Drift-Free, In-Process

CapScan 2000

Capacitance Measurement Solution

The CapScan 2000 system delivers the following advantages:

- Minimal external interference due to the complete EMC shielding of an all-in-one, stainless-steel design
- Enhanced accuracy due to a unique self-balancing bridge, automatic gain, and automatic self calibration
- Superior repeatability due to a Digital Signal Processor (DSP) running complex filtering algorithms
- Accurate readings on wet or dry trough installations with line speeds up to 3000 m/min (10,000 ft/min)
- IP68 (NEMA 6P) head and IP65 (NEMA 4) design prevents degradation of readings due to environmental factors including changes in water resistance from chemical impurities

Unrivalled technology for greater consistency between in-process and post-process capacitance measurements.

As datacom cable manufacturers face more challenging specifications for Structural Return Loss, Near- and Far-end Cross Talk and Attenuation, it's more important than ever to catch problems as they develop – not after the fact. Because downgrading or rejecting finished cable robs you of productivity and profitability.

That's why correlating in-process and post-process measurement results accurately and consistently is so important. And precisely why the Beta LaserMike's CapScan 2000 is the capacitance measurement solution of choice for cable manufacturers worldwide.

Unique, drift-free operation provides superior repeatability

The CapScan 2000 gauging system provides on-line, high-speed measurement of cable capacitance. A combination of low signal-to-noise ratio and proprietary, drift-free electronics enable the system to deliver highly accurate and consistent measurements. With a local intelligence module directly connected to the measurement head, the CapScan 2000 system can communicate directly to DataPro controllers or other host systems.

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A range of gauge heads and simple, reliable data indication for a broad scope of applications

Range of gauge heads

The KG2008 model is the standard gauge for most applications. It may be mounted at any location in the trough. Special versions are available for installation in multi-pass through applications.

The KG2016 and KG2025 models are designed for use on larger diameter cables, up to 25 mm (1 in.), for applications including special CATV, coax, cell phone, and TV antennae extrusions.

Flexible connectivity

For maximum flexibility, CapScan 2000 models are available in Profibus, DeviceNet, and RS-232 versions. This makes connecting to your PLC, PC, or Beta LaserMike controller easier than ever before.

CapScan 2000-RA Communication port: RS232, analog. Used with: PC/PLC.

CapScan 2000-P Communication port: Profibus DP slave. Used with: Profibus DP network.

CapScan 2000-D Communication port: DeviceNet slave. Used with: DeviceNet network.

**RS232 is standard on all versions.*

Easy access to measurement data

The CapScan 2000 system can be easily connected to the KI1000 indicator unit for simple, reliable data indication. The KI1000 connects to the gauge via CANBUS, one of the most robust data links available today. With this reliable digital data link, you can be assured fast data transmission from your capacitance gauge to the display for quick response to product changes. Its robust design ensures uninterrupted operation of your line. Plus, flexible I/O options are available to meet your individual communications needs.

The KI1000 is available in two different models to meet your unique application needs:

KI1000: Provides basic display, I/O, and tolerancing features. Powered from 100-230VAC.

KI1000 NET: Provides basic display, I/O, and tolerancing features. Powered from DeviceNet network.

The KI1000's many features, options, and accessories make it the perfect solution for many gauging applications.

- Communicates with the CapScan gauge through a robust CANBUS digital data link
- KI1000 functions include RS-232, tolerance and diagnostics contact, analog outputs, line speed, line start/stop inputs, and ASCII printer output
- Flexible, easy-to-use digital display and keypad
- Statistical information can be printed for examination

Special applications

On-line SRL Analysis

To eliminate costly datacom Structural Return Loss (SRL) failures, Beta LaserMike leads the industry in predicting potential SRL failures through real-time analysis of fast capacitance variations. A unique CapScan 2000 system option achieves this by using an FFT algorithm in the DSP (in-head FFT available on DeviceNet and Profibus versions). This data can then be accessed via the communications port for use in SRL analysis. In addition, the CapScan 2000 system can be used with Beta LaserMike's SRL Predictor, a comprehensive predictive analysis tool for CAT 5e/6/7 and coaxial cable, by utilizing the fast analog output.

Dry trough installation

In certain trough installations, it is not possible to naturally flood the gauge head bore (as required for accurate measurement). In this situation, high-pressure end caps can be supplied. These include connections for water and are designed to ensure the highest level of measurement accuracy for these applications.

General Gauge Specifications

	KG2008	KG2016	KG2025
Cable Range	0.1–8 mm (0.004–0.32 in.)	0.1–16 mm (0.004-0.63 in.)	0.1–25 mm (0.004-0.98 in.)
Accuracy	**Zero:** ±0.1 pF/m **Gain:** ± 0.2%	**Zero:** ±0.1 pF/m **Gain:** ± 0.2%	**Zero:** ±0.3 pF/m **Gain:** ± 0.5%
SRL Bandwidth	3.0 GHz	2.0 GHz	2.0 GHz
Short Electrode Length	66.6 mm (2.62 in.)	100 mm (3.94 in.)	100 mm (3.94 in.)
Long Electrode Length	100 mm (3.94 in.)	150 mm (5.90 in.)	150 mm (5.90 in.)
Gauge Head Dimensions	**Length:** 447 mm (17.6 in.) with CAPS; 368 mm (14.49 in.) without CAPS **Diameter:** 50.8 mm (2.0 in.)	**Length:** 629.8 mm (24.8 in.) with CAPS; 573 mm (22.56 in.) without CAPS **Diameter:** 70 mm (2.76 in.)	**Length:** 727.6 mm (28.65 in.) with CAPS; 670.7 mm (26.4 in.) without CAPS **Diameter:** 76 mm (3.0 in.)
Measurement Range	0 – 400 pF/m (0 – 120 pF/ft.)		
Resolution	0.1 pF/m (0.01 pF/m option for averaging over 0.5 sec.) 0.03 pF/ft. (0.003 pF/ft. with averaging over 0.5 sec.)		
Power Supply	11 to 25 VDC (DeviceNet standard), 6 W nominal, 9 W maximum		
Temperature Range	Electronic box 5 – 60 °C (41 - 140°F), Gauge Head 5 – 90 °C (41 - 194°F) Electronic box up to 98% condensing and Gauge Head up to 100% condensing		
	KG2016HB		
Cable Range	0.5–16 mm (0.02-0.63 in.)		
Accuracy	**Zero:** ±0.3 pF/m **Gain:** ± 0.5%		
SRL Bandwidth	6 GHz short electrode only, 9 GHz with SRL Pro		
Short Electrode Length	10 mm (0.394 in.)		
Long Electrode Length	15 mm (0.591 in.)		
Gauge Head Dimensions	**Length:** 629.8 mm (24.8 in.) with CAPS; 573 mm (22.56 in.) without CAPS **Diameter:** 70 mm (2.76 in.)		
Measurement Range	0 – 400 pF/m (0 – 120 pF/ft.)		
Resolution	0.3 pF/m (0.03 pF/m option for averaging over 0.5 sec.) 0.09 pF/ft. (0.009 pF/ft. with averaging over 0.5 sec.)		
Power Supply	11 to 25 VDC (DeviceNet standard), 6 W nominal, 9 W maximum		
Temperature Range	Electronic box 5 – 60 °C (41 - 140°F), Gauge Head 5 – 90 °C (41 - 194°F) Electronic box up to 98% condensing and Gauge Head up to 100% condensing		

CapScan 2000 Options

- High-pressure end caps for dry trough installations (KG2008 only)
- In-head FFT analysis (except KG2016HB)
- Fast analog output
- DeviceNet or ProfiBus communications interface
- KI1000 capacitance indicator and configuration module
- Calibration set
- Water-tight gland kit for installation of KG2008 in a spray trough

Combined signals from multiple electrodes of the KG2000 range capacitance probes allow for wider bandwidth coverage in on-line SRL prediction.

A special algorithm used in DSP gives the KG2008 gauge coverage up to 3 GHz.

Gauges larger than KG2008 have coverage up to 2 GHz.

In-head FFT available via DeviceNet and Profibus.

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KI1000 Indicator Specifications

Functionality

- RS-232 output
- Programmable analog O/P (three outputs available)
- Diagnostic contact
- Digital display and keypad
- Contact outputs
- Line speed input
- Line start/stop input
- ASCII printer output
- Statistics data

Power Requirements	KI1000: 100 – 230 VAC, 50/60 Hz, 25W KI1000 NET: 24 VDC, DeviceNet Power
Operating Temperature	41 – 113 °F (5 – 45 °C)
Dimensions (LxHxW)	Indicator Body (LxHxW): 243.8 x 142.2 x 111.8 mm (9.6 x 5.6 x 4.4 in.)* Front Mounting Plate (WxH): 152.4 x 129.5 mm (6 x 5.1 in.)**
Weight	1.5 kg (3.3 lb.)

*Allow ample room for cabling.

**Refer to product manual for mounting hole dimensions.

Additional information on key features and options

Digital Display	- High-visibility, 5-digit LED display - Preset capacitance and tolerance - Configuration menu - Out-of-tolerance indication
Printout	- Header: Line number and run number - During Run: Position of faults - Summary: Line number, run number, number of out-of-tolerance events, maximum capacitance, minimum capacitance, mean, and standard deviation
Options and Accessories (all models)	- Fast Analog Output: semi-programmable 1000 Hz output for FFT analysis - Display Case: IP54 (NEMA 3) case for environmental protection - 19-inch Subrack: Single and dual versions to mount the KI1000 in a 19-inch subrack

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