

TRADITION - MANUFACTURING INSTRUMENT TRANSFORMERS SINCE 1947

EXPERIENCE - MORE THAN 45 YEARS OF HIGH VOLTAGE CAPACITORS PRODUCED,
WITH MORE THAN 15000 CVT UNITS INSTALLED WORLDWIDE

FLEXIBLE DESIGN - EVERY UNIT IS DESIGNED TO SATISFY SPECIFIC CUSTOMER REQUIREMENT

LONGEVITY AND RELIABILITY - DESIGNED FOR AT LEAST 50 YEARS OF SERVICE LIFE

LPI

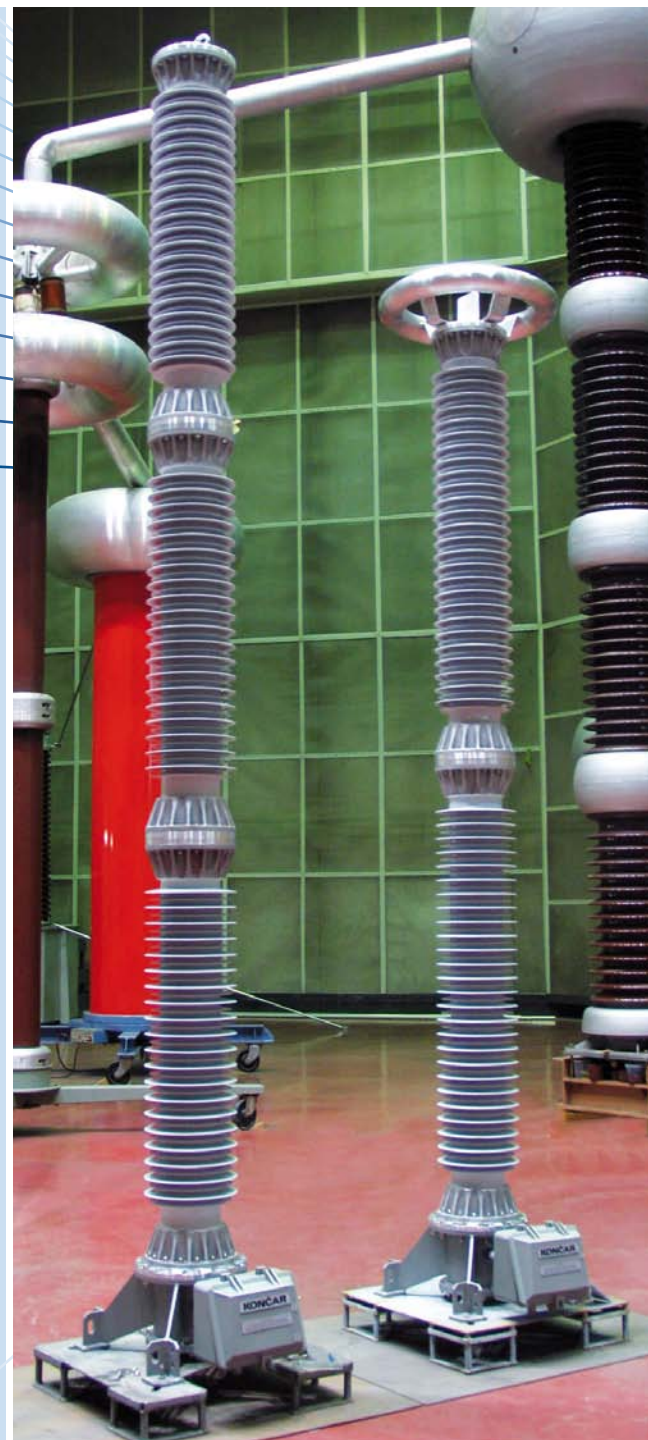
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CCU

COUPLING CAPACITORS
for Power Line Carrier systems
CAPACITOR VOLTAGE DIVIDERS
for Power Quality Measurement
72,5 to 800 kV



KONČAR

Končar - Instrument Transformers Inc.

Application

The Coupling Capacitors are used in the transmission of high frequency signals in a high voltage power system, by enabling connection of coupling device to the high voltage line.

The Capacitor Voltage Dividers are used for Power Quality Measurement in high voltage power networks. They are used to step-down the primary high voltages to defined values suitable for measurement and analysis equipment, while maintaining high accuracy at wide range of frequencies.

Both Coupling Capacitors and Capacitor Voltage Dividers type CCU are single-phase, post-type units for outdoor installation, suitable for mounting on a structure.

Performance

- Um: from 72,5 kV up to 800 kV
- Wide range of rated capacitance available
- Coupling capacitor
 - resonant frequency > 1 MHz
- Capacitor voltage divider
 - standard range of frequencies up to 50th harmonic, wider range available
 - Ability to choose rated secondary voltage, accuracy class and fixed or variable secondary output

Main Features

- Modern capacitor insulation technology - mixed dielectric with synthetic impregnating liquid
- High capacitance stability with temperature change and time
- Extremely low dielectric dissipation factor
- Virtually no temperature rise in service
- Stainless steel bellows expansion system
- Standard ambient temperatures from -35 to +40 °C, upon request extreme temperature ranges available
- Minimum impregnating liquid quantity and PCB free - environmentally friendly
- Non-corrosive hardware
- Maintenance free
- Partial discharge free on power-frequency withstand voltage

Accessories

- Coupling Capacitor
 - HF terminal on outside bushing or in secondary terminal box
 - Carrier accessories in secondary terminal box (optional)
- Capacitor Voltage Divider
 - Potential earthing switch in secondary terminal box
 - Protective surge arrester
 - Secondary terminals - threaded bolt type, terminal blocks or any standard connection

Capacitor Voltage Dividers Application

Capacitor Voltage Dividers are designed according to the requirements of standards defining Capacitor Voltage Dividers and Transformers (IEC, ANSI/IEEE, GOST, AS, IS, CAN/CSA or any other), as well as IEC 61000 series standards or IEEE 519, defining electromagnetic compatibility and power quality measurement techniques.

Power quality assessment has become an important issue in the management of electric power systems.

Conventional voltage transformers (both inductive and capacitive) cannot provide correct transformation accuracy on the range of signal frequencies. Reason for this is their complex electrical structure, being composed of inductances and capacitances.

Capacitor Voltage Dividers, having very low internal inductance, present an ideal device for precise transformation of high voltage, virtually regardless of the frequency.

Using the dividers with high rated capacitance gives us the ability to obtain high accuracy of the divider even with burden connected to secondary terminals.

Quality Assurance

Quality of our products is assured through a certified quality standard, the ISO 9001, covering all aspects of design, production and testing.

Končar - Instrument transformers Inc. is ISO 14001 and OHSAS 18001 certified, ensuring environmental and occupational health standards are met.

And most importantly, our tireless ambition to satisfy customers has sealed long lasting quality and reliability onto our product.



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DESIGN

Capacitor Stack

The Coupling Capacitor / Capacitor Voltage Divider is located inside one or more insulator enclosures - capacitor units. It is composed of a large number of series connected, plate-shaped capacitor elements, made of mixed dielectric (polypropylene and capacitor paper films) placed between aluminium foil electrodes.

These elements have been, after assembly in the set, compressed, bound, dried and filled with synthetic impregnating liquid in high vacuum. Capacitor elements are connected in such way to achieve low inductance and very high resonant frequency of the capacitor.

At the top of each capacitor unit, inside the insulator enclosure, a stainless steel expansion bellows is provided for compensation of the impregnating liquid thermal density variations. This ensures that each capacitor unit is hermetically sealed, free from air or inert gas, and completely maintenance free.

After impregnation, every capacitor unit is subject to a routine sealing test in order to ensure the enclosure perfect hermetical sealing.

In case of the Capacitive Voltage Divider, an appropriate number of capacitor elements are tapped, creating low-voltage capacitor (C1) and high voltage capacitor (C2), and providing low voltage signal.

Base Assembly (Housing)

Capacitor stack is mounted on the base assembly, which enables installation onto a support structure. Base assembly also accommodates low voltage terminals, earthing connector and lifting lugs.

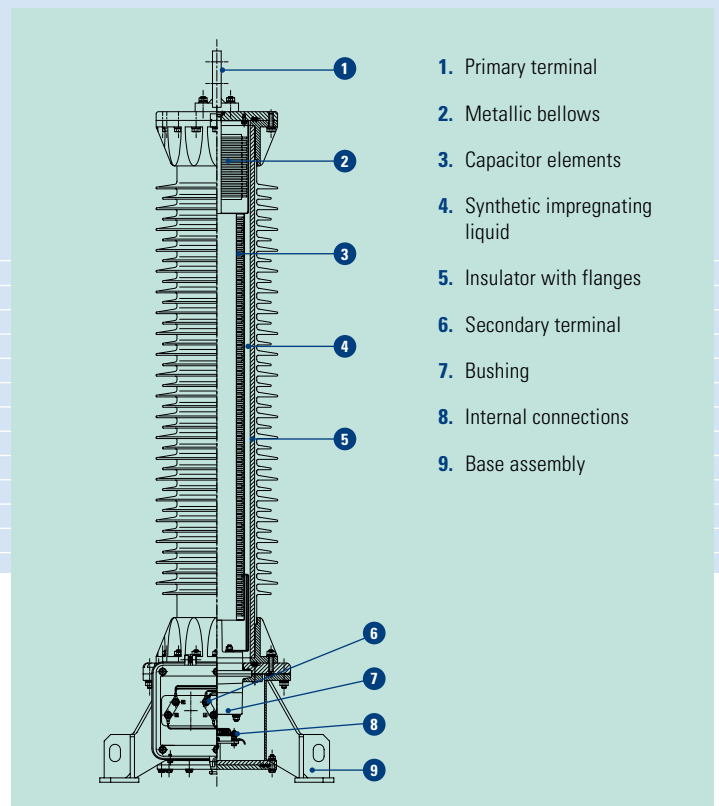
The base assembly is made of either aluminium alloy or high quality steel which is hot dip galvanized and additionally painted for long-lasting corrosion resistance.

Insulator

As per request, the external insulation can be either porcelain or composite. The porcelain insulators are made of the highest quality C130 aluminous porcelain, while the composite insulators are composed of a glass-fibre reinforced resin tube and silicone rubber sheds.

The insulators creepage distance is based on the ambient air pollution and is to be quoted in the inquiry.

Cross-Section Drawing



Terminals

The primary (high voltage) terminal is made of aluminium alloy or, alternatively, of corrosion protected (tin or silver plated) electrolytic copper. The terminal shape and type are chosen according to applicable standard and customers' requirements and practice.

Coupling Capacitor low voltage terminal can be provided either on the outside bushing on the base assembly, or in the secondary terminal box. Coupling Capacitor can also be supplied with the carrier accessories (drain coil, surge arrester and ground switch) located in the secondary terminal box.

Capacitor Voltage Divider secondary tap terminal and low voltage terminal are accommodated inside the secondary terminal box, together with earthing terminals. Standard secondary terminals are M8 in size and are of the threaded bolt type, made of stainless steel. On request, any standard size connector can be provided as secondary terminal.

Secondary terminal box is also provided with potential earthing switch, which can be operated from outside of the terminal box, and which connects secondary tap terminal to earth.

For safety purposes, secondary terminal can be protected with a surge arrester within the secondary terminal box.

Standard Dimensions

Type	Maximum System Voltage	Rated Capacitance	Total Height	Total Weight	Oil Weight	Base Mounting	Minimal Creepage Distance
	kV	pF	mm	kg	kg	mm	mm
CCU-72,5	72,5	27000	1690	185	15	470x470	1815
CCU-123	123	16000	1690	185	15	470x470	3075
CCU-145	145	13500	1980	215	20	470x470	3625
CCU-245	245	8000	2980	325	30	470x470	6125
CCU-362	362	5400	3740	400	42	470x470	9050
CCU-420	420	4400	4320	480	50	470x470	10500
CCU-525	550	3500	5150	585	60	470x470	13750
CCU-765	800	2400	6280	700	75	470x470	20000

The given indicative values refer to our standard capacitance versions with porcelain insulators. Custom capacitance values are available on request or when required by accuracy performance. Actual dimensions depend on electrical, mechanical and environmental parameters specified in the customers' inquiry.

The values are susceptible to change in the course of technical developments.

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