

# AIRCRAFT SET OF EDDY CURRENT FLAW DETECTOR "EDDYCON C"

## FOR AIRCRAFTS TESTING



- Surface and subsurface defect detection.
- Assessment of defect depth.
- Conductivity measurement.
- Paint thickness measurement.
- EN 13860-1 Compliant
- EN 13860-2 Compliant



CE MARKING



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**PURPOSE**



Set of eddy current equipment for non-destructive testing of aircraft parts on the basis of "EDDYCON C" flaw detector is used for detection of surface cracks in various parts, cracks in holes and multilayered structures, surface and subsurface corrosion. Eddy current is an acceptable method for detecting conductivity of non-ferrous materials and paint thickness.

**ACCORDING TO THE REGULATORY DOCUMENTATION THE EDDY CURRENT IS USED ON:**

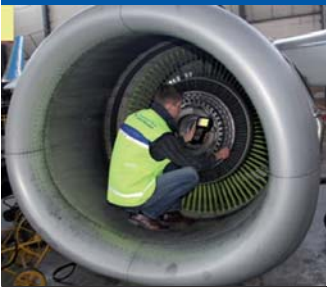
- Window and door frames.
- Aircraft wheels.
- Pre-buy aircraft inspections.
- Surface crack high-frequency inspection.
- Subsurface low frequency inspection.
- Multi layer of metal crack detection.
- Part edges.
- Crack progression verification.
- Marking the start and end of a crack to facilitate stop drilling.
- Cracks around fasteners.
- Aircraft part extent of corrosion verification and damages from mechanical peeling.
- Crack detection on Aluminum, Titanium, Iron, Stainless Steel, Inconel, Nickel, Magnesium.

**FLAW DETECTOR ADVANTAGES**



- Tuning out from the influence of an operating clearance and inhomogeneity of electromagnetic properties of a testing object.
- Storage of a great number of setups and testing results in the flaw detector memory.
- Mode of two-way connection with PC via USB port (for inputting the information from the flaw detector memory into PC and possibility of this data printing as well as setups loading from PC into the flaw detector memory).
- Upgrading the flaw detector software using USB Flash Card.
- Conditional assessment of a defect depth and length.
- Readily removable battery.
- Time of contentious battery operation \_\_\_\_\_ 8 hours.
- Light and sound ALARM system.
- Operation simplicity due to the intuitive interface.
- Small mass and dimension parameters.

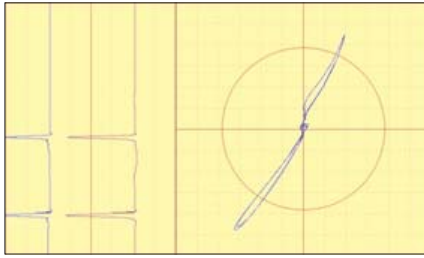
**FLAW DETECTOR DISTINCTIVE FEATURES**



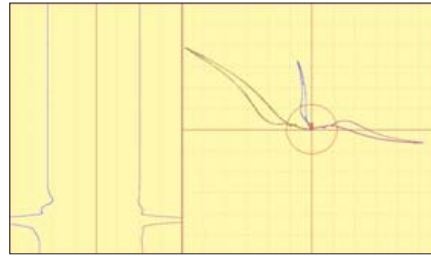
- Color high-contrast TFT display.
- ALARM system: 4 three-color LEDs, sound alarm.
- Possibility to operate in two-frequency mode.
- Possibility to assess the paint thickness.
- Simplified procedure of instrument calibration on standard calibration blocks.
- Possibility of encoder and eddy current rotary scanner connection.
- Exceptional signal/noise ratio.
- Possibility to operate with eddy current probes (ECPs) and rotary scanners from different manufacturers.
- USB slave.
- Compliance with BSS7048.
- Allows to carry out the testing according the requirements of NON-DESTRUCTIVE TEST MANUAL (51-00 PART 6, 71-20 PART 6 and etc.)

**SPECIFICATIONS AND SERVICE FUNCTIONS OF THE FLAW DETECTOR**

- Detecting defects with the depth \_\_\_\_\_ from 0.05 mm and width \_\_\_\_\_ from 0,002 mm.
- Setup range of operating frequencies \_\_\_\_\_ from 10 Hz to 16 MHz.
- Generator output voltage (double amplitude) \_\_\_\_\_ from 0,5 V to 6 V.
- Adjusted gain range \_\_\_\_\_ 100 dB.
- Signal phase change (range of signal rotation from 0° to 360° with a step 0.1°, 1°, 10°).
- Samples frequency \_\_\_\_\_ up to 10 kHz.
- Digital signal filtering (there are 4 filter types: Lowpass, Highpass, Bandpass, Averaging).
- Eddy current signal display:
  - a) complex plane (XY) - allows to detect defects among interferences by analyzing the signal waveform;
  - b) mix of two frequencies can be used for suppression of interfering factors and reduction of their influence on testing results (for mixing an operator can choose one of 4 algorithms: summation, subtraction, summation with horizontal inversion, summation with vertical inversion).

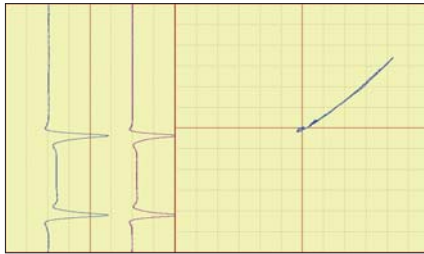


a) Complex plane (XY)

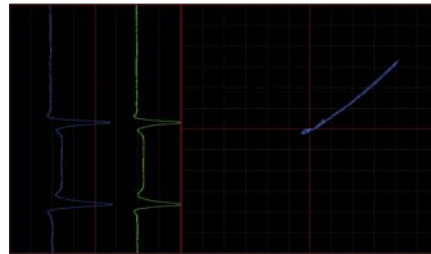


b) Mix of two frequencies (MIX)

- possibility to move the complex plane center to any visible part of the screen;
- two modes of instrument operation: "Dark" - for operation with faint outer lighting; "Light" - for operation with intense outer lighting;

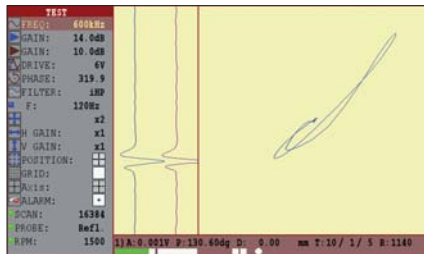


b) "Dark" mode

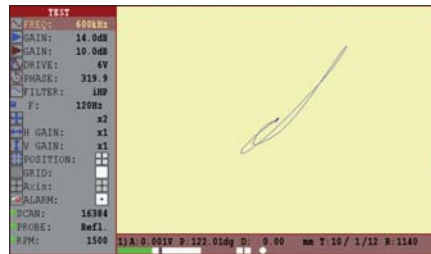


b) "Light" mode

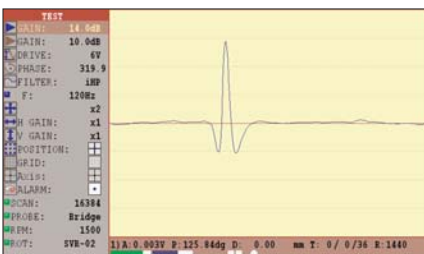
- various types of information display on the flaw detector screen:



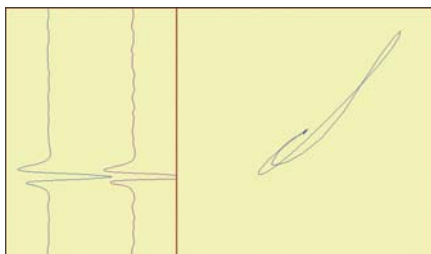
a) Menu+XY+A(t)



b) Menu+XY



c) Menu+A(t)



d) XY+A(t)



e) XY



f) A(t)



- time of flaw detector operation mode setup \_\_\_ up to 1 minute;
- “Persistence” function (adjustable time for clearing the screen is from 0.1 s; 0.5 s; 1 s; 2 s; 3 s; 4 s);
- built-in clock and calendar;
- screen backlight and screen brightness control;
- overload indicator of an input circuit;
- battery life indicator;
- possibility of ECP connection of various constructions:
  - differential ECP;
  - differential ECP, connection by the bridge circuit;
  - differential transformer ECP with center-point ground;
  - differential transformer ECP;
  - single (parametric) ECP;
- absolute transformer ECP.
- possibility of eddy current rotary scanner connection for the testing of openings and special-purpose scanners;
- user-friendly multi-language interface;
- time of continuous flaw detector operation with the fully charged storage battery \_\_\_\_\_ at least 8 hours;
- total average life \_\_\_\_\_ at least 10 years;
- flaw detector is powered from the built-in storage battery with rated voltage 12 V and rated capacity of 4500 mA.h;
- operating temperature range \_\_\_ from minus 20 °C to plus 45 °C;
- weight of flaw detector with a storage battery \_\_\_ no more than 0,9 kg;
- overall dimensions of the flaw detector - no more than 230 x 135 x 98 mm.

## BASIC DELIVERY SET OF THE FLAW DETECTOR “EDDYCON C”














Name and reference designation	Quantity
Electronic unit of eddy current flaw detector EDDYCON C _____	1 pc.
Mascot 2015/Friwo charger _____	1 set.
Connection cable (PC/electronic unit, USB) _____	1 pc.
Registration certificate for Eddycon C _____	1 copy
Certificate of verification for the flaw detector EDDYCON C _____	1 copy
Operation manual for Mascot 2015/ Friwo _____	1 copy
Software for the PC _____	1 package.
Soft case for the flaw detector _____	1 pc.
Carrying Case _____	1 pc.

## ADDITIONAL EQUIPMENT

Name and reference designation	
Rotary scanner SVR-02	
Eddy current probes	
Connection cable (Reflection, Bridge, Lemo 12 - Lemo 04 (type 0B)), _____	1800 mm
Connection cable (Electronic unit /SVR-02, Lemo 12 - Lemo 12), _____	1800 mm
Connection cable (Reflection, Bridge, Lemo 12 - Lemo 03), _____	1800 mm
Connection cable (Electronic unit / parametric ECP, Lemo 00 - Lemo 00/BNC/Microdot), _____	1800 mm
Headphones	
Calibration block 2353.08 (for operation with surface ECPs)	
Calibration block 2353.12 (for operation with rotary ECPs)	



# ECPs FOR AIRCRAFTS TESTING

No.	NAME AND APPEARANCE	SIZE OF OPERATING SURFACE, MM/INCH	OVERALL DIMENSIONS, MM/INCH	NOTE	FIELD OF APPLICATION
<b>ECPs for surface defects detection</b>					
1.	<b>SU1.8M3.2x64DSS1 - Shielded</b> Centre frequency - 1.8 MHz 	∅ 3,2/.125	∅9,6 x 64/.38 x 2.5	Spherical operating surface R1,6	Detection of surface defects in aluminum, titanium and magnum alloys
2.	<b>SU1.8M3A3.2x12.5DSS1 - Shielded</b> Centre frequency - 1.8 MHz 	∅ 3,2/.125	∅9,6 x 64/.38 x 2.5	Spherical operating surface	
3.	<b>SU1.8M5A3.2x12.5DSS1 - Shielded</b> 	∅ 3,2/.125	∅9,6 x 64/.38 x 2.5	Spherical operating surface R1,6	
4.	<b>SU1.5M3DS1 - Unshielded</b> Centre frequency - 1.5 MHz 	∅3/.118	∅12,5 x 76/.5 x 3	Spherical operating surface R1,5	
5.	<b>SU1.5M3DS02 - Unshielded</b> Centre frequency - 1.5 MHz 	∅3/.118	∅12,5 x 76/.5 x 3	Spherical operating surface R1,5	
6.	<b>SS1.5M05DA0</b> Centre frequency - 1.5 MHz 	∅5/.197	∅13 x 35/.51 x 1.38	Planar operating frequency. Ceramic protector.	
7.	<b>SS650K06DA0</b> Centre frequency - 650 kHz 	∅6/.24	∅13 x 35/.51 x 1.38	Planar operating frequency. Ceramic protector.	
8.	<b>SS400K07DA0</b> Centre frequency - 400 kHz 	∅7/.26	∅13 x 35/.51 x 1.38	Planar operating frequency. Ceramic protector.	
<b>ECP for subsurface defects detection</b>					
9.	<b>SS170K13DA0</b> Centre frequency - 170 kHz 	∅13/.51	∅13 x 35/.51 x 1.38	Planar operating frequency. Ceramic protector.	Detection of subsurface defects in aluminum alloys. Testing of primary elements of structure under the cover in 2-3 layer.
10.	<b>SS50K15DA0</b> Centre frequency - 50 kHz 	∅15/.59	∅15 x 35/.59 x 1.38		
<b>ECP for defects in holes detection</b>					
11.	<b>RO1.7M5A"X" "DFD0</b> Centre frequency - 1.7 MHz 	from ∅3.1/.12 to 25.4/.122 ÷1	–	Flexible ECP for semi-automated testing	Detection of surface defects in aluminum, titanium and magnum alloys
12.	<b>RO1.7M5A"X" "DRD0</b> Centre frequency - 1.7 MHz 	from ∅3.1/.12 to 25.4/.122 ÷1	–	Rigid ECP with semi-automated testing	
13.	<b>RO1.2M5A"X" "DFA0</b> Centre frequency - 1.5 MHz 	from ∅3.1/.12 to 25.4/.122 ÷1	–	Flexible ECP for manual testing	

• Possibility to produce other ECP types by the customer request.  
**Note** - Teflon tape is used to protect the ECP operating surface.  
<sup>1</sup>ECP nominal diameter; <sup>2</sup>ECP nominal diameter; <sup>3</sup>ECP nominal diameter.

## DESIGNATION OF EDDY CURRENT PROBE

<u>XX</u>	<u>XXX</u>	<u>XA</u>	<u>XXX x YYY</u>	<u>X</u>	<u>X</u>
1	2	3	4	5	6

- 1 - ECP configuration.
- 2 - ECP frequency.
- 3 - ECP angle.
- 4 - Size of ECP operating surface.
- 5 - ECP probe designation.
- 6 - ECP modification

### 1. ECP configuration

SU - (surface probe) - probes for surface defects detection.

SS - (subsurface probe) probes for surface and /or subsurface defects detection (MDF - type)

OD - (OD probe) outer Encircling probe.

ID - (ID probe) inside Bobbin probe.

RO - rotation probe.

### 2. ECP frequency

XXXHZ - "HZ" designation for "Hz" range;

XXXK - "K" designation for "kHz" range;

XXXM - "M" designation for "MHz" range.

### 3. ECP angle

XA - incidence angle of a sensitive element to the ECP axis.

Angle range:

0A - 0;

1A - 15;

2A - 25;

3A - 45;

4A - 60;

5A - 90;

If the incidence angle of a sensitive element concedes with the ECP axis, than this designation is only marked for the rotary ECPs with the sensitive element located on the probe tip (0A).

### 4. Size of ECP operating surface

XXXD - "D" designation for the diameter of an operating surface of surface and bobbin ECPs;

XXX-XXXD - "D" designation for diameters during the testing by adjustable rotary ECPs.;

XXXDR - "DR" (R - rigid) designation for the diameter during the testing with rotary ECPs with a metallic case for the holes of a rigid diameter;

XXXDF - "DF" (F - flexible) designation for the diameter during the testing with rotary ECPs with a flexible derling material during the holes testing with the acceptance.

XXX x YYY - designation for ECP of SU type, those sensitivity element is declined from the ECP longitudinal axis.

XXX - diameter of operating surface, YYY - bending length from the ECP longitudinal axis.

XXX/YYY - designation for ECT with a rectangular shape of the operating surface.

### 5. ECP probe designation.

D - differential;

A - absolute;

S/SS -single, additional S is added in case of a probe shielding (single shielded);

B - bridge.

### 6. ECP modification

Designated with digits: 0-9.



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