Shock absorber test bench - dyno

<table>
<thead>
<tr>
<th>Models</th>
<th>Type</th>
<th>Power CV</th>
<th>Power kW</th>
<th>Power Supply</th>
<th>Velocity minimal and maximal mm/sec</th>
<th>Strok mm</th>
<th>Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>DYNO 3-50</td>
<td>Transportable</td>
<td>3,0</td>
<td>2,2</td>
<td>Monophasre</td>
<td>4 a 950</td>
<td>12,70/25,40</td>
<td>4 fix regulations</td>
</tr>
<tr>
<td>DYNO 4-50</td>
<td></td>
<td>4,0</td>
<td>3,0</td>
<td>Monophasre</td>
<td>4 a 950</td>
<td>38,10/50,80</td>
<td>4 fix regulations</td>
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<tr>
<td>DYNO 4-60</td>
<td></td>
<td>4,0</td>
<td>3,0</td>
<td>Threephase</td>
<td>1 a 1130</td>
<td>0 a 60</td>
<td></td>
</tr>
<tr>
<td>DYNO 5,5-60</td>
<td></td>
<td>5,5</td>
<td>4,1</td>
<td>Threephase</td>
<td>1 a 1130</td>
<td>0 a 60</td>
<td></td>
</tr>
<tr>
<td>DYNO 5,5-76</td>
<td></td>
<td>5,5</td>
<td>4,1</td>
<td>Threephase</td>
<td>1 a 1430</td>
<td>0 a 76,20</td>
<td></td>
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<tr>
<td>DYNO 10-76</td>
<td>Production</td>
<td>10,0</td>
<td>7,5</td>
<td>Threephase</td>
<td>1 a 1430</td>
<td>0 a 76,20</td>
<td></td>
</tr>
<tr>
<td>DYNO 10-100</td>
<td></td>
<td>10,0</td>
<td>7,5</td>
<td>Threephase</td>
<td>1 a 1880</td>
<td>0 a 100</td>
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<tr>
<td>DYNO 15-100</td>
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<td>15,0</td>
<td>11,2</td>
<td>Threephase</td>
<td>1 a 1880</td>
<td>0 a 100</td>
<td></td>
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<tr>
<td>DYNO 20-100</td>
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<td>14,9</td>
<td>Threephase</td>
<td>1 a 1880</td>
<td>0 a 100</td>
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<tr>
<td>DYNO 25-100</td>
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<td>25,0</td>
<td>18,6</td>
<td>Threephase</td>
<td>1 a 1880</td>
<td>0 a 100</td>
<td></td>
</tr>
</tbody>
</table>

**Power:**
Electric motor, asynchronous, 1500 rpm, monophasre or threephase. Controlled by driver.
Stoke
0 to 100mm. Up to model 4-50: 4 fixed regulations. Larger models have infinite regulations that are obtained with eccentrics, without staggering. The software recognizes the new stroke automatically.

**Speed and frequency:**
Frequency and speed: The motors are controlled by a frequency converter from 0.1 to 6 Hz. With these frequencies, the shaft speed can range from a minimum of 1mm/sec to a maximum of 1885 mm/sec (0.004 to 74 °/sec), in 60 mm of stroke and 6Hz of frequency.

**Transmission:**
Up to model 3-25: With coaxial reducer. Models 3-50 to 6-76: with synchronous belts, in 2 stages in transportable models. Models 10-76 onwards, synchronous belts, with reduction in 1 stage. Synchronous belts combined with the use of lineal ball bearings, puts almost all the power at the dyno shaft, allowing it to work at very low and high speeds, and greater damper loads.

**Moving transformation system:**
Scotch yoke system that describes a perfect sinusoidal form. The mechanism has a frictionless no backlash mechanic solution, really useful for short strokes. For stroke change, a double eccentric system allows a fast and stepless stroke change, from 0 to the maximum.

**Force sensing:**
Type Z load cell.

**Position and velocity sensing:**
Digital high precision encoder system. System of speed taking through software from the position.
Data acquisition system:
Own development, it works in combination with the speed driver. The system is fully controlled by the software that transmits the information acquired to a computer.

Software:
Own development, in C++. Powerful and friendly system, fully configurable for each user.
It allows to view many files simultaneously, with interesting comparison and analysis tools. Windows-type features: open, close, maximize, reduce, zoom, print; edit colors, shapes of curves, etc. Configure all test variables: quantities, units of measurement, automatic or manual scales, test speeds, preheating time, time intervals between each test speed.
The precision is contrasted with intercomparative tests with the machine interaction pattern, calibrated twice a year.
18 different types of graphics and charts type are available. A pass/no pass curve analyzer and a production module are other available functions.

Graphics:
It allows to represent up to 7 different graphs.
1 - position and force versus time.
2 - speed and force versus time.
3 - force versus time.
4 - force versus speed.
5 - force versus average speed.
6 - force versus rhombus velocity.
7 - force versus peak speed.

Accessories:
Motorized traverse drive: It is a motorized complement that raises and lowers the top traverse by software. Very useful to close very pressurized shock absorbers (not springs). Up to 1500kgf (3300lb). Test velocity can be configured from 4 to 13mm/sec (0,15 to 0,5"/sec).

Spring measurement module: Performs static tests to any compressible or expandable elements: springs, springs, spirals, suspension rubber stops, valve springs, etc.

External panel: Allows to control the main machine functions without having a computer nearby.

Temperature module: Allows to preheat a shock absorber up to a given value, before launching a test. Allows to know the shock absorber temperature before and after the test.

Automatic upper clamping: A pneumatic system allows automatic clamping of the upper mount, regardless the type of anchor (either bolt, eyelet, ball joint, Mac Pherson). No need of special devices for each mounting. 5,5 kgf/cm² (80 lb/in²) air pressure is needed. It really speeds up when you have to test many shock absorbers.

Automatic lower clamping: same as before but for lower damper mount.

Forced ventilation of the electric motor, blower: It allows to use the equipment at very low speeds during long periods of time. At low speed, the standard motor fan works too slow and does not provide the required cooling; and at high speed consumes a lot of motor power because it is turning too fast from its original design.

**Structure:** self-supporting and leveling structure, made of high strength steel, which allows its installation in a comfortable and easy way.

**Portable structure:** They are ideal for implementation in test track or race circuit environments, where test engineers use them to determine the force-speed curve of the shock absorber, adjust it as necessary, and then test it on a car prototype of races. Original equipment manufacturers measure the dynamic attributes of the vehicle, while race teams receive feedback from the driver. Anyway, time is a factor, so the essay has to be fast, effective and systematic. These tests are normally carried out in light trucks or semi-trailers where space is of the utmost importance, so the size and portability of the test system are essential.

**Folding structure, tilting:** On request, tilting brackets are manufactured that can rotate between 0º and 90º to check dampers of both horizontal and vertical application, ideal for the railway train industry.

**Columns:** made of steel, with heat treatment ..., of ... diameter, standard height ... mm, if the spring measurement module is fixed, the columns have ... mm. Longer columns can be purchased upon request.

**Supports, anchors for shock absorbers:** Not included, accessory on request. Supports for cars: There is a great variety of measures of shock absorbers and that is why each workshop has to make its own supports.

Motorcycle fork brackets: accessory, ... € without VAT. Universal upper post + lower support + 2 sample bushings.

Bicycle fork brackets: accessory ... € without VAT. Universal top post + bottom bracket + 2 sample bushings

**Maintenance:** Pronello machines are quite accessible and easy to maintain, which makes them perfect for the world of competition, racing, motorsport, garage runners, fans, clubs and test labs with tight budgets.

**Training, after sales support:** at the customer's facilities, at our facilities, or by phone, email, WhatsApp, Skype and YouTube channel.

**Warranty:** 1 year for material failures other than for misuse.

**Options on request:** Larger engine powers. Longer strokes. Load cells of greater capacity. Higher columns to adjust to the height of shock absorbers or special forks. Stands for motorcycle or bicycle forks. Security enclosure. Enclosure with door lock according to CE. Swing folding structure for the railway industry. Forced ventilation of the electric motor.