

# Varimac<sup>®</sup>

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Eddy Current Comparator to Test for Hardness, Alloy, Dimensions, & Physical Characteristics in Metal



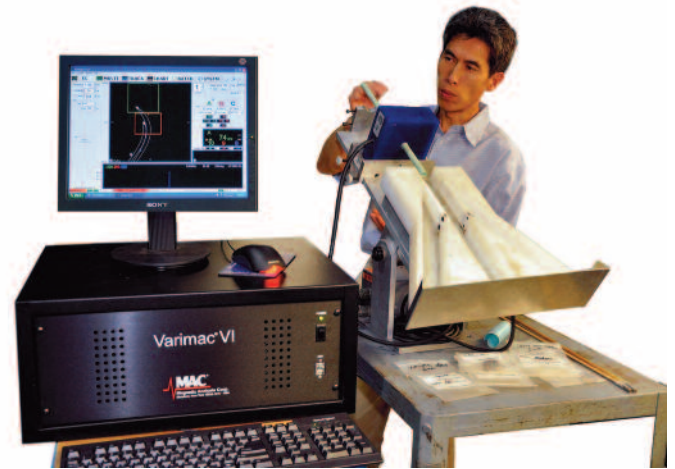
# Comparator Test Technology

## Eddy Current Comparators

Eddy current comparators operate on the principle that when a metal part is placed inside or near a test coil which is excited by an alternating current, the voltage output from the coil will be affected. This effect is directly related to the permeability, conductivity, and physical dimensions of the part. Essentially, the instrument “compares” these variations in the test part to conditions in a known sample.

Variations in hardness or heat treatment, for example, create a change in permeability; changes in alloy affect conductivity; and significant dimensional changes affect both conductivity and permeability.

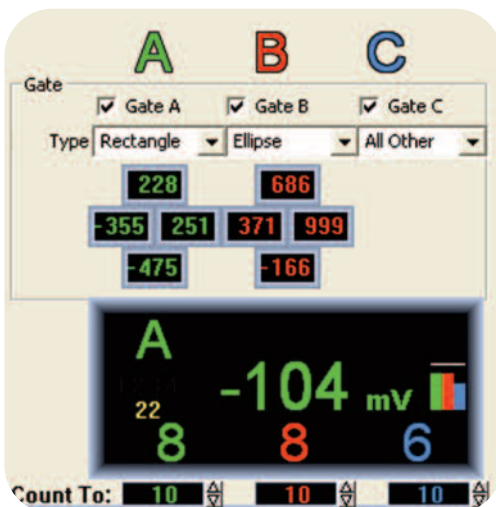
These changes in the coil result in displayed signals which can be selected based on differences in amplitudes, phase angles, or harmonic distortion, using the Varimac Vi’s thresholds and target regions.



Varimac Comparator with Test Coil and 570 Parts Gate

## Simple Operation

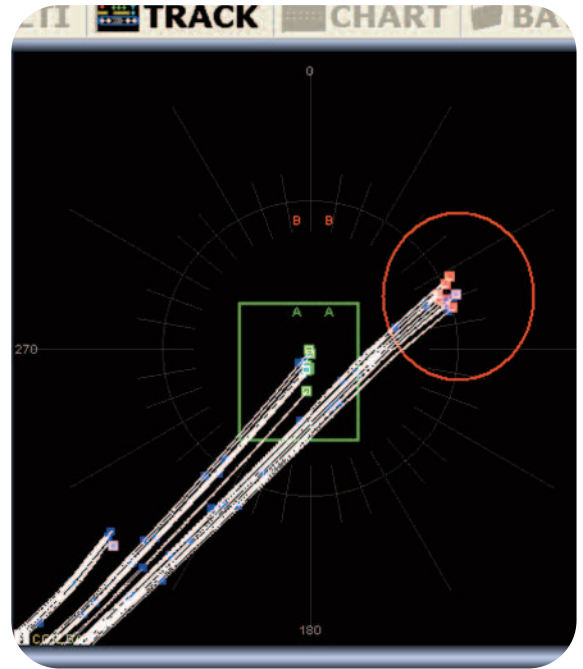
- A test coil, a balance coil, known samples of your part, a monitor and the Varimac VI instrument is all you need to set up your test.
- Vector presentation of the test signals lets you easily set up the target regions and thresholds to identify conditions and separate your parts
- After your initial setup, Varimac runs automatically.
- Convenient counter display on screen shows the number of parts in each region.
- Includes lockout to prevent unauthorized changes to settings.
- Check operation from a remote monitor.



The screen shows the number of pieces in each of the target areas – 8 in green target A, 8 in red target B, and 6 in outside area.

# Varimac<sup>®</sup> VI Features

- Fast 100% Sorting of Metal Parts
- High sensitivity with high resolution and selective circuits optimize the ability to separate wanted signals from those for unwanted conditions.
- Broad frequency range 100 Hz - 2 MHz enhances selectivity
- View peak signals for a cluster of parts on screen, and select and position target regions to capture & categorize.
- Select and adjust threshold levels within target regions
- Thresholds can be set to select signals based on amplitude, phase, or a combination of both.
- Includes a “piece count” output to activate an alarm or other device when a specified number has been reached
- 250 GB hard drive gives you all the data storage for setups and reporting you might need.



*Rectangular and Elliptical Target Regions.  
Test signal traces that peak in the green region are from acceptable parts. Those within the red region are above specification and those falling outside the target regions are below specification.*

## Varimac VI Applications

- Test fasteners, bearings, and other cold formed parts.
- Inspect for hardness, alloy, or major dimensional variations.
- Inspect ferrous (magnetic) or nonferrous (non-magnetic) parts.
- Use with MAC's 3-way Parts Gate and control system.
- Sort at speeds up to 6 parts per second into acceptable, below specification, and above specification.



*A typical eddy current test coil and .75", 1.00", and 1.25" long steel pins used to produce the test signals in the screen shown at upper right.*



## Convenient 3-Way Sorting Gate

- ❑ Parts pass through the test coil and into the correct chute, based on outputs from the Varimac VI instrumentation.
- ❑ Sort into 3 groups - accept, below specification & above specification
- ❑ Sort at speeds up to 6 parts per second
- ❑ Includes mounting for test coil and feed tube.
- ❑ Control box included for use with existing and new Parts Gates.
- ❑ Use with vibratory bowl or other mechanics.



### SPECIFICATIONS

<b>PLATFORM</b>	Intel® Core 2 Duo low power processor, single board computer with 64 GB hard drive or better & Windows OS.	<b>COUNTERS</b>	Count for the number of signals which peak in each of the 3 different threshold regions is displayed on the screen.
<b>CHANNELS</b>	Single channel comparator operation	<b>OUTPUTS</b>	3 outputs: correspond to a region assigned through the menu. Each region can be reassigned to a different output  1 output: for the up to "Piece Count" which can activate an alarm or other device.  All outputs can be delayed and their duration can be varied independently. Each output is equipped with 24 V DC relay and an opto-isolated output to go with the new MAC Parts Gate sorter.
<b>TEST FREQUENCY</b>	100 Hz - 2000 kHz	<b>REPORT</b>	Simple report shows number of pieces in each region. Detailed report includes X and Y position for each piece. Report saved on hard drive, in Excel® format.
<b>FLAW BANDWIDTH</b>	1 KHz	<b>STORE &amp; RECALL SETUPS</b>	An unlimited number of setups can be stored and recalled
<b>FILTER</b>	Low Pass positions will be chosen from discrete steps that correspond to Hertz (flaw Freq.). The filter can be turned OUT	<b>MODE</b>	A Lockout Mode prevents unauthorized changes in equipment settings. Must be unlocked to change setup.
<b>PHASE</b>	0 - 359° calibrated in 1° steps	<b>COILS &amp; COIL DRIVE</b>	All current and past Varimac coils are compatible. Primary or bridge drive and Level adjustment are all software controlled.
<b>SENSITIVITY</b>	0 - 99 dB, calibrated in 1-dB steps	<b>CABINET DIMENSIONS</b>	21.2" W x 9.2" H x 15.5" D ( 53.9 cm x 23.4 cm x 39.4 cm)
<b>THRESHOLD REGIONS</b>	Elliptical or rectangular. Each can be independently adjusted.	<b>WEIGHT</b>	34 lbs. (15.5 kg)
<b>CALIBRATION</b>	Internally generated signal provides a system check for repeatability of all parameters.	<b>POWER REQUIREMENT</b>	120/240 VAC, 50/60 Hz, single phase, 2 amp
<b>BALANCE</b>	Auto balance for entire frequency range by pressing "BAL" key		
<b>EXTERNAL DISPLAY</b>	A back panel output connector is provided for an optional external monitor. A full trace for each piece is displayed until the next piece comes on screen. Peak signals remain on screen up to the selected number of pieces.		
<b>SETUP</b>	Software controls for all functions, set through the standard keyboard or optional remote keypad		
<b>SYSTEM STATUS INDICATOR</b>	Balance indicator, coil system (open or short coil) indicator, and system ready indicator, are all displayed on monitor. Any failure causes an alarm, and system ready indicator changes to red.		