

# Safe and efficient SF<sub>6</sub> handling



# SF<sub>6</sub> service equipment

## SF<sub>6</sub> widely used as an insulating gas

SF<sub>6</sub> gas is used as an insulating and quenching gas due to its unique chemical properties. As a result of its high greenhouse potential, there are strict regulations worldwide that demand emission reductions in SF<sub>6</sub> gas.

In the EU, the F-gas regulation, (EC) no. 517/2014 on the limitation of greenhouse gas emissions, came into force in 2014. In this, the general requirements for the specific handling of SF<sub>6</sub> gas and other fluorinated gases (F-gases) were established.

## Fields of application

- Switchgear for high (> 52 kV) and medium voltage (< 52 kV)
- High-voltage cables
- Transformers
- Transducer
- Particle accelerators
- X-ray equipment
- Ultra high frequency cable systems
- Semiconductor industry (as etching and chamber cleaning gas)

## Controlled handling



So how is the gas put into the equipment? And how is it ensured that no gas escapes into the environment during filling and recovery for maintenance purposes? To meet these stringent requirements, specially developed filling and handling equipment has been used for decades. This equipment is developed specifically for the handling of SF<sub>6</sub> gas.

## Personnel safety and environmental protection

The aim is to provide a safe system that limits emissions to a minimum and at the same time almost excludes any faults in application. The escape of SF<sub>6</sub> gas and safe operation are not only very important for climate protection, but also for the safety of personnel. WIKA is the only provider of SF<sub>6</sub> handling equipment with an optimum safety control in accordance with SIL 2 / PL d.

## WIKA sets the standards

While the standards and guidelines for switchgear have clearly tightened, there has been little new for handling instruments. Thus, WIKA set itself the task of developing a new generation of filling and handling equipment.

|   | GPU-x-x000 |            |            |            |
|---|------------|------------|------------|------------|
|   | GPU-B-2000 | GPU-S-2000 | GPU-B-3000 | GPU-S-3000 |
| Fully automatic operation   | ✓          | ✓          | ✓          | ✓          |
| Intuitive operation by means of a 10" IntelliTouch touchscreen  | ✓          | ✓          | ✓          | ✓          |
| Fast SF <sub>6</sub> gas recovery for large gas compartments             | ✗          | ✗          | ✓          | ✓          |
| Additional SIL 2 safety control with SF <sub>6</sub> gas warning device  | ✗          | ✓          | ✗          | ✓          |

# GPU series product characteristics

## Versatile and compact

The GPU series combines high-quality and high-performance components – a compressor, a vacuum compressor for SF<sub>6</sub>, a vacuum pump for air, filter elements, a humidity measuring system and a storage tank – in one instrument.

## Reliable and safe

Through the integrated safety control of SIL 2 in the GPU-S series, maximum safety is ensured.

The built-in monitoring system warns the operator as soon as even very small quantities of gas escape, thus reducing emissions to a minimum.

## Communication and easy integration

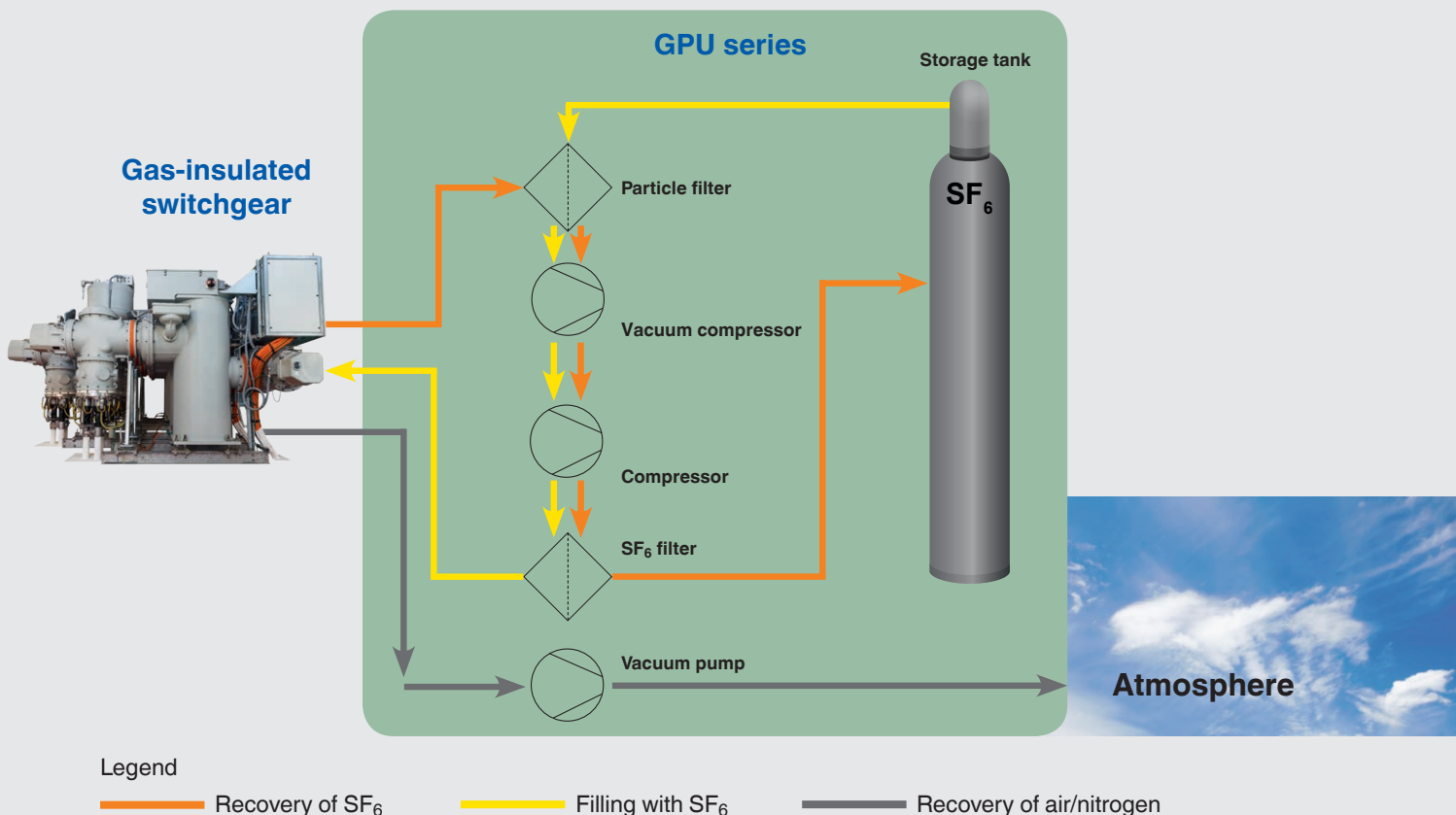
The GPU series features a USB connection. This enables software updates and a simple export of relevant process data to the documentation. The built-in Ethernet port ensures easy remote maintenance of the equipment.



## Low-maintenance and efficient

High-performance components and an optimised design make the GPU series the fastest and most efficient service equipment in its class. Low downtimes through long service intervals of more than 2,500 hours make the GPU series an extremely durable product that is always ready for use.

# Gas handling with the GPU series





# Specifications GPU series



## Voltage supply

| Voltage supply |                                     |
|----------------|-------------------------------------|
| Option 1       | AC 360 ... 440 V, 3-phase, 50/60 Hz |
| Option 2       | AC 220 ... 265 V, 3-phase, 50/60 Hz |
| Option 3       | AC 190 ... 230 V, 3-phase, 50/60 Hz |

## Oil-less compressor (SF<sub>6</sub> gas)

| Oil-less compressor (SF <sub>6</sub> gas) |   |
|---|---|
| Gas flow rate (GPU-X-2000)                | 9.8 m <sup>3</sup> /h<br>(with medium suction pressure) |
| Gas flow rate (GPU-X-3000)                | 19 m <sup>3</sup> /h<br>(with medium suction pressure)  |
| Output pressure                           | 50 bar abs.   |

## Oil-less vacuum compressor (SF<sub>6</sub> gas)

| Selectable versions   |                      |               |
|-----------------------|----------------------|---------------|
|                       | Gas flow rate        | Final vacuum  |
| Option 1 (GPU-X-2000) | 6 m <sup>3</sup> /h  | < 1 mbar abs. |
| Option 2 (GPU-X-2000) | 10 m <sup>3</sup> /h |               |
| Option 3              | 15 m <sup>3</sup> /h |               |
| Option 4 (GPU-X-3000) | 35 m <sup>3</sup> /h |               |

## Vacuum pump (air)

| Selectable versions |                       |               |
|---------------------|-----------------------|---------------|
|                     | Gas flow rate         | Final vacuum  |
| Option 1            | 25 m <sup>3</sup> /h  | < 1 mbar abs. |
| Option 2            | 40 m <sup>3</sup> /h  |               |
| Option 3            | 63 m <sup>3</sup> /h  |               |
| Option 4            | 100 m <sup>3</sup> /h |               |

## Integrated tank, storage capacity

| Selectable versions |                             |
|---------------------|-----------------------------|
| Option 1            | without tank                |
| Option 2            | 300 litres                  |
| Option 3            | 600 litres                  |
| Option 4            | Stowage for 6 gas cylinders |

## Permissible input and output pressure

≤ 10 bar abs.

≤ 50 bar abs. at high-pressure connection

## Control element

10" IntelliTouch touchscreen

## Safety systems (GPU-S-x000)

Safety control: Based on SIL 2 components

SF<sub>6</sub> gas warning equipment: 0 ... 2,000 ppmv, based on infrared technology

## Filter element

Molecular sieve, aluminium oxide, particle filter 1 µm

Max. water absorption: 75 g

## Permissible ambient temperature

Operation: 10 ... +40 °C

Storage: -20 ... +60 °C

## Permissible air humidity

< 95 % r. h. (non-condensing)

## Ingress protection

IP42

## Weight

Approx. 665 kg without tank

Approx. 1,000 kg with empty 300-litre tank

Approx. 1,300 kg with empty 600-litre tank

Approx. 1,050 kg with empty gas cylinder stowage

## Tyres

Solid rubber, Ø 200 mm, with rollover protection

## Integrated gas cylinder scales

| Selectable versions |   |
|---------------------|---|
| Option 1            | without scales  |
| Option 2            | Measuring range 0 ... 136 kg<br>Tare function<br>Accuracy ±30 g |

## Connections

| Selectable versions                      |  |
|--|--|
| GIS                                      | 1 valve DN 20, pressure range 0 ... 10 bar abs.  |
| Gas cylinder                             | 2 valves DN 20, pressure range 0 ... 50 bar abs.   |
| Option (additional coupling, GPU-x-3000) | 1 valve DN 20, pressure range 0 ... 1.2 bar abs.<br>Simultaneous evacuation, recovery or filling |
| Standard                                 | 1 valve DN 20, pressure range 0 ... 10 bar abs.  |
|  | 2 valves DN 20, pressure range 0 ... 50 bar abs.   |