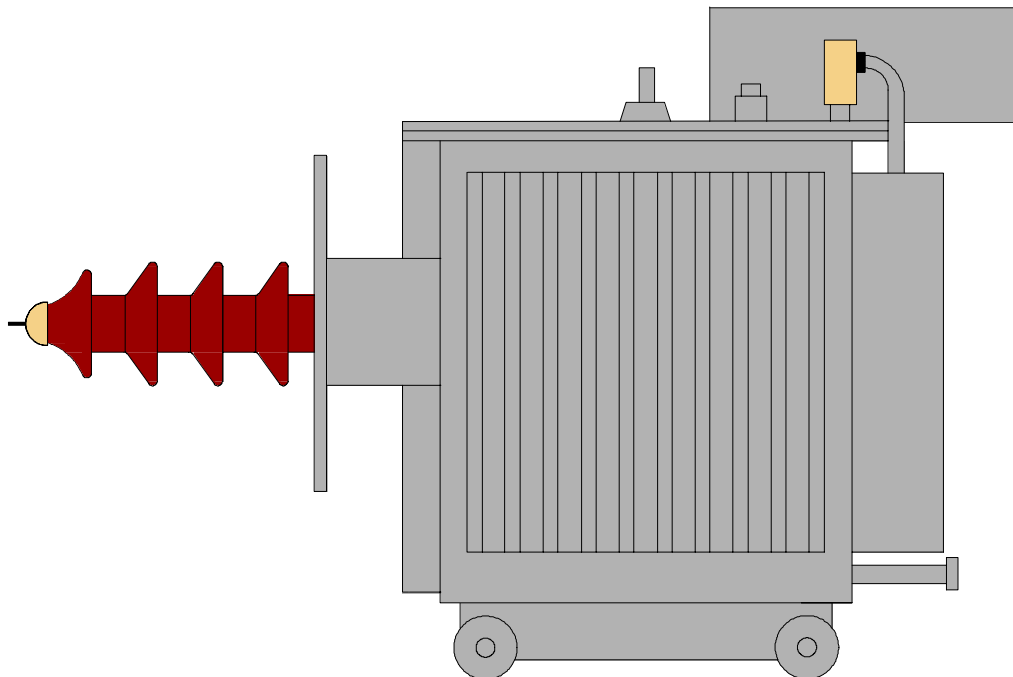


# *Rico-Werk*

## Elektrotechnik

### High - Voltage Transformer / Rectifier Unit With Hermetic Tank



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## 1. Description

### 1.1 Use

The high-voltage transformer/rectifier unit is used in connection with a control cubicle to supply electrostatic precipitators with variable directed high-voltage.

### 1.2 Type code (Example)

ESO-40-79/1960

E = single phase

S = self-cooling

O = oil insulated

40 = mains voltage (400 V AC)

79 = output alternating voltage ( 79 V AC<sub>eff</sub> )

1960 = output direct current ( 1960 mA DC<sub>eff</sub> )

Further technical dates see rating plate

### 1.3 High-voltage unit

Containing:

- a single-phase high-voltage (HV) transformer, whose high-voltage winding is manufactured using Aluminiumfoil-winding-system.
- a current limiting reactor, referring to size of the installed unit in control cubicle, in series with the primary winding of the high-voltage transformer. It limits the short circuit current which results after spark overs inside the precipitator and improves the form factor of the unit and is designed that the short circuit current is limited on the 2.5-times rated current.
- a high-voltage (HV) rectifier in single-phase bridge connection on silicon technique.
- a high-voltage (HV) dividing resistor.
- a HF Choke between HV-rectifier and HV-bushing
- an oil tank in which the above mentioned components are arranged

In a terminal box on the tank top the following components are arranged :

- a. Shunt for measuring of secondary current (mA)
- b. Resistor for measuring of secondary voltage (kV)
- c. Overvoltage arrester for above mentioned measuring circuits
- d. Low voltage bushings for :
  - supply U+V
  - control voltage V1
  - Measuring output for sec. current (mA)
  - Measuring output for sec. voltage (kV)
- e. Monitoring devices for the protection of the HV-aggregate.

**1.4 Protection class**

active part	IP 65
terminal box	IP 54
HV bushing	IP 00

**1.5 Painting**

basic painting	60 µm
intermediate painting	60 µm
cover painting	60 µm
2 component paint	
Standard-color RAL 7032	

**1.6 Oil Filling**

Standard procedure is to fill the HV-aggregates with mineral insulating oil according VDE0370 (DIN57370). The dielectric strength of 250 kV/cm was tested according VDE0370 Part 1 (DIN 47370 Part 1).

The insulating oil is free of PCB, PCT or TCDD substances.

The following oil types are used:

**Manufacturer:****Type:**

<b>ARAL</b>	<b>ISOLAN TT-N</b>
<b>BP</b>	<b>ENERGOL ISO</b>
<b>ESSO</b>	<b>UNIVOLT N 53</b>
<b>SHELL</b>	<b>DIALA D</b>

All above mentioned oil types may be mixed.

Silicone-oil filling may be used as **special design**.

- Dow Corning 561 Silicone Fluid
- Baysilone Fluid M50 EL

## 2. Mounting

### 2.1 Transport

The unit must be transported standing upright.

Canting or tilting is not allowed !

For transportation the units must be fixed. The tank top is provided with lifting rings.

### 2.2 Installation

The units are, if there is nothing else indicated, designed for following conditions :

- 1) Installation indoors and outdoors
- 2) Cooling fluid temperature  
(airtemperature) min.  $-25\text{ °C}$  / max.  $40\text{ °C}$
- 3) Installation high  $< 1000\text{m}$  higher sea level

At higher ambient temperatures the rated current must be reduced according to the following list :

ambient temperature (°C)	current load (%)
40	100 (rated current)
45	90
50	80
55	70

At higher installation than  $1000\text{m}$  further inquiry is necessary concerning the spark over resistance of the high-voltage bushing.

Further the load of the unit reduces according to the following values :

m higher sea level	current load (%)
1000	100 (rated current)
1500	97
2000	95
2500	92

### **2.3 Connection**

Pay attention that during installation no larger amounts of dust may lay down on the unit. A sufficient air circulation is necessary that the temperature losses are diverted efficient. Below the tank no additional sources of heat must be located.

Connection should generally be performed according top rating plate instructions and wiring diagram. The cables must be inserted into the terminal box. The terminal box is provided with the necessary cables entrances.

### **2.4 Starting-up**

Before starting-up the unit perform optical control of tightness (possible transport damages).

The main voltage mentioned on the rating plate must be compared with the supply voltage.

The correct connection of the cables and the secure grounding must be checked. Pay attention to the specification VDE 0146 for installation of electrostatic precipitator plants.

## **3. Maintenance**

The aggregate is maintenance free.

### **3.1 General instructions**

As the aggregate is hermetically sealed, it may never be opened, not even for taken oil samples.

The manufacture's warranty is void if the seals of the filling stud/draining stud are damaged. The manufacturer or supplier must be contacted if the aggregate was damaged or if the safety devices were triggered.