components, tested for **humidity** and **salt mist resistant**,,
  - designed & tested for applications up to **IP54** (dust & water projections proof).
- When **harsh environment** require high protection against chemical aggression:
  - Pre-designed solutions for **corrosive ambience**: class 3C2, as per IEC60721-3-3, for **H<sub>2</sub>S** (sulfide of hydrogen) and **SO<sub>2</sub>** (sulfur dioxide) atmospheres.

# Blokset withstands sever earthquakes

- Requirements on switchgears' behavior exposed to earthquake are taken into account.



- **Stability** : the equipment shall not become a projectil
  - **Integrity** : the equipment must recover its initial geaometry
  - **Operation** : Shall ensure a either a partial or total service operation
- Comply with international standards
    - IEC68-3-3
    - UBC 97 and amendments
    - IBC 2000 and amendments
    - IBCO AC 156

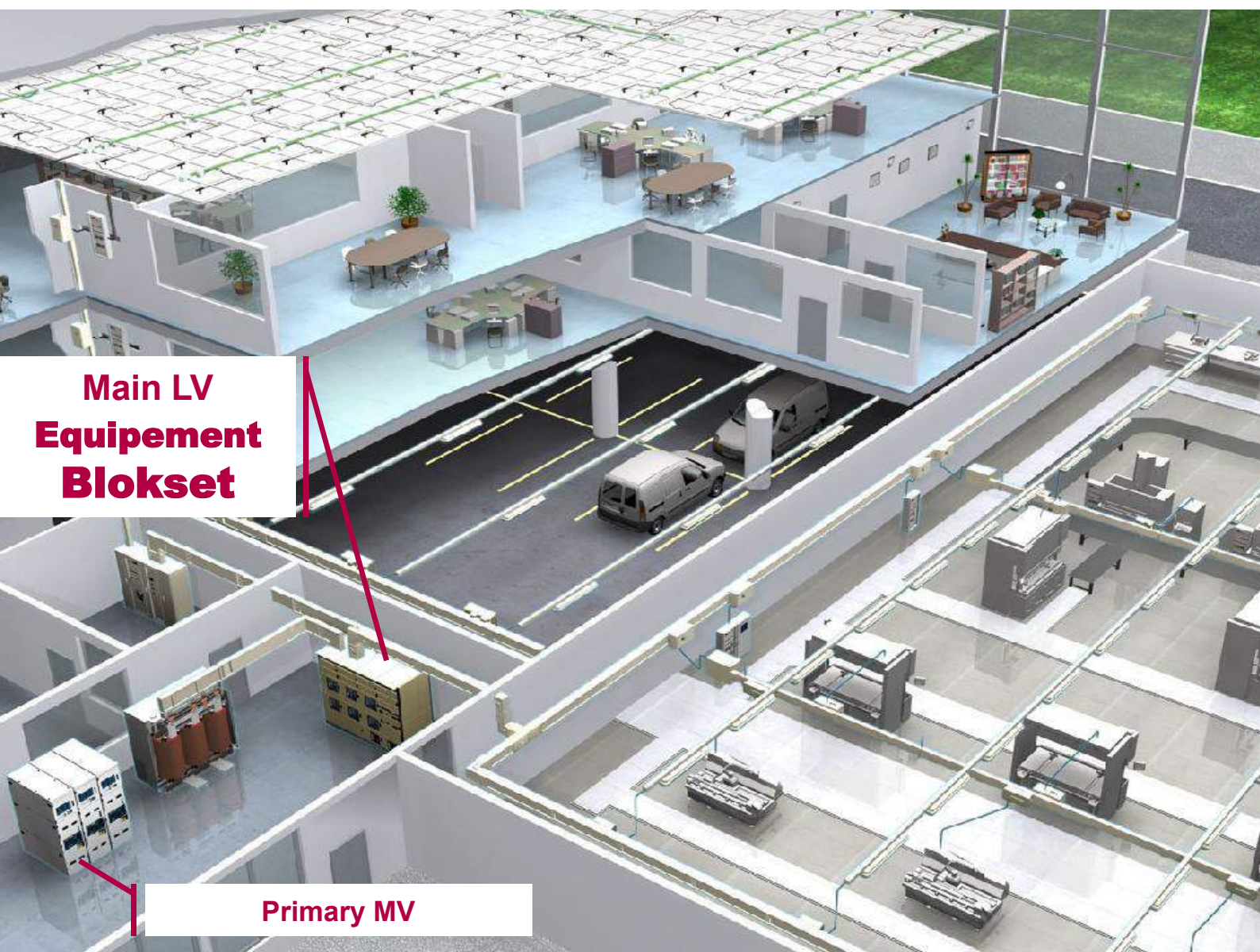
# Blokset withstands server earthquakes

Blokset has run successfully tests ensuring its compliance with the following spectrums			Spectrum equivalence with <b>Richter scale</b> , according to IEC68-3-3
<b>IBC 2000</b> and amendment <b>ICBO AC 156</b>  <b>UBC 97</b> and amendment <b>ICBO AC 156</b>	Site class B, C and D	<b>Floor level only</b>	-
	Zone 2A	Floor and roof levels	< <b>5.5</b>
	Zone 2B	Floor and roof levels	
	Zone 3	Floor and roof levels	<b>5.5 to 7.0</b>
	Zone 4	<b>Floor level only</b>	<b>7.0 to 9.0</b>



## Blokset, performances





**Main LV  
Equipement  
Blokset**

**Primary MV**



# Blokset, high safety and availability switchboard up to 6300 A

- A wide range of solutions:

- **Electrical distribution / PCC**

- For high power incomers or feeders up to 6300 A,
    - Withdrawable solution for high availability and safety applications
    - Fixed solutions for economical applications
    - Power factor correction

- **Motor Control Center / MCC**

- Fixed-type motor control center for economical solution
    - Withdrawable motor control center for high availability and safety applications,
    - Solution with motor controller, soft starters and drives

- Protection levels: IP20, IP31, IP42, IP54.



# General data

Rated voltage (Ue)	<b>690 V AC</b>
Main busbar rating	4600 A (simple busbar) ; <b>7000 A</b> (double busbar)
Distribution busbar rating	up to 3200 A
Rated short-time current (I <sub>cw</sub> )	<b>85/100 kA rms 1s</b> (rated peak current I <sub>pk</sub> 187/220 kA)
Rated conditional short-circuit current (I <sub>cc</sub> )	up to 85/100 kA 1s
Internal arcs	<b>85 kA 0.4 s</b>
Earthing system	TT-IT-TNS-TNC
Form	<b>1/2b/3b/4/4b</b>
Withdrawability	<b>FFF/WWW</b>
Standard	IEC 60947-2, IEC61641, IEC 60068-2-11, IEC 68-2-30, IEC60439-1 and 2, IEC61439-1/2
Seism	UBC/CBC (Uniform/California Building Code), Zone 4, floor & roof levels
Installation	indoor environment (EMC) type 2
Communication buses	Ethernet, Modbus SL, Profibus DP, DeviceNet, CanOpen.



# BLOKSET range overview

# Blokset, a complete range

- All LV power applications in one equipment.



For each categories, there are many certifications level according to you needs.

# Blokset, a complete range

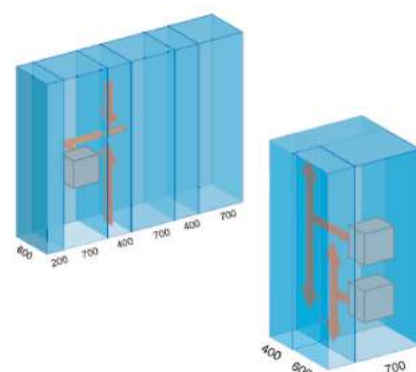
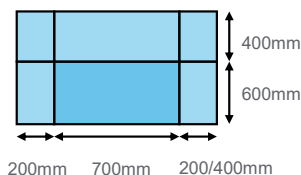
- High flexibility to deserve our customers

- Modular enclosures

- For front or rear connection
    - For top or bottom cable entrance

- Front face diversity

- Full or individual doors
    - Operation behind or through door
    - Mechanism control
      - Toggle
      - Rotary handle
      - Motor mechanism



Type		Position	Circuit breaker control	IP
A		Behind door (2-4 CB)	 Toggle    Direct Rotary Handle    M.Mechanism	20 31 42 54
B		Through door	 Toggle    Direct Rotary Handle    M.Mechanism	20 31
C		Behind door (individual)	 Toggle    Direct Rotary Handle    M.Mechanism    Extended Rotary Handle	20 31 42 54
D		Through front plate Through front plate + global door	 Toggle    Direct Rotary Handle	20 20 31 42 54
E		Behind door (frame)	 Telescop: Extended Rotary Handle	20 31 42 54

# Blokset type D

- High performance incomers & feeders
- Electrical distribution solution
  - Equipped with premium circuit breaker offers
    - **Masterpact NT & NW**
    - **Compact NS & NSX**
  - Fixed or withdrawable – F.F.F / W.W.W
  - Intelligence available through optional module
- Performances
  - Circuit breaker up to 6300A
  - Horizontal bus bar up to **7000A**
  - Distribution bus bar up to 3200A
  - Icw up to **100kA 1s\*** Architecture
  - 1 to 3 circuit breakers per panel
  - Cable access from rear or front side
  - Forms 1 / 2b / 3b / 4
  - IP20 / 31 / 42 / 54

\*depending upon architecture

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# Blokset type D



- Size & Electrical performances



1200mm



700mm



200+700mm



200+700mm

# Blokset type Dc



- Power factor/reactive power correction

- Energy efficiency and operating expense savings

- Electrical distribution solution

- Equipped with premium device offers
      - Compact NSX
      - Tesys D-K contactor **specific for reactive current**
      - VarplusBox Compact & VarplusCan capacitors
    - Fixed type solution – F.F.F
    - **Varlogic relay** managing the reactive power to feed in the circuit

- Performances

- Max Reactive Power **6x100 kVAR**
    - Circuit breaker NSX250
    - Horizontal bus bar 4000A
    - Vertical bus bar 3200A
    - Icw up to 85kA 1s

- Architecture

- Cable access from rear or front side

- Forms 1 / 2b
      - IP20 / 31 / 42 / 54



Varlogic



VarplusCan



VarplusBox Compact



# Blokset type Mf



- Motor Control Center – **Fixed solution**

- **Dedicated to economical installations**

- Motor control center solution

- Equipped with premium device offers
    - Compact NSX breakers
    - Tesys GV2 & GV3 breakers (new 2013)
    - Tesys D power control
  - Fixed – F.F.F
  - **Coordination type 2 (Therm. Relay)**
  - Intelligence available through CB trip unit

- Performances

- Up to **480V**
  - Max rated power **250kW** (per F.U.)
  - Horizontal bus bar up to 7000A
  - Vertical bus bar up to 3200A
  - Icw up to 85kA 1s

- Architecture

- Cable access from rear or front side
  - Vertical bus bar at left side
  - Forms 1 / 2b / 3b / 4
  - IP20 / 31 / 42 / 54



- Mini 2M size allowing enough space for auxiliary components
- 18 functional units per col

# Blokset type Ms



## ● Motor Control Center – Fixed solution

### ● Dedicated to Variable speed drives and soft starters

#### ● Motor control center solution

- Equipped with premium device offers
  - Drives : **ATV61-ATV71-ATV312**
  - Soft starters : **ATS 48** (250kW-415V / 315kW-500V)
  - Compact NS & NSX
  - Tesys D power control
- Fixed – F.F.F
- **Coordination type 2**
- Intelligence available through ATV or ATS

#### ● Performances

- Up to **690V**
- Max rated power **90kW** (per F.U.)
- Horizontal bus bar up to 6300A
- Vertical bus bar up to 3200A
- Icw up to 85kA 1s

#### ● Architecture

- Cable access from rear or front side
- Vertical bus bar at rear or left side
- Forms 1 / 2b / 3b / 4
- IP20 / 31 / 42 / 54



Drive	Applications	Rated Power
<b>ATV 61</b>	Pumps & fans (Industrial)	0,37 to 55kW (415v) 0,37 to 90kW (690v) (Power limited in Blokset)
<b>ATV71</b>	Hoisting, Handling, Packaging, Textile machine, Wood work machines	0,37 to 55kW (415v) 0,37 to 90kW (690v) (Power limited in Blokset)
<b>ATV312</b>	Pumps & fans (Building) (Heating,ventilation,HVAC)	0,18 to 15kW

# Blokset type Mw2



- Motor Control Center – **Whithdrawable solution**

- **Dedicated to Direct on line starters**

- Motor control center solution (Mcc / iMCC)

- Equiped with premium device offers
    - Compact NS & NSX Breakers
    - Tesys GV2 & GV3 breakers
    - Tesys D power control + Tesys T & U protection
  - Withdrawable – W.W.W
  - **Coordination type 2 or total**
  - Intelligence available through CB or Tesys device

- Performances

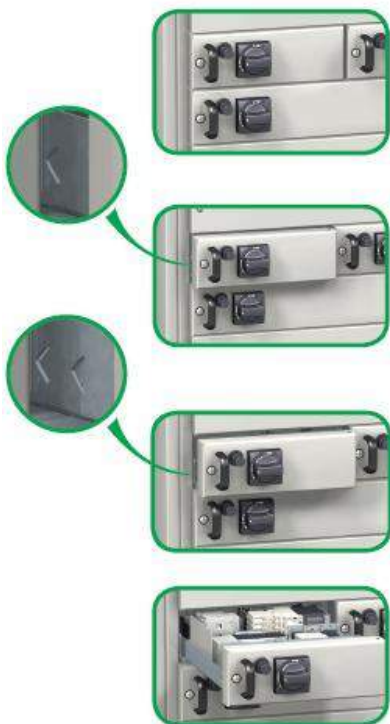
- Up to **690V**
  - Max rated power **250kW** (per F.U.)
  - Horizontal bus bar up to 7000A
  - Vertical bus bar up to 2000A
  - Icw up to 85kA 1s

- Architecture

- Cable access from rear or front side
  - Vertical bus bar at rear side
  - Forms / 3b / 4b
  - IP20 / 31 / 42 / 54



# Withdrawable functional units



- **New drawers for more safety and availability**

- Type tested solution (IEC 61439)
- Fully Withdrawable functional unit (WWW)
- Withdrawable safety in all position :
  - Connected position
  - Test position
  - Disconnected position
- Clear indication of the drawer position





# Withdrawable functional units

## • Drawers performances

15kW  
(2M/2)



**Half drawer,  
100 mm**

18,5kW  
(2M)



**Full drawer,  
100 mm**

30kW  
(4M/2)



**Half drawer,  
200 mm**

45kW  
(4M)



**Full drawer,  
200 mm**

75kW  
(6M)

**Full drawer, 300 mm**



110kW  
(8M)

**Full drawer, 400 mm**



200kW  
(10M)

**Full drawer, 500 mm**



250kW  
(12M)

**Full drawer, 600 mm**



# Mw2 Architecture

- According to the type of busbar, the modularity will change.

## Single Horizontal busbar on top

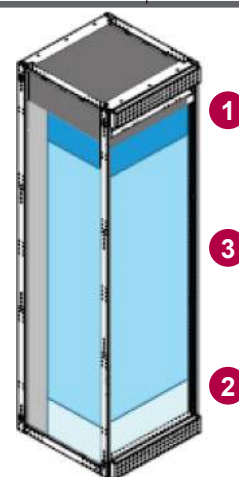
Cubicle height	2200 mm	
No. of poles	3P	3P+N
Available modularity <b>3</b>	34 modules	32 modules
Bottom link cover dimension <b>2</b>	62,5 mm	162,5 mm
Drawers density F= full width H=1/2width	<b>17F / 34H</b>	<b>16F / 32H</b>

## Double Horizontal busbar on top

Cubicle height	2200 mm	
No. of poles	3P	3P+N
Available modularity <b>3</b>	30 modules	28 modules
Bottom link cover dimension <b>2</b>	62,5 mm	162,5 mm
Drawers density F= full width H=1/2width	<b>15F / 30H</b>	<b>14F / 28H</b>

## Single Horizontal busbar at bottom

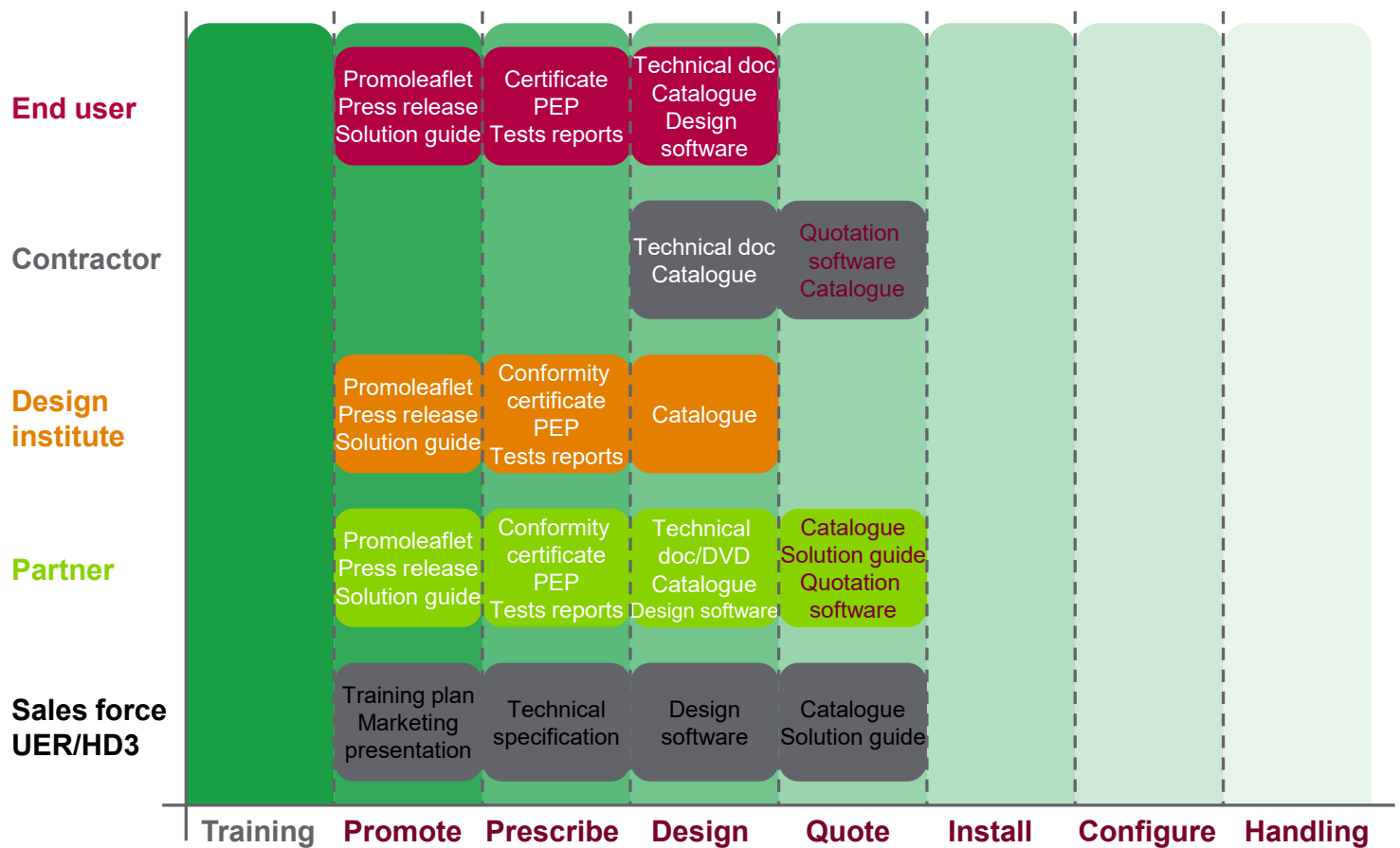
Cubicle height	2200 mm	
No. of poles	3P	3P+N
Available modularity <b>3</b>	34 modules	32 modules
Top link cover dimension <b>1</b>	52,5 mm	152,5 mm
Drawers density F= full width H=1/2width	<b>17F / 34H</b>	<b>16F / 32H</b>





# Communication tools

# A complete set of tools





**Offer structure  
International  
presence**

# Blokset, close to you

A premium proximity service guaranteed through :

- **Schneider Electric Regional Equipment Unit**
  - Equipment manufactured within Schneider Electric factories
  - Equipment unit dedicated to serve several countries
  - High skill staff kept with high activity volume
- **Wide network of assembly manufacturer**
  - Equipment manufactured through our selected partners
  - Regularly trained and audited



# International offer

**250 000 columns sold worldwide**



● Schneider Electric plants

● Partners

## Some references

Year	Country	Market segment	Client	Panel Qty
2010	Indonesia	Food&Beverage	Unilever	40
2010	Indonesia	Oil & Gas	Pertamina RU II Dumai (ES#13)	54
2010	Indonesia	Datacenter	Data Center Faasri	87
2010	Turkey	Automotive	Oyak Renault	8
2010	Turkey	MMM	EMET BORON	48
2011	China	Chemical	Xingpu chemical factory	250
2011	China	Infrastructure & Ports	Beijing subway (line 6)	609
2011	China	MMM	Coke over plant of handan steelworks	157
2011	Qatar	Water	Ashghal	189
2011	Oman	Healthcare	Minstry of health , Oman	17
2011	Qatar	Hotel	Regent Hotel	60
2011	Brazil	MMM	Vale	75
2011	India	Oil & Gas	Hindustan Petroleum Corporation Limited	241
2012	China	Building	Beijing Tiantan Bilological Pharmaceutica	147
2012	China	Infrastructure & Ports	Xiaoshan Airport terminal 3 & 4	51
2012	Colombia	Oil & Gas	Quion Lianito	88
2012	Korea	Microelectronic	Nokia	29
2012	KSA	Building	ITTC International Hotel	30
2012	KSA	Building	Qassim University	38
2012	Kuwait	Oil & Gas	Main intake at A27 sub-station	40
2012	Thailand	Food&Beverage	Cargill	22
2012	Thailand	Infrastructure & Ports	Amatra cogeneration plant	113
2012	Turkey	Glass	Soda Sanayi Kuvvet Santrali	20
2012	Qatar	Waste water treatment plant	Doha south sewage treatment works	66