



AC and AC/DC Desalter Transformers Illustrated Configuration Guide

This series of **100% reactance desalter transformers**, available in **AC and AC/DC versions**, is designed for crude-oil desalting and dehydration. The conventional capacity range is 50–250 kVA, with AC high-voltage outputs of 13–40 kV and DC outputs of ± 5.85 to ± 18 kV for the AC/DC version. The parameters and configurations shown are conventional selection references. Customization is available to suit project requirements.



Input voltage: 380 V, 400 V or 6000 V; frequency: 50 Hz or 60 Hz. Single-phase and three-phase versions are available.

The input junction box has

an increased-safety

explosion-protection

design. A 100 V

measurement winding is

provided for voltage

monitoring,

instrumentation signal

acquisition and

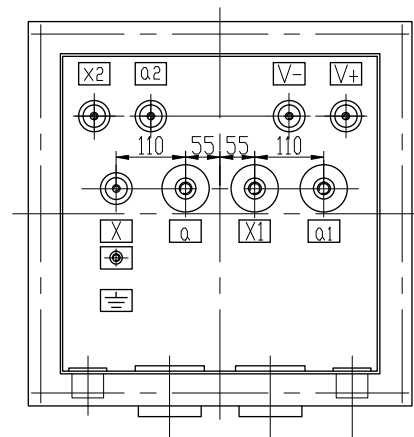
protection/control circuits.

The actual

measurement-winding

voltage varies with the

input voltage.





Five-Step Off-Circuit Tap Settings

This transformer series has five off-circuit tap positions. Select the tap with the power disconnected to match the electric-field strength required for desalting or dehydration. The five AC/DC output settings are:

20 kV Class

- AC: 13 kV / 16 kV / 19 kV / 22 kV / 25 kV
- DC: ± 5.85 kV / ± 7.2 kV / ± 8.55 kV / ± 9.9 kV / ± 11.25 kV

35 kV Class

- AC: 16 kV / 22 kV / 28 kV / 34 kV / 40 kV
- DC: ± 7.2 kV / ± 9.9 kV / ± 12.6 kV / ± 15.3 kV / ± 18 kV

The five tap positions define the available rated-voltage range. Select a suitable tap for the crude-oil properties, dehydration stage and process requirements.

The AC version uses the AC settings above; both AC and DC settings are shown for the AC/DC version. A matched voltage-regulation control cabinet provides continuous adjustment within the selected tap range. See “Continuous Voltage Regulation via Pulse Control Cabinet” below.



The transformer has an **oil-immersed, naturally cooled construction**, with **Ex ec oc IIC T5 Gc** explosion-protection marking and **IP66** enclosure protection. It complies with **JB/T 9645-2014** and **GB/T 6451-2023** and is suitable for outdoor oil-field service in high-humidity and salt-spray environments.



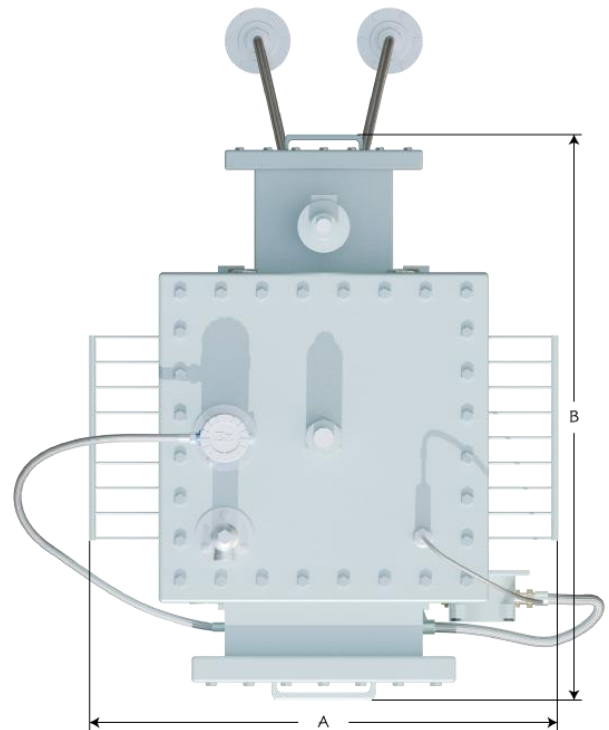
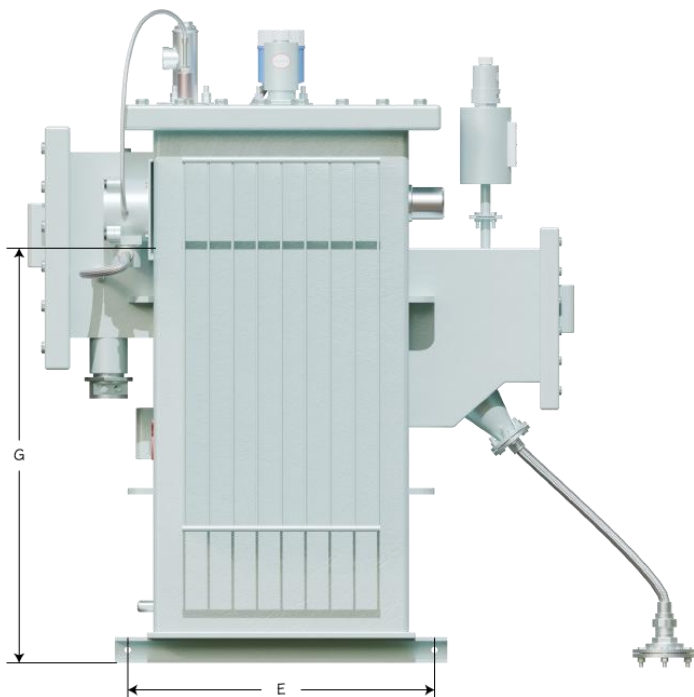
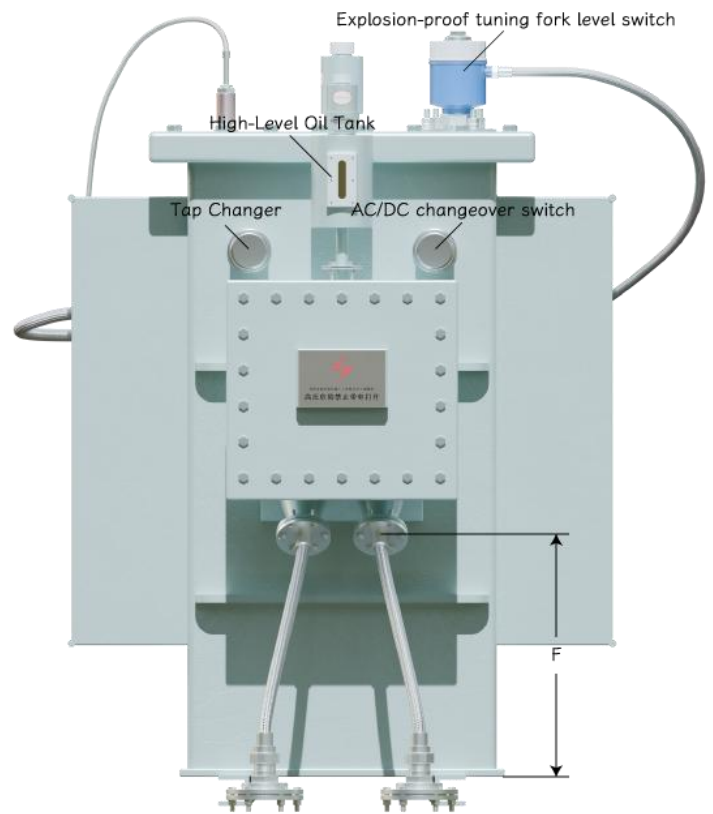
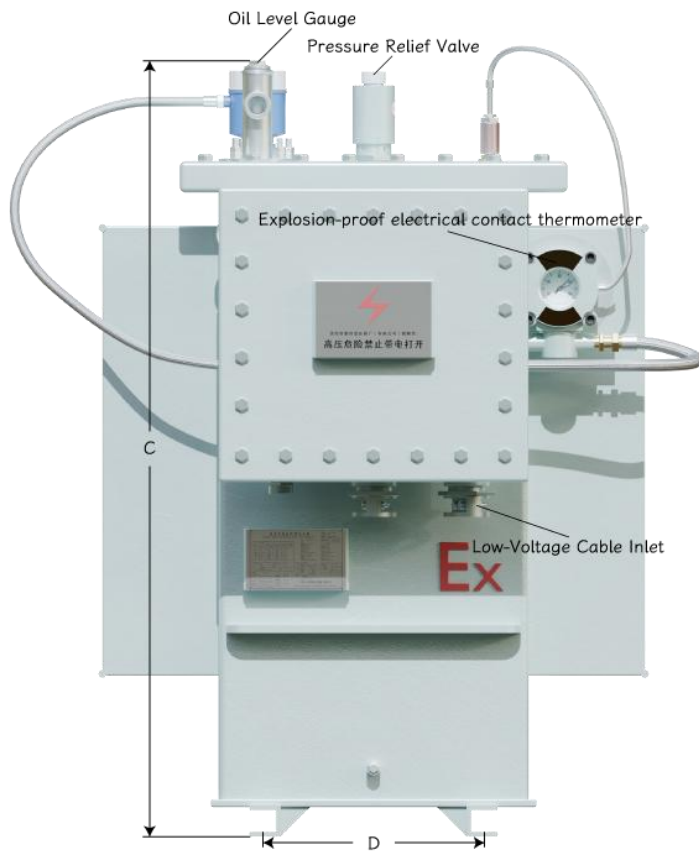
The high- and low-voltage windings and reactor coils of this series use **oxygen-free copper conductors**.

This reduces operating losses and heat generation and provides greater mechanical strength under short-circuit stresses for stable long-term operation.

The conventional insulation class is Class B. The configuration can be confirmed for the selected model and service conditions.



AC/DC Version Structure and Capacity Dimensions



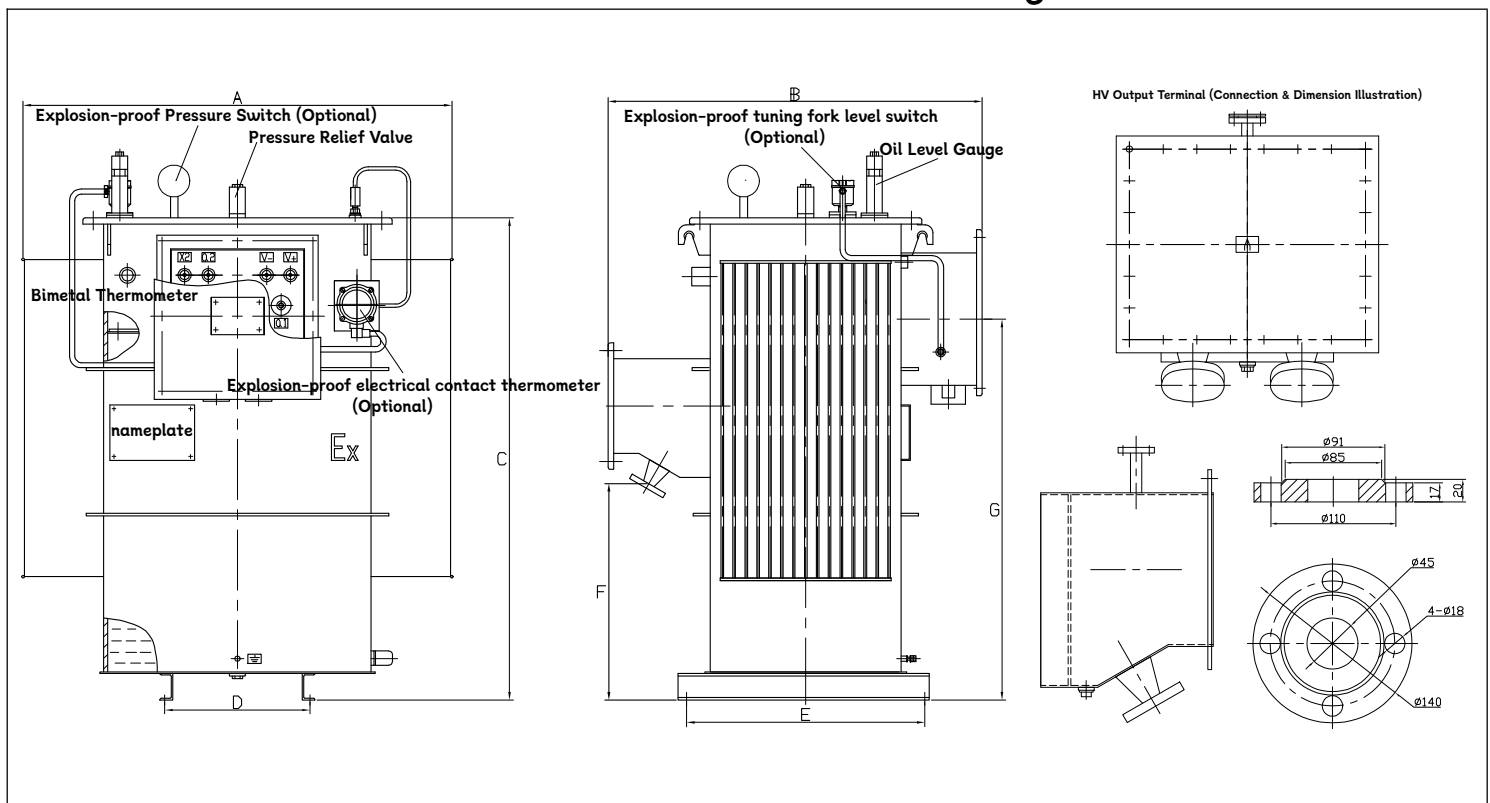


AC/DC Version Capacity and Dimensions

Dimensions (mm) (20 kV Class) Rating	A	B	C	D	E	F	G
50KVA	1200	1250	1630	400	850	600	1210
80KVA	1250	1290	1730	400	850	700	1160
100KVA	1280	1300	1750	400	850	800	1170
125KVA	1320	1320	1800	400	850	800	1230
160KVA	1450	1380	1870	550	900	800	1270
200KVA	1490	1410	1920	550	900	800	1285
250KVA	1530	1450	1980	550	900	800	1300

Dimensions (mm) (35 kV Class) Rating	A	B	C	D	E	F	G
50KVA	1350	1220	1770	550	850	800	1200
80KVA	1390	1410	1830	550	850	800	1260
100KVA	1430	1250	1880	550	850	800	1310
125KVA	1530	1490	1950	550	850	800	1360
160KVA	1610	1500	2060	550	900	800	1440
200KVA	1630	1510	2080	550	900	800	1450
250KVA	1660	1540	2100	550	900	800	1480

AC/DC Version Structural Drawing



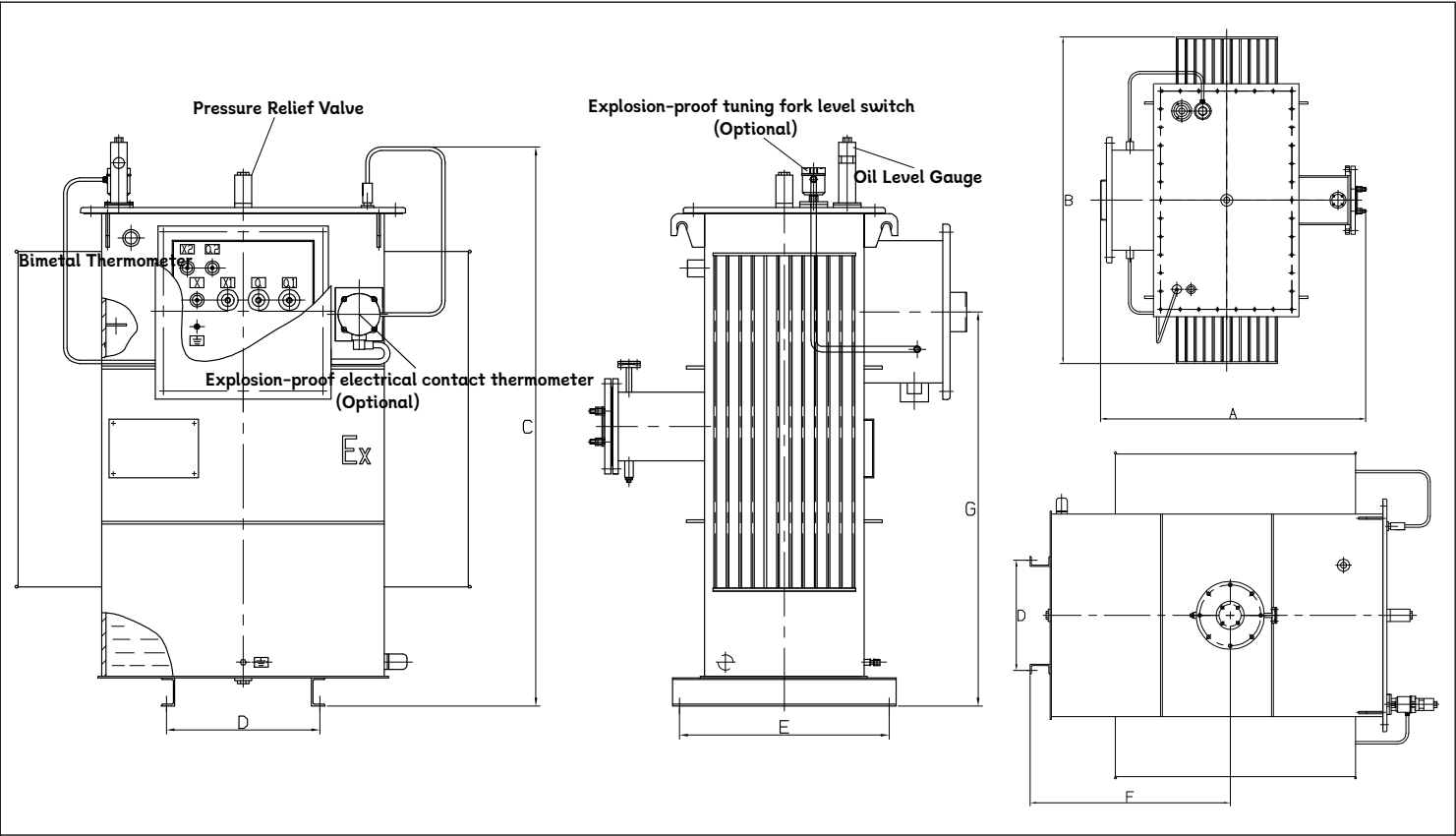


AC Version Capacity and Dimensions

Dimensions (mm) (20 kV Class) Rating	A	B	C	D	E	F	G
50KVA	1200	1210	1630	400	750	1000	1210
80KVA	1250	1250	1730	400	750	1000	1160
100KVA	1280	1260	1750	400	750	1000	1170
125KVA	1320	1280	1800	400	750	1000	1230
160KVA	1450	1340	1870	550	750	1000	1270
200KVA	1490	1370	1920	550	850	1000	1285
250KVA	1530	1410	1980	550	850	1000	1300

Dimensions (mm) (35 kV Class) Rating	A	B	C	D	E	F	G
50KVA	1350	1190	1770	550	650	1000	1210
80KVA	1390	1230	1830	550	650	1000	1260
100KVA	1430	1250	1880	550	750	1000	1310
125KVA	1530	1300	1950	550	750	1000	1360
160KVA	1610	1320	2040	550	800	1000	1440
200KVA	1630	1350	2080	550	800	1000	1450
250KVA	1660	1370	2100	550	800	1000	1480

AC Version Structural Drawing





Oil-Immersed Construction and Separate Oil Tanks

This transformer series has an **oil-immersed, naturally cooled construction**. The main tank is filled with transformer oil for winding cooling and insulation.

Insulating oil: Grade 25# or 45#. Conventional ambient temperature: -20 to +40 °C; altitude: ≤1000 m. Special service conditions can be accommodated through customization.

The high-voltage output section has an **independent oil tank with no oil connection to the main tank**:

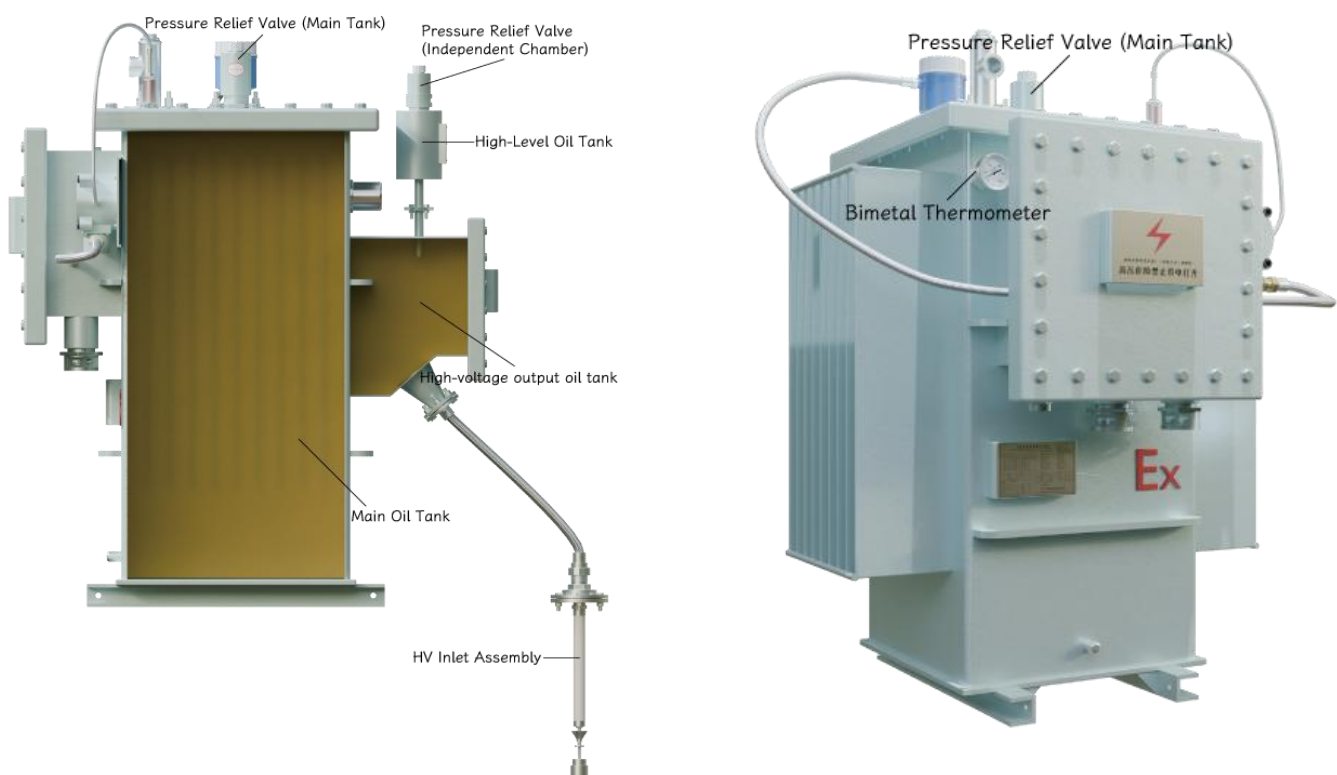
- Main tank = main insulation oil tank
- HV junction box / HV outlet = HV output oil tank
- The two oil circuits are completely isolated and do not communicate.

The **HV output oil tank** prevents **temperature rise, gases or contaminants** in the main tank from affecting the HV terminals, maintaining reliable insulation in outdoor, high-humidity and salt-spray environments.

To keep the **independent oil tank fully filled**, the following components are provided above the HV outlet:

- **High-level oil tank**: stabilizes the oil level and allows visual observation of the oil level.
- **Pressure relief valve**: prevents pressure changes caused by temperature rise or external forces from damaging the high-level oil tank and protects the flexible conduit and electrode bushing.

This auxiliary system maintains insulation performance and mechanical safety along the entire HV outlet/inlet path under varying operating conditions.





HV Connection to the Vessel

High voltage is carried from the HV junction box to the vessel interior through the following components:

- **Special HV cable** (high-voltage rated, oil-resistant, dual insulation)
- **Stainless-steel flexible conduit** (mechanical protection for vibration, salt spray and sunlight exposure)
- **HV inlet assembly** (introduces high voltage from outside into the vessel)
- **Conductor coupler** (spring-loaded contact; recommended compression: 5–15 mm)



This compact, reliable HV connection supports stable long-term operation in oil-field service.

Continuous Voltage Regulation via Pulse Control Cabinet

With a pulse voltage-regulation control cabinet, thyristors regulate the input voltage supplied to the transformer. The input is configured for **380 V, 400 V or 6000 V** and is continuously controlled within the corresponding rated-voltage range:

380 V class: 0–380 V;

400 V class: 0–400 V;

6000 V class: controlled within the rated **6000 V class**.

The HV output varies continuously with the input voltage. The operating voltage is therefore not limited to the five fixed tap voltages and can be adjusted precisely within the selected tap range.

Continuous regulation supports soft start, constant-voltage control, constant-current control, automatic recovery after electric-field breakdown and pulsed-field operation, allowing the system to deliver the required electric field under different crude-oil conditions.

