



# Eddy Current Flaw Detectors

Locator 3s, Phasec 2s, Phasec 2d



GE imagination at work

Locator 3s  
Phasec 2s  
Phasec 2d

## Detecting Flaws on Ferrous and Non-Ferrous Metals. Suitable for almost any Eddy Current Application.



### 3 types of flaw detectors

#### Locator 3s

The Locator 3s offers full phase functionality in an ultra-compact package which can fit into a toolbox, briefcase, or even your pocket.

#### Phasec 2s

Phasec 2s adds dynamic rotating inspection capability.

#### Phasec 2d

The Phasec 2d additionally offers dual frequency inspection capability plus several features to facilitate eddy current inspections.

### Feature Summary

- Conductivity and coating thickness modes
- Finds flaws and corrosion in metal components and structures
- Output via RS232 to computer for easy reporting
- Trace record with parameter adjustment to optimise signal
- Independent X & Y gain adjustment
- Band pass and ultra filters
- Light & portable - weighs only 0.94 kg (33.15 oz)
- Lithium-ion batteries typically run for up to 8 hours from a full charge
- Compatible with most existing probes
- Simple set-up procedure
- Storage of 50 set-ups and up to 50 traces
- Phase plane/YT display modes
- Advanced LCD allows easy viewing in all light levels
- Trace enhance makes signal trace easier to see
- Spot info giving co-ordinates on screen

# Typical Industry Sectors and Applications

## Aerospace

- Fastener hole inspection
- Conductivity measurement
- Heat damage assessment
- Surface crack inspection
- Multi-layer inspection
- Corrosion detection
- Coating thickness measurement
- Wheel inspection

## Petrochemical & Power Generation

- Weld inspection
- Tube and pipe inspection
- Conductivity measurement
- Coating thickness measurement

## Manufacturing

- Conductivity measurement
- Metal sorting
- Tube and pipe inspection
- Surface breaking defects

## Automotive

- Wheel inspection
- Conductivity measurement
- Metal sorting

## Other

- Fire brigade ladders and cutting tools
- Rail tracks
- Prison bars



# Locator 3s Phasec 2s Phasec 2d

## Common Features

The Locator 3s is the base model in the eddy current flaw detection family. All the characteristics described on these pages apply equally to the Phasec 2s and Phasec 2d models. The specific extra options available on the Phasec 2s and Phasec 2d are fully described later in this brochure.

### General crack detection

All our eddy current flaw detectors can be used with a wide range of probes to detect surface-breaking and sub surface cracks. Adapters are available, allowing you to use other manufacturers' probes.

One of the main advantages of eddy currents over other NDT techniques is that this works through surface coatings such as paint and oil with no residual effects. Inspections can be carried out with minimal preparation, this saves large amounts of time and money.

### Sub-surface cracking and corrosion

Using a low frequency inspection, eddy currents can also detect cracking and corrosion that is not surface breaking. Examples of sub-surface crack detection include aircraft wing spars and for sub-surface corrosion detection, areas such as aircraft fuselage are common test areas. These tests are also applicable for materials such as stainless steel.

### Conductivity measurement

The Locator 3s, Phasec 2s and Phasec 2d can handle non-ferrous material sorting for a number of applications, including:

- Measuring conductivity to establish correct inspection frequency
- Verification of material hardness & state of heat treatment
- Assessment of heat damage in aluminium alloys
- Aids in material identification as part of a quality control system

These instruments measure the conductivity of non-magnetic metals and alloys in the range of 0.8 to 110.0 % IACS and use the eddy current technique for measuring the conductivity of materials in % IACS or MSiemens/metre (user selectable).

To make the conductivity measurement process as simple as possible, all our flaw detectors provide the operator with step-by-step instructions for the test. The results are clearly displayed on the screen as shown below.

### Coating thickness measurement

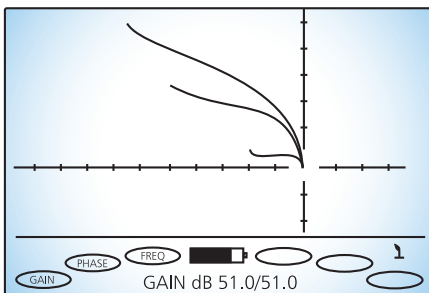
The Locator 3s, Phasec 2s and Phasec 2d have an inbuilt coating thickness meter which may be used for:

- Non-conductive coating measurement on non-ferromagnetic materials
- Paint coating measurement
- Quality control in the surface coating industry
- As part of a test procedure to improve the reliability of eddy current testing

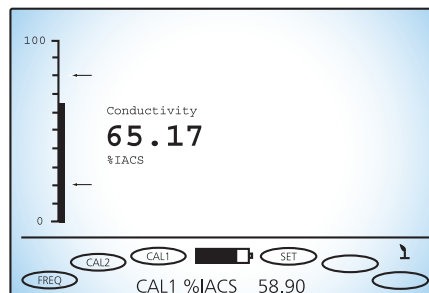
As with conductivity measurement, our instruments take the operator through a simple set of instructions and displays the results clearly on the screen.

### Instantaneous Balance

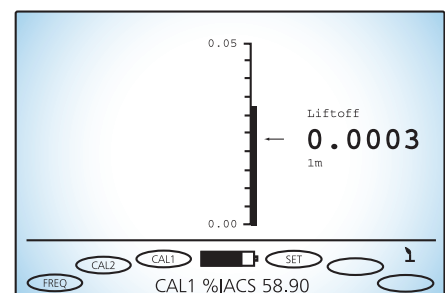
Locator 3s / Phasec 2s / Phasec 2d balances immediately on pressing the button so there is no waiting for the unit to ready itself.



3 different depths of surface-breaking cracking using a pencil probe



Conductivity reading from a non ferrous material



Coating thickness of paint on a non-ferromagnetic weld



Weld inspection with a specially designed WeldScan probe.

### Weldscan probes

In conjunction with the GE WeldScan range of probes, Locator 3s, Phasec 2s and Phasec 2d offer an advanced system for checking the integrity of welds on steel structures such as bridges, ships, oil rigs and steel framed buildings. Cracks can be detected through surface coating materials such as paint, so minimal time and money is needed for preparation.

The WeldScan range of probes can be used on ferrous, stainless steel (magnetic and non-magnetic) and aluminium materials and the technique is so successful it has been written into British and European Standard BS EN 1711:2000 "Eddy current examination of welds by complex plane analysis".

The following authorities have approved the technique:

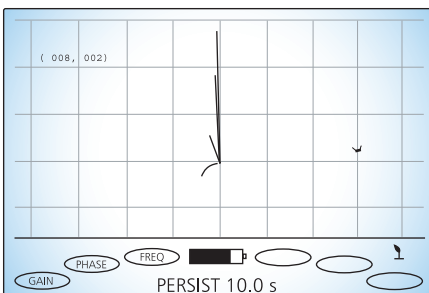
- Lloyds register
- DNV (Det Norske Veritas)
- Bureau Veritas
- PCN qualification system

### Fastener inspection

Metal around fasteners, such as those found on aircrafts, must be inspected regularly to ensure their material integrity. Locator 3s / Phasec 2s / Phasec 2d, coupled with the appropriate probe, can easily and quickly carry out such inspections.

### Thread inspection

Thread inspection is carried out in a range of industries, including aerospace, petrochemical, civil engineering and automotive. Locator 3s / Phasec 2s / Phasec 2d provides the ideal solution to ensure quality, safety and reliability.



Dual channel weld inspection (differential and absolute)

Locator 3s  
Phasec 2s  
Phasec 2d

## Single Frequency Eddy Current Instrument for Crack and Corrosion Detection, with Conductivity and Coating Measurement

### Small, Rugged and Light, but Tough

The small dimensions and light weight packaging make our flaw detectors ideal for the site engineer who needs to climb ladders, squeeze into tight access areas, or simply wishes to operate remotely from AC power supplies. The backlit LCD display is easy to read in all lighting conditions.

Locator 3s / Phasec 2s / Phasec 2d is designed for maximum operator convenience and is rugged enough for the rigours of continued site use. True portability is ensured by battery operation, offered by lithium-ion batteries which allow up to 8 hour battery life with none of the memory effects of more traditional batteries.

Furthermore the instruments have been specifically designed to allow the interchangeability of accessories such as probes, cables and test pieces, reducing the amount of kit the operator needs to purchase or carry around for inspections.

### The big-screen unit you can put in your pocket

Reliable inspections depend on the operator and the operator depends on the equipment. Locator 3s / Phasec 2s / Phasec 2d is designed with the operator in mind to maximise performance. Its lightness, unique keypad controls, ease of programming and particularly its big screen mean lots of inspections with little fatigue. No more staring at small, dim, blurred images or dragging large electronic gear.

Weighing less than 1 kg (35.2 oz) including batteries and the size of a hardback book Locator 3s / Phasec 2s / Phasec 2d is ideal for work in confined spaces. It will fit in your hand luggage, even your pocket.

But that doesn't mean it's flimsy! Rated to IP64, the tough case is resistant to day-to-day handling and the shocks that come with it. It resists most fluids and the internals have been designed to resist moist tropical or salt-laden atmospheres. Take it anywhere - harsh environments are no problem.





Surface inspection using an absolute pencil probe.

### **Versatile high performer**

Reduced size doesn't mean reduced performance. The Locator 3s / Phasec 2s / Phasec 2d wide frequency range covers all normal inspections in most materials.

All 3 instruments will be compatible with most of the probes you already own so you can make the best use of your inventory. It's powerful, but if you don't need all its power, you can select any controls to be accessible or inhibited.

### **Fast to learn, fast to use**

Locator 3s / Phasec 2s / Phasec 2d controls are highly intuitive so you can become a confident user after only a few hours. Operating parameters can be rapidly selected and adjusted using the unique keyboard arrangement. Setups can be stored and recalled at any time. Large tactile buttons in easy reach of either hand give good feedback even wearing gloves. The huge range of options means that you can tailor the operation to your inspection task. The fast response, high resolution display gives you the clearest possible picture of your inspection.

Every unit has a menu system that is so easy to read and navigate its operation is intuitive. Set ups are rapid, and softkeys can be assigned to assist parameter adjustment without referral to the menu.

Infinite parameter adjustment enables the instrument to be matched to the most exacting inspection requirements providing pre-eminent flexibility and performance.

Our flaw detectors have a unique Windows based reporting software package, Supervisor PC4. This easy to use package allows operators to download both data sets and screen images for reporting purposes.

### **Advanced Alarms Keep You Informed**

The Locator 3s, Phasec 2s and Phasec 2d are equipped with a vigilant alarm system to prevent flaws from being overlooked. Alarms cover the full screen and can be configured to meet your precise requirements. Choose audio and/or visual settings. The LED display also shows when the spot is in the active alarm area.

### **High powered**

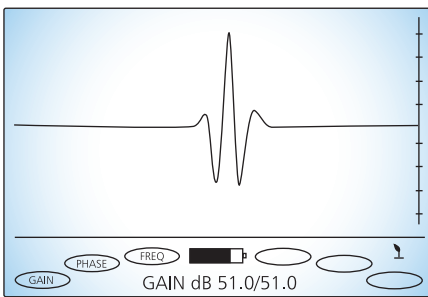
The Locator 3s / Phasec 2s / Phasec 2d all use lithium-ion batteries which do not suffer from 'memory effects' and can be charged from any state without any degradation in performance. They can operate for over 8 hours non-stop before recharging, even with the backlight on and it still weighs less than 1 kg (35.2 oz). Fewer charge cycles mean longer battery life, keeping costs down. Alternatively, use standard AA cells or AC power via the charger/battery eliminator.

### **Instant recall easy reporting**

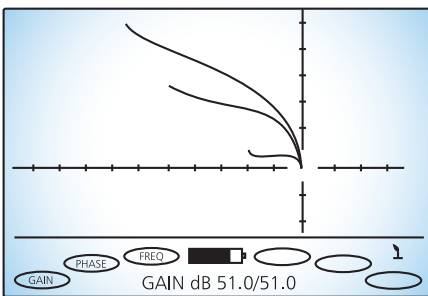
The on-screen menu allow all functions and parameters to be set, stored in the memory and recalled as needed. You can store 50 settings and up to 50 traces for recall later. The Locator 3s / Phasec 2s / Phasec 2d can be connected to an external PC for control of setting up, data transfer and printing.

# Phasec 2s Phasec 2d

## Single Frequency Eddy Current Instrument for Crack and Corrosion Detection, with Dynamic Rotating Capability



Results of a bolt hole inspection in timebase mode



3 different depths of surface-breaking cracking using a pencil probe

### Crack Detection

Stepping up to the Phasec 2s / Phasec 2d adds dynamic rotating inspection capability. The instruments Phasec 2s and Phasec 2d have an optional powerful dynamic rotating drive that facilitates easy inspections of ferrous and non-ferrous metals. These rotary inspections give the operator an increased Probability of Detection (POD) of flaws compared to a manual hole inspection.

Probe drives from GE and other manufacturers can be used with Phasec 2s / Phasec 2d. The AutoDetection facility automatically detects the use of the rotary probe and immediately switches to the correct mode. If a GE Inspection Technologies drive is being used, Phasec 2s / Phasec 2d will also automatically bring up the previously used rotary settings.





Different operators like to view inspections in different ways. This is catered for with Phasec 2s / Phasec 2d as it has both a timebase and spot mode display.

## More Applications Possible

Phasec 2s / Phasec 2d is a highly versatile eddy current instrument which can be used for a wide variety of inspection tasks. It is particularly suited to general surface application inspections and for work in confined spaces due to its small size and weight. Its rotary capability means that fastener inspections with a rotating probe are now possible, increasing the range of applications from Locator 3s.

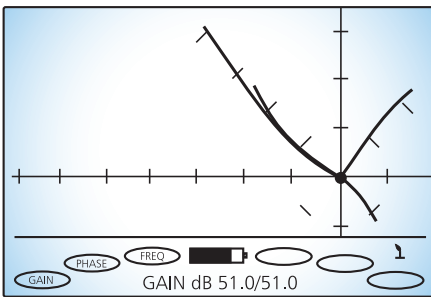
## Feature Summary

- Conductivity measurement
- Coating thickness measurement
- Step-by-step instructions for simple inspections
- Dynamic hole inspection
- Fast and accurate results
- Compatible with other commonly used rotating drives
- Timebase or Spot Mode (shown)
- Split screen view

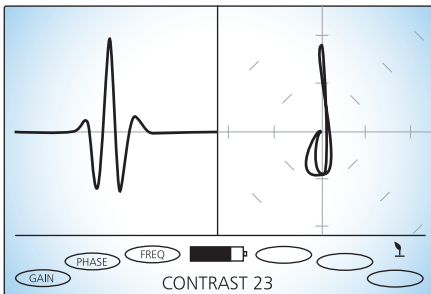
# Phasec 2d

## Dual Frequency Eddy Current Instrument for Crack and Corrosion Detection in Metal Components, Tubes, Structures and Welds

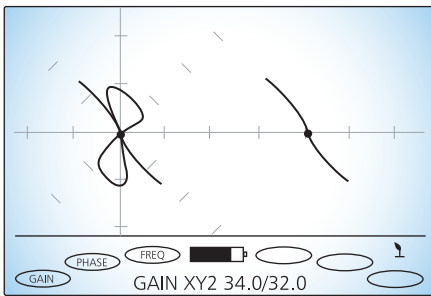
Stepping up to the Phasec 2d adds dual frequency inspection capability plus several features designed to facilitate Eddy Current inspections.



Dual frequency FastScan probe showing depth discrimination as phase rotation



Timebase and spot split screen for rotary set-up



Dual frequency tube inspection with baffle plate mixed out

### Fastener Inspection

The specially designed FastScan probe and guide work with Phasec 2d's dual frequency capabilities to quickly and accurately inspect fasteners both on and below the surface. This technique is more effective than hand scanning or using sliding probes as it can find smaller defects due to its increased sensitivity and the fact that it's not dependent on the fastener type or defect orientation.

### Rotary Inspections

Phasec 2d is ideally suited to rotary inspections such as the inspection of fastener holes. Its superb performance with the GE MiniDrive along with a range of competitor drives means that fast, accurate results are obtained every time. Phasec 2d also has a split screen (XY/YT) display in Rotary Mode.

This is ideal for setting up rotary inspections on the timebase display whilst being able to easily see where the flaw phase component is on the XY display eliminating the need to click between displays as a check.

### Cracking & Corrosion

Phasec 2d, with the appropriate probe, can be used to detect:

- Surface breaking cracks - ferrous and non-ferrous metals
- Sub surface cracks and corrosion - non-ferrous metals only

### Tube and Pipe Inspection

Because Phasec 2d is dual frequency, it can be used to mix out the unwanted signals from baffle plates in tubes which enables significantly improved defect detectability. This enables the operator to find cracks and corrosion at their most common site.



## Feature Summary

- Trace enhance makes signal trace easier to see
- Split screen display into timebase and spot display
- Two frequency operation running two channels simultaneously
- Spot info giving co-ordinates on screen

## Technical Specifications

Locator 3s - Phasec 2s - Phasec 2d			
	Locator 3s	Phasec 2s	Phasec 2d
<b>Frequency</b>			
Frequency Range	10 Hz to 10 MHz	10 Hz to 10 MHz	10 Hz to 10 MHz
<b>Gain</b>			
Gain	- 8 dB to 96 dB	- 8 dB to 96 dB	- 8 dB to 96 dB
Independent X-Y Gain	•	•	•
Input Gain	Selectable 0 dB and 14 dB	Selectable 0 dB and 14 dB	Selectable 0 dB and 14 dB
Probe Drive	0 / -8 dB / +8 dB	0 / -8 dB / +8dB	0 / -8 dB / +8 dB
<b>Phase</b>			
Phase	0 to 359 degrees in 0.1 degree steps	0 to 359 degrees in 0.1 degree steps	0 to 359 degrees in 0.1 degree steps
<b>Filters</b>			
Low Pass	3 Hz to 2.0 kHz	3 Hz to 2.0 kHz	3 Hz to 2.0 kHz
High Pass	DC to 1.99 kHz	DC to 1.99 kHz	DC to 1.99 kHz
<b>Balance Load</b>			
Automatic or Manual	•	•	•
<b>Alarms</b>			
Box	•	•	•
Sector	•	•	•
"+/-" Level	•	•	•
Flashing LED, Tone or Freeze options	•	•	•
<b>Operating Modes</b>			
Single Frequency	•	•	•
Dual Frequency Capability			•
Rotary Capability		•	•
Split Screen - Timebase/Spot	N/A	•	•
Competitive Scanners Capability	N/A	•	•
Conductivity	•	•	•
Coating Thickness	•	•	•
<b>Display</b>			
Display Type	Backlit LCD	Backlit LCD	Backlit LCD
Display Size (Viewable Area)	115 mm x 78 mm	115 mm x 78 mm	115 mm x 78 mm
Trace Enhance	•	•	•
Spot Position Readout	•	•	•
Graticules - 4 options Grid 1, Grid 2, Polar & None	•	•	•
<b>Internal Data Storage</b>			
Stored Set-ups	Up to 50	Up to 50	Up to 50
Stored Traces	Up to 50	Up to 50	Up to 50
Record/Replay	•	•	•
<b>Probe Connection</b>			
12 Way Lemo	•	•	•
<b>Outputs</b>			
PC Connectivity	Standard RS 232 via 7 Way Lemo	Standard RS 232 via 7 Way Lemo	Standard RS 232 via 7 Way Lemo
X/Y Analog	•	•	•
VGA	•	•	•
<b>Languages</b>			
English, French, German, Spanish, Portuguese, Chinese & Japanese	•	•	•
<b>Physical Characteristics</b>			
Weight including Battery	0.94 kg	0.94 kg	0.94 kg
Size	192 mm x 140 mm x 55 mm	192 mm x 140 mm x 55 mm	192 mm x 140 mm x 55 mm

## Accessories



40A038D  
Supervisor PC4



29A028 & 29A029  
Test blocks



33A100  
Rotating miniDrive



39A035 & 39A030  
Battery charger and battery



40A041  
Splash-proof carrying case



851P101 & 851A007  
FastScan probe & guide



40A142  
Soft carrying case



39A043 & 40A043  
Transit case with foam inserts  
(contents not included)



### GE Inspection Technologies: productivity through inspection solutions

GE Inspection Technologies provides technology-driven inspection solutions that deliver productivity, quality and safety. We design, manufacture and service Ultrasonic, Remote Visual, Radiographic, X-ray and Eddy Current equipment and systems. Offering specialized solutions that will help you improve productivity in your applications in the Aerospace, Power Generation, Oil & Gas, Automotive or Metals Industries.

Visit [www.ge.com/inspectiontechnologies](http://www.ge.com/inspectiontechnologies) for more information.