

CBN10x

Isolating Measurement Probes for High Voltages



High Voltage Measurement in Hybrid or Electric Vehicles

Electric motors of hybrid and electric vehicles provide high engine powers. They are operated at voltages in the range of about 600 V and powered by a strong traction battery. When handling voltages in this range, special measures have to be taken to protect the users. The ETAS isolating measurement probes are used to measure voltages on high-voltage electrical systems used in hybrid or electric vehicles. The probes offer a high level of safety due to electrical isolation near the measuring point. They are insensitive to transient voltages caused by the power consumption of the aggregates of the high-voltage onboard electrical system.

Applications

Typical applications are for example the measurement of voltages on the traction battery, on individual cells of the traction battery or on intermediate circuits. For

instance, voltage measurements can determine the battery charge condition, the battery behavior under load, oscillations in the high-voltage on-board power supply or the discharge of the battery in safety-critical situations independently of the ECU.

Integration into Measurement Systems

CBN10x measurement probes have a cable length of one meter. On the measurement side, they have open cable ends. For connection to the measurement device, there are variants with different connectors and with open cable ends available.

The power is supplied ideally by the measuring module. The setting of the measuring range can be done manually according to the attached data sheet or read automatically by the measurement module from the integrated TEDS (Transducer Electronic Data Sheet).

At a Glance

Compact isolating probes for measuring voltages on high-voltage electrical systems of hybrid or electric vehicles

High level of safety due to electrical isolation near the measuring point

Electrical isolation from high-voltage on-board power supply up to a potential difference of 840 V

Probe model with 840 V range for measuring electrical system voltages

Probe model with 10 V range for measuring battery voltages

Use in combination with voltage measurement modules

Technical Data

Item	Feature	Description			
Size and weight	Probe dimensions	25 x 88 mm 1.0 x 3.6 in (Ø x L)			
	Cable length	0.20 m 0.7 ft (to measurement point) 0.80 m 2.6 ft (to measurement device)			
	Weight	0.105 kg 0.23 lb (without connector)			
Environment	Temperature range	-40 °C ... +75 °C -40 °F ... +167 °F			
	Protection class	IP65			
Power supply	Supply voltage	11.5 - 12.5 V DC			
	Current consumption	24 mA (at 12 V 77 °F) 28 mA max. (at 12 V -40 °F ... +167 °F)			
TEDS	Type	Dallas DS2431			
	Data template	According to the standard IEEE 1451.4-2004, template 30 (High-level voltage output sensors)			
Input interface	Maximum input voltage	±840 V (below 4,000 m above see level) ±600 V (between 4,000 m and 5,000 m above see level)			
	Isolation voltage	±840 V DC (input wires to ground wire)			
	Isolation test voltage	±1,500 V DC (input wires to output wires)			
	Input impedance	12 MΩ			
	Input capacitance	4 pF (including 20 cm high voltage wires, at 10 kHz)			
	Coupling capacitance	10 pF (input to output)			
		CBN100/100/104/106	CBN101/103/105/107		
	Measurement range	±840 V	±10 V		
	Measurement accuracy	±100 mV + U _{in} * 0.02% (+25°C 77 °F) ±400 mV + U _{in} * 0.10% (-40°C...+75°C -40 °F ... +167 °F)	±1 mV + U _{in} * 0.05% (+25°C 77 °F) ±5 mV + U _{in} * 0.20% (-40°C...+75°C -40 °F ... +167 °F)		
Output interface	Connector	CBN100/101	CBN102/103	CBN104/105	CBN106/107
		Open Wires	Lemo FGA.0B.306 (6 pin male)	Lemo FGG.1B.306 (6 pin male)	Lemo FGG.1B.310 (10 pin male)

Order information

Order name	Short name	Order number
Isolating Measurement Probe, 840 V Isolation, 1 Channel, ±840 V Range, Open Wires, 1m	CBN100.1-1	F-00K-107-887
Isolating Measurement Probe, 840 V Isolation, 1 Channel, ±10 V Range, Open Wires, 1m	CBN101.1-1	F-00K-107-888
Isolating Measurement Probe, 840 V Isolation, 1 Channel, ±840 V Range, Lemo FGG.0B.306 - Open Wires, 1m	CBN102.1-1	F-00K-107-889
Isolating Measurement Probe, 840 V Isolation, 1 Channel, ±10 V Range, Lemo FGG.0B.306 - Open Wires, 1m	CBN103.1-1	F-00K-107-890
Isolating Measurement Probe, 840 V Isolation, 1 Channel, ±840 V Range, Lemo FGG.1B.306 - Open Wires, 1m	CBN104.1-1	F-00K-107-891
Isolating Measurement Probe, 840 V Isolation, 1 Channel, ±10 V Range, Lemo FGG.1B.306 - Open Wires, 1m	CBN105.1-1	F-00K-107-892
Isolating Measurement Probe, 840 V Isolation, 1 Channel, ±840 V Range, Lemo FGG.1B.310 - Open Wires, 1m	CBN106.1-1	F-00K-108-260
Isolating Measurement Probe, 840 V Isolation, 1 Channel, ±10 V Range, Lemo FGG.1B.310 - Open Wires, 1m	CBN107.1-1	F-00K-108-262

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