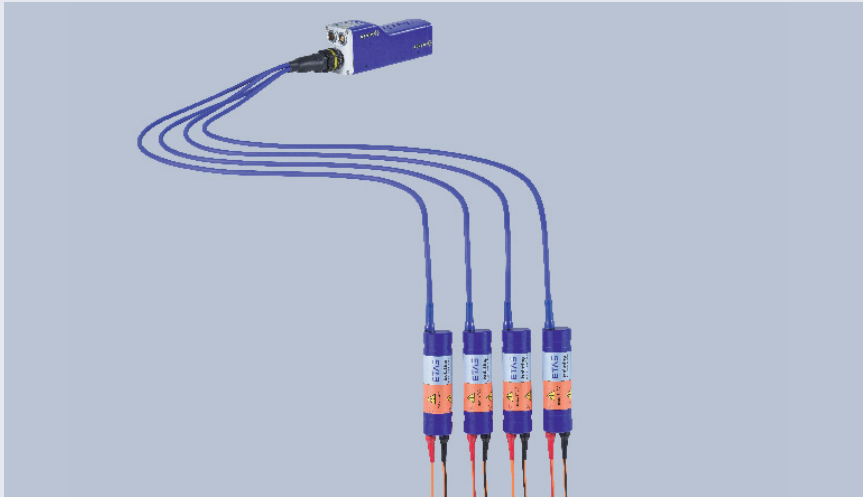


CBN40x

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 the Measurement and Calibration System

The ability to integrate the probes seamlessly into ETAS measurement systems and into INCA allows efficient solutions for acquiring voltages during calibration and validation of control units for electric drive systems.

The sensors are automatically supplied with voltage by the measurement module, which recognizes the type of sensor attached and automatically sets the measurement range for each channel. The measurement range and the sensor features are forwarded to the measurement software, which automatically displays the correct physical reading. ETAS measurement systems allow simultaneous measurement of many different values. In combination with a current measurement for example, it is possible to determine the power consumption of electrical loads.

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

For use in combination with ES411, ES415, and ES411 measurement modules

Time-synchronous recording of ECU signals and other measurement data from the vehicle environment

Technical Data

Item	Characteristics	Features
Size and weight	Probe dimensions	25 mm x 88 mm / 1.0 in x 3.56 in (Ø x L)
	Cable length	0.20 m / 0.7 ft (to measurement point) 0.80 m / 2.6 ft (to measurement module)
	Cable weight	0.430 kg / 0.95 lb (probes included)
Environment	Temperature range	-40 °C to +75 °C / -40 °F to +167 °F (operation)
	Protection class	IP65
	Altitude	Up to 5,000 m / 16,400 ft (operation)
Inputs	Channels	4
	Measurement range	±840 V (CBN400) ±10 V (CBN401)
	Maximum input voltage	±840 V (below 4,000 m altitude) ±600 V (between 4,000 m and 5,000 m altitude)
	Isolation test voltage	±1500 V DC (input to output)
	Isolation voltage	±840 V DC (any input to U _{Batt.})
	Transient immunity	±800 V/µs
	Input resistance	12 M Ω
	Input capacitance	4 pF
	Coupling capacitance	10 pF (input to output)
	Maximum measurement error (probe plus ES411 module)	CBN400: +/- 0.40 V + I _{U_{ini}} * 0.15 % (at 25 °C / 171 °F)
		CBN400: +/- 2 V + I _{U_{ini}} * 0.4 % (-40 °C to +75 °C / -40 °F to 167 °F)
CBN401: +/- 5 mV + I _{U_{ini}} * 0.15 % (at 25 °C / 171 °F)		
	CBN401: +/- 30 mV + I _{U_{ini}} * 0.35 % (-40 °C to +75 °C / -40 °F to 167 °F)	
System Requirements	Software	Supported by INCA V6.2.1 and higher with INCA Add-on V1.2.1 or higher

Ordering Information

Order Name	Short Name	Order Number
Isolating Measurement Probe, 840 V Isolation, 4 Channels, 840 V Range, Souriau 8ST12-35 – 4 x Open Wires (22mc-4x2c), 4 x 1 m	CBN400.1-1	F-00K-107-227
Isolating Measurement Probe, 840 V Isolation, 4 Channels, 10 V Range, Souriau 8ST12-35 – 4 x Open Wires (22mc-4x2c), 4 x 1 m	CBN401.1-1	F-00K-107-228

Accessoires

Ordering Information	Short Name	Order Number
A/D Module with Sensor Supply	ES411.1	F-00K-104-485
A/D Module with Sensor Supply, 100 kHz sampling rate	ES415.1	F-00K-107-908
Counter and Frequency Module with Sensor Supply	ES441.1	F-00K-107-908

ETAS Locations Worldwide

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Stuttgart (Headquarter)

Brazil

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Canada

Kitchener

France

Saint-Ouen

India

Bangalore

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