NZ7 Series Automatic Transfer Switching Equipment

1. Scope of application
Applicable to the three-phase four-line two-circuit power supply network with an AC power frequency of 50Hz, rated operational voltage of AC400V, and rated operational current of up to 630A, the NZ7 series automatic transfer switching equipment can automatically connect one or several loads from one power source to another to ensure the normal power supply of the load circuit.

This product is applicable to the important places such as industrial, commercial, and storied buildings, and residential houses.

Execution standard: GB/T 14048.11.

2. Type designation

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Basic type</td>
</tr>
<tr>
<td>Z</td>
<td>Liquid crystal type</td>
</tr>
<tr>
<td>7</td>
<td>Automatic transfer switching equipment</td>
</tr>
</tbody>
</table>

Additional function:
- X: fire control linkage function
- Without code: no fire control linkage function

Transfer mode without code:
- Users can set the matter
- R: self-throwing and self-reset (power network to power network)
- S: self-throwing and not self-reset (power network to power network)
- F: self-throwing and self-reset (power network to power generation)

Controller type:
- A: basic type
- B: liquid crystal type

Structure:
- Y: integrated (type)
- Without code: separated (type)

Actuator circuit breaker type:
- Without code: NM1

Rated current (Arabic numerals):
- Release with nothing as its code: NM1

Number of poles: 3, 4

Breaking capacity code: S, H, R

Shell grade rated current (Arabic numerals)

3. Normal service conditions

3.1 Ambient air temperature
The upper limit for the ambient air temperature is +40°C, lower limit -5°C, and the mean value of the temperature is not greater than +35°C within 24 hours;

3.2 Altitude
Altitude: not higher than 2,000m for the installation site.

3.3 Atmospheric conditions:
- When the ambient air temperature is +40°C, the relative humidity of the air shall not be higher than 50%, a higher relative humidity is allowed at a lower temperature, e.g. 90% at +20°C, and special measures shall be taken for the condensation occasionally produced due to temperature changes.

3.4 Class of pollution:
Class of pollution: 3
4. Technical parameters and performance

<table>
<thead>
<tr>
<th>Product type</th>
<th>NZ7-63</th>
<th>NZ7-100</th>
<th>NZ7-225</th>
<th>NZ7-400</th>
<th>NZ7-630</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to standard</td>
<td>GB/T14048.11-2008</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actuator circuit breaker</td>
<td>NM1-63</td>
<td>NM1-100</td>
<td>NM1-225</td>
<td>NM1-400</td>
<td>NM1-630</td>
</tr>
</tbody>
</table>

**Parameters of electrical characteristics**

- **Rated control supply voltage (Us)**
- **Operating transfer time (no time delay)**

<table>
<thead>
<tr>
<th>Specification for current</th>
<th>≤2s</th>
<th>≤2s</th>
<th>≤3s</th>
<th>≤3s</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,10,16,20,25, 32,40,50,63A</td>
<td>16,20,25,32,40, 50,63,80,100A</td>
<td>100,125,160, 180,200,225A</td>
<td>250,315, 350,400A</td>
<td>400,500, 630A</td>
</tr>
</tbody>
</table>

- **Rated operational voltage (Ue)** AC500V
- **Nominal insulation voltage (Ui)** AC800V
- **Rated short circuit breaking capacity codes (Icm)**
- **Rated short circuit breaking capacity (Icn)**
- **Rated ultimate short circuit breaking capacity (Icu)**

<table>
<thead>
<tr>
<th>Number of poles</th>
<th>3P</th>
<th>4P</th>
<th>3P</th>
<th>4P</th>
<th>3P</th>
<th>4P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short circuit breaking capacity codes (S, H, R)</td>
<td>S</td>
<td>H</td>
<td>S</td>
<td>H</td>
<td>S</td>
<td>H</td>
</tr>
<tr>
<td>Rated short circuit making capacity (Icm)</td>
<td>52.5</td>
<td>105</td>
<td>105</td>
<td>73.5</td>
<td>105</td>
<td>105</td>
</tr>
<tr>
<td>Rated short circuit breaking capacity (Icn)</td>
<td>25</td>
<td>50</td>
<td>50</td>
<td>35</td>
<td>50</td>
<td>85</td>
</tr>
<tr>
<td>Rated ultimate short circuit breaking capacity (Icu)</td>
<td>25</td>
<td>50</td>
<td>50</td>
<td>35</td>
<td>50</td>
<td>85</td>
</tr>
<tr>
<td>Rated service short circuit breaking capacity (Ics)</td>
<td>50%Icu</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Service life** 6000 times
- **Usage category** AC-33B
- **Electric equipment grade** CB Class
- **Protection level** IP30 (except the main circuit terminal)
- **Protection** Overload protection/short circuit protection

**Controller characteristic**

<table>
<thead>
<tr>
<th>Controller</th>
<th>Type (A (basic type))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated control supply voltage (Us)</td>
<td>230V 50Hz</td>
</tr>
<tr>
<td>Installation mode for the controller</td>
<td>Integrated/separated (as installed on the surface of the cabinet)</td>
</tr>
<tr>
<td>Operating transfer time (no time delay)</td>
<td>≤2s ≤2s ≤2s ≤3s ≤3s</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤10W</td>
</tr>
<tr>
<td>Installation and connection</td>
<td></td>
</tr>
<tr>
<td>Installation mode</td>
<td>Fixed tepe</td>
</tr>
<tr>
<td>Connection mode</td>
<td>Front connection</td>
</tr>
</tbody>
</table>

5. Characteristics and functions

The NZ7 series automatic transfer switching equipment (hereinafter referred to as automatic transfer switch) is the CB class product of a new generation combined with the advanced digital electronic control technique. The product features compactness, energy conservation, convenient installation, reliable dual-interlock protection, etc., and is advanced and complete in terms of function.
NZ7 Series Automatic Transfer Switching Equipment
NZ7

5.1 Compactness
The transfer function is achieved via using the forward and backward rotation of the only one motor which allows for reducing the product’s height and room for its installation.

5.2 Energy saving
The driving mechanism works in the mode of motor drive with less power consumption and noise.

<table>
<thead>
<tr>
<th>Type A controller (long-term service)</th>
<th>Transmission mechanism (short-term service)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤10W</td>
<td>Type 63/Type 100</td>
</tr>
<tr>
<td></td>
<td>20W</td>
</tr>
<tr>
<td></td>
<td>Type 225</td>
</tr>
<tr>
<td></td>
<td>40W</td>
</tr>
<tr>
<td></td>
<td>Type 400/Type 630</td>
</tr>
<tr>
<td></td>
<td>20W</td>
</tr>
</tbody>
</table>

5.3 Advanced and multipurpose functions

Settable transfer parameter
- Under voltage transfer value
- Delay time transfer
- Power network to power network self-throwing and self-reset/power network self-throwing and not self-reset/power network to power generation Self-throwing and self-reset

Visualized management
- Three-phase voltage magnitude display
- Off/on state display

Multi auxiliary functions
- Off/on indication external-terminal
- Fire control linkage
- Generator signal
- External power source

Integrated controller in the modes of integrated and separated configurations easy for installation
5.4 Dual-interlock protection
The mechanical-electrical interlock duplex protection is used to prevent two power sources from being connected simultaneously to the load, wherein the electrical interlock works in the breaker contact position mode for directly indicating the automatic transfer switch to perform the genuine electrical interlock so that the automatic transfer does not take place automatically in such cases as contact fusion welding, breaker handle damage, and circuit fault breaker tripping.

6. Controller

<table>
<thead>
<tr>
<th>Type and function</th>
<th>Type A (basic type)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modes of manual and automatic transfer</td>
<td>■</td>
</tr>
<tr>
<td>Working position of the main contact (actuator circuit breaker)</td>
<td>■</td>
</tr>
<tr>
<td>Prime power turned on</td>
<td>■</td>
</tr>
<tr>
<td>Standby power turned on</td>
<td>■</td>
</tr>
<tr>
<td>Double-break</td>
<td>■</td>
</tr>
<tr>
<td>Automatic control</td>
<td>■</td>
</tr>
<tr>
<td>Monitoring the prime power</td>
<td>Failures such as loss of phase/voltage, under and over voltage for any of three phases of the power supply</td>
</tr>
<tr>
<td>Monitoring the standby power</td>
<td>Failures such as loss of phase/voltage, under and over voltage for any of three phases of the power supply</td>
</tr>
<tr>
<td>Self-throwing and self-reset</td>
<td>■</td>
</tr>
<tr>
<td>Self-throwing and not self-reset</td>
<td>■</td>
</tr>
<tr>
<td>Power network to power network</td>
<td>■</td>
</tr>
<tr>
<td>Power network to power generation</td>
<td>■</td>
</tr>
<tr>
<td>No-voltage transfer</td>
<td>■</td>
</tr>
<tr>
<td>Under voltage transfer</td>
<td>■</td>
</tr>
<tr>
<td>Over voltage transfer</td>
<td>■</td>
</tr>
<tr>
<td>Adjustable delay time</td>
<td>■</td>
</tr>
<tr>
<td>Transfer delay a</td>
<td>Continuously adjustable in the range of 0s—180s</td>
</tr>
<tr>
<td>Return c</td>
<td>Continuously adjustable in the range of 0s—180s</td>
</tr>
<tr>
<td>Generator control</td>
<td>■</td>
</tr>
<tr>
<td>Fire control linkage (inactive contact)</td>
<td>■</td>
</tr>
<tr>
<td>Indication</td>
<td>■</td>
</tr>
<tr>
<td>Indication for on, off, and double-break</td>
<td>■</td>
</tr>
<tr>
<td>Prime power indication</td>
<td>(Displaying voltage magnitude)</td>
</tr>
<tr>
<td>Standby power indication</td>
<td>(Displaying voltage magnitude)</td>
</tr>
<tr>
<td>Fault tripping indication</td>
<td>■</td>
</tr>
<tr>
<td>External indication signal terminal</td>
<td>■</td>
</tr>
<tr>
<td>Parameter setting indication</td>
<td>■</td>
</tr>
<tr>
<td>Interlock protection</td>
<td>■</td>
</tr>
<tr>
<td>Mechanical interlock</td>
<td>■</td>
</tr>
<tr>
<td>Electrical interlock</td>
<td>(not transfer automatically with faulty tripping)</td>
</tr>
</tbody>
</table>

6.1 The Type A integrated controller works in the modes of integrated or separated configurations, and is installed in the cabinet or on the panel to allow operation outside the cabinet. Whether to transfer from one power source to another depends on the state of the operational power supply.

6.2 Control voltage
AC230V 50Hz

6.3 Operation: automatic operation, manual operation

6.4 Setting delay
Transfer delay: adjustable in the range of 0 - 180s, prime power failure, time before off for QN
Return delay: continuously adjustable within the range of 0s - 180s, prime power recovery, time before off for QN
N7 Series Automatic Transfer Switching Equipment
N7

6.5 Interface for display and operation
LED digital display

1. Indication for the auto work mode
2. Indication for the manual work mode
3. Fault indication
   This indicator turns on when the switch fails or the short circuit of the load results in the tripping of the breaker.
4. The prime power voltage parameter display area shows the prime power voltage parameter and transfer delay time in the work state, and the set item symbol in the setting state.
5. The power breaker on the side of the prime power is closed to cut off the indication.
6. Setting the status indication.
7. The power breaker on the side of the standby power is closed to cut off the indication.
8. Fire control linkage function start-up indication.
9. Units for the voltage, time, and frequency on the side of the prime power.
10. Phases of A, B, and C.
11. Units for the voltage, time, and frequency on the side of the standby power.
12. The standby power voltage parameter display area shows the standby power voltage parameter and transfer delay time in the work state, and the set item parameter in the set state.
14. The selector buttons for the modes of auto and manual transfer are used for selecting such modes in the normal work state, and perform the functions of save and exit in the set state.
15. Fling-cut switch for the prime power.
   In the manual control mode, if the prime power works properly, pressing this button allows switching over to the standby power in a forced way; this key acts as the down button for the set item in the set state.
16. Fling-cut switch for the standby power.
   In the manual control mode, if the standby power works properly, pressing this button allows for forced switch over to the standby power in a forced way; this key acts as the down button for the set item in the set state.
17. OFF pushbutton.
   In the manual control mode, if any of the two powers works properly, pressing this button allows for switch over to the OFF position; this key acts as the minus button for the set parameter in the set state.
18. Fault inquiry button.
   After the fault indicator on the failure screen turns on, pressing this button allows for inquiring the detailed fault code for the switch; this key acts as the plus button for the set parameter in the set state.
19. Setting button.
   Pressing this button allows for entering into the menu for parameter setting of the controller.
6.6 Setting parameters for the Type A controller

Note for keys
When the controller is in operation, press the setting key, and the LED will display the parameter setting menu interface shown as 1 in the drawing; under the setting menu Pressing the "↑" or "↓" key(s) allows for setting of options in way of UP/DOWN, and pressing the auto/manual key allows for the exit of the setting menu Pressing the "↑" key(s) allows for the modification of parameters
NZ7 Series Automatic Transfer Switching Equipment

NZ7

Type A controller operating process

Power network to power network
Auto status self-throwing and self-reset

Prime power OK
Prime power failure T1: adjustable within the range of T1: 0s~180s
Prime power OFF
Prime power recovery T2: adjustable within the range of T2: 0s~180s
Standby power OFF
Throw-in of the prime power
Throw-in of the prime power to supply power

T1: Transfer delay time, adjustable within the range of 0s~180s, prime power failure, time before off for QN
T2: Return delay time, adjustable within the range of 0s~180s, prime power recovery, time before off for QR
T3: Generation start-up delay time, adjustable within the range of 0s~180s
T4: Generation OFF delay time, adjustable within the range of 0s~180s
QN: Actuator circuit breaker on the prime (normal) side
QR: Actuator circuit breaker on the standby (reserve) side

Prime power OK
Prime power failure T1: adjustable within the range of T1: 0s~180s
Prime power OFF
Prime power recovery T2: adjustable within the range of T2: 0s~180s
Standby power OFF
Throw-in of the standard power to supply power

Supplying power of the standby power
Standby power failure T1: 0s~180s

Standby power OFF
Throw-in of the prime power
Throw-in of the prime power to supply power

Prime power OK
Prime power failure T1: adjustable within the range of T1: 0s~180s
Prime power OFF
Throw-in of the standard power to supply power

Throw-in of the prime power
Throw-in of the prime power to supply power

Prime power OK
Prime power failure T1: adjustable within the range of T1: 0s~180s
Prime power OFF
Throw-in of the standard power to supply power

Throw-in of the prime power
Throw-in of the prime power to supply power

Prime power OK
Prime power failure T1: adjustable within the range of T1: 0s~180s
Prime power OFF
Throw-in of the standard power to supply power

Generator start-up
Generator output reaches the setting value T1: adjustable within the range of 0s~180s
Prime power OFF
Throw-in of the standard power to supply power

Throw-in of the prime power
Prime power recovery T2: adjustable within the range of T2: 0s~180s
Standby power OFF
Throw-in of the prime power to supply power

Throw-in of the prime power
Throw-in of the prime power to supply power

Generator OFF
7. NZ7 external connection diagram

7.1 product connection diagram

Note:
QN actuator circuit breaker on the prime (normal) side
QR actuator circuit breaker on the standby (reserve) side
7.3 Type A controller’s external wiring

Active AC230V/0.5A

Note: the part indicated by the dashed lines is the controller’s internal wiring

7.4 Typical application

The 401 and 402 terminals can only be connected with the passive signal; directly inputting the active signal will result in the burnout of the controller! The passive signal may be input by switchover of a relay. After the product is put through to the fire control signal double-break, the 403 and 404 are energized. After any key is pressed for the controller, the product returns to normal.

For the use of the mode of power network to power generation, the connection may be neglected, but the default option for the generator start-up delay is 0s.
8. Line incoming pattern
8.1 Wire to enter from the upper port

8.2 Installation mode: vertical installation and horizontal installation

9. Overall and Mounting dimensions (mm)
9.1 NZ7-63~630

<table>
<thead>
<tr>
<th>Dimension</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>H</th>
<th>H1</th>
<th>H2</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>NZ7-63</td>
<td>355</td>
<td>240</td>
<td>322</td>
<td>220</td>
<td>150</td>
<td>170</td>
<td>25</td>
<td>Φ8</td>
</tr>
<tr>
<td>NZ7-100</td>
<td>390</td>
<td>240</td>
<td>357</td>
<td>220</td>
<td>150</td>
<td>180</td>
<td>25</td>
<td>Φ8</td>
</tr>
<tr>
<td>NZ7-225</td>
<td>435</td>
<td>240</td>
<td>402</td>
<td>220</td>
<td>160</td>
<td>190</td>
<td>25</td>
<td>Φ8</td>
</tr>
<tr>
<td>NZ7-400</td>
<td>565</td>
<td>330</td>
<td>505</td>
<td>300</td>
<td>200</td>
<td>227</td>
<td>24</td>
<td>Φ10</td>
</tr>
<tr>
<td>NZ7-630</td>
<td>682</td>
<td>330</td>
<td>622</td>
<td>300</td>
<td>200</td>
<td>232</td>
<td>24</td>
<td>Φ10</td>
</tr>
</tbody>
</table>
9.2 Size of the hole to be drilled on the Type A controller’s panel

10. What you need to know to order

The user shall indicate such items as the type, current specification, number of poles.

Example: If you order an auto transfer switch equipment, shell current 100A, rated current 100A, breaking capacity of Type H, 4 poles, Type A controller, you can write it as NZ7-100H/4100YAX.