



ISONIC PA AUT

Automatic Ultrasonic Inspection of Girth Welds Combining
Phased Array, TOFD, and Conventional Pulse Echo Techniques



Sonotron NDT

4, Pekeris str., Rabin Science Park, Rehovot, 76702, Israel
Phone: ++972-(0)8-9311000 Fax: ++972-(0)8-9477712
www.sonotronndt.com

Typical Scope of Supply

#	Item	Q-ty
1	<p>ISONIC PA AUT 2X64 / 16 - Portable Platform for Automatic Combined Phased Array, Conventional Pulse Echo and TOFD Inspection / 128 Phased Array (PA) Channels and 16 Conventional Pulsing Receiving Channels</p> <ul style="list-style-type: none"> ☐ <u>ISONIC PA AUT 2X64 / 16 Electronic unit</u> <ul style="list-style-type: none"> > IP 67 waterproof housing > Internal PC (AMD LX 800 500 MHz, RAM-512M, Quazi-HDD Flash Memory Card 4G, Windows XP Embedded, Ethernet Interface > SW 80500201 ISONIC PA AUT Services SW Pack for on-board hardware control and communicating with remote control computer > Spare Flash Memory Card 4G - plug and play (Operating System and SW 80500201 ISONIC PA AUT Services Package installed) > 100 ... 250 VAC AC/DC converter > Incremental Encoder Terminal - 1 socket > Scanner Motor Control and Powering Terminal - 1 socket > "Emergency Stop Scanner" Button > 64 Elements Phased Array Probe Terminals - 2 sockets > Conventional / TOFD probes connection terminals - 32 sockets LEMO 00 > SE 254064 PA - 64-Channel Phased Array Pulsing Receiving and Processing Card - 2 pieces > SE 254016 - 16-Channel UDS 3-6 Pulsar Receiver Card - 1 piece > Bipolar Square Wave – Tunable Width / Tunable Firing Level Pulsar; Single / Dual Modes of Operation; Special Probe Protection Circuit to Prevent Probe Damage for Not Properly Adjusted Pulse Width > Gain: 0...100 dB controllable in 0.5 dB resolution; Advanced Low Noise Design: 81mV peak to peak input referred to 80 dB gain / 25 MHz bandwidth; Frequency Band: 0.2 ... 25 MHz Wide Band / 32-Taps FIR bandpass digital filter with controllable lower and upper frequency limits ☐ Toshiba Satellite Laptop Control Computer ☐ 100 ... 250 VAC AC/DC converter (SK 80500201) - 2 pieces (1 for operation + 1 spare) ☐ 25 meter length armored power / data umbilical (SK 80500207) - 2 pieces (1 for operation + 1 spare, other length umbilical on request) ☐ 24 months warranty period for the electronics / Lifetime free software update 	1
2	<p>ISONIC PA AUT Weld Inspection Software Package</p> <ul style="list-style-type: none"> > API for communicating with ISONIC PA AUT 2 X 64 / 16 platform > Theoretical Setup Pack: <ul style="list-style-type: none"> ⇒ Selection and complete dimensioning of Weld Bevel for seam under test ⇒ Keying in dimensions and ultrasound velocity for phased array probe wedge or selection of phased array probe wedge from database ⇒ Division of weld root, cap, and volume into narrow zones for narrow gate / wide gate insonification ⇒ PA Probe positioning and beam tracing for Phased Array probes from both sides of the weld (Down Stream and Upstream) and defining of complete sequence of inspection shots ⇒ Creating of theoretical setup file > ISONIC PA AUT 2 X 64 / 16 Instrument and Scanner control pack: <ul style="list-style-type: none"> ↳ Independent hardware control module <ul style="list-style-type: none"> ▼ Phased Array pulser receiver for downstream 64 elements PA probe ▼ Phased Array pulser receiver for upstream 64 elements PA probe ▼ 16-channel pulser receiver for conventional and TOFD probes ▼ Scanner motor control and setup and encoder calibration ⇒ Virtual joystick for scanner control at setup time - start / stop / direction / speed ⇒ Pre-scanning routine: <ul style="list-style-type: none"> ▼ Upload theoretical setup file ▼ Pulsing/Receiving calibration of downstream PA Probe inspection shots ▼ Pulsing/Receiving calibration of upstream PA Probe inspection shots ▼ Pulsing/Receiving calibration of downstream and upstream coupling monitor shots (longitudinal wave back echo and / or throuiygh transmission) ▼ Pulsing/Receiving calibration of conventional channels inspection shots (pulse echo and TOFD) ▼ Pulsing/Receiving calibration of coupling monitor for conventional probes ▼ Forming strip chart and test scanning ▼ Automatic wedge temperature monitoring and compensation ▼ Storing complete pre-scanning calibration file ↳ Inspection routine - start / stop automatic scanning with strip chart recording and complete inspection file storing; automatic start of postprocessing routine upon completing each scanning > Postprocessing pack: <ul style="list-style-type: none"> ⇒ Viewing recorded strip chart with play back recorded A-Scans, defects marking and sizing ⇒ All-functional TOFD postprocessing for TOFD strips ↳ Printing comprehensive inspection report 	1
3	<p>Orbital Scanner for Girth Weld Inspection</p> <ul style="list-style-type: none"> > On-belt clamping and traction mechanism > Digitally controlled stepped motor with power / control cable and terminal at instrument side > Platform for fitting of ISONIC PA AUT 2 X 64 /16 > Frame for fitting PA Probes, conventional pulse echo and TOFD probes > Incremental Encoder with cable and terminal at instrument side - 2 pieces (1 for operation + 1 spare) > Irrigation channel entry and distribution to probes with set of rubber pipes (plus one set spare) 	1
4	5 MHz 64 element Phased Array Probe, pitch size 0.8 mm with cable (64-pin terminal at instrument side)	4
5	Wedge for Phased Array Probe with Pipe OD Matching Contoured Contact Face and Irrigation Channel	8
6	TOFD Probe - active elements 1/4" dia, 5 MHz with cable (LEMO 00 Terminal at instrument side)	4
7	TOFD Probe - active elements 1/4" dia, 10 MHz with cable (LEMO 00 Terminal at instrument side)	4
8	Wedge for 1/4" dia TOFD probe, 60 deg - with Irrigation Channel and Fit-Into-Scanner Fixture	4
9	Wedges for 1/4" dia TOFD probes, 65 deg - with Irrigation Channel and Fit-Into-Scanner Fixture	4
10	Wedges for 1/4" dia TOFD probes, 70 deg - with Irrigation Channel and Fit-Into-Scanner Fixture	4
11	45 Deg 4 MHz Miniature Probe for the detection of compact, longitudinal, and transversal cracks with cable (LEMO 00 Terminal at instrument side), irrigation channel and Fit-Into-Scanner Fixture	8
12	60 Deg 4 MHz Miniature Probe for the detection of compact, longitudinal, and transversal cracks with cable (LEMO 00 Terminal at instrument side), irrigation channel and Fit-Into-Scanner Fixture	8
13	70 Deg 4 MHz Miniature Probe for the detection of compact, longitudinal, and transversal cracks with cable (LEMO 00 Terminal at instrument side), irrigation channel and Fit-Into-Scanner Fixture	8
14	Travel Bands for various pipe OD specified by customer	4