

# **HZSF-15-50 SF6 Gas Recovery and Purification Device**

## **USER MANUAL**

## **Contents**

I.Overview.....	1
II.Description of SF6 Gas Recovery Unit Work Flow.....	1
III.The Main Components and Advantages of The Recovery Unit.....	3
IV.Main Technical Performance Index.....	3
V.The Main Components and Functions of The Device.....	4
VI.The Main Component Configuration Parameters are as Follows.....	5
VII.Supporting Equipment of Recycling Device.....	5
VIII.Reference Picture.....	6

## I. Overview

SF6 gas recovery and purification charging and discharging device is used for the manufacturing plant of SF6 gas insulation electrical equipment. In the departments of use, operation and scientific research, various electrical equipment is vacuumized, SF6 gas is filled into the electrical equipment, and SF6 gas is recovered from the electrical appliances in use or test, and purified, compressed and stored to storage tank at the same time.

The recycling device is suitable for SF6 electrical equipment and GIS combined electrical equipment.

According to DL/T662-1999 "Sulfur Hexafluoride Inflater and Recovery Device", the device is composed of recycling system, gas charging system, vacuum pumping system, purification system and gas storage system, with the following main functions:

1. Measure the vacuum and vacuum degree of the device and electrical equipment;
2. Recycle the gas in the electrical equipment;
3. Dry and purify SF6 gas recovered and refilled;
4. Inflate SF6 electric appliance;
5. Compressed storage and bottle filling of SF6 gas in electrical appliances.

## II. Description of SF6 Gas Recovery Unit Work Flow

### 1. Recovery of SF6 gas

When SF6 is extracted from an air chamber, the gas flows automatically through the purification filter. It is compressed and cooled by the SF6 compressor and can be either gaseous or liquid at high pressure into the SF6 tanks. (see figure 1)

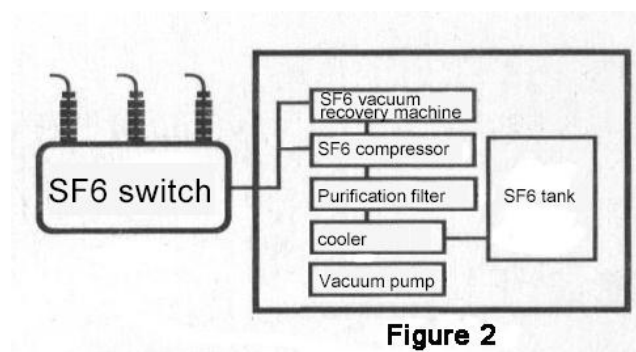
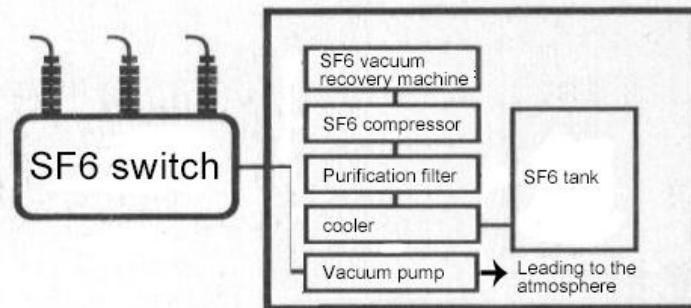


Figure 2

2、SF<sub>6</sub> switches vacuum

Vacuum pump is used to remove the gas from the electrical switch. The outlet of the vacuum pump leads to the atmosphere. (see figure 2)

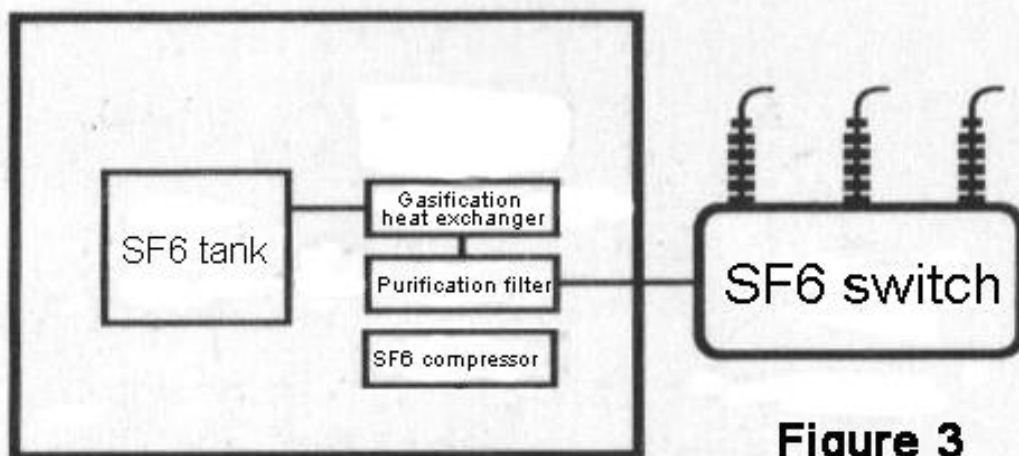


**Figure 1**

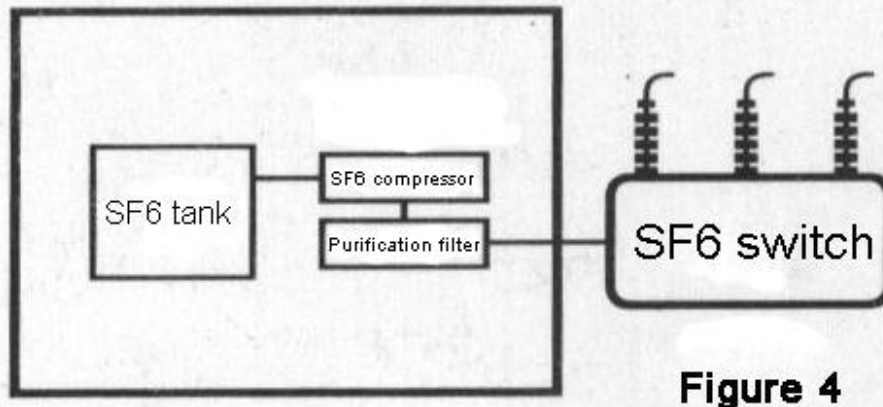
3、inflatable

The purified and dried SF<sub>6</sub> is filled back into the vacuumized air chamber from the storage tank until the air chamber pressure reaches the set working pressure. The above work is carried out in two steps:

1. Make the gas flow to SF<sub>6</sub> switch with the help of SF<sub>6</sub> tank pressure until the predetermined inflation pressure is reached. (see figure 3)
2. When SF<sub>6</sub> tank pressure and SF<sub>6</sub> switch pressure are in balance, the compressor is used to pressurize and inflate until the predetermined inflation pressure is reached. (see figure 4)



**Figure 3**



### III.The Main Components and Advantages of The Recovery Unit

(1) advanced design, complete functions, reasonable structure, simple and clear operation.

(2) compression system: SF6 sealed compressor, no leakage.

(3) double-stage rotary vane vacuum pump is adopted in the vacuum pumping system, which is equipped with an automatic oil return prevention device.

(4) the purification system adopts the principle filter of CKD company in Japan, and the filter adopts electric heating and high-efficiency adsorbent inside, so the purification effect is more significant (there is no need to change the adsorbent frequently).

(5) automatic confirmation of three-phase power supply and automatic protection of phase break in the electrical system of the device.

(6) the device control system adopts SF6 special valve with the latest technology

(7) the storage system shall be equipped with 50KG liquid storage tank according to user requirements. And can directly fill gas cylinders.

(8) the equipment is mobile.

### IV.Main Technical Performance Index

(1) type: mobile type, refrigeration type

(2) operating principle

- A. Use compressor pressure -- refrigerate and liquefy SF6 gas.
- B. Air recovery and recharge assisted by the dryer.
- C. It is filled by buffer gasification during air filling (it can be heated).

(3) operating environment temperature:  $-10^{\circ}\text{C}$  ( $-30$  optional) ---  $+40^{\circ}\text{C}$

(4) Main performance and technical parameters

- 1、 The ultimate vacuum of the device  $< 10\text{Pa}$
- 2、 Vacuum pumping rate of the device is  $55\text{m}^3/\text{h}$  (vacuum pump limit is less than  $0.06\text{Pa}$ )
- 3、 Initial inflation pressure of the device  $< 133\text{ Pa}$
- 4、 Final inflation pressure of the device  $\leq 0.8\text{M Pa}$
- 5、 Inflation rate of the device  $> 6\text{m}^3/\text{h}$
- 6、 Initial pressure of recovery of the device  $\leq 0.8\text{M Pa}$
- 7、 The final recovery pressure of the device  $< -0.053\text{MPa}$
- 8、 The recovery rate of the compressor is  $10\text{m}^3/\text{h}$
- 9、 Annual leakage rate of the device  $< 1\%$
- 10、 The maximum design pressure of device storage tank is  $4\text{M Pa}$
- 11. Tank capacity is  $50\text{KG}$
- 12. Storage mode: liquid
- 13. Noise  $\leq 75\text{dB}$  sound pressure level
- 14. Drying filter regeneration: vacuum regeneration, heating and activation
- 15. Power supply: AC three-phase  $220\text{V}/380\text{V}\pm 10\%$ 、  $50\text{HZ}$
- 16、 Total power of the device  $< 13\text{KW}$
- 17、 purification: micro water  $60\text{PPm}$  , oil  $5\text{PPm}$  , impurities  $\leq 1$  micron 100% filtration.

## V.The Main Components and Functions of The Device

The main functions of the device include compressor, vacuum pump, refrigeration system, dry filter regenerator, heater, purifier, filter, pipeline, valve, instrument, electrical control and structural parts, frame panel, running wheel and storage tank.

## **VI.The Main Component Configuration Parameters are as Follows**

1. SF6 compressor: oil semi-enclosed compressor with high pressure
  - A: theoretical displacement: 10m<sup>3</sup>/h
  - B: maximum exhaust pressure: 2.5mpa
  - C: minimum inspiratory pressure: 53Kpa
  - D: maximum suction pressure: 0.35~ 0.8mpa
  - E: power: 3KW
  - F: power supply: 380V 50HZ
2. The vacuum system adopts two-stage rotary plate 2X-15
  - A: vacuum pump adopts air-cooled type, which can run for a long time
  - B: vacuum rate is 55m<sup>3</sup>/h
  - C: Final vacuum 0.06pa
  - D: power 3KW
3. Refrigeration system: domestic compressor
4. Filtration system (purification system: dual-stage filtration with vacuum activation and self-regeneration)
- 5, SF6 valve: ball valve DN15 SF6 dedicated
6. Pressure gauge, vacuum gauge: Shanghai Yichuan pressure gauge, Shanghai thermal even number display vacuum gauge.

## **VII.Supporting Equipment of Recycling Device**

1. One device
2. 1 storage tank (built-in)
3. One vacuum gauge (installed in the main machine)
4. Two high-pressure pipes
5. A set of accessories and wearing parts attached to the device

### VIII.Reference Picture

