**Alberto Carini, LPLS Italy, June 2013**

# MNS3.0
# Product presentation

# MNS3.0
# Front access Power Motor Control Center



- Two ACB per panel up to size E3
- Power cables connection from the front, wall-standing installation
- Double busbar position: upper and lower
- Power and control cables in the same compartment
- Compact motor feeder starting from size 8E/4 (H=200mm W=150mm)

# MNS3.0
# Granted performances



Institut 'Prüffeld für elektrische Hochleistungstechnik' GmbH

IPH BERLIN

TEST CONFIRMATION

on the given range of performed tests

Client: ABB Schaltanlagentechnik GmbH
Wallstadter Straße 59
D-68526 Ladenburg

Manufacturer: ABB Schaltanlagentechnik GmbH

Equipment under test: Low-voltage switchgear assembly

Type: Low-voltage switchgear assembly System MNS 3.0 consist of:
Outgoing unit with withdrawable parts 4E, 8E¼, 8E½, 8E, 16E and 24 E of different combinations and
Incoming unit with circuit breaker NEGAMAX F2-2000

Rated characteristics:

| | | | |
|---|---|---|---|
| Rated voltage | | 690 | V |
| Rated current | up to | 6000 | A |
| Rated short-time withstand current | for | 100 | kA |
| Rated impulse withstand current | | 350 | kA |
| Degree of protection (IP Code) | | IP 42 | |

Normative document:
IEC 439-1:1985+Corrigendum 1992
EN 60439-1:1994
DIN EN 60439 Teil 1 (VDE 0660 Teil 500):1994-04
IEC 1641:1996-01
1 TGB 175 002 E (ABB Gebäudetechnik AG, Test instruction)

Range of performed tests:
- Test under conditions of arcing due to internal fault with a prospective short-circuit current of 65 kA and a prospective peak withstand current of 143 kA at a prospective arc duration of 0.3 s and a test voltage of 750 V.

Date of test: 9 and 10 October 1996 and 20 to 22 November 1996

Test result: The equipment under test has fulfilled the criteria 1 to 6 according to IEC 1641:1996-01 and the criteria 6a of 1 TGB 175 003 E.
The performed tests are documented in the IPH Test Report No. 117 339 E-379

Berlin, 20 January 1997

Dr.-Ing. K. Hinrichs, Head of low-voltage test laboratory

Ronald Borchert, Test engineer in charge

- 1.2 billion of MNS system installed in the world since 1973
- A long history of tests and certifications
- ASTA certification for internal arc proof up to 100 kA, 300ms at 690V
- Tested according Germanischer Lloyd
- Shock and vibrations test (IABG)
- Seismic test for safety area in nuclear power plants (DLR)

# MNS3.0
# Electrical performances



- Rated Current 6300A
- Rated peak withstand current Ipk 250kA
- Rated short time withstand current Icw 100kA
- Arc fault containment 100kA x 300ms
- Rated frequency 50/60Hz

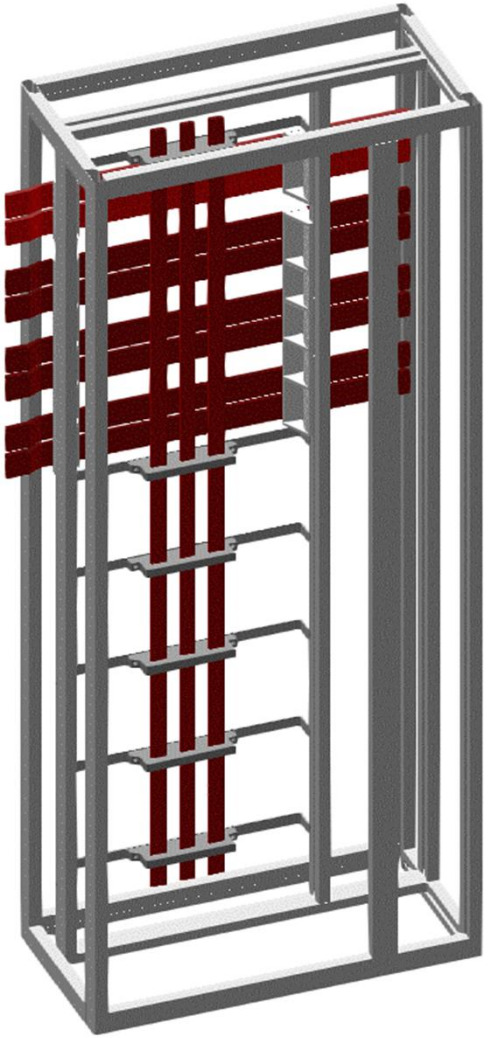
# MNS3.0
# Electrical performances



- Rated insulation voltage Ui — 1000Vac – 1500Vdc
- Rated operating voltage, Ue — 690 Vac – 750Vdc
- Rated impulse withstand voltage — 6/8/12kV
- Overvoltage category — II / III / IV
- Degree of pollution — 3

# MNS3.0
# Electrical performances





## Main busbar

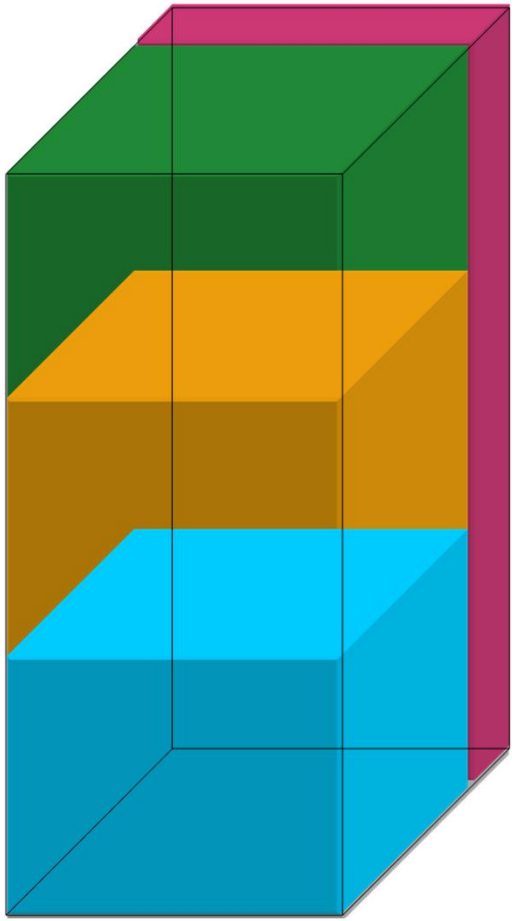
- Rated current 6300A
- Peak withstand current 250kA
- Short-time withstand current 100kA

## Distribution busbars

- Rated current 2000A
- Peak withstand current 176kA
- Short-time withstand current 100kA

# MNS3.0
# Mechanical characteristics



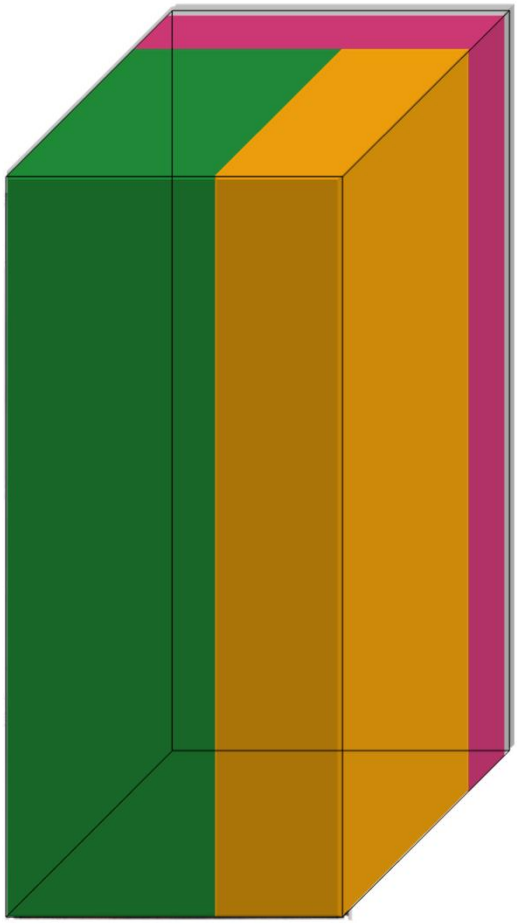


Functional compartments column with ACB breaker

- Busbar
- Instrumentation
- Air circuit breaker
- Cable

# MNS3.0
# Mechanical characteristics



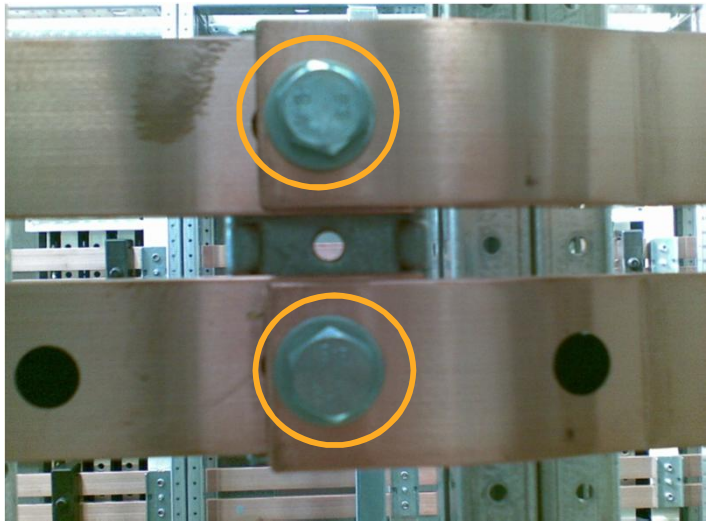


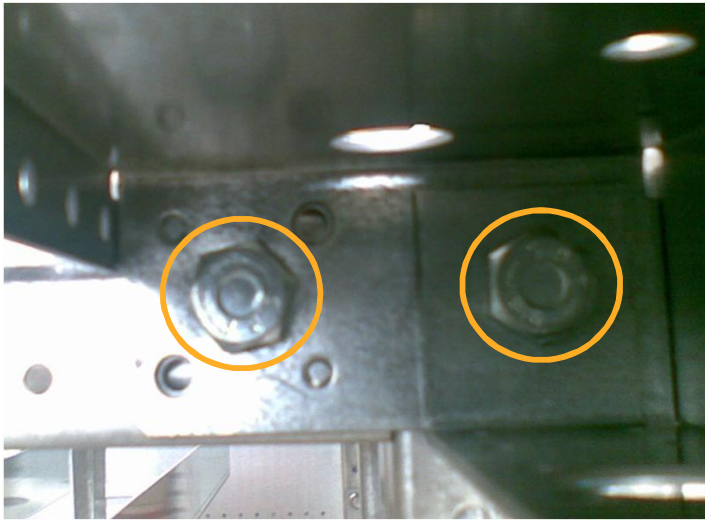
Functional compartments
MCC column

- Busbar
- Equipment
- Cable

# MNS3.0
# Mechanical characteristics





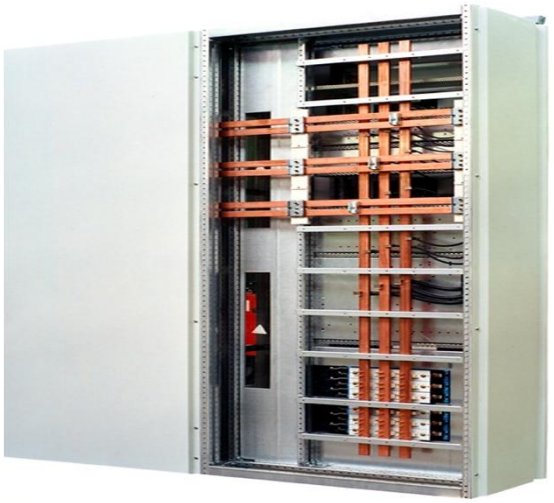


The cubicles structures and the busbars are fixed with special screw and ESLOCK bolts

**Maintenance free !**

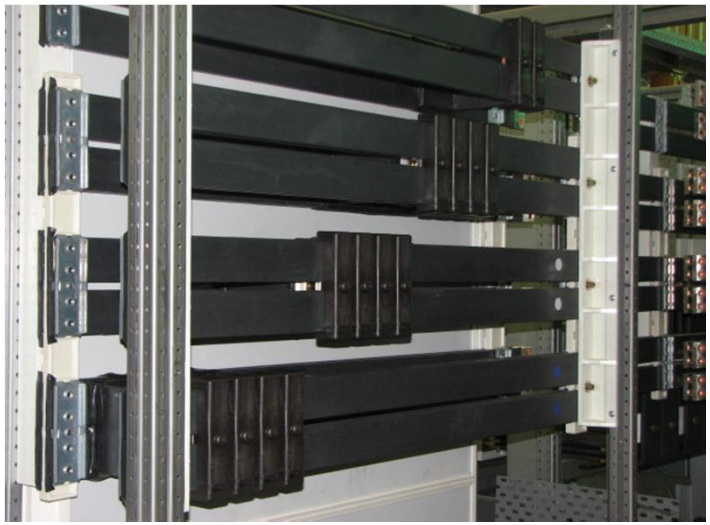
# MNS3.0
# Mechanical characteristics





## Main busbars position

- Upper
- Lower
- Upper & Lower (double busbars system)

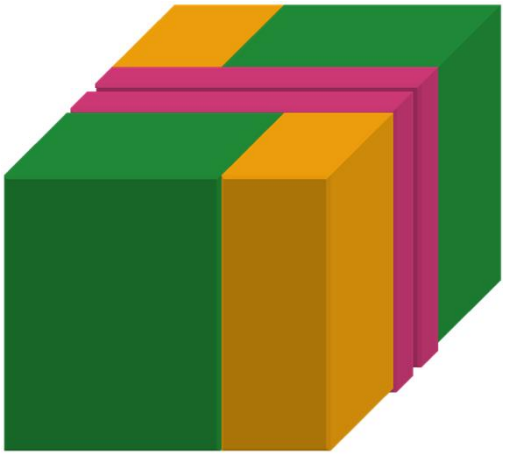


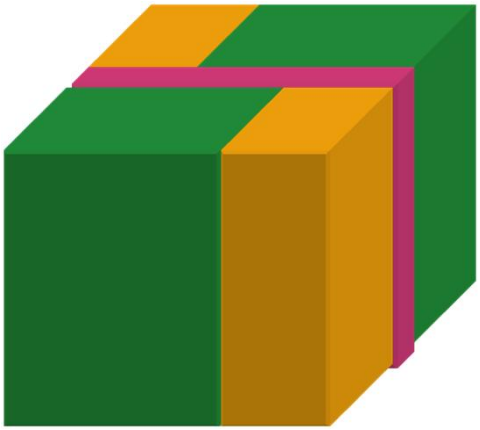
## Busbar Treatment

- Bare
- Silvered
- Sleeved

# MNS3.0
# Mechanical characteristics





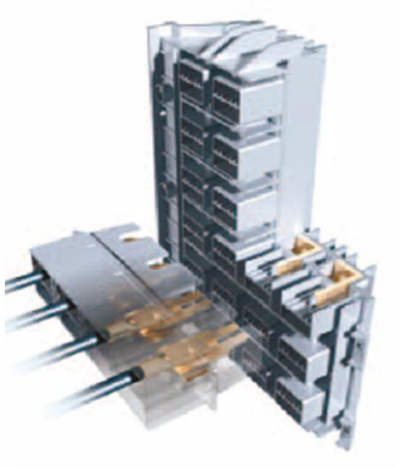


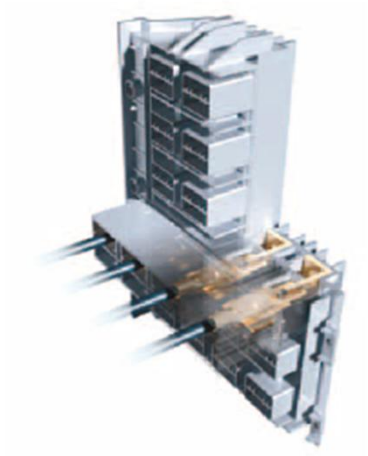
Busbar front access allow wall standing installation and special layout with reduce footprint:

- Back to back : two separated busbar compartments
- Duplex: one common busbar compartment

# MNS3.0
# Mechanical characteristics







Multifunction wall:

- Segregation and insulation of the distribution busbars
- Segregation of the main busbar from the functional units
- Free Fault zone: sensible reduction of possible to have an internal arc
- IP2X guarantee also with drawers removed

# MNS3.0
# Mechanical characteristics : from IP20 up to IP54



First digit: protection against solid foreign objects

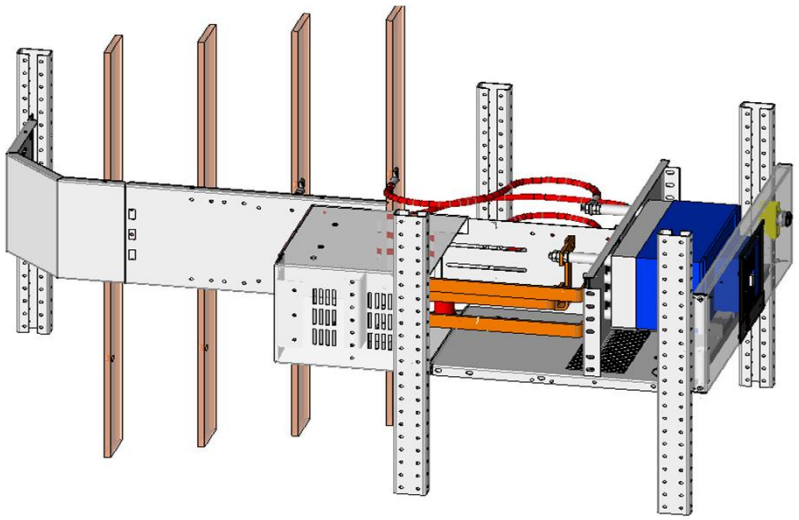
- 0 = No protection
- 1 = solid bodies > 50mm
- 2 = solid bodies > 12mm
- 3 = solid bodies > 2.5mm
- 4 = solid bodies > 1mm
- 5 = dust protected

Second digit: protection against Water

- 0 = No protection
- 1 = vertically dripping water
- 2 = dripping water (15° tilted)
- 3 = sprayed water (60° tilted)
- 4 = splashing water (all direction)

# MNS3.0
# Mechanical characteristics: segregation form up to 4b





**Form 4b**: segregation of the busbars from functional units and between functional units; segregation of the terminals from the functional units and from the busbars; the terminal for external conductors are in the same compartment as the associated functional unit..

# MNS3.0
# MCC Cubicles



Wide range of solution

- Fix modules
- Removable modules (SlimLine)
- Withdrawable modules

# MNS3.0
# MCC Cubicles



| | Switch Position | Module position | Main and auxiliary circuits |
|---|---|---|---|
|  | **ON** | insert | All main and control circuit are connected |
|  | **OFF**<br>Can be locked with 3 padlocks | insert | All main and control circuit are disconnected |
|  | **TEST**<br>Can be locked with 3 padlocks | insert | All main circuits are disconnected, the control circuits are connected |
|  | **MOVE** | Insert / insulated / removed | All main and control circuits are disconnected |
|  | **ISOLATED**<br>Can be locked with 3 padlocks | The module is 30mm draw out of the cubicle | All main and control circuits are disconnected and the isolating distance is fulfilled |

Friendly use: all the operations are made with only one switch keeping the highest safety standard

# MNS3.0
# MCC Cubicles



Modularity and flexibility

- Interchangeable modules
- Possibility to modify the modules layout with reduce “out of Service” time
- Modules for industrial drives and Soft starters
- Reactive power compensation modules

# MNS3.0
# Unit equipped with variable Speed Drive



- MNS *offer* feeders equipped with variable speed drive type ABB ACS 850
- Withdrawable execution up to 55kW, fix version up to 200kW
- Reduction of the plant consumption through the motor speed control: A pump or fan running at half speed consumes only one eighth of energy.

# MNS3.0
# Intelligen feeders




- Possibility to install intelligent modules inside the withdrawable units
- Like the ABB M102, a unit complete of
  - Protections (26, 27, 37, 46, 49, 51LR, 66…)
  - Measuring (A, V, Hz, kW, kVA, kWh….)
  - Communication (Profibus DP, Modbus RTU)

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