Power Transmission and Distribution

NXPLUS C double busbar
The economical solution when replacing old systems
Besides the NXPLUS and BDJ/H types, NXPLUS C is the only switchgear in the world with an all-round hermetically tight pressure system inside a seal-less welded stainless steel enclosure for all performance classes. That means no work on the gas system is ever required - neither during installation on site, nor throughout the whole service life of the system. And with such a compact design, replacement can take place in existing buildings. These benefit from the use of pressure relief ducts with absorber technology designed to relieve the pressure on the individual compartments.

**High availability of energy supply**

NXPLUS C is easily extendable, allowing a stage-by-stage replacement of old equipment. Old and new switchgear can be operated in parallel, thus maximizing the availability of the energy supply. The small panel width of 600 mm means that more feeders can be included when old systems are replaced by NXPLUS C: i.e. a power supply system can be expanded without having to construct a new switchgear building.

**Potential capacity increase**

With plug-in busbars you also have the option of later increasing the capacity of industrial load-center substations. This can be achieved by replacing the 1250 A infeed transformer panels (as end-panel) with 2000 or 2500 A panels and upgrading the busbar from 1250 A up to 2500 A – all this without the need for any work on the gas system.

The NXPLUS C duplicate busbar can be combined with the entire NXPLUS C single busbar product range, thus allowing just about every type of system (e.g. Z circuit).

**A secure system – in every respect**

Thanks to its sophisticated design, NXPLUS C provides the highest levels of personal and operating safety and is also extremely reliable. NXPLUS C can always be operated with the encapsulation closed, as the primary enclosure is sealed (both safe to touch and hermetically welded). Excellent standards of personal safety are also ensured by features such as arc-fault testing, metal cladding, interrogative interlocking, a capacitive voltage detection system and IP65 protection for the primary part.

Interruptions to operation caused by harmful environmental influences can be ruled out thanks to the hermetically-sealed and welded enclosure and the maintenance-free operating mechanisms mounted outside the NXPLUS C enclosure. Current and voltage transformers outside the main enclosure are optimally accessible. Comprehensive interrogative interlocking, minimal fire-load and (as an option) aseismic design all help to maximize operating reliability.

**Proven reliability**

NXPLUS Cs reliability has been proven by means of type and routine tests in accordance with IEC 60694/IEC 60298 (in future IEC 62271). 17,000 switchpanels in operation around the world today testify to the system’s dependability. Quality assurance conforms with DIN EN 9001.

**A summary of advantages:**

- Sophisticated design provides high levels of personal safety and operating reliability
- Hermetically sealed and welded enclosures make replacement of old switchgear a safe procedure
- No work on the gas system required on site
- Easy to fit inside existing buildings
- Parallel operation of old and new switchgear systems
- Expanding the power supply system, yet making use of existing switchgear buildings
- Plug-in busbars can increase the capacity
- Just about every type of system can be created
- Maintenance-free operating mechanisms, and thus maintenance-free switchgear
- More than 17,000 switchpanels in operation worldwide
- Etc., etc., etc.
**RWE AG Mayen Substation**

Old: Open, air-insulated double busbar system
20 kV, 1250 A
Panel width 1400 mm

New: Gas-insulated double busbar system
NXPLUS C 20 kV, 1250 A
Panel width 600 mm + 100 mm spacer panel
(the width of the spacer panels can be adapted to given conditions on site)

**Benefits:**
- Minimal modifications to existing foundations thanks to variable panel widths
- 2 new feeders take up as much space as one old one (→ potential doubling of number of feeders)
- NXPLUS C installed during operation of old system

**RWE AG Appelhülsen Substation**

Old: 30 kV air-insulated double busbar system (outdoor)
10 kV air-insulated double busbar system – type AWJ

New: 30 kV gas-insulated double busbar system – NXPLUS
10 kV gas-insulated double busbar system – NXPLUS C

**Benefits:**
- Space saved, thanks to compact NXPLUS C design with 600 mm panel width
- Integration of 30 kV outdoor equipment into existing substation building
- Space in front of substation building freed for other purposes

**Further references**
- EAM Energie AG (D)
- E.ON Hanse AG (D)
- Technische Werke Ludwigshafen AG (D)
- Ravdex A/S (DK)
- Jihomoravská energetika, a.s. (CZ)
- ZE Krakow (PL)
- EVN AG (A)
Product Range

Circuit-Breaker Panels

- Three-position disconnector
- Vacuum circuit-breaker
- Plug in voltage transformer
- Plug in voltage transformer, outside
- Current transformer
- Capacitive voltage detection system
- Disconnectable and plug-in voltage transformer
- Surge arrester or limiter
- Max. 3 external cone connection systems (not included in scope of supply), one of which can be replaced by a surge arrester or limiter
- Panel busbar

Abbreviations
BB1 = busbar 1
BB2 = busbar 2

Front view, sectional views, floor cutouts

1) Busbar rated normal current ≤ 1250 A
(> 1250 A on request)

Single busbar panel, prepared for future expansion to double busbar

- Floor cutout for control cables
- Pressure relief duct
- Fixing hole for M8/M10
- Floor cutout for high voltage cable

1) in the case of one cable or two cables, a surge arrester may be added

Abbreviations
HA35-2501 eps
HA35-2500 eps
BB1
BB2

or Plug-in cable – double
or Plug-in cable – single
or Plug-in cable – triple

*) in the case of one cable or two cables, a surge arrester may be added

- Floor cutout for control cables
- Pressure relief duct
- Fixing hole for M8/M10
- Floor cutout for high voltage cable
Floor cutout for control cables
Pressure relief duct
Fixing hole for M8/M10

1) Busbar rated normal current
≤ 1250 A
(> 1250 A on request)

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≤ 1250 A
(> 1250 A on request)
Room planning

System arrangement
For double busbar switchgear: Back-to-back arrangement (floor-mounted)

Room dimensions
See adjacent plan

Panel fixing
- For floor cutouts and fixing points, see construction details
- Foundations:
  - Steel girder construction
  - Reinforced concrete floor with foundation rails, welded or bolted

Panel dimensions
See pages 4 and 5

Weights
- Duplicate busbar panel 600mm: approx. 1600 kg

Room planning
double busbar systems
Floor-mounted arrangement (plan view)
Switchpanels with pressure relief duct

Shipping data for duplicate busbar systems

Transport
NXPLUS C switchgear is delivered in individual panels (A and B sides are separated)

Transport dimensions
Panel widths Transport dimensions
mm Length x width x height
mm x mm x mm

Transport in Germany / to other European countries
1 x 600 1450 x 1100 x 2470

Overseas transport
1 x 600 1450 x 1130 x 2650

Transport weights *
Panel widths Transport weight with packing without packing
mm approx. kg approx kg
1 x 600 900 800

* Mean values depending on complement of panels
## Electrical data, filling pressure, temperature

### Common electrical data, filling pressure and temperature

<table>
<thead>
<tr>
<th>Rated insulation level</th>
<th>Rated voltage $U_r$</th>
<th>kV</th>
<th>7.2</th>
<th>12</th>
<th>15</th>
<th>17.5</th>
<th>24</th>
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<tbody>
<tr>
<td>Rated short-time power-frequency withstand voltage $U_{rd}$:</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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<tr>
<td>– phase-to-phase, phase-to-earth, open contact gap</td>
<td>kV</td>
<td>20</td>
<td>281)</td>
<td>36</td>
<td>38</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>– for isolating distance</td>
<td>kV</td>
<td>23</td>
<td>322)</td>
<td>39</td>
<td>45</td>
<td>60</td>
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<tr>
<td>Rated lightning impulse withstand voltage $U_{pp}$:</td>
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<tr>
<td>– phase-to-phase, phase-to-earth, open contact gap</td>
<td>kV</td>
<td>60</td>
<td>751)</td>
<td>95</td>
<td>95</td>
<td>125</td>
<td></td>
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<tr>
<td>– for isolating distance</td>
<td>kV</td>
<td>70</td>
<td>851)</td>
<td>110</td>
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<td>Rated frequency $f_r$</td>
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<td></td>
<td>50/60 Hz</td>
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<tr>
<td>Rated normal current $I_{r2}$</td>
<td>for the busbar</td>
<td>A</td>
<td>2500</td>
<td>2500</td>
<td>2500</td>
<td>2500</td>
<td>2500</td>
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<tr>
<td>Rated filling pressure $P_{re3}$</td>
<td></td>
<td></td>
<td>150 kPa (absolute) at 20°C</td>
<td></td>
<td></td>
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<tr>
<td>Minimum operating pressure $P_{me3}$</td>
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<td></td>
<td>130 kPa (absolute) at 20°C</td>
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<td></td>
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<tr>
<td>Ambient temperature</td>
<td></td>
<td></td>
<td>–5°C to +55°C</td>
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</tbody>
</table>

### Switchpanel data

#### Circuit-breaker panel, bus coupler

<table>
<thead>
<tr>
<th>Rated normal current $I_{r2}$</th>
<th>A</th>
<th>1000</th>
<th>1000</th>
<th>1000</th>
<th>1000</th>
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<tbody>
<tr>
<td>Rated short-time current $I_k$ for systems with $t_k = 1$ s</td>
<td>up to kA</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>25</td>
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<tr>
<td>for systems with $t_k = 3$ s</td>
<td>up to kA</td>
<td>25</td>
<td>25</td>
<td>25</td>
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<td>25</td>
</tr>
<tr>
<td>Rated peak withstand current $I_p$</td>
<td>up to kA</td>
<td>63</td>
<td>63</td>
<td>63</td>
<td>63</td>
<td>63</td>
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<tr>
<td>Rated short-circuit making current $I_{ma}$</td>
<td>up to kA</td>
<td>63</td>
<td>63</td>
<td>63</td>
<td>63</td>
<td>63</td>
</tr>
<tr>
<td>Rated short-circuit breaking current $I_{sc}$</td>
<td>up to kA</td>
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<td>25</td>
<td>25</td>
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<td>25</td>
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<tr>
<td>Electrical service life of vacuum circuit-breakers with rated normal current</td>
<td>10,000 operations cycles</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>with rated short-circuit breaking current</td>
<td>50 breaking operations</td>
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</table>

#### Incoming feeder coupler

<table>
<thead>
<tr>
<th>Rated normal current $I_{r2}$</th>
<th>A</th>
<th>1250</th>
<th>1250</th>
<th>1250</th>
<th>1250</th>
<th>1250</th>
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</thead>
<tbody>
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<td>25</td>
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<tr>
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<td>25</td>
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<td>25</td>
</tr>
<tr>
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<td>63</td>
<td>63</td>
<td>63</td>
<td>63</td>
<td>63</td>
</tr>
<tr>
<td>Rated short-circuit making current $I_{ma}$</td>
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<td>63</td>
<td>63</td>
<td>63</td>
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<td>63</td>
</tr>
<tr>
<td>Rated short-circuit breaking current $I_{sc}$</td>
<td>up to kA</td>
<td>25</td>
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<td>25</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
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</table>

1) Higher rated short-time power-frequency withstand voltage available with:
   - 42 kV with phase-to-phase, phase-to-earth and open contact gap plus
   - 48 kV across isolating distance
2) Rated normal currents are determined for ambient temperatures of up to max. 40 °C.
   The 24-hour mean is 35 °C max. (to IEC 60 694/VDE 0670 Part 1000).
3) Pressure values for SF₆ insulated enclosures
   Please see Catalog HA 35.41 for further details on NXPLUS C
   (Order no. E50001-K1435-A401-A6)
If you have any questions about Power Transmission and Distribution, our Customer Support Center is available around the clock.

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The information in this document contains general descriptions of the technical options available, which do not always have to be present in individual cases. The required features should therefore be specified in each individual case at the time of closing the contract.

Subject to change without prior notice
Order No. E50001 U229 A223 X-7600
Printed in Germany
Dispo-Stelle 40402
61 C 6065 Br. 101231 WS 04053.