

DISTRIBUSENSE® SENSORS

KEVA 17.5 B21, UL Certified

Indoor voltage sensor



The KEVA 17.5 B21 is used for voltage measurement in low or medium voltage equipment, including, but not limited to, switchgear.

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01 Application of voltage sensor as a post insulator in air insulated medium voltage switchgear

Sensor principles

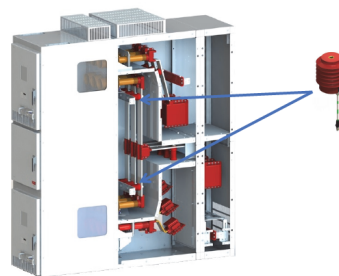
Electronic voltage transformers (sensors) offer an alternative method for voltage measurement to protect and monitor medium voltage power systems. Sensors are significantly smaller, offer improved safety, and provide greater rating standardization over a wider range than conventional instrument transformers. They can only be fully utilized in combination with versatile electronic relays and meters compatible with the sensor outputs.

Application

The KEVA 17.5 B21 is used for voltage measurement in low or medium voltage equipment, including, but not limited to, switchgear. The sensor is designed to be used as a post insulator in medium voltage apparatus, but can be used as a standalone unit as well. KEVA sensors are designed for indoor use only and must be installed in a humidity-controlled environment since they are not IP rated for outdoor use.

Resistive divider technology

Voltage measurement in this sensor is based on the resistive divider principle. The output voltage is directly proportional to the input voltage (1:10000 transformation ratio) and reproduces the actual waveform of the primary voltage signal.



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Benefits

- Linear response over a wide dynamic range due to the lack of a ferromagnetic core and influence by the width of hysteresis curve
- Voltage sensing for both metering (0.5) and protection classes (3P) in one device
- Lightweight and easy to install
- Low power, improved safety
- Low energy consumption
- Amplitude and phase error are constant and independent from primary voltage; can be easily corrected with IED correction factors
- VT fuses are not required
- No ferroresonance due to non-inductive device
- No need for an additional insulator

Intelligent electronic devices (IED)

Protection and control IEDs incorporate the functions of traditional relays with additional functions. The IED must be able to operate at a sensor's low output signal level. Modern IEDs (such as ABB's 615, 620, and 640 series relays) are designed for such use.

Modern digital apparatus (microprocessor-based relays) combine protection and measurement functions. They fully support voltage sensing realized by the single sensor with dual accuracy class designation (e.g.: voltage sensing with combined accuracy class 0.5/3P).

The IED's impedance should match the rated burden of the sensor (10 MOhm). To achieve the correct function of the protection and control IED, the selected rated voltage, as well as the rated transformation ratio, must be properly set in the IED.

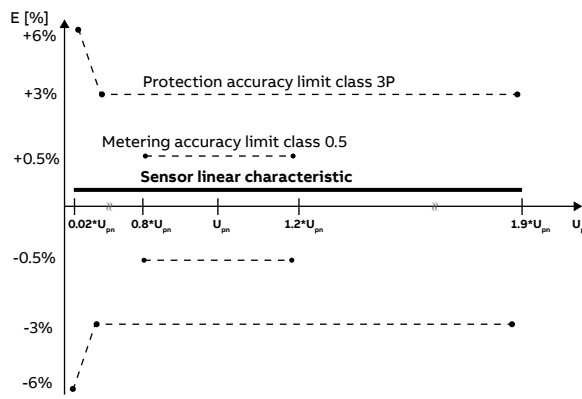
To ensure accurate measurement and proper performance, the sensor and IED must be compatible. Due to the wide variety of relays and controllers offered in the market today, contact the factory or your ABB sales representative to ensure sensor compatibility.



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IEC 60004-7 voltage measurement range for KEVA 17.5 B21 with accuracy class 0.5/3P

The graph below describes the tested accuracy limits.



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Correction factors

Values of the correction factors (Cfs) for the amplitude (aU) and phase error (pU) of a voltage sensor are stated on the sensor label. (For more information, refer to the Instructions for Installation, Use, and Maintenance.) These should be uploaded without any modification into the IED before the sensors are placed into operation. To achieve the required accuracy classes, it is recommended to use both correction factors: amplitude correction factor and phase error correction factor.

Secondary cables

The KEVA 17.5 B21 is equipped with cables and RJ45 cable connectors for connection to the IED. The sensor accuracy classes are verified up to the RJ45 connector and therefore consider the influence of the secondary cable. These cables are intended to connect directly to the IED and neither burden calculation nor secondary wiring is required. Every sensor is accuracy tested when equipped with its own cable and connector. For more information about connectors, adapters, and coupling adapters, contact your ABB sales representative.

Connector adapters

A group of adapters was designed to provide connectivity between a sensor with a RJ45 cable connector and IEDs with Twin-BNC connectors. The use of connector or coupling adapters has no influence on the voltage signal and accuracy of the sensor with the cable.



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Standards

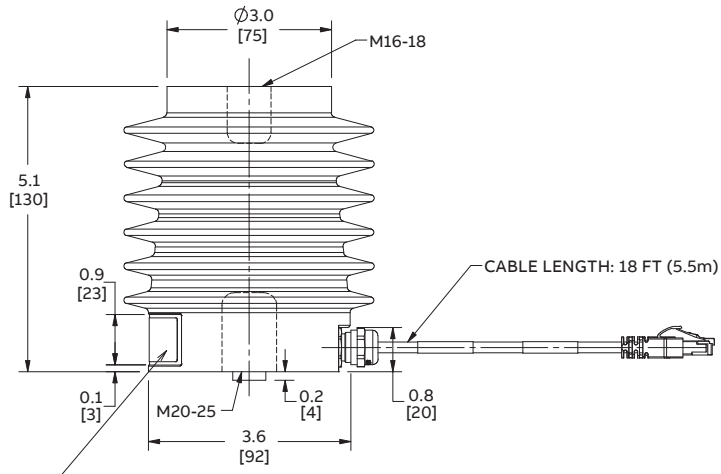
The KEVA 17.5 B21 voltage sensor complies with the IEC 60044-7 (1999-12): Instrument transformers, Part 7: Electronic voltage transformers

Certification

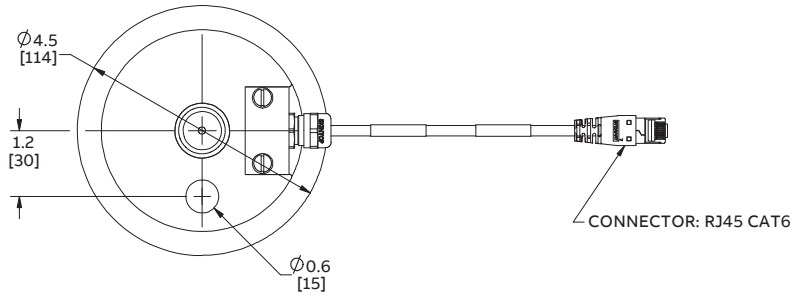
UL Certified, file #501098.



Dimensions (inches [mm])



SIZE OF SOCKET FOR RATING PLATE:
2.76 x 0.91 [70 x 23]



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Highest voltage for equipment and test voltages

Type	Highest voltage for equipment U_m (kV)	Rated power frequency test voltage (kV)	Rated lightning impulse test voltage (kV)
KEVA 17.5 B21	17.5	38 (42)	95

Note: for KEVA 17.5 B21 the extended power frequency test voltage of 42 kV can be selected.

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Voltage sensor, rated values

Rating	Value
Rated frequency, f_r	60/50 Hz
Accuracy class	0.5/3P
Rated burden (input impedance), R_{br}	10 M Ω
Rated transformation ratio, K_n	10000:1
Rated voltage factor, K_u	1.9/8h

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Rated primary voltage

Type	Rated primary voltage U_{pn} (kV)
KEVA 17.5 B21	17.5/ $\sqrt{3}$

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Miscellaneous data

Characteristic	Value	
Weight	4.3 lbs. (2.0 kg)	
Temperature category	Operation	-25°C/+80°C
	Transport and storage	-40°C/+80°C
Connector	RJ45 (CAT-6)	

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Selection guide

Sensor	Style number
KEVA 17.5 B21 (5.5 meter cable)	1VL5400060V0302