



# **JDQXF SF<sub>6</sub> Voltage Transformer**

## **Installation and Operation Instruction**

**Shandong Taikai Instrument Transformer Co.,Ltd**

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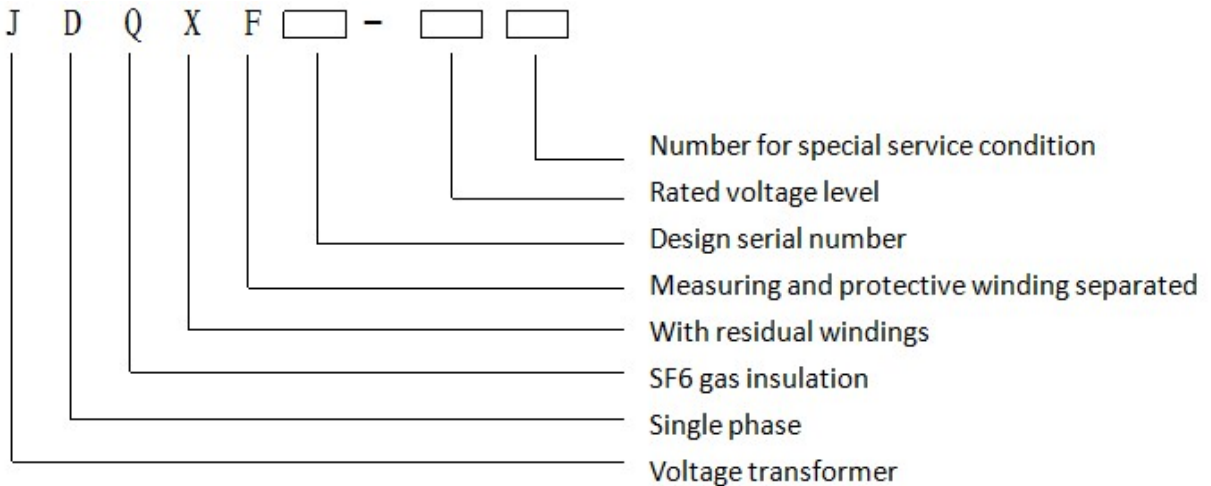
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# 1 Product description

## 1.1 Product application

JDQXF series voltage transformer is used to transmit an information signal to measuring instruments, meters and protective or control device in the power system with rated voltage 35kV to 220kV, rated frequency 50Hz.

## 1.2 Model designation



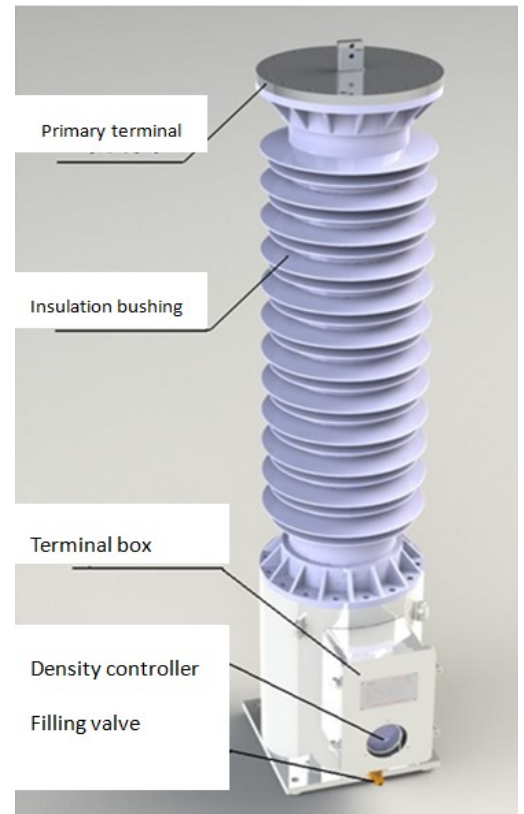
## 1.3 Product construction

- 1) JDQXF series voltage transformer is composed of primary terminal, insulation bushing, tank, core and winding assembly, terminal box, density controller, filling valve and other parts.
- 2) Insulation bushing comprises two types: ceramic bushing and silicon rubber bushing.
- 3) Sulfur hexafluoride (SF<sub>6</sub>) gas is used as the insulation gas.
- 4) The lower part of the tank is designed with earthing plate and the earthing marks.
- 5) The secondary terminal is led from the junction box.

## 2 Service condition

- Maximum temperature: +40°C
- Daily mean temperature: not exceeding: +35°C
- Minimum temperature: -40°C
- Monthly Max.relative humidity: 95% (at 25°C)
- Maximum wind velocity: 34 m/s

There is no contamination and corrosive and explosive media in the atmosphere that seriously affect the insulation of the product.  
 The product is used in areas where the seismic intensity is not greater than 8 degrees.



### 3 Storage and transportation

#### 3.1 Storage

- 1) The product shall be stored in ventilated condition, without flammable, explosive and corrosive gases.
- 2) The product shall be stored in vertical state. Long-term storage needs to be packaged to avoid product damage.

#### 3.2 Transport

- 1) The product should be packed before transportation. Meanwhile prevent collision and other mechanical damage.
- 2) The on-site handling should adopt the protective measures required for transportation. It is recommended to keep the original package of the transformer or repackage it in the original form.  
The value on the pressure meter indicates between +0.03 and +0.05MPa during storage and transportation process.

### 4 Installation

#### 4.1 Check before installation

- 1) Check the shipping list whether the product, accessories and the documents are complete. The accessories include one set of filling device. The documents include installation instruction and the qualification certificate.
- 2) Check whether the package of the product is intact without damage.
- 3) Check whether the product appearance is intact without damage.
- 4) For any question, please contact the service department of the manufacturer.

#### 4.2 Erecting

After unpacking, product of voltage 35kV to 110kV, shall be lifted as shown in figure 1.

220kV product shall be hoisted and erected as shown in figure 2.

When hoisting or erecting, **both two lugs shall be used together, No other parts can be used as hoisting lugs.** When the products required to the horizontal position, the terminal box shall face side.

Note: Refer to the nameplate for product weight.

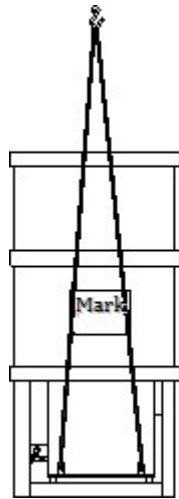


Fig.1-1 Hoisting with package



Fig.1-2 Hoisting vertically

Fig. 1 Hoisting for product of 35kV to 110kV

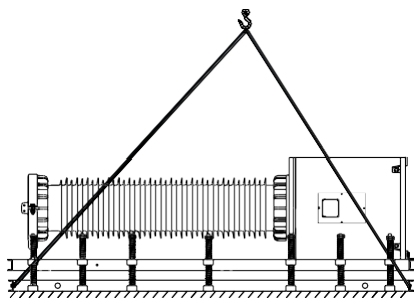


Fig.2-1 Horizontal

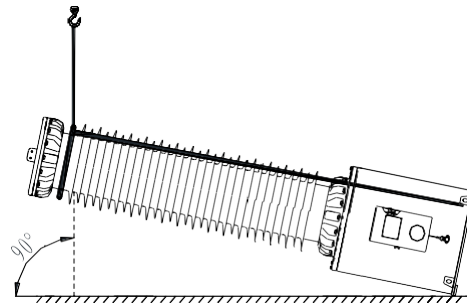


Fig.2-2 Erecting

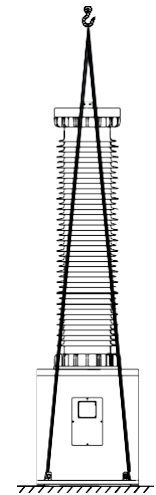


Fig.2-3 Vertical

Fig. 2 Hoisting for 220kV product

Note: The gravity center of the product is at the center of first or second shed on the top tank. When lifting, the angle formed by string and ground shall be  $90^{\circ}$ .

#### 4.3 Installation

- 1) The product shall be installed vertically on a smooth and horizontal platform.
- 2) **The earthing plate on the pedestal must be earthed effectively.**

#### 4.4 Primary wiring

Dirt part and oxide layer shall be cleaned up before the wiring connected with the terminal to ensure the good electrical contact. The recommended tightening torque values are shown in table 1.

Table 1 Recommended torque value.

Bolt Specification, mm	The recommended value	
	N·m	kgf·m
M12	48±5	4.8±0.5
M16	120±10	12±1

**Note: Tensile strength of primary terminal shall be within its tolerable static load limit.**

#### 4.5 Secondary wiring

The secondary connection shall be according to the data on the nameplate.

**Note: The terminal “N” of primary winding shall be earthed separately before operation. No short-circuit on the secondary winding.**

### 5 Gas filling

1) Before filling, the required checks shall be conducted: whether the bolts of the sealing surface are loose or not, bushings damaged or not, density controller intact or not.

2) Before operation, the SF<sub>6</sub> gas pressure shall reach the rated value on the nameplate before put into operation. The specific filling procedure is as follows.

a) SF<sub>6</sub> gas cylinder shall be kept vertically;

b) Unscrew the cylinder protective cap first, and then connect the filling device end with the reducing valve to the contact joint of cylinder. See fig.3;

c) Open the reducing valve to release all the residual gas in the filling pipe, and then close the reducing valve;

d) Unscrew the plug of the filling valve of the product; connect the contact joint of the filling device to the filling valve of the product;

e) Open the switch of the filling valve of the product and the valve of the cylinder. The filling pressure shall not exceed 0.5MPa (the value on pressure meter of the filling device) ;

f) In the filling process, maintain the same speed by controlling reducing valve, and observe the value on density controller. Dab the density controller to fill to the rated pressure, when filling pressure reaches to the minimum service pressure but the value stops there.

3) After the rated filling pressure reached, keep the product stand motionless for 2 hours. Use portable detectors to detect the sealing surface and filling valve. After 24 hours motionless, measure the moisture content of the SF<sub>6</sub>, which shall not exceed 250μL/L.

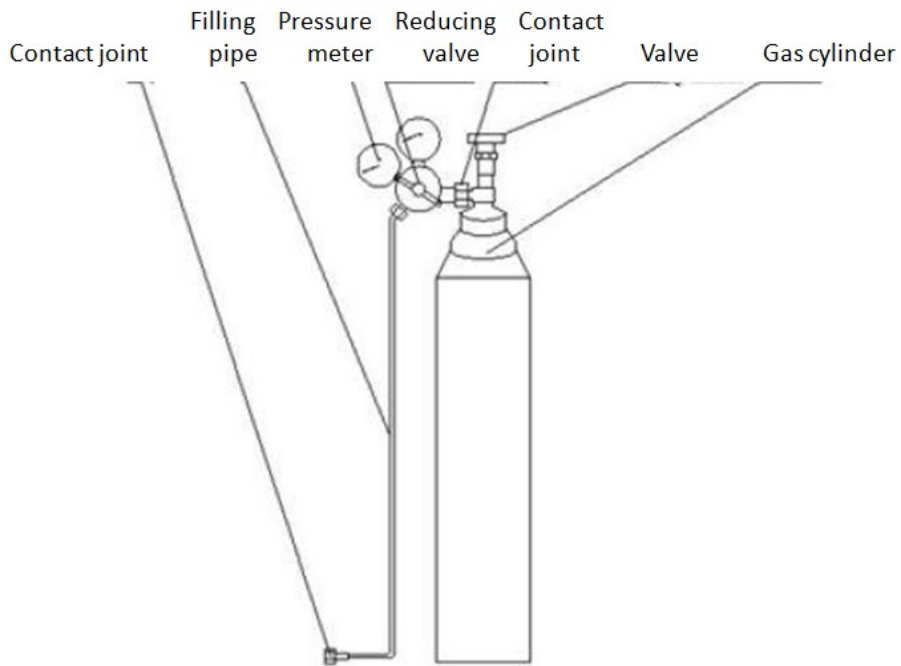


Fig. 3 Schematic diagram of filling device

## 6 Handling of common exception

See table 2 for the handling of common exception.

Table 2 Handling of common exception.

Items	Descriptions	Approaches	Measures
1	On-site density controller alarm	Handling on site	<ol style="list-style-type: none"> <li>1. Remove and calibrate the density controller. If any exception, change the density controller.</li> <li>2. Detect gas leakage whether any leakage, if any, contact the service department of the manufacturer.</li> </ol>
2	There is a discharge sound on the secondary side when the SF6 PT is running	Handling on site	Check whether there is short-circuit line, and any exception on the secondary voltage or not ;whether the unused winding is short circuited
3	Primary of SF6 PT to ground has low insulation resistance.	Handling on site	Check whether the surface of the insulating sleeve is dirty or damp, and retest after cleaning.

4	Severe deviation in SF6 PT field error test	Handling on site	Check whether there is a measurement error at the HS control cabinet on site. If the measurement error at the HS control cabinet will increase the system error caused by the voltage drop of the lead wire from the SF6 PT secondary wiring board to the HS control cabinet, it will cause the SF6 PT error test to fail. It is required to carry out the error test at the SF6 PT secondary wiring board to reduce the system error.
5	After the SF6 PT is put into operation, the third harmonic appears, and the amplitude of the third harmonic of the three phases is basically equal, the phase is exactly the same, and the output voltage of the open triangle is basically zero.	Handling on site	Check the secondary circuit whether there is virtual connection in neutral point wiring.
6	A group of JDQX-35 products (3 units) has a low secondary output voltage of one phase, and abnormal voltage appears in the open triangle.	Handling on site	After the power outage of the substation, the following test items are carried out: 1. Test whether the DC resistance of A-N of each phase PT is normal. 2. Test whether the DC resistance of each phase fuses is normal.
7	A group of 110kV SF6 PT products (3 units) are put into operation, the output voltage of the open triangle is 200V, and the other secondary output voltages are normal.	Handling on site	Check whether the three-phase PT residual winding connection meets the requirements (three residual windings are required to be connected end to end).
8	Rupture disc ruptured	Replace product	Stop the operation immediately
9	Others	/	Contact the service department of the manufacturer



Address: High-tech Industry Development Zone (South) Tai'an City, Shandong Province.

Post Code: 271000

Service Department Tel: 0538-8932560

Technical Department Tel: 0538-8933806

Fax : 0538-8932538

Website: [www.tkhgq.cn](http://www.tkhgq.cn)

E-mail: [tkhgq@163.com](mailto:tkhgq@163.com)

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