CONTENTS

Supports
SA-BC Adjustable support for bars and cylinders ................................................... 03
SB-AP Support for small samples and clamped beams ........................................... 04
SX-PD Adjustable support for discs and rings ........................................................ 05
SA-AG Adjustable support for large samples ......................................................... 06

Excitation
IED Automatic Electromagnetic Impulse Device ..................................................... 08
Medium, light and extra light manual impulse devices ............................................ 09

Acquisition
CA-DP Directional Acoustic Sensor ...................................................................... 10
Sturdy tripod .................................................................................................... 11

Processing
Sonelastic® Software .......................................................................................... 12

Instrumented furnaces
HT-1200 AC ...................................................................................................... 13
Technical requirements:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum dimensions for cylindrical samples (L x D)</td>
<td>550 x 200 mm</td>
</tr>
<tr>
<td>Minimum dimensions for cylindrical samples (L x D)</td>
<td>100 x 5 mm</td>
</tr>
<tr>
<td>Maximum dimensions for rectangular samples (L x W x T)</td>
<td>550 x 170 x 170 mm</td>
</tr>
<tr>
<td>Minimum dimensions for rectangular samples (L x W x T)</td>
<td>100 x 5 x 5.2 mm</td>
</tr>
<tr>
<td>Maximum weight when using Ø 0.7mm support-cable</td>
<td>10 kg</td>
</tr>
<tr>
<td>Maximum weight when using Ø 1.2mm support-cable</td>
<td>30 kg</td>
</tr>
<tr>
<td>Support maximum dimensions (L x W x T)</td>
<td>360 x 522 x 270 mm</td>
</tr>
<tr>
<td>Support weight</td>
<td>4.6 kg</td>
</tr>
<tr>
<td>Working temperature range</td>
<td>From -5 to +50°C</td>
</tr>
</tbody>
</table>

Features:

- Specifically developed for tests based on the Impulse Excitation Technique (ASTM-E1876) and the Sonelastic® Systems.
- Suitable for rectangular bars and cylinders between 100 and 500 mm long and up to 30 kg heavy.
- Optimum for tests applying the flexural vibration mode.
- Allows tests on longitudinal and torsional vibration modes.
- Manufactured in stainless steel rods and anodized aluminum.
- Available in Manual and Automatic configurations.

Typical configurations:

**Manual configuration:**
- **Parts:**
  - SA-BC sample holder;
  - CA-DP acoustic sensor with a vertical mounting base.
- **Accessories:**
  - Set of spare support-cables;
  - Height-adjusting disc;
  - Medium manual impulse device;
  - Light manual impulse device.
- **Optional items:**
  - Sturdy tripod.

**Automatic configuration:**
- **Parts:**
  - SA-BC sample holder;
  - CA-DP acoustic sensor.
- **Accessories:**
  - Sturdy tripod;
  - Set of spare support-cables;
  - Height-adjusting disc;
  - Sonelastic IED - Control Unit;
  - Sonelastic IED - Impulse Device (Actuator);
  - Manual impulse device of medium impact;
  - Manual impulse device of light impact;
- **Optional items:**
  - Sturdy tripod.
SB-AP - Support for small samples and clamped beams

Features:
- Specifically designed for tests based on the Impulse Excitation Technique (ASTM-E1876) and the Sonelastic® Systems.
- Allows clamped samples characterization (ASTM-E756).
- Allows tests on flexural, torsional and planar vibration modes.
- Suitable for rectangular bars, cylinders, discs and small rings.
- Manufactured in stainless steel and anodized aluminum.
- Available in Standard and Clamped configurations.

Typical configurations:

**Standard configuration:**
- **Parts:**
  - SB-AP support;
  - CA-DP acoustic sensor.
- **Accessories:**
- **Optional items**
  - N/A.

**Clamped configuration:**
- **Parts:**
  - SB-AP support;
  - CA-DP acoustic sensor.
- **Accessories:**
  - Adjustable jaw system;
  - Fastening tool for the adjustable jaw;
- **Optional items**
  - N/A.

Technical requirements:

| Maximum dimensions for cylindrical samples (L x D) | 120 x 60 mm |
| Minimum dimensions* for cylindrical samples (L x D) | 20 x 2 mm |
| Maximum dimensions for rectangular samples (L x W x T) | 120 x 40 x 40 mm |
| Minimum dimensions* for rectangular samples (L x W x T) | 20 x 2 x 2 mm |
| Maximum dimensions for clamped samples (L x W x T) | 200 x 25 x 5 mm |
| Minimum dimensions* for clamped samples (L x W x T) | 120 x 10 x 0.5 mm |
| Maximum dimensions for discs and rings (D x T) | 80 x 8 mm |
| Minimum dimensions* for discs and rings (D x T) | 15 x 1 mm |
| Support maximum dimensions (L x W x T) | 90 x 225 x 265 mm |
| Standard Support weight without a sample | 1.2 kg |
| Clamping Support weight without a sample | 2.1 kg |
| Working temperature range | from -5 to +50°C |

*Note: The minimum dimensions may vary according to the elastic properties of the material and the aspect ratio of the sample.
The Sonelastic Systems and SX-PD support may be used to characterize the resonance frequencies of rectangular plates, but not their elastic moduli.

Features:

- Specifically designed for tests based on the Impulse Excitation Technique (ASTM-E1876) and for the Sonelastic® Systems.
- Suitable for discs and rings up to 30 kg heavy and diameter measuring up to 380 mm.
- Optimum for tests applying the planar vibration mode.
- Structure manufactured in a resistant anodized aluminum.
- Available in Manual and Automatic configurations.

External dimensions:

Typical configurations:

Manual configuration:
- Parts:
  - SX-PD support;
  - CA-PD acoustic sensor with a vertical mounting base.
- Accessories:
  - Manual impulse device of medium impact.

Optional items:
- N/A.

Automatic configuration:
- Parts:
  - SX-PD support;
  - CA-PD acoustic sensor with a vertical mounting base.
- Accessories:
  - Manual impulse device of medium impact;
  - Sonelastic IED - Control Unit;
  - Sonelastic IED - Impulse Device.
- Optional items:
  - N/A.

Technical requirements:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum dimensions for circular samples (D x T)</td>
<td>380 x 60 mm</td>
</tr>
<tr>
<td>Minimum dimensions for circular samples (D x T)</td>
<td>80 x 5 mm</td>
</tr>
<tr>
<td>Maximum dimensions for rectangular samples* (L x W x T)</td>
<td>380 x 380 x 60 mm</td>
</tr>
<tr>
<td>Minimum dimensions for rectangular samples* (L x W x T)</td>
<td>60 x 60 x 5 mm</td>
</tr>
<tr>
<td>Maximum weight capacity</td>
<td>30 kg</td>
</tr>
<tr>
<td>Distance between the sliding props (minimum - maximum)</td>
<td>50 - 385 mm</td>
</tr>
<tr>
<td>Support dimensions (L x W x T)</td>
<td>562 x 562 x 160 mm</td>
</tr>
<tr>
<td>Support weight without a sample</td>
<td>1.6 kg</td>
</tr>
<tr>
<td>Working temperature range</td>
<td>From -5 to +50°C</td>
</tr>
</tbody>
</table>

(*) The Sonelastic Systems and SX-PD support may be used to characterize the resonance frequencies of rectangular plates, but not their elastic moduli.
SA-AG - Adjustable support for large samples

Features:

- Specifically designed for tests based on the Impulse Excitation Technique (ASTM-E1876) and for the Sonelastic® Systems.
- Suitable for bars and cylinders up to 5.3 m long and up to 200 kg heavy.
- Optimum for tests applying the flexural vibration mode.
- Allows tests on longitudinal and torsional vibration modes.
- Manufactured in resistant stainless steel.
- Nylon structure.

Technical requirements:

- Maximum dimensions for rectangular samples* (L x W x T) ....................................................... 5,300 x 200 x 200 mm
- Minimum dimensions for rectangular samples (L x W x T) ........................................................... 120 x 20 x 20 mm
- Maximum dimensions for cylindrical samples* (L x D) ................................................................. 5,300 x 200 mm
- Minimum dimensions for cylindrical samples (L x D) ................................................................. 120 x 30 mm
- Maximum dimensions for the standard support (L x W x T) ........................................................... 1,000 x 250 x 57 mm
- Maximum dimensions for the extended support* (L x W x T) ........................................................... 3,000 x 250 x 57 mm
- Maximum weight capacity .............................................................................................................. 200 kg
- Standard support weight without a sample .................................................................................... 2.8 kg
- Extended support weight without a sample* .................................................................................. 5.2 kg
- Working temperature range ........................................................................................................... from -5 to + 50 °C

* Extensions rod as an optional item.

Typical configuration:

- Parts:
  - SA-AG support;
  - CA-DP acoustic sensor;
  - Sturdy tripod.

- Accessories:
  - Manual impulse device of medium impact;
  - Extension rod.

- Optional items:
  - Extension rod (maximum of 1 unit).
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**IED**

Automatic Electromagnetic Impulse Device

**Features:**
- Specifically designed for tests based on the Impulse Excitation Technique (ASTM-E1876) and for the Sonelastic® Systems.
- Excitation of the sample by controlled and automatic impulse.
- Manual or remote operation using a USB connection and the Sonelastic® software.
- Stainless steel impulse device.
- Suitable to be used together with SA-BC, SB-AP, SX-PD and SP-B supports.

**Dimensions:**

**Technical requirements:**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjustable voltage range for the electrical pulse</td>
<td>From 1 to 11 V</td>
</tr>
<tr>
<td>Adjustable time range for the electrical pulse</td>
<td>From 1 to 60 ms</td>
</tr>
<tr>
<td>Protection against electric shock</td>
<td>Class I</td>
</tr>
<tr>
<td>International Protection Rating (IP code)</td>
<td>IP30</td>
</tr>
<tr>
<td>Supply voltage (input)</td>
<td>90-240 VAC (auto)</td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td>Input current (at 115 VAC)</td>
<td>0.7 A</td>
</tr>
<tr>
<td>Input current (at 230 VAC)</td>
<td>0.35 A</td>
</tr>
<tr>
<td>Output voltage (max)</td>
<td>11 VDC</td>
</tr>
<tr>
<td>Output current (max)</td>
<td>1.25 A</td>
</tr>
<tr>
<td>Working temperature range</td>
<td>from -5 to +50°C</td>
</tr>
<tr>
<td>Control unit dimensions (L x P x A)</td>
<td>165 x 160 x 68 mm</td>
</tr>
<tr>
<td>Impulse device maximum dimensions (Ø x A)</td>
<td>63 x 162 mm</td>
</tr>
<tr>
<td>Total weight of the equipment</td>
<td>1.5 kg</td>
</tr>
</tbody>
</table>

**Typical configuration:**

- **Parts:**
  - Unit control;
  - Medium RT impulse device.

- **Accessories:**
  - USB cable for the computer connection.

- **Optional items:**
  - Light RT impulse device.
**Medium, light and extra light manual impulse devices**

**Features:**
- Impact tip manufactured in stainless steel.
- Body made of a polymer presenting low elastic moduli and high damping coefficient.
- Suitable for the manual configurations of SA-BC, SB-AP, SX-PD and SA-AG supports.

**Technical specifications:**

<table>
<thead>
<tr>
<th>Device Type</th>
<th>Total Length</th>
<th>Ø of Body</th>
<th>Ø of Impact Tip</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 - Medium Manual Impulse Device</td>
<td>262 mm</td>
<td>9 mm</td>
<td>12.7 mm</td>
<td>25 g</td>
</tr>
<tr>
<td>02 - Light Manual Impulse Device</td>
<td>204 mm</td>
<td>3.8 mm</td>
<td>5.5 mm</td>
<td>3 g</td>
</tr>
<tr>
<td>03 - Extra Light Manual Impulse Device</td>
<td>150 mm</td>
<td>3.5 x 1.0 mm</td>
<td>5.0 mm</td>
<td>1 g</td>
</tr>
</tbody>
</table>
CA-DP Directional Acoustic Sensor

Features:

- Specifically designed for tests based on the Impulse Excitation Technique (ASTM-E1876) and for the Sonelastic® Systems.
- Directional signal acquisition (it is more sensitive to the acoustic response of the sample than to possible background noise).
- Frequency ranging between 20 Hz and 96 kHz.
- Reinforced connector (P3 / 3.5 mm).
- Body manufactured in anodized aluminum.
- 2 m long shielded cable.

Typical configuration:

- Parts:
  - CA-DP acoustic sensor.

- Optional items:
  - Vertical mounting base;
  - Sturdy tripod.

Technical requirements:

- Transducer element: Custom electret.
- Frequency range: From 20 Hz to 96 kHz
- Sensibility: -36 ± 4 dB (0 dB = 1 V/Pa)
- Directivity: Unidirectional (-12 dB in 180° and 1 kHz)
- Signal-noise ratio (S/N): 60 dBA
- Supply voltage: From 1.5 to 10 VDC
- Impedance: 680 Ω
- Maximum dimensions: Ø x L: 20 x 138 mm
- Weight: 110 g
- Connector: Reinforced P3 / 3.5 mm

Observation: Both channels, L and R, are connected to the electret.
Sturdy tripod

Features:

- Allows the correct placement and positioning of the CA-DP acoustic sensor and IED Impulse Device with 5 degrees of freedom.
- Isolates possible vibrations by combining massive elements with bumpers.
- Telescopic arm with adjustable length ranging from 425 to 724 mm
- Anti-slippery feet.
- Structure manufactured in carbon steel and injected aluminum with electrostatic painting.

Dimensions:

Typical configuration:

- **Parts:**
  - Sturdy tripod.

- **Accessories:**
  - CA-DP acoustic sensor clip.

- **Optional items:**
  - CA-DP Acoustic Sensor.

Technical requirements:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degrees of freedom</td>
<td>05</td>
</tr>
<tr>
<td>Reach of the telescope arm</td>
<td>From 425 to 725 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>3 kg</td>
</tr>
</tbody>
</table>
Features:

- Specifically designed for tests based on the Impulse Excitation Technique (ASTM-E1876) and for the Sonelastic® Systems.
- Allows the characterization of elastic moduli, damping and sound speed of materials.
- Suitable for rectangular bars, cylinders, discs and rings.
- Suitable for flexural, torsional, longitudinal and planar vibration modes.
- Estimates the fundamental resonance frequencies.
- Automatically calculates the standard deviation for measurements of each dimension taking into consideration the uncertainty of the measurement tool.
- Automatically calculates the measurement uncertainty.
- Exports results to an Excel spreadsheet and files compatible to Origin.
- Allows automatic characterizations as a function of time and temperature.
- Compatible with Windows 7, 8 and 10.
HT-1200 AC
Instrumented furnace

Features:

- Specifically designed for tests based on the Impulse Excitation Technique (ASTM-E1876) and for the Sonelastic® Systems.
- Allows characterizations up to 1,200°C in controlled atmosphere and/or with gas exhaustion.
- Suitable for bars of rectangular cross-section, employing the flexural vibration mode.
- Platinum wires for temperature up to 850°C, and alumina elements for temperature up to 1,200°C.
- Integrated impulse device and acoustic sensor.
- Stainless steel body and structural anodized aluminum base.

Views:

Parts, accessories and optional items:

- Parts:
  - Chamber;
  - Temperature controller;
  - Integrated acoustic sensor;
  - Integrated impulse device;
  - Cooling system.

- Accessories:
  - Platinum wires support;
  - Dense alumina support.

- Optional items:
  - Gas flow meter and valve.

Technical requirements:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum dimensions for the sample (L x W x T)</td>
<td>150 x 30 x 30 mm</td>
</tr>
<tr>
<td>Minimum dimensions for the sample (L x W x T)</td>
<td>120 x 10 x 10 mm</td>
</tr>
<tr>
<td>Maximum working temperature</td>
<td>1,200 °C</td>
</tr>
<tr>
<td>Maximum power</td>
<td>1,700 Watts RMS</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>220 VAC / 50-60 Hz</td>
</tr>
<tr>
<td>Internal dimensions of the chamber</td>
<td>200 x 150 x 100 mm</td>
</tr>
</tbody>
</table>