

TRADITION AND EXTENSIVE EXPERIENCE - MANUFACTURING INSTRUMENT TRANSFORMERS SINCE 1947

FLEXIBLE DESIGN - READINESS AND WILLINGNESS TO COMPLY WITH CUSTOMER REQUIREMENTS

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

AGU
CURRENT TRANSFORMERS
VKU
VOLTAGE TRANSFORMERS
12 to 52 kV - oil insulated

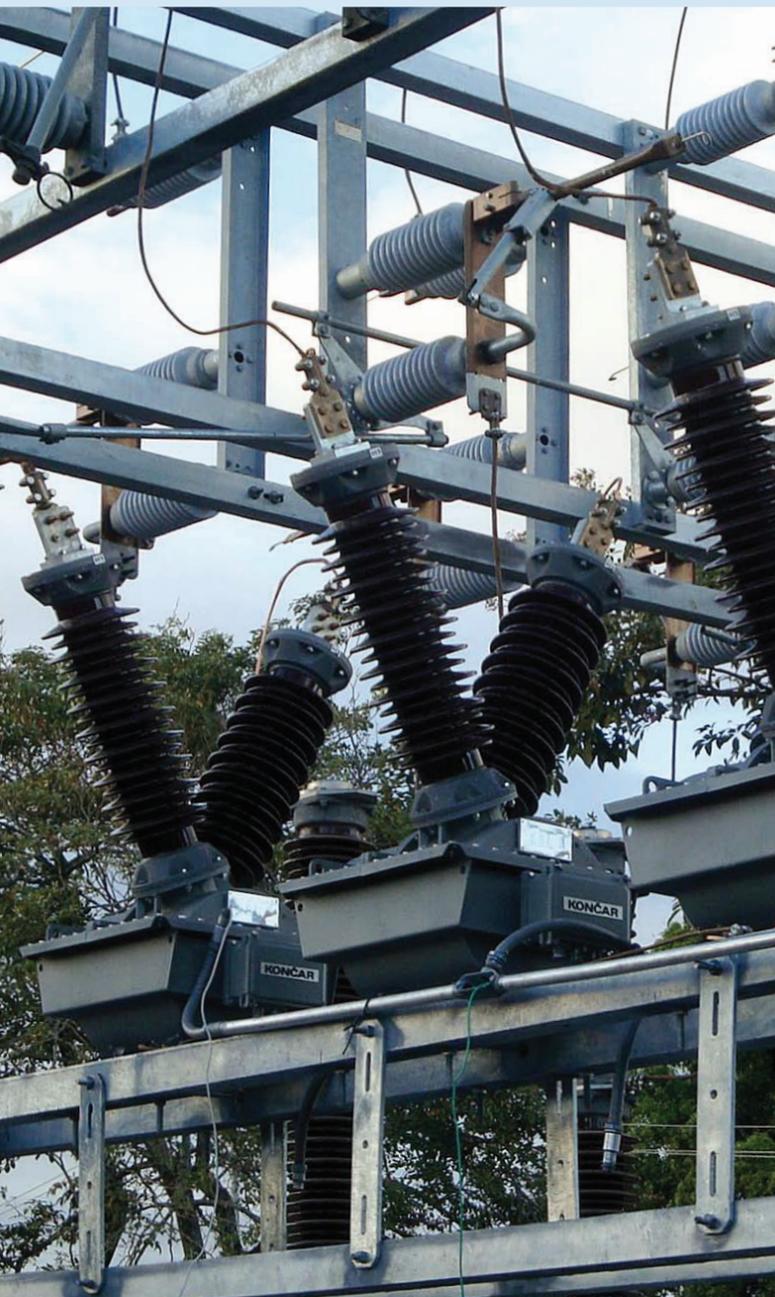


KONČAR

Končar - Instrument Transformers Inc.



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Application

Current and voltage instrument transformers are used to step-down current and voltage (respectively) to defined values, and thus provide standardized, useable levels of current and voltage in a variety of power monitoring, measurement and protection applications while insulating the measurement and protection equipment from high system voltage.

Performance

- Um: 12 to 52 kV
- All metering and protection classes
- **AGU**
 - In: up to 6000 A
 - Short circuit: up to 100 kA (Idyn: 250 kA peak)
 - Secondary cores: up to 6
- **VKU**
 - Secondary windings: up to 4
 - Single or double pole insulated design

Main Features

- **AGU**
 - Top core design - ensuring low primary winding losses
 - Primary and/or secondary transformation ratio reconnection
 - Low leakage reactance type
- **VKU**
 - Secondary transformation ratio reconnection
 - High thermal overload capability
 - Ideal for capacitor bank discharge
- High quality paper-oil insulation
- High-precision measurement accuracy and protection classes with superior transient response
- Standard ambient temperatures from -35 to +40 °C (extreme ranges upon request)
- High quality porcelain or composite (silicone shed) insulator
- Extensive experience in seismically active regions
- Minimum oil design and PCB free - environment friendly
- Stainless steel bellows oil expansion system
- Sealing for life - every single transformer is vacuum tested with helium
- Non-corrosive hardware
- Maintenance free
- Explosion-safe design

Accessories

- Terminal for measuring dielectric dissipation factor ($\text{tg}\delta$) (optional)
- Secondary winding protection (optional)
 - fuses or Micro Circuit Breakers (MCB) for VKU
 - surge arresters for AGU
- Oil level indicator (optional for VKU)
- Separate revenue metering secondary terminals sealing
- Internal overpressure indicator (optional)

Quality Assurance

Končar instrument transformers are designed in compliance with IEC, ANSI/IEEE, GOST, AS, IS, CAN, or any other relevant standard.

Product quality 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 and safety 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

Current Transformer (AGU)

The active part of the current transformer comprises of wound toroidal cores, an aluminium or copper primary winding passing through them and paper insulation. As such, the top core transformer has its minimal length primary winding and only the low voltage part insulated in paper. Another benefit of this design is that local saturation is avoided and minimal losses and leakage reactance are ensured.

Variable transformation ratios are achieved through reconnection on either the primary (HV) and/or the secondary (LV) side.

The transformer can accommodate several independent cores which can, depending on required accuracy class, be made of cold-rolled grain-oriented magnetic steel, soft magnetic materials or nanocrystalline alloys. The cores and secondary winding reside inside an aluminium cast protective housing which is designed to safely lead the fault current to ground without danger of an arc occurring within the external insulator.

Paper-Oil Insulation

The high voltage primary side is insulated from the low voltage secondary side by means of oil impregnated paper of high dielectric strength.

The paper insulation is then dried in high vacuum and impregnated with high grade inhibited and degassed (moisture content of no more than 2 ppm) mineral transformer oil. We guarantee the oil in our transformers not to contain polychlorinated biphenyls and terphenyls (PCB & PCT).

The paper-oil insulation is closed in and hermetically sealed off from ambient air by means of a stainless steel bellows. The stainless steel bellows compensates the thermal oil expansion and thus also serves as an expansion mechanism and an oil level indicator. Alternatively, the VKU type transformers with lower oil quantity (lower voltage levels) have a gas cushion system implemented.

All of the above ensure excellent and long lasting dielectric properties of the transformers main insulation.

Voltage Transformer (VKU)

In the laminated magnetic core is of the closed 3 limb type and is made of stacked silicone steel sheets.

The primary winding is made in layers with the interlayer insulation made of high quality insulating paper.

Secondary enamelled copper windings are wound with high-grade enamelled copper wire of large cross-section area, making it capable of withstanding a secondary short circuit.

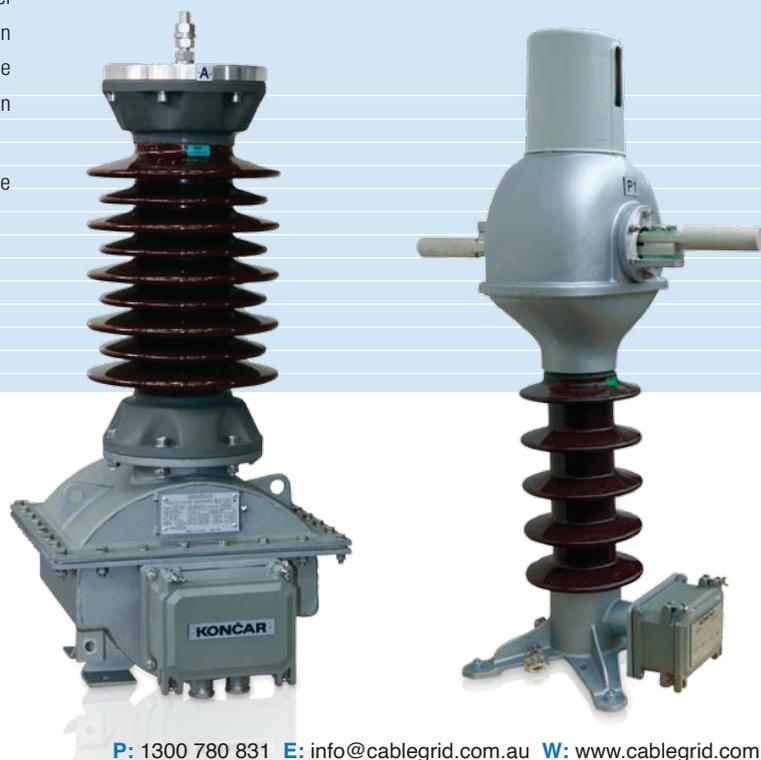
Moreover, the insulation is tested at higher than nominal test voltages thus additionally contributing to transformer safety.

The two pole variant differs from the single pole one only in having an additional insulated primary (HV) lead residing inside a separate external insulator.

Insulator

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

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





Terminals

In case of current transformers (AGU), the primary terminals are made of aluminium or, alternatively, of galvanic corrosion protected (tin or silver plated) electrolytic copper. The terminal shape and type are both designed according to current ratings and applicable standards, unless specified otherwise in the inquiry.

In case of voltage transformers (VKU), the standard primary terminal material is tin plated brass and is M16x50 mm in size, unless otherwise defined in the inquiry.

Standard secondary terminals are M8 in size and are of the stainless steel threaded bolt type. Other terminal types, materials and dimensions are available on request.

The secondary terminals, along with protective devices and tariff terminal sealing, reside in the secondary terminal box. Cable glands or plates provide entry to the box and are designed in accordance with customers' needs.

Housing

The transformer housing consists of a base, insulator, head (AGU), tank (VKU) and bellows cover.

During production, before the oil-filling process, a vacuum sealing test is performed on every transformer, ensuring perfect hermetical sealing of the enclosure.

The transformer base is made of high quality steel, which is hot dip galvanized and additionally painted for long-lasting corrosion resistance, or of cast aluminium. The IP 65 secondary terminal box is located on it, along with various other accessories, such as name plate, oil sampling and filling valve, lifting lugs, earthing terminals and an optional oil overpressure indicator.

Dimensions

Type	Maximum System Voltage	Total Height	Terminal Height	Total Weight	Oil Weight	Base Mounting	Minimal Creepage Distance
	kV	mm	mm	kg	kg	mm	mm
AGU-24	24	1125	750	80	15	280x280	600
AGU-36	36	1350	950	120	20	280x280	950
AGU-52	52	1800	1440	200	35	400x400	1300
VKU1-24;36	24;36	900	900	95	11	230x155	600;950
VKU1-52	52	1375	1375	130	20	230x155	1300
VKU-24;36	24;36	850	850	120	15	230x155	600;950
VKU-52	52	1375	1375	240	25	400x400	1300

The given indicative values refer to our standard porcelain versions and vary depending 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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