ORION RESISTOR

Transformer Neutral Grounding Resistor User Guide

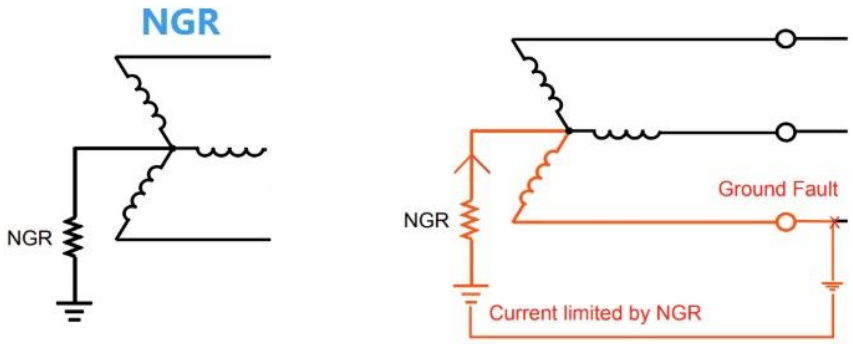
Orion Resistors

2025

Overview

Transformer Neutral Point Grounding refers to the practice of connecting the neutral point of the transformer's primary or secondary winding to the ground through a grounding device, ensuring protection and stability of the system. The main purpose of neutral point grounding is to limit the rise in system voltage during a ground fault and to provide a path for fault current, reducing the risk of damage to electrical equipment.

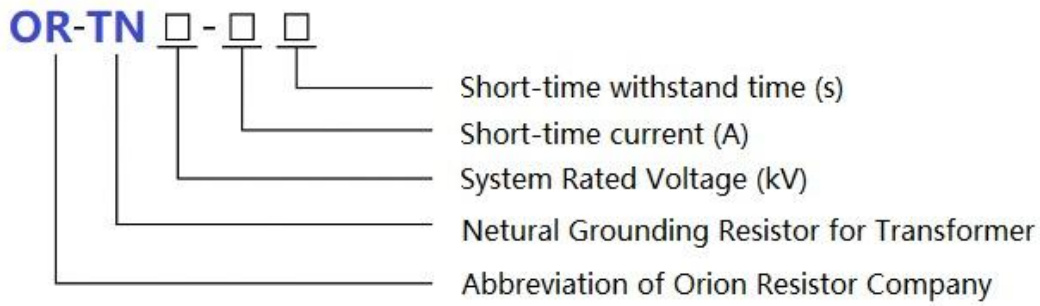
Principle: When a ground fault occurs in the system, the fault current flows through the grounding system to the ground. The grounded neutral point allows the fault current to flow quickly, thus limiting the voltage rise at the fault point and preventing excessive voltage to ground at the equipment. The fault current is routed through protective devices (such as grounding protection relays) that quickly disconnect the faulty circuit, preventing more severe damage.



Application: Transformer neutral point grounding is widely used in distribution systems, especially in medium- and low-voltage distribution networks. Common grounding methods include direct grounding, grounding via arc suppression coils, and grounding through resistors. Direct grounding is commonly used in low-voltage systems for its quick fault clearance advantage. Grounding through arc suppression coils is suitable for high-voltage systems, effectively reducing fault current peaks during ground faults and protecting equipment from excessive currents.

The OR-TN Transformer Neutral Point Grounding Resistance Cabinet is a specialized complete set of equipment developed by our company for resistor grounding in neutral points, tailored to the current grid situation. It effectively reduces overvoltage in the grid and enhances the safety and reliability of the system. This device can be installed in power plants (6–66kV), substation power supply systems, and industrial distribution networks, ensuring the reliable operation of the system with neutral point resistor grounding.

1. Model Naming Convention:



2. Features and Specifications

2.1 The internal resistors are made of high-quality non-metallic special materials or stainless steel nickel-chromium alloys, offering stable resistance, high conductivity, strong current-carrying capacity, high-temperature resistance, and protection against fire and explosion.

2.2 The resistor cabinet can be installed indoors or outdoors. The cabinet body is made from powder-coated cold-rolled steel plates or stainless steel plates, providing excellent corrosion resistance and a high protection rating.

2.3 The intelligent controller of the resistor cabinet can monitor and record the system's zero-sequence current value under normal conditions, single-phase ground current during ground faults, grounding time, system zero-sequence voltage, resistor temperature, environmental temperature and humidity inside the cabinet, and the number of grounding actions. It also features alarm outputs for various conditions, including system grounding alarms, environment over-temperature alarms, resistor over-temperature alarms, resistor disconnection monitoring alarms, and resistor grounding timeout protection alarms. The device is equipped with a communication interface, enabling the transmission of monitoring data to the main control room for communication with the upper-level computer system.

Common Neutral Grounding Resistor Ratings (for reference only)

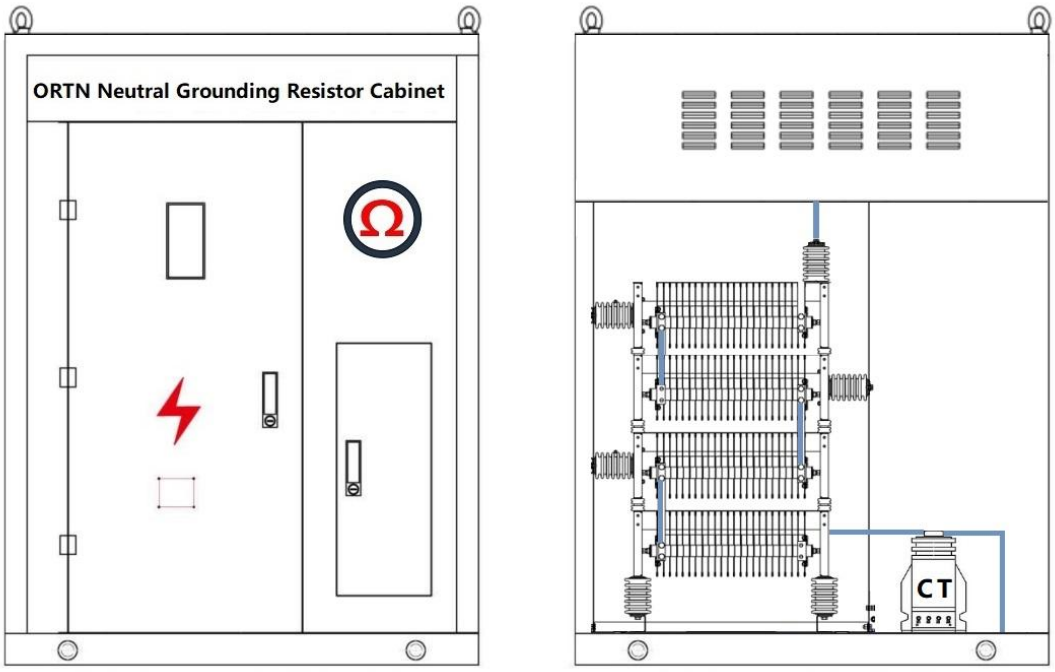
System Voltage	Line to Neutral Voltage	Initial Current Amps	Ohms +/- 10%
2400	1390	100	13.9
2400	1390	200	6.9
2400	1390	400	3.4
2400	1390	600	2.3
2400	1390	800	1.7
2400	1390	1000	1.4
4160	2400	100	24.0
4160	2400	200	12.0
4160	2400	400	6.0
4160	2400	600	4.0
4160	2400	800	3.0
4160	2400	1000	2.4
7200	4160	100	41.6
7200	4160	200	20.8
7200	4160	400	10.4
7200	4160	600	6.9
7200	4160	800	5.2
7200	4160	1000	4.2
13800	8000	100	80
13800	8000	200	40
13800	8000	400	20
13800	8000	600	13.3
13800	8000	800	10
13800	8000	1000	8

3. Technical Parameters:

3.1 Recommended Technical Parameter Table (OR-TN Series)

Model	System Rated Voltage (kV)	Rated Voltage (L-N) (kV)	Current Ratings (A)	Rated Time (s)	Resistance at 25℃ (Ω, ±5%)
OR-TN-6.3–100–10	6.3	3.64	100	10	36.4
OR-TN-6.3–600–10	6.3	3.64	600	10	6.0
OR-TN-10.5–200–10	10.5	6.0	200	10	30
OR-TN-10.5–400–10	10.5	6.0	400	10	15
OR-TN-10.5–600–10	10.5	6.0	600	10	10
OR-TN-10.5–1000–10	10.5	6.0	1000	10	6
OR-TN-35–400–10	35	20	400	10	50
OR-TN-35–600–10	35	20	600	10	33.3
OR-TN-35–800–10	35	20	800	10	25
OR-TN-35–1000–10	35	20	1000	10	20

OR-TN transformer NGR cabinet outline drawing



OR-TN transformer NGR cabinet outline drawing

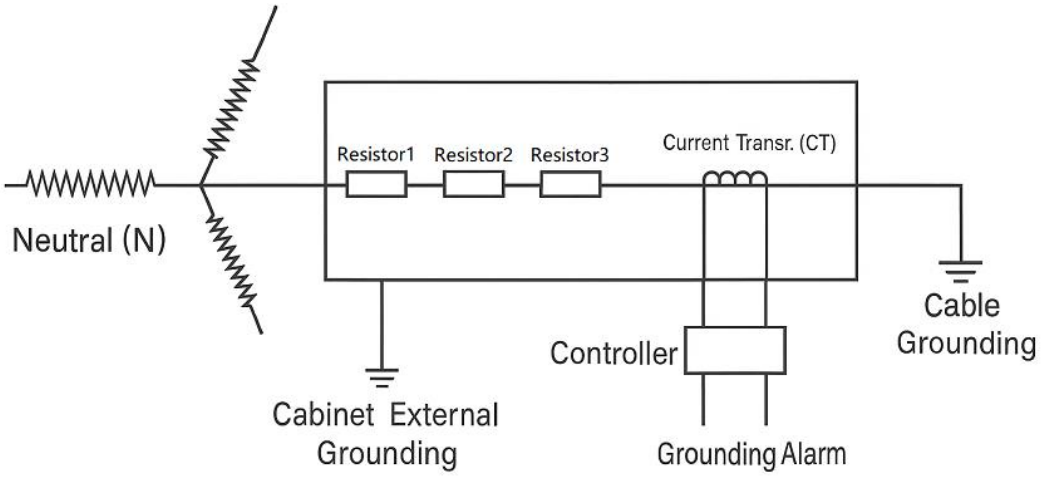
OR - TN - 10 kV recommended size: 1200 * 1200 * 2000 mm (w * d* h)

OR - TN - 35 kv recommended size: 2800 * 1700 * 2200 mm(w * d* h)

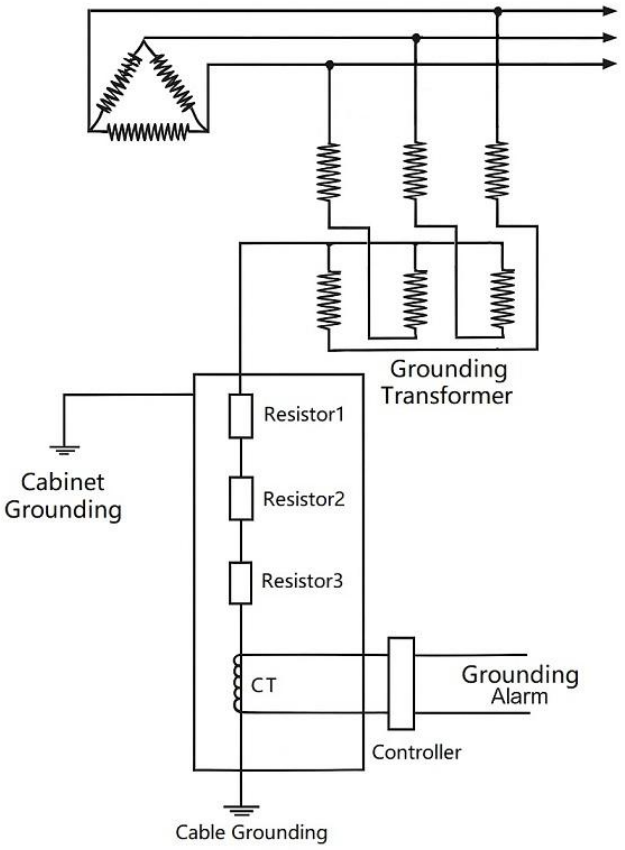
As with earth changes, should consider to increase the size of cabinet put oneself in another's position.

Indicate: the shape, size of resistance ark, cabinet put oneself in another's material and color mark can be designed and manufactured according to customer's specific requirements.

4. Principle diagram of NGR :



Principle diagram of NGR for Transformer



Principle diagram of NGR for Transformer （with grounding transformer）

5. Usage Conditions:

A. the altitude does not exceed 3000 m;

B. air relative humidity is not more than 95%, no conductive dust exists;

C. environmental temperature: - 40 ℃ ~ + 40 ℃;

4. seismic intensity is not more than 8 degrees;

5.no fire, explosives, chemical corrosion product and violent vibration.

6. **The important information before ordering:**

When placing order, please let us know the following parameters:

A. the system of rated voltage (kV);Short: (A) allow current;

B. nominal resistance (Ω);Short flow time allow (S);

C. Outlet and inlet line of 3, cabinet put oneself in another's position of ways: top posts or, into out;

D.the material of cabinet put oneself in another's position, color (or provide color code), protection grade (IP) and the installation location (indoor or

outdoor);

E. whether to need to add current transformer (CT ratio and capacity), intelligent controller, isolating switch, etc.

7.Packing Details:

Orion Resistor has designed a special vacuum packaging suitable for long-distance maritime transportation. Both the resistor cabinet and its outer packaging are double vacuum-sealed, with high-density, fumigation-free boards used for packaging. This ensures moisture and corrosion resistance, guaranteeing that the electrical performance of the resistor cabinet remains perfectly preserved during extended sealed transportation.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