NATUS ENERGON Draw-out Type Low Voltage Switchgear System

Geared to the future thanks to innovation and quality
NATUS switchgear systems offer you professional, top quality solutions based on the highest safety standards. In our more than 50 year company history, NATUS has been building and delivering draw-out type switchgears since 1978.

**Innovative developments**

We are making the distribution of power in low voltage networks even safer with our own developed, type-tested switchgear assembly (TTA) certified switchgear system ENERGON. ENERGON switchgears have taken low voltage systems to a new safety level through a withdrawable system that had only till then been reached by medium voltage switchgears.

With the patented contact mechanism DTS, we very quickly set the standard on the market of MCC-systems. Since then, we have regularly enhanced the system with the help and advice of our customers. A globally unique ergonomic latch, the one-handed safety latch CONTINUOUS LATCH, closes the door “arc safe” without the use of tools.

Since 2004, the certified arc fault distribution busbar ARC SAFE has been built into the systems as a standard.

**Low voltage – geared to the future**

Numerous innovations and constant further developments are our guarantee for a reliable and geared to the future switchgear. We provide our customers with experienced engineering teams. That is how we guarantee an optimal design and the shortest possible delivery time.
The ENERGON-Highlights

ENERGON has taken low voltage switchgears to a new level of safety and technology

**ARC SAFE – Safety against arc faults**

With this vertical distribution busbar, the replacement and addition of functional units can take place while the switchgear is live. The “Automatic Shutter” is mechanically interlocked, is a positively driven contact and can additionally also be padlocked. The bus duct provides the highest level of protection through insulated encapsulation and separation between the phases. Accredited testing laboratories have certified the bus duct as “arc safe”.

**DTS – Double Transfer System**

The term Double Transfer System stands for our patented contact mechanism. The system stands out thanks to the safe and mechanical separation of the main circuits and control circuits during the point of disconnection and the testing point. It also has coloured indicators for the disconnected position (green), test position (blue) and operating position (red).

**CONTINUOUS LATCH – Design meets functionality**

The new door locking mechanism is setting the standard in safety and ease of use worldwide. This progressive functional design offers maximum security by means of the easy and simple one-hand use.
PD-cubicle
Withdrawable or fixed mounted circuit-breakers (bus-compatible)

Used for:
- incoming supply
- outgoing feeders
- coupler

Cubicle features:
- air circuit breaker (ACB)
- design/construction according to requests
- measuring technique according to customer’s specifications
- 3-pole or 4-pole
- up to 6,300 A
- up to 690 V
- separation up to form 4b (IEC)
- cable connection possible from the top or from the bottom
- compact coupler busraiser possible (width of 200 mm)

VERSATILE FUNCTIONS
Benefit from the range of low voltage cubicles NATUS has to offer you. The cubicles have multiple functions:
- in example for:
  - the incoming supply
  - the power distribution with air circuit breakers (ACB’s), molded case circuit breakers (MCCB’s) or fuse blocks
  - the mounting of converters, soft starters or a partially fixed-mounted design for small consumer’s as well as a programmable logic controller (PLC)
- motor starters either as withdrawable or semi-withdrawable units

ENERGON – Types of cubicles
Construction options for PD-cubicle

<table>
<thead>
<tr>
<th>rated current (A)</th>
<th>cubicle depth (mm)</th>
<th>3-pole circuit breaker</th>
<th>4-pole circuit breaker</th>
<th>main busbar</th>
</tr>
</thead>
<tbody>
<tr>
<td>630</td>
<td>500, 700, 1,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>800</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1,250</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1,600</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2,500</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3,200</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6,300</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1) derating depends on make, frame size, installation status, degree of protection, ambient temperature
2) if cable department is downwards (if upwards min. 700 mm), without cabinet offset
3) depends on make, frame size and required space in control compartment
4) if cable departure is downwards
5) special constructions possible, i.e. busbars on bottom

- main distribution board with high rated currents and short-circuit currents
- electrical equipment make according to customer’s requests
- bus-compatible for the direct integration of control systems
ENERGON – Types of cubicles

**MD-cubicle**
Multifunctional outgoing cubicle

**Used for:**
- motor starters
- power feeder

**Design**
- draw-out type
- semi-withdrawable type

Any combination in one cubicle is possible.

**Construction**
- the cubicle has 31 units of height (U), 27 U can be used for modules
- main busbar: 2 U
- N-Type withdrawable units in different compartments with their own doors: 2–12 U
- 4 Q-Type withdrawable units in the same compartment: 4 U
- PE, N, PEN busbar: 2 U
- cabling room 400 mm wide (optional 600 mm), cable entry point from top (depth of 700 mm is necessary) and bottom possible

- withdrawable unit is mechanically codable (protection against mix-up of units)
- separation up to form 4b (IEC) as well as form 4b type 7 (BS) (W=1200 mm) (without Q-Type withdrawable units)

**Vertical distribution busbar ARC SAFE**
- automatic protection (shutter) against contact with distribution busbar when withdrawable unit is withdrawn, shutter can be padlocked
- rated current up to 1,000 A
- L1, L2, L3, optionally also with N-busbar (4-pole switching)
2 layer roof-sheeting with staggered ventilation opening (sandwich design)

busbars L1, L2, L3 on the top up to 3 x 100 x 10 mm per phase bare or coated

busbar supports with an arc fault barrier

busbars in the rear up to 4 x 140 x 10 mm per phase, bare or coated (with cubide depth of 700 mm)

double-walled compartment

inner corpus made of galvalumed metal and stainless steel components

minimum metal sheet thickness of 2 mm

sturdy construction of bottom module with 3 mm material thickness

powder coating in accordance with RAL colour palette (80 µm)

compartment for Q-Type withdrawable units

compartment for N-Type withdrawable units

cubicle breakdown into 31 U

open configuration of cubicle

busbar N / PE (PEN)
ENERGON – Types of cubicles

FD-cubicle
The fixed mounted cubicle is a multifunctional cubicle that provides the reception of the following:
- control voltage distribution
- outgoing feeders in fixed mounting
- soft starter
- frequency converter
- automation equipment

SD-cubicle
The in-line fuse switch unit for power distribution with switch fuses:
- assembly of different makes
- horizontal and vertical installation possible with in-line fuse switch size 3 (630 A)
- vertical distribution busbar up to 2,000 A
- large cable compartment (400 mm or 600 mm)

CD-cubicle
The power factor compensation unit
- each cubicle up to 400 kVar (incl. chokes)
- modular construction
- connection of the distribution busbars via upstream fuse switch disconnectors – with or without separate ventilation
- with controller
ENERGON – Types of withdrawable units

**N-Type withdrawable unit**

**Patented contact mechanism**

DTS:  
- safe connection, user-friendly, bus-compatible  
- main switch can only be operated when the door is closed  
- cubicle door only opens in the disconnected position (can be overridden)  
- unit can only be withdrawn in disconnected position  
- unit can only be withdrawn if the main switch is disconnected

- disconnection contact for incoming and outgoing circuits on both sides  
- compartments can be padlocked to prevent insertion of withdrawable units  
- both withdrawable units and subsections can be exchanged or converted while the board is live  
- mechanical encoding ensures protection against mix-up of units  
- coloured display that can be seen through a window on the units door indicates the switching status

**Disconnected and test position**

- Closed door operating / disconnected / and test position. The required isolating distance is provided, besides by the main switch, by the mobile, patented contact mechanism (DTS)  
- control connector adapts to changing needs: up to 40 poles, with additional bus contacting
ENERGON – Types of withdrawable units

Switching status of the withdrawable units

Disconnected position
The patented contact mechanism ensures that the withdrawable unit can only be withdrawn in the disconnected position – this maximises the user-friendliness.

Test position
You can safely configure and test the control circuit while the circuit breaker is disconnected in the test position.

Operating position
Main circuit and control circuit are contacted while the withdrawable unit is mechanically secured against extraction.
Plug-in type semi-withdrawable unit (M-Type)

The semi-withdrawable unit offers you an economical alternative to the N-Type withdrawable unit while retaining utmost plant safety. Thanks to the plug-in technique ENERGON semi-withdrawable units can be easily built in and removed from the power and control side.

◆ the semi-withdrawable unit can be combined with other withdrawable units in the cubicle
◆ unit can only be withdrawn in the disconnected position (without overriding insertion forces)
◆ compartments can be padlocked to prevent insertion of withdrawable units
◆ mechanical encoding ensures protection against mix-up of units
◆ control connector adapts to changing needs: up to 40 poles, with additional bus contacting

Q-Type withdrawable unit

Small, space saving withdrawable unit up to 11 KW or 32 A
◆ has the same operating and locking logic as the N-Type
◆ mechanical operating / disconnected / test position
◆ disconnection contact for incoming and outgoing circuits
◆ unit can only be withdrawn in the disconnected position (without overriding insertion forces)
◆ compartments can be padlocked to prevent insertion of withdrawable units
◆ mechanical encoding ensures protection against mix-up of units
◆ control connector adapts to changing needs: up to 40 poles, with additional bus contacting
◆ main switch with motor switching capacity
◆ operating mechanism can be padlocked in disconnected mode (maximum of three padlocks)
◆ common door for 4 Q-Type withdrawable units
◆ coloured display that can be seen through a window on the units front panel indicates the switching status
◆ for motor control units and feeders to subdistribution boards in plug-in-technique up to 630 A
◆ for compact power distribution (multiple outgoing feeders)
◆ for other components, i.e. generation of control voltage, remote I/O modules, etc.
◆ operation and display can be available outside of the unit
## Typical configurations

### Motor starters, fuseless, 400 V – 50 kA with SIMOCODE pro

<table>
<thead>
<tr>
<th>Typical</th>
<th>Rated data (AC-2/AC-3)</th>
<th>Size of withdrawable unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$P_n$</td>
<td>$I_d(A)$</td>
</tr>
<tr>
<td>D3Q0_75A</td>
<td>0.75</td>
<td>1.85</td>
</tr>
<tr>
<td>D3Q07_5A</td>
<td>7.5</td>
<td>15.17</td>
</tr>
<tr>
<td>D3Q0011A</td>
<td>18.5</td>
<td>21.73</td>
</tr>
<tr>
<td>D3N0022A</td>
<td>22</td>
<td>41.09</td>
</tr>
<tr>
<td>D3N0045A</td>
<td>45</td>
<td>81.21</td>
</tr>
<tr>
<td>D3N0055A</td>
<td>55</td>
<td>100.42</td>
</tr>
<tr>
<td>D3N0075A</td>
<td>75</td>
<td>133.91</td>
</tr>
<tr>
<td>D3N0090A</td>
<td>90</td>
<td>160.69</td>
</tr>
<tr>
<td>D3N0110A</td>
<td>110</td>
<td>196.4</td>
</tr>
<tr>
<td>D3N0132A</td>
<td>160</td>
<td>230.52</td>
</tr>
<tr>
<td>D3N0250A</td>
<td>250</td>
<td>436.59</td>
</tr>
</tbody>
</table>

### Cable feeders, fuseless

<table>
<thead>
<tr>
<th>Typical</th>
<th>Rated current*</th>
<th>Rated current at 35 °C ambient temperature (A)</th>
<th>Size of withdrawable unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$P_n$</td>
<td>unventilated</td>
<td>ventilated</td>
</tr>
<tr>
<td>F1Q0012A</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>F1Q0025A</td>
<td>25</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td>F1N0050A</td>
<td>32/50</td>
<td>26/39</td>
<td>30/43</td>
</tr>
<tr>
<td>F1N0100A</td>
<td>100</td>
<td>77</td>
<td>86</td>
</tr>
<tr>
<td>F1N0125A</td>
<td>125</td>
<td>95</td>
<td>102</td>
</tr>
<tr>
<td>F1N0160A</td>
<td>160</td>
<td>127</td>
<td>138</td>
</tr>
<tr>
<td>F1N0250A</td>
<td>250</td>
<td>175</td>
<td>192</td>
</tr>
<tr>
<td>F1N0400A</td>
<td>400</td>
<td>285</td>
<td>312</td>
</tr>
<tr>
<td>F1N0630A</td>
<td>630</td>
<td>450</td>
<td>510</td>
</tr>
</tbody>
</table>

* stated values and withdrawable unit sizes can vary depending on the make used and ambient conditions
## Technical data at a glance

### Standards and specifications

<table>
<thead>
<tr>
<th>Type</th>
<th>Specification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type tested low voltage switchgear assembly (TTA)</td>
<td>IEC 60439-1, DIN EN 60439-1, VDE 0660 part 500</td>
<td></td>
</tr>
<tr>
<td>Protection against electric shock</td>
<td>DIN VDE 50274, VDE 0660, part 514</td>
<td></td>
</tr>
<tr>
<td>Testing of the response during internal faults (arc fault)</td>
<td>IEC 61641, DIN VDE 0660 part 500, supplement 2</td>
<td>$U_x = 725\text{V AC}, I_{cw} = 65\text{kA}, t = 300\text{ms}$</td>
</tr>
<tr>
<td>Testing during ground motion (earthquake testing)</td>
<td>IEC 68 part 2 and 3, DIN EN 60068</td>
<td></td>
</tr>
</tbody>
</table>

### Creepage distances and clearances

| Rated impulse withstand voltage ($U_{imp}$) | 8 kV (12 kV) |
| Degree of pollution | III |

### Rated insulation voltage ($U_i$)

<table>
<thead>
<tr>
<th>Rated voltage</th>
<th>Busbar system</th>
<th>Switchgear</th>
</tr>
</thead>
<tbody>
<tr>
<td>U_i busbar system</td>
<td>1,000 V</td>
<td>up to 1,000 V</td>
</tr>
<tr>
<td>U_i switchgear</td>
<td>up to 690 V</td>
<td></td>
</tr>
</tbody>
</table>

### Rated operational voltage ($U_e$)

<table>
<thead>
<tr>
<th>Rated voltage</th>
<th>Horizontal main busbars installation position: top or rear blank or coated (insulated) material copper Cu-E-F30</th>
</tr>
</thead>
<tbody>
<tr>
<td>U_e</td>
<td>rated current</td>
</tr>
<tr>
<td></td>
<td>rated peak withstand current ($I_{pk}$)</td>
</tr>
<tr>
<td></td>
<td>rated short-time withstand current ($I_{cw}$), 1s</td>
</tr>
<tr>
<td></td>
<td>Vertical busbar for the multifunctional outgoing cubicle MD single pole, enclosed, insulated material copper Cu-E-F30</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Rated currents

<table>
<thead>
<tr>
<th>Rated current</th>
<th>Circuit breaker (ACB) incoming supply, coupler or outgoing feeder type 1 or type 2 IEC 947-4-1, IEC 60439-1 / DIN EN 60439-1, VDE 0660, part 500, 7.7 UK National Annex to BS EN 60439-1</th>
<th>up to $I_n = 6,300$ A up to $I_n = 630$ A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Motor-starter starter combination type 1 or type 2 IEC 947-4-1, IEC 60439-1 / DIN EN 60439-1, VDE 0660, part 500, 7.7 UK National Annex to BS EN 60439-1</td>
<td>up to $I_n = 6,300$ A up to $I_n = 630$ A</td>
</tr>
</tbody>
</table>

### Internal separation

<table>
<thead>
<tr>
<th>Form of separation</th>
<th>Specification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form 2b to form 4b</td>
<td>IEC 60439-1 / DIN EN 60439-1, VDE 0660, part 500, 7.7 UK National Annex to BS EN 60439-1</td>
<td>up to $I_n = 6,300$ A up to $I_n = 630$ A</td>
</tr>
<tr>
<td>Up to form 4b type 7</td>
<td>IEC 60439-1 / DIN EN 60439-1, VDE 0660, part 500, 7.7 UK National Annex to BS EN 60439-1</td>
<td>up to $I_n = 6,300$ A up to $I_n = 630$ A</td>
</tr>
</tbody>
</table>

### Surface treatment

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pieces of frame, roof and rear panel doors, side panels colour of the powder coated parts (coating thickness 80 µm)</td>
<td>Galvalumed powder coating standard RAL 7035, light grey (optional all other RAL tones)</td>
</tr>
</tbody>
</table>

### Degree of protection

<table>
<thead>
<tr>
<th>Specification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC 60529, DIN 40050</td>
<td>Standard IP41 (optional higher IP)</td>
</tr>
</tbody>
</table>

### Dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>2,200 mm</td>
</tr>
<tr>
<td>Width</td>
<td>500/600/800/1,000/1,200 mm</td>
</tr>
<tr>
<td>Depth</td>
<td>500/700/1,000 mm</td>
</tr>
<tr>
<td>Single front</td>
<td>1,000/1,400 mm</td>
</tr>
</tbody>
</table>
Excerpt of our documentation

1. Diagram showing a top view of the system components.
2. Wiring diagram illustrating the connections and layout of the electrical system.

**NATIONAL COM. ARR.**
- MAIN BARRIER: 2 x 4/580x355
- RAL HUE: RAL 7032
- DEGREE OF PROTECTION: IP 41
- SHORT CIRCUIT CURRENT: 50 kA
- COVER PLATE: SEAL. STRIP
- MAINS VOLTAGE: 400 V
- SYSTEM CONFIGURATION: TN-C-S
- TYPE: 3WL 1000A
- WEIGHT: 600kg
- TRANSPORT UNIT: 1

**Description**
- Direct online motor starter up to 50kW
- Typical name: MCC TOP
- Blatt/sheet: 1

- Major components and their positions are labeled, including mains sections, control voltage devices, and indicator positions.
- Connections and wiring details are clearly marked for each unit.
Electrotechnical Solutions under one Roof

NATUS products and services

**SWITCHGEARS** For decades we have been setting standards in innovation, safety and quality in our core business of switchgear systems.

**SERVICES** Our comprehensive service package leaves no wish unanswered— we do everything from assembly to maintenance and a 24-hour emergency service, right through to a comprehensive spare parts service.

**AUTOMATION** We are constantly developing reliable solutions that are specifically tailored to customers’ needs in the field of automation and control systems.

**SOLUTIONS** We combine the products of selected partners with NATUS services and a comprehensive project management to come up with professional solutions.