



DISC BRAKE WEAR ANALYSIS SYSTEM

Next Generation of rotor wear test electronics and sensors

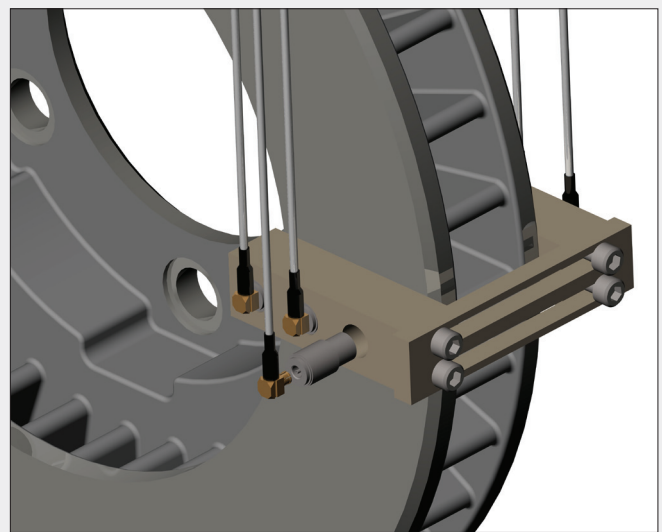
Driven by Automotive Manufacturers, Disc Brake System Suppliers and Brake Test Labs, Capacitec offers a next generation of rotor wear test electronics and sensors.

The System Includes:

- New Capteura® 220 and 520 series amplifiers with improved signal to noise ratio, bandwidth, amplifier drift and significantly better linearity
- The 520 model removes Apparent Dynamic Thickness Variation (ADTV)
- New 208 modular channel racks that are three times smaller than the previous generation
- HPC-150C-H (400°C) probe with replaceable cable and connectors
- HPC-150-V (870°C) probe with integral high temp cable



Capteura® 208 Series modular 8-channel design versus legacy 4008 8-channel system



Six Capacitec sensors shown with integral connectors and mounted on a disc brake

Measurements

- Rotor run-out (TIR)
- Static Rotor Thickness Variation (RTV)
- Apparent Dynamic Thickness Variation (ADTV)
- Rotor coning
- Plate-to-plate orientation (V-ing, barreling)
- Wobble
- Thermal expansion

Benefits

- High temperature probe operation:
H Series (400°C at sensor face)
V Series (870°C probe and cable)
- Small sensor diameter (OD 9.5mm) for large stand off (up to 2mm) or high sensitivity
- Spatially small diameter sensors allow small rotor maximum coverage
- Small sensor size fits between vented rotor holes for easier data acquisition (see image below)
- New Capteura® 220 and 520 series amplifiers with low signal to noise ratio, higher bandwidth, improved amplifier drift and significantly better linearity
- 520 model removes Apparent Dynamic Thickness Variation (ADTV)
- Modular, multichannel 208 and 216 electronic rack modules
- ESD: 20kV amplifier protection
- Replaceable coaxial extension cables lowers sensor replacement cost (H model)



HPC-150C-H-FX

Dynamic On-Vehicle or In Lab Analysis Profiles

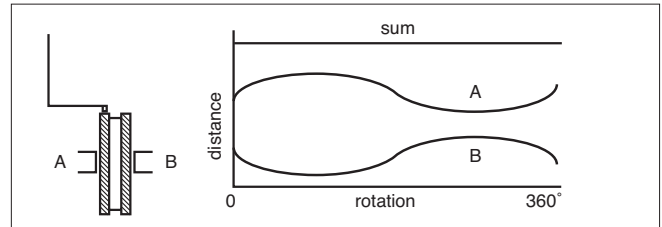


FIG. 1: The sum of the two opposite facing probe outputs [A-B] will be a constant value if there are no variations in the rotor thickness.

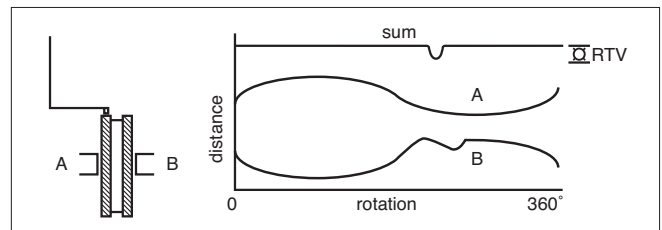


FIG. 2: If there is a variation in the rotor thickness there will be a corresponding change from the summed nominal value output from above

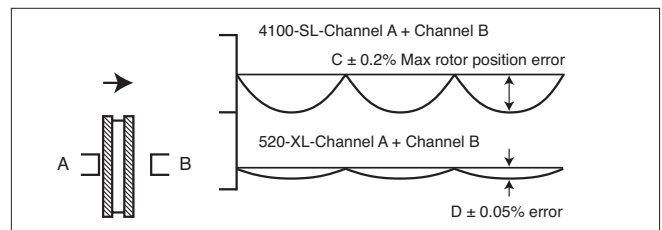
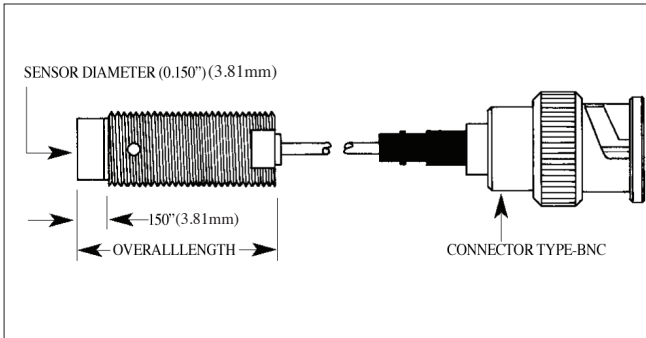


FIG. 3: For On-Vehicle applications Model 520 higher linearity and bandwidth takes out Apparent DTV from large caliper induced rotor movement toward one probe (B)

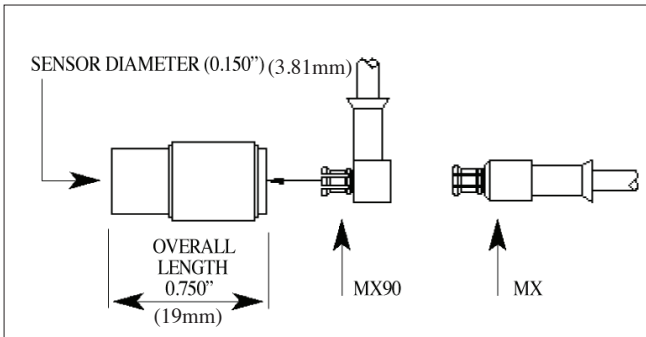
Specifications



EXAMPLE (1) : HPT-150E-V



8 channel Capteura® electronics rack with 520 dual cards
(H) 3.5" (89mm) X (W) 5.7" (145mm) X (L) 7.3" (185mm)



EXAMPLE (2) : HPC-150C-H-FX

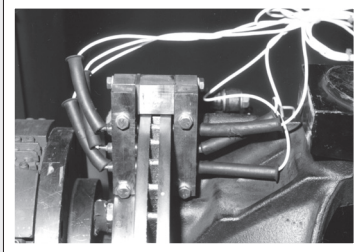


520-XL-BNC-ENC dual channel enclosure
(H) 1.26" (32mm) X (W) 4.25" (108mm) X (L) 9.5" (241mm)

Probe Material Composition	A, E and H: stainless 303; V: Inconel 600, other materials available
Dimensions	All dimensions are shown as typical only. Please contact the factory for exact dimensions
Maximum Range	Same as the diameter of the sensor element. (Minimum recommended range is 0.1% of full scale)
Linear Range	Two thirds (0.67) times the sensor diameter typical
Probe Interchangeability	±10% of full scale with maximum cable lengths, ±2% typical
Linearity	Model 220-S: +/- 1% of full scale or better to 2/3 sensor diameter Model 220-SL: +/- 0.2% of full scale or better to 2/3 sensor diameter Model 520: +/- 0.05% of full scale or better to 2/3 sensor diameter
Bandwidth	Model 220: 200 Hz, 4 kHz, or 12 kHz frequencies (user specified) Model 520: 200 Hz, 4 kHz, or 16 kHz frequencies (user specified switch selectable)
Low Noise High Resolution	Model 220: 0.1 nm measurement, HPC-150E-A-L2-1-B, 250 µm range, 200Hz Model 520: 1.28 nm measurement, HPC-150E-A-L2-1-B, 250 µm range, 200Hz
Extension Cables	Many extension cables are available (eg:EC-CMX90-L2-10 typical for HPC-150E-H-FX series probe) Model 220: 10 foot (3.05m) cable length change affects the output by less than 0.1% FS Model 520: 10 foot (3.05m) cable length change affects the output by less than 0.2%, to 32.8' (10m) max
Analog output	Model 220: 0-10 VDC, +/- 10 VDC, or 0-5VDC (specify for calibration). Optional USB on rack Model 520: 0-10 VDC, +/- 10 VDC, or 0-5VDC (specify for calibration). Optional USB on rack

Application & Accessories

Laboratory Testing On Dynamometers



Capacitive probes mounted in a holder used to measure characteristics of a brake rotor while running on a dynamometer.

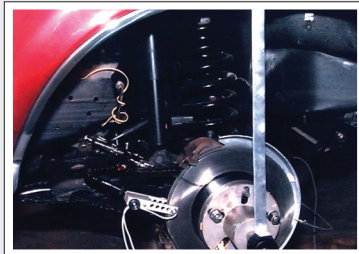


Model 208 (8-channel rack) with (4) 520-XL amplifiers and (1) 200-C oscillator card



Capteura® 208-ACU, 90-240V 50/60HZ universal AC power, BNC and D-Sub output

On-Vehicle Testing



Capacitive probes mounted in a holder measuring disc brake wear and run out during on-vehicle testing.

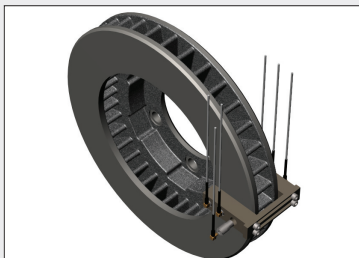


Optional Capteura® Model 200-ENC dual channel enclosure, 5-12V DC power, output cable provided

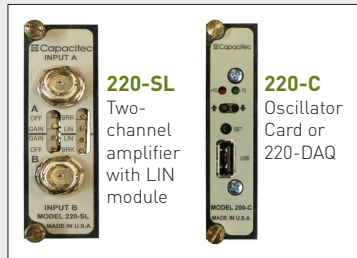


Capteura® 208-DCU, 9-36V DC power, BNC and D-Sub output

Accessories



Capacitive probes shown with new integral connectors and mounted on disc brake



220-SL Two-channel amplifier with LIN module

220-C Oscillator Card or 220-DAQ

DAQ A/D converter (8-channel 14 Bit) and USB Driver for 200 Series



Calibration stands and micrometers

Application photos Courtesy of Link Testing Laboratories, Inc., Detroit, MI

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