Low Frequency RotoArray™

for wind turbine blade inspection

GE
Measurement & Control

Wind blades are the crucial part of wind turbines converting wind energy to a rotational motion from which power is generated. Prior to installation on the wind turbine, the blades have to be inspected for any defects like undulations, delamination or shear-web disbonding.

It is important to check their condition on a regular basis also in-service to prevent unplanned shut-downs. During planned downtime the blades can be inspected in order to decide if a blade is still in good condition or has to be repaired or replaced.

Low Frequency RotoArray

Due to the high attenuation of ultrasound in the materials from which the wind blades are manufactured, an operation frequency of 500 kHz is prefered to obtain a good depth penetration while still having a reasonable spatial resolution. The RotoArray from GE is designed to cover large inspection areas and is now available in a 500 kHz version. Its ease of use allows a comprehensive inspection of large areas with a reliable interpretation and documentation of the inspection results. Thanks to its low weight it is also suited for in–service inspection tasks.

Features

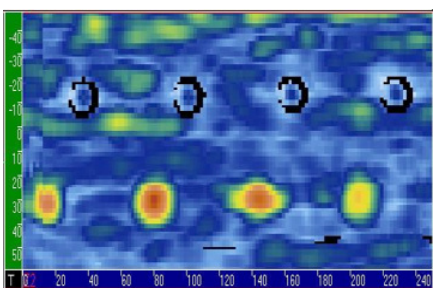
Portable RotoArray design puts the power of a C-scan immersion system in the palm of your hand

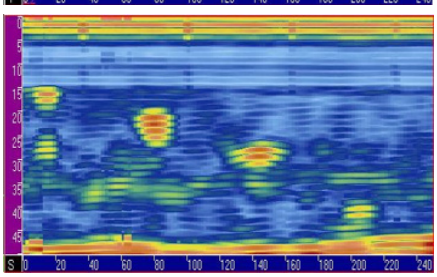
- Increased fluid path
  -> Enables inspection of GFK materials up to 100 mm (4") thick
- Flexible transparent tire
  -> Conforms to test piece
  -> Enables air-free coupling
- Efficient rolling scanning action
  -> Minimal couplant needed
- Ergonomic design
- Reliable 1 axis encoder
- Tool-free probe normalization
- Remote switches to control scan start/ stop/index/clear switches (not all instruments support this function)
- Optional line-laser guides
- User serviceable with optional service station

UT Scanning Results

C-scan of a test-piece made of GFRP in which four ø 13 mm FBH in different depths have been machined. The position of the FBHs (as seen from the top of the test piece) can directly be identified in the areas with a high reflection amplitude (yellow to red color).

B-scan of the same test-piece displaying the different depths of the FBHs. The machined depths of the FBH are respectively 15 mm, 21 mm, 25 mm and 41 mm. The back-wall at 50 mm can also be seen. Detection of ø 12 mm FBH down to a depth of 65 mm have been verified .





Phased Array Probes

- Penetrating low frequency array
- Wide 120 mm coverage for productivity
- Two standard connector options
  - » Tyco e.g. for Phasor and Krautkramer USM Vision+
  - » Ipex e.g. for Omniscan*

Part Number	Connector	Frequency (MHz)	Pitch (mm)	Elements	Elevation (mm)	Probe Dimensions (mm/in)	Weight (kg)
115-910-525	Tyco for Phasor and Krautkramer USM Vision+	0.5	2	60	19	155 (6.1) W x 150 (5.9) L x 140 (5.5) H	3.3 (without filling)
115-930-525	Ipex for Omniscan*	0.5	2	60	19	155 (6.1) W x 150 (5.9) L x 140 (5.5) H	3.3 (without filling)

* Omniscan is a trademark of Olympus

Optional Accessories

Product Offering		
RotoArray Service Station	Used for RotoArray filling and service. Follow the instructions on the digital guide for the procedure you wish to perform	389-079-390
Ergonomic Couplant Sprayer	Optional battery operated ergonomic sprayer. Use water in this bottle to mist the test piece	021-265-020
RotoArray Digital Guide	Comprehensive video based instruction and service manual on CD with links to web-based updates and information	021-002-589
Detachable Side Handles	Can be installed on either or both sides of the RotoArray as desired for stabilizing during use	388-000-519
Service Tools	Tools needed to perform service tasks on the RotoArray	388-000-502
Parts and Tools Kit	Kit including metric hex keys for RotoArray service, detachable side handles, and spare parts	388-000-850
Pressurized Fill Bottle	Used to fill the tire. Follow the instructions in the quick start tab of the RotoArray digital guide for instructions on filling and purging air from the tire	389-079-240
Miniature Fill Bottle	Miniature version of the pressurized fill bottle. Used to fill RotoArray tires	389-085-230
Manual Couplant Spray Bottle	Use water in this bottle to mist the test piece. For use in the large shipping / storage case	021-265-015
Miniature Couplant Spray Bottle	Use water in this bottle to mist the test piece. For use in the small shipping / storage case	021-265-023
Spare Tire #3	Customer changeable spare tire for minimal downtime if one is damaged during use. **Fits models with 120 mm active widths**	100M5430
Laser Line Guide	Improve scan path alignment with a line laser attachment that can be added to any RotoArray	389-086-610
Spare Parts Kit	Spare hardware including replacement rear wheels	388-000-503
Metric Allen Wrench Set	Compact Allen wrench set use for RotoArray maintenance tasks. For use in the small shipping / storage case	100N3743

For more detailed information please visit utprobes.com

Solution Packages

0.5 MHz RotoArray Package for Krautkramer USM Vision+ or Phasor	389-088-510
0.5 MHz RotoArray	115-910-525
Phasor to USM Vision+ Encoder adaptor	0037241
Small transportation case	021-026-377
Digital guide	021-002-589
Side handles	388-000-519
Propylene glycol-1 pint	111-200-568
Miniature fill bottle	389-085-230
Small couplant spray bottle	021-265-023
Tool kit	388-000-850
Spare parts kit	388-000-503
SD card with setup files	100N3630

0.5 MHz RotoArray Package for Omniscan*	389-088-520
0.5 MHz RotoArray	115-930-525
Encoder adaptor for Omniscan MX1	380-000-501
Encoder adaptor for Omniscan MX2	388-000-564
Small transportation case	021-026-377
Digital guide	021-002-589
Side handles	388-000-519
Propylene glycol-1 pint	111-200-568
Miniature fill bottle	389-085-230
Small couplant spray bottle	021-265-023
Tool kit	388-000-850
Spare parts kit	388-000-503

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Imagination at work

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