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LOW VOLTAGE SWITCHGEARS

PURPOSE

USG is a series of low voltage modular design switchgears operated in power plant auxiliaries and used for power supply, sectioning and distribution as well as controlling electric drives for various actuators (for example, controlling isolation valves, ventilation valves, pumps, etc.).

USG (Ural Switchgear) are an advanced series of low voltage switchgear cabinets manufactured by FSUE UEMZ, modernized in accordance with international standards and manufactured in seismic protection in accordance with IEC 60990.

KEY FEATURES

- Modular Design
- Short-Term Production and Maintenance
- Compact
- Resistance to Environmental Impact
- Enhanced Protection of Electrical Equipment
- A Wide Range of Electrical Circuits
- Possibility of Installing Additional Automation and Diagnostics Modules in Cabinets
- High Reliability and Long Service Life

MODULAR DESIGN

The cabinet design provides for the installation of a full set of electrical and other equipment, controls, protection and field devices in accordance with the customer’s requirements, and ensures access to devices and terminals during installation, wiring, maintenance, and repair.

USG cabinets of one maintenance type (unilateral or bilateral) can be connected into multi-cabinet structures – switchboards (assemblies, sections).

The design provides for bus-bar jumpers (bus ducts) to connect individual parts of a switchboard (assembly, section) located at a distance from each other.

SHORT-TERM PRODUCTION AND MAINTENANCE

The average recovery time is no more than 1 hour if SPTA are available.

The availability factor is no less than 0.998.
**A WIDE RANGE OF ELECTRICAL CIRCUITS**

As a rule, USG are built on a system of standard functional units and solutions, but it is possible to manufacture cabinets according to non-standard schemes for the main and auxiliary circuits, including the use of non-standard functional units according to the customer’s concepts.

**HIGH RELIABILITY AND LONG SERVICE LIFE**

USG are manufactured using unified load-bearing structures and shells.

The cabinets’ design provides the necessary rigidity, shock resistance, and resistance to external effects.

The average time between failures is no less than 250,000 hours per unit, provided that the number of cycles of switching devices does not exceed the permissible values for them.

The average service life is 50 years.

**POSSIBILITY OF INSTALLING ADDITIONAL AUTOMATION AND DIAGNOSTICS MODULES IN CABINETS**

USG cabinets are intended for joint operation with microprocessor automation tools to perform I&C and diagnostic functions.

For a distributed I&C system, USG cabinets may include RTU and upper level communication modules operating via optical or wired interface (up to 15 modules).

Cabinets with a built-in diagnostic system of motor operated valves can be used to acquire diagnostic data and monitor the state of controlled electric devices.
COMPACT

Due to a wide range of cabinet dimensions the most optimal use of space is ensured, thereby reducing the number of cabinets.

RESISTANCE TO ENVIRONMENTAL IMPACT

The degree of protection ensured by a cabinet casing is IP31 by default. Upon special order, cabinets can be manufactured with a IP41 or IP54 degree of protection. USG cabinets are resistant to corrosive agents in the environment corresponding to a Type II or III atmosphere. Internal mounting elements and fasteners are made of corrosion-resistant materials or have a protective coating.

KEY FEATURES

- **POWER GENERATION FACILITIES**
  - Nuclear Power Plants
  - Thermal Power Plants
  - Hydroelectric Power Plants

- **ELECTRIC POWER TRANSMISSION AND DISTRIBUTION FACILITIES**
  - Power supply centers
  - Distribution substations
  - Transformer substations

- **OIL AND GAS FACILITIES**
  - Oil and gas extraction facilities
  - Oil and gas refineries
  - Oil and gas chemical facilities
  - Tank farms
  - Oil product terminals

- **INDUSTRIAL FACILITIES**
  - Iron and steel plants
  - Pulp-and-paper mills
  - Mining facilities
  - Machine engineering plants, etc.

- **INFRASTRUCTURAL FACILITIES**
  - Airports
  - Ports and port facilities
  - Water utilities
  - Medical institutions

SCOPE OF APPLICATION

- **POWER GENERATION FACILITIES**
  - Seismic resistance
  - Increased reliability
  - Retractable design

- **ELECTRIC POWER TRANSMISSION AND DISTRIBUTION FACILITIES**
  - Seismic resistance
  - Increased reliability
  - Retractable design
  - Power distribution

- **OIL AND GAS FACILITIES**
  - Seismic resistance
  - Increased reliability
  - Retractable design
  - Power distribution

- **INDUSTRIAL FACILITIES**
  - Special anti-corrosion coating of conductive parts
  - High degree of protection (IP54)

- **INFRASTRUCTURAL FACILITIES**
  - Special anti-corrosion coating of conductive parts
  - High degree of protection (IP54)
NUCLEAR POWER PLANTS

- Kalinin NPP (Unit 4)
- Rostov NPP (Units 2, 3, 4)
- Beloyarsk NPP (Unit 4)
- Belarusian NPP
- Kursk NPP-2
- Leningrad NPP-2
- Novovoronezh NPP-2
- Smolensk NPP
- Kudankulam NPP

THERMAL POWER PLANTS

- TPP-14 (Pervomayskaya TPP)
- Nyagan SDPP
- Krasnoyarsk TPP-3
- Nizhnevartovsk SDPP
- Perm SDPP-9
- Chelyabinsk TPP
- TPP-12 (Moscow)
- TPP-16 (Moscow)
- TPP-20 (Moscow)
- Omsk TPP
- South-West TPP

Power Reception and Distribution
USG 210 (P8SH) and USG 220 (P13SH) cabinets are designed for secure power input and distribution. Cabinets of this type can have input and sectional switches, switches for outgoing lines occupying 16-20 modules, power supply input controlling units, and units for sectional devices occupying 12-16 modules installed.

The maximum height number of modules is 72 (1 module is 25 mm).

Cabinets of this type are designed to install Masterpact NW08-32 / NT08-16 automatic switches.

For USG 220 (P13SH), power supply input controlling units and units for sectional devices can be installed in one cabinet with Masterpact. For USG 210 (P8SH), power supply input controlling units and units for sectional devices cannot be installed in one cabinet with Masterpact. Those units are installed in an individual cabinet.
**Control of Electric Motors**

**SCOPE**

<table>
<thead>
<tr>
<th>1</th>
<th>Busbar section</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Functional units</td>
</tr>
<tr>
<td>3</td>
<td>Cable connections</td>
</tr>
</tbody>
</table>

**DESCRIPTION**

USG 310 (P9SH) and USG 320 (P14SH) cabinets are designed to control electric motors.

Cabinets of this type can also be used for power distribution and supply input of up to 630 A.

Cabinets of this type house functional units (motor control units, protection units for outgoing lines, units for sectional devices, etc.) with a size of 1/3 module to 4 modules and supply input control units of up to 630 A.

The maximum height number of modules is 72 (1 module is 25 mm).

Designed to install NSX, NS, GV, iC automatic switches.

A group switch of up to 630 A is possible to install.
## Control of Electric Motors

### USG 310 (P9SH)

<table>
<thead>
<tr>
<th>Cabinet type</th>
<th>USG 310</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width, mm</td>
<td>1200 / 1000</td>
</tr>
<tr>
<td>Height, mm</td>
<td>2200</td>
</tr>
<tr>
<td>Depth, mm</td>
<td>700 / 600</td>
</tr>
<tr>
<td>Rated current of horizontal busbars, A</td>
<td>2500 / 2000 / 1600 / 1000 / 630 / 400</td>
</tr>
<tr>
<td>Rated current of vertical busbars, A</td>
<td>1600 / 1000 / 630 / 400</td>
</tr>
<tr>
<td>Incoming CB</td>
<td>NSX / GV / iC</td>
</tr>
<tr>
<td>Outgoing CB</td>
<td>NSX / GV / iC</td>
</tr>
</tbody>
</table>

### USG 320 (P14SH)

<table>
<thead>
<tr>
<th>Cabinet type</th>
<th>USG 320</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width, mm</td>
<td>600</td>
</tr>
<tr>
<td>Height, mm</td>
<td>2200</td>
</tr>
<tr>
<td>Depth, mm</td>
<td>1000</td>
</tr>
<tr>
<td>Rated current of horizontal busbars, A</td>
<td>2500 / 2000 / 1600 / 1000 / 630 / 400</td>
</tr>
<tr>
<td>Rated current of vertical busbars, A</td>
<td>1600 / 1000 / 630 / 400</td>
</tr>
<tr>
<td>Incoming CB</td>
<td>NSX</td>
</tr>
<tr>
<td>Outgoing CB</td>
<td>NSX / GV / iC</td>
</tr>
</tbody>
</table>
**DESCRIPTION**

USG 110 (P7SH) and USG 120 (P12SH) cabinets are special items intended for the interface of supply input from a voltage transformer or by a heavy-gauge wire.

**USG 110 (P7SH)**

<table>
<thead>
<tr>
<th>Cabinet type</th>
<th>USG 110</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width, mm</td>
<td>600 / 400</td>
</tr>
<tr>
<td>Height, mm</td>
<td>2200</td>
</tr>
<tr>
<td>Depth, mm</td>
<td>700</td>
</tr>
<tr>
<td>Rated current of horizontal busbars, A</td>
<td>2500 / 2000 / 1600 / 1000 / 630 / 400</td>
</tr>
<tr>
<td>Rated current of vertical busbars, A</td>
<td>2500 / 2000 / 1600 / 1000 / 630 / 400</td>
</tr>
</tbody>
</table>

**USG 120 (P12SH)**

<table>
<thead>
<tr>
<th>Cabinet type</th>
<th>USG 120</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width, mm</td>
<td>600 / 400</td>
</tr>
<tr>
<td>Height, mm</td>
<td>2200</td>
</tr>
<tr>
<td>Depth, mm</td>
<td>1000</td>
</tr>
<tr>
<td>Rated current of horizontal busbars, A</td>
<td>2500 / 2000 / 1600 / 1000 / 630 / 400</td>
</tr>
<tr>
<td>Rated current of vertical busbars, A</td>
<td>2500 / 2000 / 1600 / 1000 / 630 / 400</td>
</tr>
</tbody>
</table>
## TECHNICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GENERAL</strong></td>
<td></td>
</tr>
<tr>
<td>Application type</td>
<td>- power reception and distribution, - control of electric motors</td>
</tr>
<tr>
<td>Compliance with standards</td>
<td>- IEC 60529, - IEC 61439, - IEC 61641-V3</td>
</tr>
<tr>
<td>Seismic resistance, M</td>
<td>up to 9 (per MSK64 scale)</td>
</tr>
<tr>
<td>Casing protection class</td>
<td>IP31, IP41, IP54</td>
</tr>
<tr>
<td>Degree of equipment protection (IK)</td>
<td>50</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>from -5 °C to +35 °C</td>
</tr>
<tr>
<td>Storage and transportation temperature range</td>
<td>from -40 °C to +70 °C</td>
</tr>
<tr>
<td>Maintenance type</td>
<td>Unilateral/bilateral maintenance</td>
</tr>
<tr>
<td>Template</td>
<td>2b, 3b, 4a, 4b</td>
</tr>
<tr>
<td>Environment type [EMC]</td>
<td>Type 2</td>
</tr>
<tr>
<td>Draw-out items</td>
<td>FFF/WFD/WFW/WWW</td>
</tr>
<tr>
<td>Supply input/output techniques</td>
<td>- by cables: top/bottom, - by buses: right, left, top</td>
</tr>
<tr>
<td>Dimensions, mm</td>
<td>- Height: 2200, - Width: 400/600/700/1000/1200, - Depth: 600/700/1000</td>
</tr>
<tr>
<td>Average cell weight, kg</td>
<td>650</td>
</tr>
<tr>
<td>Types of internal separation</td>
<td>2b, 3b, 4a, 4b</td>
</tr>
<tr>
<td>Types of connections of functional units</td>
<td>Stationary, removable, withdrawable</td>
</tr>
<tr>
<td>Service life, years</td>
<td>50</td>
</tr>
<tr>
<td>Average time to failure, hours</td>
<td>250,000 [min]</td>
</tr>
<tr>
<td>Average recovery time, h</td>
<td>1 [max]</td>
</tr>
</tbody>
</table>

## ELECTRICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal operating voltage, V</td>
<td>- main circuits: 415, - auxiliary circuits: 230</td>
</tr>
<tr>
<td>Nominal current frequency, Hz</td>
<td>50/60</td>
</tr>
<tr>
<td>Nominal insulation voltage, V</td>
<td>up to 1000</td>
</tr>
<tr>
<td>Nominal withstandable pulse voltage, kV</td>
<td>up to 12</td>
</tr>
<tr>
<td>Overvoltage class</td>
<td>IV</td>
</tr>
<tr>
<td>Contamination degree</td>
<td>3</td>
</tr>
<tr>
<td>Rated current of bus bars [inlet current, main distribution bus current], A</td>
<td>up to 2500</td>
</tr>
<tr>
<td>Rated current of vertical buses for power distribution, A</td>
<td>up to 2500</td>
</tr>
<tr>
<td>Rated short-term admissible current, kA</td>
<td>up to 100</td>
</tr>
<tr>
<td>Types of grounding system</td>
<td>TT, IT, TN-S, TNC, TNC-S</td>
</tr>
</tbody>
</table>

## FUNCTIONAL UNITS

### POSITION TYPES FOR FUNCTIONAL UNITS

#### Attached position
- Closed power circuits
- Closed secondary circuits
- Withdrawable part of the unit locked in the unit’s stationary area

#### Test position
- Open power circuits
- Closed secondary circuits
- Withdrawable part of the unit locked in the stationary part
- Due to the design features of USG cabinets, it is possible to install the unit into the test position both from the attached position and from the disconnected position.

#### Disconnected position
- Open power circuits
- Open secondary circuits
- Withdrawable part of the unit locked in the stationary part

#### Separated position
- Open power circuits
- Open secondary circuits
- Withdrawable part of the unit disconnected from the cabinet

The drawing out mechanism of functional units is equipped with a stop that limits the maximum movement of the unit or device, as well as a lock that eliminates the movement of the device under a load. Functional units provide the possibility of generating signals on the conditions of the contacts of the main circuits of switching devices.

The functional compartment with withdrawable parts is equipped with limit switches, signaling the position of the withdrawable parts with the possibility of issuing information to I&C about the attached position of the withdrawable parts.

USG withdrawable units are equipped with a special mechanical coding system that eliminates the installation of the unit in an inappropriate cell.
**FUNCTIONAL UNITS**

Separation of terminals for external conductors and functional units with no separation from terminals of another functional units

3A

Terminals for external conductors not separated from busbars

3B

Terminals for external conductors separated from busbars

Separation of terminals for external conductors associated with one functional unit and terminals of another functional unit and the busbars

4A

Terminals for external conductors in the same section with the functional unit

4B

Terminals for external conductors in different sections with the functional unit

**POWER DISTRIBUTION UNITS**

**UNIT 1/3M**
- Withdrawable part
- Main circuit breakers: iC60
- Test position
- Lock on connection or disconnection of the unit with the automatic switch on

**UNIT 1/2M**
- Withdrawable part
- Main circuit breakers: iC60, iC120, NSX
- Test position
- Lock on connection or disconnection of the unit with the automatic switch on
**FUNCTIONAL UNITS**

**UNIT 1M**
- Withdrawable part
- Main circuit breakers: iC60, iC120, NSX
- Test position
- Lock on connection or disconnection of the unit with the automatic switch on

**UNIT 1M**
- Split-design part
- Main circuit breakers: iC60
- No test position
- No lock on connection or disconnection of the unit with the automatic switch on

**UNIT 1M**
- Withdrawable part
- Main circuit breakers: iC60, iC120, NSX
- Test position
- Lock on connection or disconnection of the unit with the automatic switch on

**UNIT 2M**
- Withdrawable part
- Main circuit breakers: NSX
- Test position
- Lock on connection or disconnection of the unit with the automatic switch on

**FUNCTIONAL UNITS**

**UNIT 1/3M**
- Withdrawable part
- Main circuit breakers: GV2
- Test position
- Lock on connection or disconnection of the unit with the automatic switch on

**UNIT 1/2M**
- Withdrawable part
- Main circuit breakers: iC60, iC120, NSX
- Test position
- Lock on connection or disconnection of the unit with the automatic switch on

**UNIT 1M**
- Withdrawable part
- Main circuit breakers: iC60, iC120, NSX
- Test position
- Lock on connection or disconnection of the unit with the automatic switch on

**MOTOR CONTROL UNITS**
### Functional Units

**UNIT 2M**
- Withdrawable part
- Main circuit breakers: NSX
- Test position
- Lock on connection or disconnection of the unit with the automatic switch on

**UNIT 3M**
- Withdrawable part
- Main circuit breakers: NSX
- Test position
- Lock on connection or disconnection of the unit with the automatic switch on

**UNIT 4M**
- Withdrawable part
- Main circuit breakers: NSX
- Test position
- Lock on connection or disconnection of the unit with the automatic switch on

---

### Selection of Unit Size Depending on Power

<table>
<thead>
<tr>
<th>Power, kW</th>
<th>Current, A</th>
<th>CB</th>
<th>Contactor</th>
<th>Unit size</th>
<th>Unit size, mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.37</td>
<td>1</td>
<td>GV2 P05</td>
<td>LC1 D09</td>
<td>1/3M</td>
<td>150</td>
</tr>
<tr>
<td>0.55</td>
<td>1.5</td>
<td>GV2 P06</td>
<td>LC1 D09</td>
<td>1/3M</td>
<td>150</td>
</tr>
<tr>
<td>0.75</td>
<td>2</td>
<td>GV2 P07</td>
<td>LC1 D09</td>
<td>1/3M</td>
<td>150</td>
</tr>
<tr>
<td>1.1</td>
<td>2.5</td>
<td>GV2 P08</td>
<td>LC1 D09</td>
<td>1/3M</td>
<td>150</td>
</tr>
<tr>
<td>1.5</td>
<td>3.5</td>
<td>GV2 P08</td>
<td>LC1 D09</td>
<td>1/3M</td>
<td>150</td>
</tr>
<tr>
<td>2.2</td>
<td>5</td>
<td>GV2 P10</td>
<td>LC1 D09</td>
<td>1/3M</td>
<td>150</td>
</tr>
<tr>
<td>3</td>
<td>6.5</td>
<td>GV2 P14</td>
<td>LC1 D09</td>
<td>1/3M</td>
<td>150</td>
</tr>
<tr>
<td>4</td>
<td>8.4</td>
<td>GV2 P14</td>
<td>LC1 D18</td>
<td>1/3M</td>
<td>150</td>
</tr>
<tr>
<td>5.5</td>
<td>11</td>
<td>GV2 P16</td>
<td>LC1 D25</td>
<td>1/3M</td>
<td>150</td>
</tr>
<tr>
<td>7.5</td>
<td>14.8</td>
<td>GV2 P20</td>
<td>LC1 D25</td>
<td>1/3M</td>
<td>150</td>
</tr>
<tr>
<td>9</td>
<td>18.1</td>
<td>GV2 P21</td>
<td>LC1 D25</td>
<td>1/3M</td>
<td>150</td>
</tr>
<tr>
<td>11</td>
<td>21</td>
<td>GV2 P22</td>
<td>LC1 D38</td>
<td>1/3M</td>
<td>150</td>
</tr>
<tr>
<td>15</td>
<td>28.5</td>
<td>GV2 P32</td>
<td>LC1 D38</td>
<td>1/3M</td>
<td>150</td>
</tr>
<tr>
<td>18.5</td>
<td>35</td>
<td>NSX100</td>
<td>LC1 D80</td>
<td>1/2M</td>
<td>150</td>
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<tr>
<td>22</td>
<td>42</td>
<td>NOX100</td>
<td>LC1 D80</td>
<td>1/2M</td>
<td>150</td>
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<td>30</td>
<td>57</td>
<td>NOX100</td>
<td>LC1 D80</td>
<td>1/2M</td>
<td>150</td>
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<td>37</td>
<td>68</td>
<td>NOX100</td>
<td>LC1 D80</td>
<td>1M</td>
<td>150</td>
</tr>
<tr>
<td>45</td>
<td>81</td>
<td>NOX100</td>
<td>LC1 D115</td>
<td>1M</td>
<td>150</td>
</tr>
<tr>
<td>55</td>
<td>100</td>
<td>NOX160</td>
<td>LC1 D150</td>
<td>1M</td>
<td>150</td>
</tr>
<tr>
<td>75</td>
<td>135</td>
<td>NSX160</td>
<td>CRI F150, LC1 F150</td>
<td>2M</td>
<td>300</td>
</tr>
<tr>
<td>90</td>
<td>165</td>
<td>NSX250</td>
<td>CRI F150, LC1 F150</td>
<td>2M</td>
<td>300</td>
</tr>
<tr>
<td>110</td>
<td>200</td>
<td>NSX250</td>
<td>CRI F225, LC1 F225</td>
<td>2M</td>
<td>300</td>
</tr>
<tr>
<td>132</td>
<td>240</td>
<td>NSX400</td>
<td>CRI F225, LC1 F225</td>
<td>3M</td>
<td>450</td>
</tr>
<tr>
<td>160</td>
<td>285</td>
<td>NSX400</td>
<td>CRI F330, LC1 F330</td>
<td>3M</td>
<td>450</td>
</tr>
<tr>
<td>200</td>
<td>352</td>
<td>NOX630</td>
<td>CRI F400, LC1 F400</td>
<td>3M</td>
<td>450</td>
</tr>
<tr>
<td>220</td>
<td>388</td>
<td>NOX630</td>
<td>CRI F500, LC1 F500</td>
<td>4M</td>
<td>600</td>
</tr>
<tr>
<td>250</td>
<td>437</td>
<td>NOX630</td>
<td>CRI F500, LC1 F500</td>
<td>4M</td>
<td>600</td>
</tr>
</tbody>
</table>
### TT / IT / TN-S Distributed neutral

<table>
<thead>
<tr>
<th>Connections</th>
<th>Switchgear</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 wires</td>
<td>4P</td>
</tr>
</tbody>
</table>

### TT / IT / TN-S Non-distributed neutral

<table>
<thead>
<tr>
<th>Connections</th>
<th>Switchgear</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 wires</td>
<td>3P</td>
</tr>
</tbody>
</table>

### TN-S Distributed neutral not switched off

<table>
<thead>
<tr>
<th>Connections</th>
<th>Switchgear</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 wires</td>
<td>3P</td>
</tr>
</tbody>
</table>

The N bus distributed into the connection compartment: N bus mounted on insulators.

### TN-S Distributed neutral not switched off

<table>
<thead>
<tr>
<th>Connections</th>
<th>Switchgear</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 wires</td>
<td>3P</td>
</tr>
</tbody>
</table>

The horizontal PEN bus replaces the PE neutral bus routed through the input and distribution cabinet: A single PEN/PE jumper for the entire switchgear on the input device.

### TN-C-S

A combination TN-C-S connection is possible at the distribution level, not on the rack.

The horizontal PEN bus replaces the neutral (H-BB in TN-C).

The PE bus runs horizontally to ground the racks.

The PEN/PE jumper on each input device (TN-C).

### DIMENSIONS OF FREE SPACE

#### For all cabinet types

Provide a minimum gap of 500 mm between the USG top and the room ceiling to allow for top cable connection and maintenance of horizontal busbars.

#### Bilateral maintenance cabinets

Provide at least 1,200 mm clearances on the front and rear side of the front side to open doors.

#### Unilateral maintenance cabinets

Provide at least 100 mm clearance on the back side of the cabinet, and at least 1,200 on the front side to open doors.
Unilateral maintenance cabinets

Bilateral maintenance cabinets

Electrical power distribution and/or motor control cabinet
- The maximum number of outgoing line units is 33 pieces.
- Power supply for the switchboard is provided from another cabinet.

Electrical power input and distribution cabinet and/or motor control cabinet
- The maximum number of outgoing line units is 30 pieces.

NOTES
- The strength class of fasteners shall be at least 8.8.
- Type of fasteners is M12.
Electrical power distribution and/or motor control cabinet with a group switch

- The maximum number of outgoing line units is 30 pieces.
- Power supply for the switchboard is provided from another cabinet.

Electrical power input and distribution and/or motor control cabinet with a group switch

- The maximum number of outgoing line units is 28 pieces.
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
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</thead>
<tbody>
<tr>
<td>MCC</td>
<td>Motor Control Center</td>
</tr>
<tr>
<td>PCC</td>
<td>Power Control Center</td>
</tr>
<tr>
<td>ACB</td>
<td>Automatic Circuit Breaker</td>
</tr>
<tr>
<td>ALT</td>
<td>Automatic Load Transfer</td>
</tr>
<tr>
<td>I&amp;C</td>
<td>Instrumentation and Control System</td>
</tr>
<tr>
<td>NPP</td>
<td>Nuclear Power Plant</td>
</tr>
<tr>
<td>LV SG</td>
<td>Low Voltage Switchgear</td>
</tr>
<tr>
<td>TPP</td>
<td>Thermal Power Plant</td>
</tr>
<tr>
<td>RTU</td>
<td>Remote Terminal Unit</td>
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</tbody>
</table>
JSC RUSATOM AUTOMATED CONTROL SYSTEMS

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