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PHAsis Phased Array Ultrasonic Inspection Devices

for the fast and precise inspection of welded joints - manually or with robots in production, especially spot welds and short weld seams (e.g. Arplas®)

Imaging inspection

Phased array technology for simple and reliable inspection and evaluation

Precise inspection

729 virtual probes and a physical resolution more accurate than 0.35 mm

Over 25 years of experience

in spot weld inspection combined in our innovative **PHAsis** inspection systems

PHAsis systemhighlights

Based on more than 30 years of experience in spot weld inspection we have developed PHAsis inspection systems for manual and robot supported inspection of spot welds and short weld seams of steel and aluminum. **PHAsis** inspection devices use imaging phased array ultrasonic technology, achieving a high resolution of lens diameter more accurate than 0.35 mm with 121 elements in an 11x 11 matrix.

PHAsisNEO Manual inspection device for intuitive inspection without in-depth ultrasonic knowledge

- Inspection of 2- and 3-sheet joints with a single sheet thickness of 0.6 mm to 5 mm from just one side
- Extremely high image sequence and inspection speed due to 20,000 ultrasonic measurements per second for high-resolution spot weld inspection
- More than 700 measuring points (A-scans) recorded in the inspection area per spot weld
- Storage of all A-scans for possible re-evaluation and correlation to destructive testing
- Imaging display of the spot weld as live scan (C-scan) and as result (D-scan, depth accurate)

- Minimum coupling agent requirement when using water. Surface dries by itself within a few minutes
- A universal standard probe; special solutions available (e.g. for coarse grain structure, aluminum, hard-to-reach areas)
- All in one device: management of inspection plans, monitoring of inspection equipment, secured inspection according to inspection plan or flexible with one-klick presets or individual parameters in „free inspection“ mode
- Support of high probe frequencies up to 25 MHz for reliable spot weld inspection
- Minimal training time of approx. 4 hrs.

PHAsisBLU for automated testing with cobots and robots

Innovative **PHAsis** probe technology:
Innovative Fixed rexolite delay or flexible water delay paths with membrane for best results – even on rough or uneven surfaces.

Two devices. Two ways. One software. One database. Everything in view.

The **PHAsisNEO** handheld inspection device and **PHAsisBLU** for robot-controlled inspection use the same inspection and evaluation software as well as database, so that the results of manual ultrasonic inspections can be combined with those of robots and combined in the **PHAsisMANAGER** management software.

When using multiple inspection devices, the administration software can be installed on an independent PC as to organize and synchronize all information with the ultrasonic inspection devices:

- Single user or central management of test equipment, plans and results
- Management of access rights
- Monitoring of inspection equipment incl. scheduling for calibrations
- Data import of test plans (CSV files)
- Data export of test results (modern REST interface)
- Secured test sequence up to 100% fulfillment through preset test plans
- Wireless test plan and data synchronization via WLAN between device and server
- If required, **PHAsis** can communicate with the customer's existing database system via standardized interface.

PHAsisNEO single and multi-user solution for manual testing

Single user:

PHAsisNEO
(all in one)

- **PHAsisMANAGER** administration software
- **PHAsisDEVICE** inspection and evaluation software
- MS SQL Express database

Multi-user solution for central management:

PHAsisNEO
(one or more)

Server with MS SQL database

Workplace

PHAsisDEVICE
inspection and evaluation software

PHAsisMANAGER
administration software: Central organization of test plans, equipment and results, imports, exports etc.

PHAsisBLU Single user and robotic solution

Single user:

Stationary workplace or optionally with test trolley

- **PHAsisBLU** ultrasonic inspection device
- PC or notebook with **PHAsisMANAGER** administration software, **PHAsisDEVICE** inspection and evaluation software and MS SQL Express data base
- Optional mobile test trolley with battery operation

Automated inspection with robot:

Workplace

PHAsisMANAGER administration software: Central organization of test plans, equipment and results, imports, exports etc.

19“ PC Racks or Mini PC

PHAsisDEVICE inspection and evaluation software

Industrial tablet

for initial setup and maintenance

Test station / Test stations

Variant 1:
Robot manipulates the probe; **PHAsisBLU** is mounted on the robot

Variant 2:
Robot manipulates the component in front of the fixed probe

PHAsisBLU with robot technology

Advantages of the PHAsisBLU Technology

- Fast processing and evaluation of test data by use of multicore technology
- Fast test cycles through a fast LAN or WLAN connection and high pulse rate frequency of 20 KHz
- Ultrasonic inspection time less than 1 second
- Rugged, milled, solid housing
- Simple mounting of the inspection device
- Service-friendly component exchange
- Fast and economical repairs due to good accessibility of the components
- Windows operating system 64 bit
- Customer's own computer systems can be used, resulting in high serviceability
- Remote access via WLAN for setting and service actions

Tools

- Communication interface: Automation interface, PHReAP (REST-interface), interface licence / interface licence for remote control for each **PHAsis** ultrasonic inspection device, incl. detailed description
- Probe holder incl. water coupling nozzle for **PHAsis** probe diameter 24 mm for mounting on a robot
- 4 pieces of distance information for vertical alignment on the spot weld surface via automation interface
- Reference plate with reflectors for system monitoring and calibration
- Export interface for test results, import interface for test plans

Fig. Example of an integration: ABB robot with **PHAsisBLU** ultrasonic device and probe, incl. coupling agent spray unit and surface milling cutter

Option: Cobot

On request, we can provide you with a cobot, which can be used with the **PHAsisBLU** ultrasonic inspection device and an industrial tablet or laptop as a single unit for testing joint connections.

The robot can be easily teached by an experienced inspector or an inspection supervisor and be used as a mobile unit.

Such robots can make spot weld inspection and longitudinal weld seam inspection less expensive. Instead of manually testing with one device, the testing technican can test several components simultaneously with 2-3 cobots.

www.vogt-ultrasonics.de/en/phasisblu

Inspection software

In just a few seconds per weld spot, the testing and evaluation software provides data on the diameter of the welded spot, the remaining wall thickness of the welded area as well as the sound attenuation caused by structural transformation as possible evaluation criteria for zinc adhesion bonding.

Mode „Inspection according to test plan“

In this mode, the inspection plans are created by an experienced ultrasonic inspector and made available to the users by means of synchronization with the individual inspection devices.

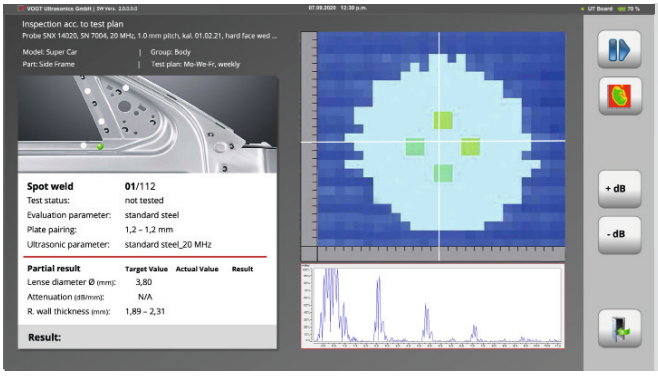
As a result, the users no longer have to make any test settings. They only inspect the spot welds using the visually displayed test plan and the automated proposed evaluation. This means even test personnel without in-depth knowledge of ultrasonics is easily able to perform reliable testing.

Mode „Free testing“

The mode „Free testing“ enables a fast inspection of various spot welds, without the use of test plans.

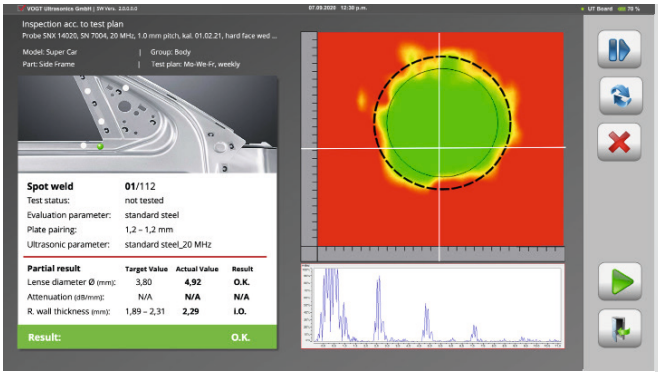
Access to the full functionality of inspection and evaluation as known from the mode „Inspection according to test plan“ is still possible. After the inspection, the results of the free testing can be transferred into an inspection plan as well as into a standard inspection.

The **PHAsis** inspection and evaluation software communicates the inspection plan with the robot controller via a standardized REST interface. Spot welds defined in the inspection plan are individually approached and inspected with the parameter sets defined for the spot.



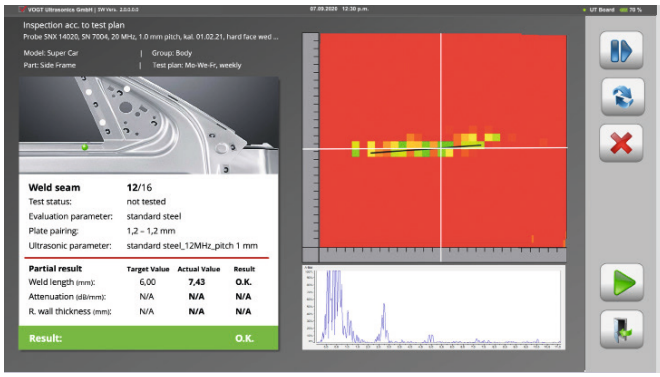
Live C-Scan for positioning

- Runtime-based orientation points for vertical positioning of the probe to the surface of the spot weld
- Automatic adjustment of the display depending on the probe position (right- and left-handed)



D-Scan as an evaluation proposal

- Status information of the automated process
- Live imaging display of results during operation
- Online A-scan of a selected grid point



Option: Weld seam testing module

- Testing of short seams, e.g. Arplas®, with a length of approx. 3 - 12 mm without changing the probe
- Intelligent evaluation, even of interrupted weld seams

Technical data

Here you will find an overview of the most important technical data.
Further questions? Send us an e-mail to info@vogt-ultrasonics.de

Administration and Communication

- Access rights and user management
- Test equipment monitoring and management of inspection devices
- Management of plate pairing and materials
- Various interfaces such as test plan import, result export or communication interface for automated testing

Data management

- Creation and administration of test plans and free testing
- Transfer of the results of the free testing into new test plans
- Management of plate pairings, evaluation and ultrasonic parameters
- Inspection plans available on all devices by means of synchronization
- Individual color display of spot welds (D-Scan)
- Test reports can be exported as Word, Excel or PDF documents. Two different types of reports available – detailed or compressed
- Predefined, universal ready to go setups as well as the possibility for creation of individually advanced setups

Inspection

- “Inspection according to test plan” mode: secures testing with 100% fulfillment and enables safe testing with minimal training
- Improved setup of inspection plans and inspection according to proven standards of conventional ultrasonic inspection
- “Free testing” mode: fast testing without a test plan with instantly selectable standard or individual parameter sets
- Inspection mode for highly sound-attenuating materials or very rough surfaces
- Multiple modes for detection of cladding
- Access to all setting parameters at any time for the implementation of individual evaluations

Standard Probe

Type	Phased Array 2D Matrix
Number of elements	11 x 11 arranged in square
Cable	Long-Life 2.5 m; 5 m for robot applications
Nominal frequency	12 MHz or 20 MHz
Inspection area	9 x 9 mm^2 or 11.7 x 11.7 mm^2
Physical resolution more precise than	0.35 mm or 0.45 mm

PHAsisNEO

Dimensions	350 x 280 x 90 mm
Weight	4,95 kg incl. batteries
Display	13.3" TFT, Multi-Touch 1920 x 1080 Pixel, 16:9, hardened, replaceable
PC Board	Intel Pentium QuadCore @ 2.5 GHz, 8 GB RAM, 512 GB SSD
Protection class	IP 64, restricted
Battery	2x Lithium-Ion, min. runtime 7 hours, hot swap capable
Phased Array test channels	128, 16 thereof parallel
Digitization rate	100 MHz
Communication	2 x USB 2.0, 1 x USB 3.0 1 x LAN 1GBit/s, WLAN, HDMI, Bluetooth 4.2
Max. IFF	20 KHz
Max. pulse amplitude	+/- 100 V (neg. square pulse)
Band width (-3dB)	0.5 - 25 MHz
Pulse width	≥ 5 ns
Focal Laws	> 700 (virtual probes)
Power supply	100 - 240 VAC 50 Hz - 60 Hz
Operation temperature	0°C - 40°C
Relative Humidity	80%, non-condensing
Cooling	passive (no fan)

PHAsisBLU

Dimensions	200 x 200 x 82 mm
Weight	2.5 kg
Housing	CNC made aluminum housing
Mounting	Threaded mounting holes on the back side for easy mounting
Protection class	IP 64
Phased array inspection channels	128, 16 thereof parallel
Digitization rate	100 MHz
Communication	1 x LAN 1GBit/s
Max. IFF	20 KHz
Max. pulse amplitude	+/- 100 V (neg. square pulse)
Band width (-3dB)	0.5 - 25 MHz
Pulse width	≥ 5 ns
Focal Laws	> 700 (virtual probes)
Power supply	12 V DC, external power supply 100-240 VAC, 50-60 Hz
Operation temperature	0°C - 40°C
On board sensors	4 x temperature
Cooling	Passive (no fan)

UT data management PC min. requirements

PC Board	Intel Pentium QuadCore @ 2.0 GHz, 8 GB RAM, 512 GB SSD
Communication	1 x HMDI, 2 x LAN 1GBit/s

Arrange an appointment now for a live/online presentation with us!

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Proven quality
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