

# bapro

## CHASSIS DYNAMOMETERS



### PERFORMANCE DYNAMOMETER CATALOGUE

- Performance dynamometers for motorcycles, cars and trucks
- From one-axle to two-axle roller dynamometers for 2WD and 4WD vehicles
- Precision measurement instrumentation, reliable, accurate, reproducible measurement results
- 2017 products updates



## Some of our partners



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## Company profile

Bapro is the only company totally dedicated to the development and production of chassis dynamometers test benches for cars and motorbikes; developing chassis dynamometers for the utmost repeatability and accuracy. Bapro test benches are designed only in braked configuration by eddy current brake. That is the reason why all the hardware is designed to adsorb the vehicle power and therefore has characteristics of high resistance.

Hardware and software design are carried out in house by our technician: this allows us to be independent from any third part supplier and to know exactly every detail of our instruments.

Bapro is working continuously at the development of its products following vehicles evolution. We customize our instruments on specific requests and provide consulting services for the installation in the most suitable area. Bapro offers the right solution to every needs: installation in the area chosen by the customer, installation with soundproof cabin and ventilation system.

Bapro road simulators are compliant with every laws in force and EC guidelines. On the commercial side Bapro offers specific solutions on demand.

## History

Bapro, engine calibration specialists, on January 2004 gave birth to its Italian Headquarters in Correggio, Reggio Emilia (Italy) in the middle of the Italian 'Motorvalley' with its Production, Training & Technical Center.

Many partnerships with big Automotive brands give us the opportunity to further our development into the automotive diagnostic equipment, and will continue leading the way in highly accurate and affordable products.

# BAPRO Chassis Dynamometers

## Bapro test benches, all series (STANDARD and HIGH PERFORMANCE) immediate advantages:

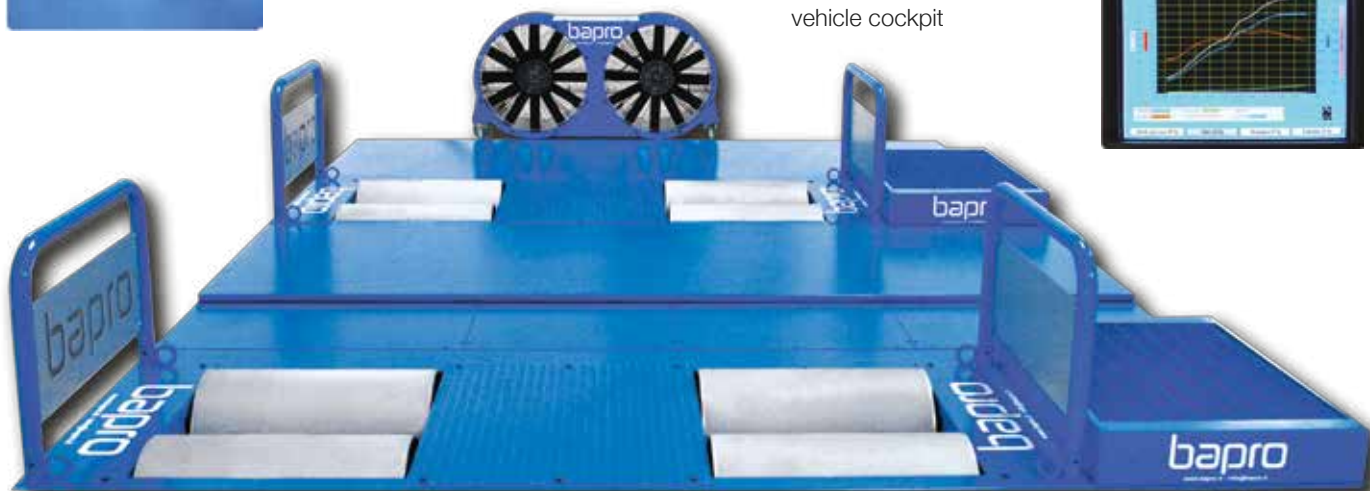
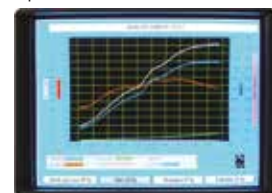
- Improved use of the instruments already present in workshop (diagnosis equipment) lead to a shorter repair time
- Results certification increases accessories sales and tuning business (performance enhancement)
- No more risks and costs originated from classic road tests (traffic, accidents)
- Second-hand vehicles sale improvement by engine health certification
- All our car 2WD dynamometer models are upgradable to 4WD/AWD
- Easy to install, extremely easy to use, Bapro high accuracy guaranteed
- Renting for tests, events, motorsport Balance of Performance
- All our models could be installed IN or ABOVE ground

High performance Fan ventilation systems, up to 44.000 cubic/mt/h; wind speed over 90 km/h



Infrared remote control. Test bench management directly from vehicle cockpit

Fully functional software, no extra charge for updates or add-ons



Double balanced rollers guarantee a perfect grip. All our rollers are knurled by metal cutting over entire width, ensuring no tires heating and typical Bapro accuracy

HTD high quality belts distribute vehicle power between rollers, a guarantee of high accuracy (HP series)



All our models are equipped with high quality EDDY CURRENT BRAKES technology

# Our quality in Chassis Dynamometers

## **Bapro product Series** (Standard - High Performance)

**S Series (Standard)** , especially designed for car/motorcycle workshops, suitable for lower HP vehicles applications or common diagnosis usage.

**HP Series (High Performance)** dynos, dedicated to highest HP vehicle tuning applications and research and development dpts.

All measure values are automatically standardized to international standards.

## **Tubular Frame**

**Powder coated (customizable color) tubular frame in high strength steel.**

Allow to test high power heavy vehicles ensuring steady measures over time. Pro: Maximum strength with minimum flexure (and vibration proofing) compared to the competitor's sheet metal frame.

## **Steel structure**

Tubular frame, long lasting structure, **high quality vibration proofing equilibrated components for the best accuracy.** Moreover, our dynos are always ready to be upgraded from the pit version to the above ground version.

## **Eddy Current Brake**

Allow to perform load tests and fixed rpm (speed). Pro: the brake and the rollers are mounted in the same frame, this is conceived to withstand the power of the ultra highpower vehicles.

## **Remote Control**

Operating system free. Allow to perform any tests without stopping the vehicle.

## **Built-in Weather Station**

Pressure-temperature. Allow to measure the weather conditions. Bapro dynamometer corrects the power reading in real-time according to different standards (different systems from S to HP Series)

## **Management Software**

Allow to perform, save, compare and print the tests. Pro: Updated, complete (no add-on or extra charges), particularly easy and intuitive, with analogue and digital gauges. It works without mouse and by remote control. Compatible with the present and future Windows operating systems. It doesn't need a dedicated computer and it works on the notebooks too!

## **Possible Tests with our test benches** (go to page 13 for more details):

- Braked tests: constant rpm, constant speed, constant load, Steady state RPM
- Power and torque controlled acceleration measurement (sweep test)
- Road Simulation (straight, uphill, aerodynamic drag, vehicle mass)
- Measurement at steps of power and torque
- Diagnosis under load in road conditions
- ECU mapping at all engine speeds
- Endurance tests and final tests

Bapro provides customized products on demand,  
contact us for any question at [info@bapro.it](mailto:info@bapro.it)

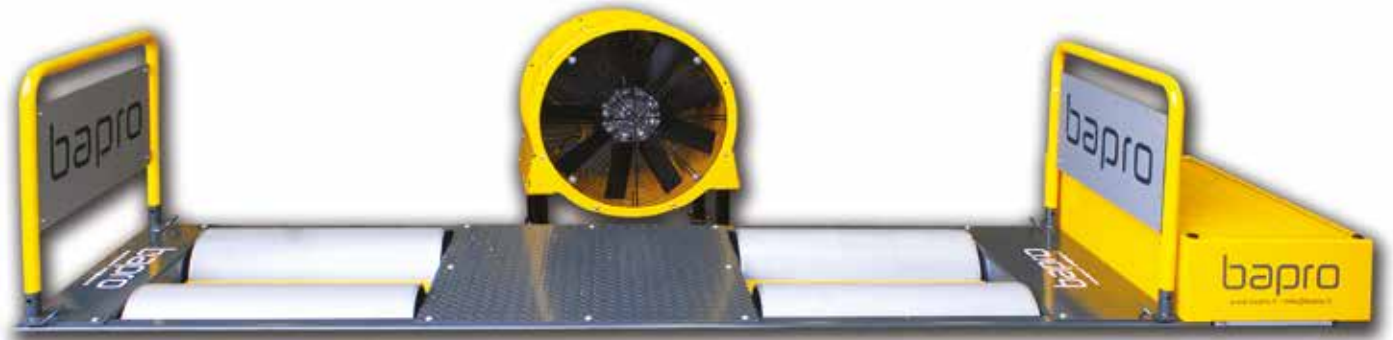
*bapro Technology as passion!*

## 2wd CHASSIS DYNAMOMETER BPA-2R S (Standard)



The **S series** comes standard with knurled rollers which provides the highest traction between rollers and tires, a guarantee of an extremely high accuracy in measurement. Equipped by eddy current brake all power is directly transferred from the wheels to the load cell.

Especially designed for standard car workshops, test lanes; this series has lower performances than our HP (High Performance) Series, keeping the same accuracy and top level components, allowing to minimize test bench maintenance, over the years. All our 2wd models are upgradable to 4wd.



<b>Model</b>	<b>BPA-2R S</b> (2017 updated version)
• <b>Roller diameter</b>	240 mm
• <b>Roller width</b>	660 mm
• <b>Maximum speed</b>	250 km/h
• <b>Maximum absorbable power</b>	350 HP
• <b>Maximum measurable power</b>	500 HP (Sweep Power Test)
• <b>Overall dimensions mm</b>	3.070 x 870 x 310
• <b>Max weight per axle</b>	2.000 kg
• <b>Voltage</b>	220 V 50 Hz

### STANDARD FEATURES

- **1 Eddy currents brake, 4 rollers knurled over the entire width**, finished by CNC cut knurling
- **Pneumatic vehicle lifter, with integrated rollers lock**
- **Fully functional management software**

### OPTIONAL ACCESSORIES

- **Double ventilation system movable on wheels**, target power 6 kW, flow rate 44.000 m<sup>3</sup>/h
- **Single ventilation system movable on wheels**, target power 3 kW, flow rate 22.000 m<sup>3</sup>/h
- **Wide band lambda system** 5 wires wide band lambda probe with controller (Requires outer meteo sensor box)
- **Boost pressure input** 0÷2.5 bar relative pressure ± 0.035 bar error. (Requires outer meteo sensor box)
- **Lambda Input** connect a vehicle lambda probe with an external controller (Outer meteo sensor box)
- **Aluminum loading ramps** high width aluminum ramps. Necessary when test bench installed on the ground
- **Computer trolley** built by heavy duty lasting steel, Pro: heavy duty, movable, wide working surface
- **Proportional ventilation speed control** adjust the fan speed in function of the rollers speed
- **Infrared remote control** test bench management directly from vehicle cockpit
- **Roller covers** protect the rollers when the dynamometer is not working
- **Personal computer and display**
- **Safety Equipments:** Side safety barriers with logo panels, Anchoring ratchet straps, High attenuation ear muff

## 2wd CHASSIS DYNAMOMETER BPA-2R HP (High Performance)



The **HP series** is the Bapro's highest performance chassis dynamometer. A couple of belted 400 mm rollers is the best guarantee for the utmost in repeatability and accuracy. With a massive tubular frame made by high strength steel, this High Performance series suits all needs: Testing, R&D, Motorsport, Tuning and Chip Tuning. All our 2wd models are upgradable to 4wd.

Model	<b>BPA-2R HP</b> (2017 updated version)
• Roller diameter	400 mm
• Roller width	700 mm
• Maximum speed	360 km/h
• Maximum absorbable power	650 HP
• Maximum measurable power	1.000 HP (Sweep Power Test)
• Overall dimensions aprox. in mm	3.470 x 1.135 x h. 410
• Max weight per axle	2.500 kg
• Voltage	400 V 50 Hz



### STANDARD FEATURES

- **1 Eddy currents brake; 4 rollers paired by HTD belts, knurled over entire width**, finished by CNC cut knurling
- **Infrared remote control** test bench management directly from vehicle cockpit
- **Lambda Input** to connect the vehicle lambda probe or an external controller
- **Boost pressure input** 0÷2.5 bar relative pressure  $\pm$  0.035 bar error
- **Pneumatic vehicle lifter, with integrated rollers lock**
- **Fully functional management software**

### OPTIONAL ACCESSORIES

- **Double ventilation system movable on wheels**, target power 6 kW, flow rate 44.000 m<sup>3</sup>/h
- **Single ventilation system movable on wheels**, target power 3 kW, flow rate 22.000 m<sup>3</sup>/h
- **Wide band lambda system** 5 wires wide band lambda probe with controller
- **Aluminum loading ramps** high width aluminum ramps. Necessary when test bench installed on the ground
- **Computer trolley** built by heavy duty lasting steel, Pro: heavy duty, movable, wide working surface
- **Proportional ventilation speed control** adjust the fan speed in function of the rollers speed
- **Roller covers** protect the rollers when the dynamometer is not working
- **Personal computer and display**
- **Safety Equipments:** Side safety barriers with logo panels, Anchoring ratchet straps, High attenuation ear muff

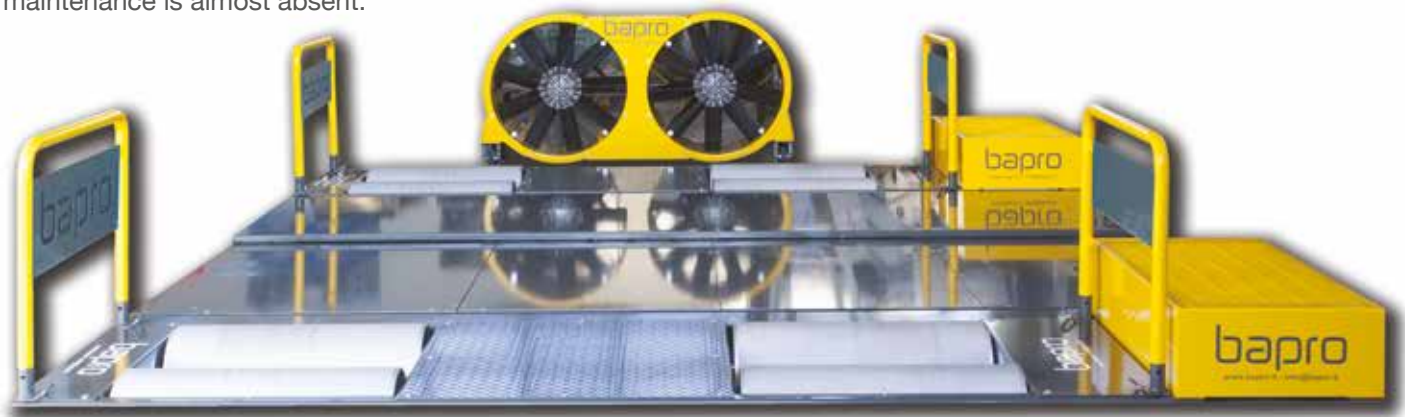
## 4wd CHASSIS DYNAMOMETER BPA-4R S (Standard)



The **S series** comes standard with knurled rollers which provides the highest traction between rollers and tires, a guarantee of an extremely high accuracy in measurement. Especially designed for standard car workshops, test lanes; this series has lower performances than our HP (High Performance) Series, maintaining the same accuracy and balanced top level components.

**Axles synchronization:** Electronic linked and synchronized axles via software, made by fast and precise high frequency control of eddy current brakes to synchronize the axles in a 4wd car (Bapro's patented system).

This to avoid differentials damage and to be more accurate in tests because power wasted in slippage inside the differentials is avoided too. Thanks also to this, BPA-4R S dyno is extremely easy to be installed and the maintenance is almost absent.



### Model

**BPA-4R S** (2017 updated version)

• <b>Roller ext. diameter</b>	240 mm
• <b>Roller width</b>	660 mm
• <b>Maximum speed</b>	250 km/h
• <b>Maximum absorbable power</b>	700 HP
• <b>Maximum measurable power</b>	1.000 HP (Sweep Power Test)
• <b>Overall dimensions mm</b>	3.130 x 4.870 x h. 360
• <b>Max weight per axle (kg)</b>	2.000
• <b>Voltage</b>	220 V 50 Hz

### STANDARD FEATURES

- **2 Eddy currents brakes, 8 rollers knurled over the entire width**, finished by cut knurling
- **Electric adjustment of vehicle wheelbase; pneumatic vehicle lifter**, with integrated rollers lock
- **Fully functional management software**

### OPTIONAL ACCESSORIES

- **Double ventilation system movable on wheels**, target power 6 kW, flow rate 44.000 m<sup>3</sup>/h (4 kW optional)
- **Single ventilation system movable on wheels**, target power 3 kW, flow rate 22.000 m<sup>3</sup>/h (2 kW optional)
- **Wide band lambda system** 5 wires wide band lambda probe with controller (Requires outer meteo sensor box)
- **Boost pressure input** 0÷2.5 bar relative pressure ± 0.035 bar error. (Requires outer meteo sensor box)
- **Lambda Input** connect a vehicle lambda probe with an external controller (Outer meteo sensor box)
- **Aluminum loading ramps** high width aluminum ramps. Necessary when test bench installed on the ground
- **Computer trolley** built by heavy duty lasting steel, Pro: heavy duty, movable, wide working surface
- **Proportional ventilation speed control** adjust the fan speed in function of the rollers speed
- **Infrared remote control** test bench management directly from vehicle cockpit
- **Roller covers** protect the rollers when the dynamometer is not working
- **Personal computer and display**
- **Safety Equipments:** Side safety barriers with logo panels, Anchoring ratchet straps, High attenuation ear muff



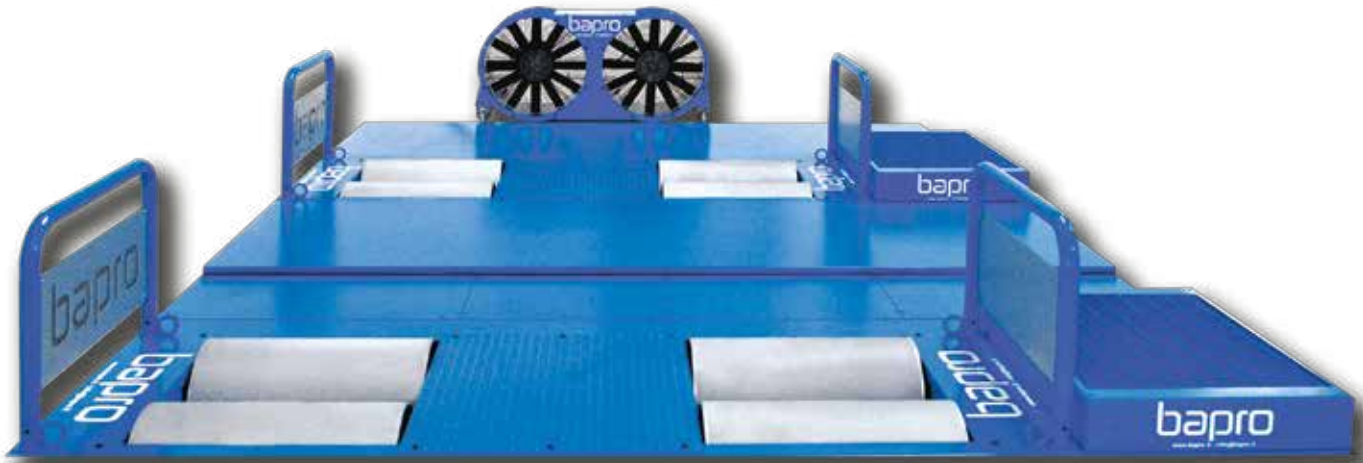
# 4wd CHASSIS DYNAMOMETER BPA-4R HP (High Performance)



The **HP series** is the Bapro's highest performance chassis dynamometer. A couple of belted 400 mm diameter rollers, the best guarantee for the utmost in repeatability and accuracy. With a massive tubular frame made by high strength steel, this High Performance series suits all needs: Testing, R&D, Motorsport, Tuning and Chip Tuning. BPA-4R High Performance is suitable for every kind of power and torque.

**Axles synchronization:** Electronic linked and synchronized axles via software, made by fast and precise high frequency control of eddy current brakes to synchronize the axles in a 4wd car (Bapro's patented system). This to avoid differentials damage and to be more precise in tests because power wasted in slippage inside the differentials is avoided too. Thanks also to this, BPA-4R HP dyno is extremely easy to be installed and the maintenance is almost absent.

Model	BPA-4R HP (2017 updated version)
• Roller diameter	400 mm
• Roller width	700 mm
• Maximum speed	360 km/h
• Maximum absorbable power	1.300 HP
• Maximum measurable power	2.000 HP (Sweep Power Test)
• Overall dimensions mm	3.470 x 5.345 x h. 460
• Max weight per axle (kg)	2.500 kg
• Voltage	400 V 50 Hz



## STANDARD FEATURES

- **2 Eddy currents brakes; 8 rollers paired with HTD belts, knurled over entire width**, finished by cut knurling
- **Infrared remote control** test bench management directly from vehicle cockpit
- **Lambda Input** to connect the vehicle lambda probe or an external controller
- **Boost pressure input** 0÷2.5 bar relative pressure  $\pm$  0.035 bar error
- **Fully functional management software; Pneumatic vehicle lifter**, with integrated rollers lock
- **Electric adjustment of vehicle wheelbase**

## OPTIONAL ACCESSORIES

- **Double ventilation system movable on wheels**, target power 6 kW, flow rate 44.000 m<sup>3</sup>/h
- **Single ventilation system movable on wheels**, target power 3 kW, flow rate 22.000 m<sup>3</sup>/h
- **Wide band lambda system** 5 wires wide band lambda probe with controller
- **Aluminum loading ramps** high width aluminum ramps. Necessary when test bench installed on the ground
- **Computer trolley** built by heavy duty lasting steel, Pro: heavy duty, movable, wide working surface
- **Proportional ventilation speed control** adjust the fan speed in function of the rollers speed
- **Roller covers** protect the rollers when the dynamometer is not working
- **Personal computer and display**
- **Safety Equipments:** Side safety barriers with logo panels, Anchoring ratchet straps, High attenuation ear muff

# 1 ROLLER MOTORCYCLE DYNAMOMETER BPM-1R S (Standard)

The **S series** comes standard with knurled rollers which provides the highest traction between rollers and tires, a guarantee of an extremely high accuracy in measurement. Equipped by eddy current brake all power is directly transferred from the wheels to the load cell. Especially designed for standard motorbike workshops, test lanes; this series has lower performances than our HP (High Performance) Series, maintaining the same accuracy and top level components, allowing to minimize test bench maintenance, over the years.

## Model

## BPM-1R S

• Roller diameter	400 mm
• Roller width	310 mm
• Maximum speed	330 km/h
• Maximum absorbable power	450 HP
• Maximum measurable power	500 HP
• Maximum pull strength (Traction force)	5.000 N
• Overall dimensions mm	2.560 x 1.860 x h. 410
• Max weight per axle kg	500
• Voltage	400 V 50 Hz

## STANDARD FEATURES

- **1 big diameter roller, knurled over the entire width**, finished by CNC cut knurling
- **Lambda Input** Allow to connect a lambda probe with an external controller
- **Fully functional management software**

## OPTIONAL ACCESSORIES

- **Safety Equipments:** Side safety barriers with logo, Anchoring ratchet straps, High attenuation ear muff
- **Single Ventilation system movable on wheels**, 3 kW, flow rate 22.000 m<sup>3</sup>/h with *remote control*
  - **Proportional ventilation speed control** adjust the fan speed in function of the roller speed
  - **Wide band lambda system** 5 wires wide band lambda probe with controller
  - **Front wheel adjustable mechanical lock** with or without front frame
  - **Integrated Tilttable ramp made by grating with gas springs**
    - Personal computer and display
    - PC trolley on wheels
    - Removable **aluminium alloy loading ramp**
    - Infrared **remote control**
    - **Boost pressure input**
    - **Air Conveyor**



## 2 ROLLERS MOTORCYCLE DYNAMOMETER BPM-2R HP (High Performance)

The HP series is the Bapro's highest performance chassis dynamometer. A couple of 400 mm diameter rollers, the best guarantee for the utmost in repeatability and accuracy. With a massive tubular frame made by high strength steel, this High Performance series suites all needs: Testing, R&D, Motorsport, Tuning and Chip Tuning. Bapro BPM-2R High Performance dynamometer is suitable for every kind of power and torque.

### Model **BPM-2R HP**

• Roller diameter	400 mm
• Roller width	310 mm
• Max speed	350 km/h
• Max absorbable power	500 HP
• Max measurable power	550 HP
• Max pull strength	5.000 N
• Overall dimensions mm	2.560 x 1.860
• Deck height mm	410
• Max weight per axle kg	500
• Voltage	400 v 50 Hz



### STANDARD FEATURES

- **2 big diameter rollers paired by HTD belts, knurled over the entire width**, finished by CNC cut knurling
- **Lambda Input** Allow to connect a lambda probe with an external controller
- **Fully functional management software**
- **Infrared remote control**

### OPTIONAL ACCESSORIES

- **PC support with Integrated Ventilation system**, target power 3 kW, flow rate 22.000 m<sup>3</sup>/h with *remote control*
- **Single Ventilation system movable on wheels**, 3 kW, flow rate 22.000 m<sup>3</sup>/h with *remote control*
- **Safety Equipments:** Side safety barriers with logo, Anchoring ratchet straps, High attenuation ear muff
- **Proportional ventilation speed control** adjust the fan speed in function of the rollers speed
- **Wide band lambda system** 5 wires wide band lambda probe with controller
- **Front wheel adjustable mechanical lock** with or without frame
- **Integrated Tiltable ramp made by grating with gas springs**
- Removable **aluminium alloy loading ramp**
- Personal computer and display
- Motorbike electric starter
- **Boost pressure input**
- PC trolley on wheels
- **Air Conveyor**

## Bapro high performance FAN cooling systems

In house developed fan with a perfect circular shaped wind output, optimized for our dynamometers. This fan provides up to 90 km/h wind speed. Matching you workshop power availability, starting from 3 kW.

Construction specifications:

- Round-shaped fan, with inspection door on the case.
- Protection net, motor side and impeller side, made of stainless steel AISI 304, according UNI 294 law.
- Balance's done according to UNI ISO 1940 regulation.
- During standard execution the electromotor has IP55 protection, CL F insulation, EEF2 efficiency, S1 service, tropicalized, each one built according to IEC/EEC (UNELMEC) laws.

Equipped with one or two counter rotating fans with an installed power of 3 or 6 kw (optional 2 or 4 kw), to allow you cool down the car, even under chassis parts like exhaust system.

**NOTE:** Bapro's test benches always require a proper ventilation system for vehicle cooling, in order to guarantee the maximum accuracy.

**OPTIONAL:** Proportional ventilation speed control system, adjust the fan speed in function of the rollers speed



**SINGLE fan system, movable on wheels (code FS1-22)**

- |                                   |                          |
|-----------------------------------|--------------------------|
| • <b>Airflow</b>                  | 22.000 cubic mt per hour |
| • <b>Wind speed</b>               | up to 90 km/h            |
| • <b>Weight</b>                   | 75 kg                    |
| • <b>Motor power</b>              | 3 kW                     |
| • <b>Power supply</b>             | 3/N/PE 400 V 50 Hz       |
| • <b>Dimensions (LxWxH) in mm</b> | 730 x 520 x 740          |



**DOUBLE fan system, movable on wheels (code FS2-44)**

- |                                   |                          |
|-----------------------------------|--------------------------|
| • <b>Airflow</b>                  | 44.000 cubic mt per hour |
| • <b>Wind speed</b>               | up to 90 km/h            |
| • <b>Weight</b>                   | 155 kg                   |
| • <b>Motor power</b>              | 6 kW                     |
| • <b>Power supply</b>             | 3/N/PE 400 V 50 Hz       |
| • <b>Dimensions (LxWxH) in mm</b> | 1500 x 520 x 740         |



# Bapro performance dynamometers - Software features

## Software functions

- Graphical, dynamic and numerical display of wheel power, power loss, engine power and torque
- Correction of engine power in accordance with DIN 70020, EWG, ECE-R15, ISP 1585
- Multilanguage customizable software, works with all Windows OS versions
- Continuous (sweep) and discrete (static) performance measurement
- Analysis of the performance diagrams through cursor function
- Possibility of running driving cycles for vehicles homologations
- Load simulation at constant RPM, speed and traction force
- Road simulation: slope%, air resistance, weight, frictions.
- Test program for speedometer indication
- Dedicated 'Engine Tuning' menu
- Graphical display of the measured values
- Clearly laid out A4 printout (diagram and table)
- Saving and loading of performance diagrams
- Exporting of datas

## Professional soundproof cabins for cars and motorcycles

Sound-insulated cabin made to measure according to installation site and specific requests. Under current legislation the installation of test benches within soundinsulated cabins is not mandatory, but with intensive use of test benches installation within a cabin is highly recommended.

The care taken when assembling the structure and the quality of the materials guarantee high levels of noise reduction from within the vehicle. This allows the test bench to coexist with any surrounding working or residential environment.

The structure can be customised in many ways; for example, extensive glazing can be produced to complement a waiting room/reception so that customers are presented with the high standard of technology, and professionalism being employed on their car for their appreciation.

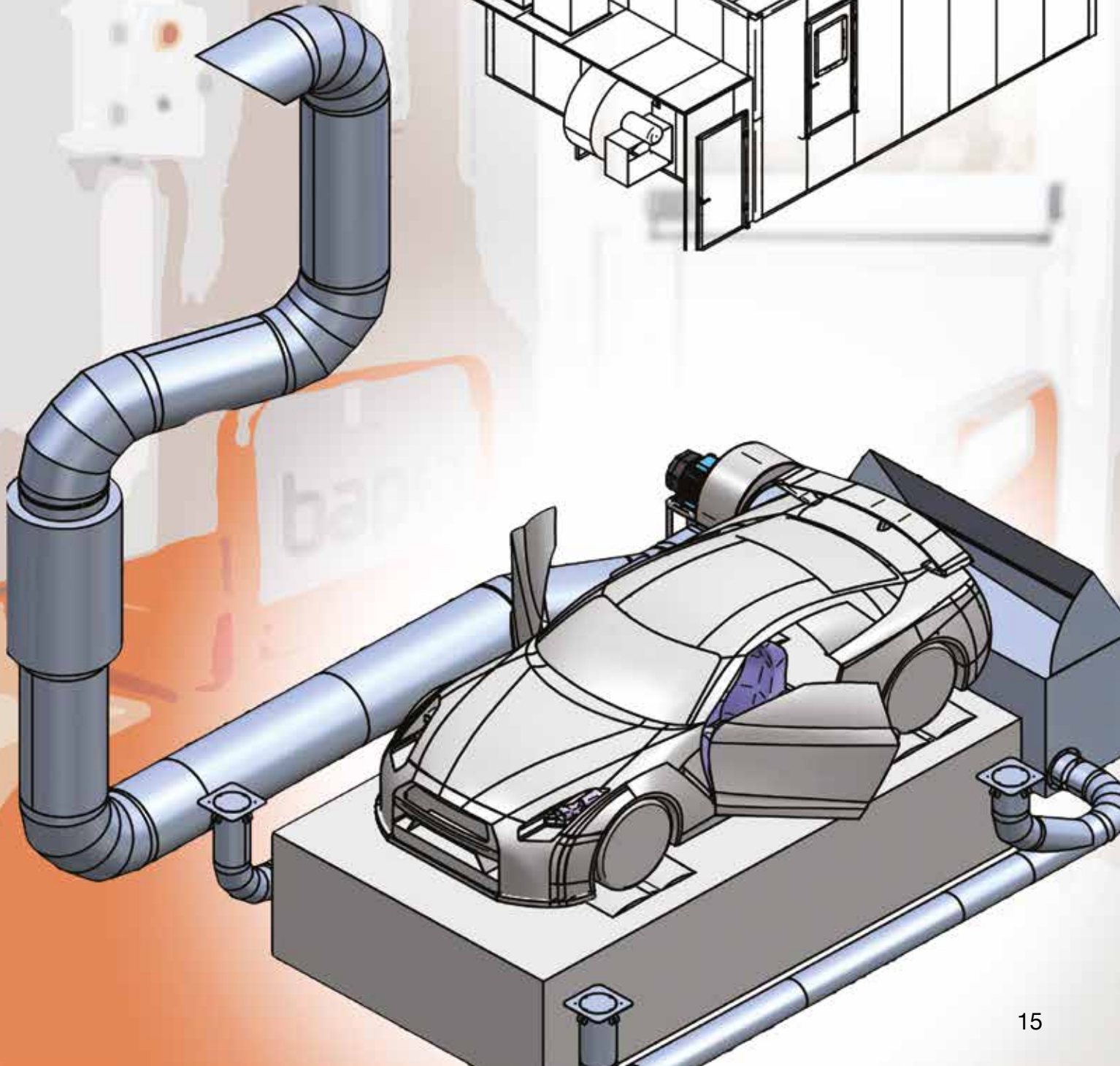
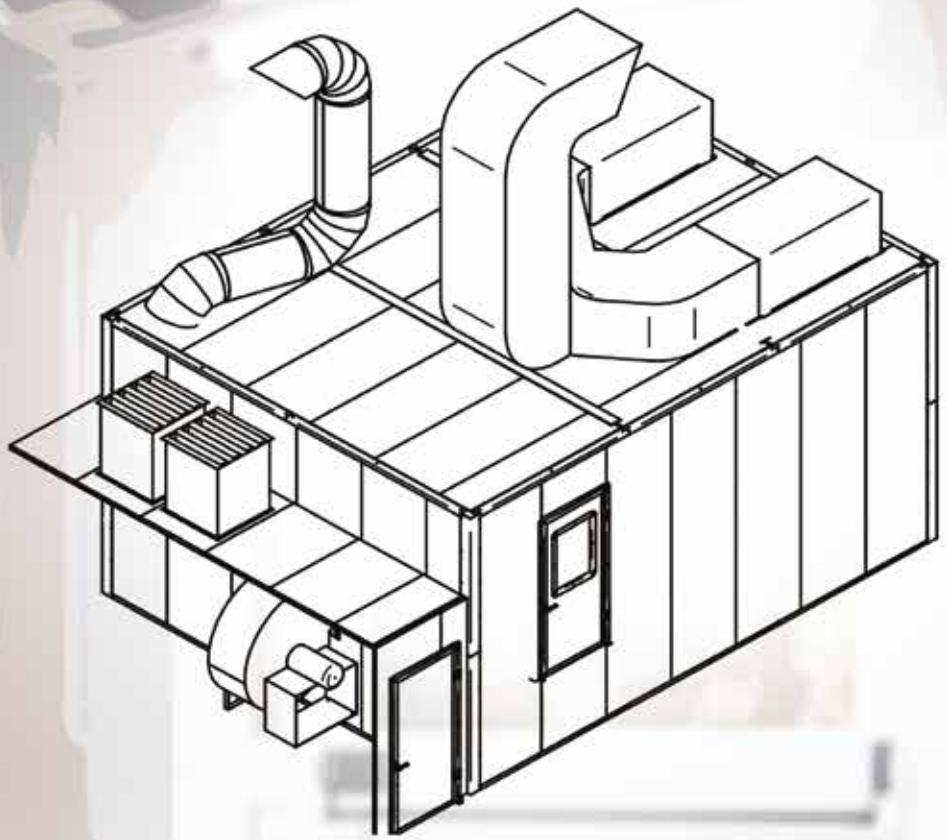
### Technical specifications:

The bearing structure is made up of steel beams onto which panels are fixed, made up of a prepainted metal support which is microperforated to achieve high sound absorption coefficients. The panels contain a substantial layer of material with a high level of soundproofing/sound absorption with certified reduction coefficient.

The cabin is equipped with a suitably sized ventilation system to allow correct internal air exchange and minimise the risk of reaching high temperatures which distort the results of the tests carried out at bench.



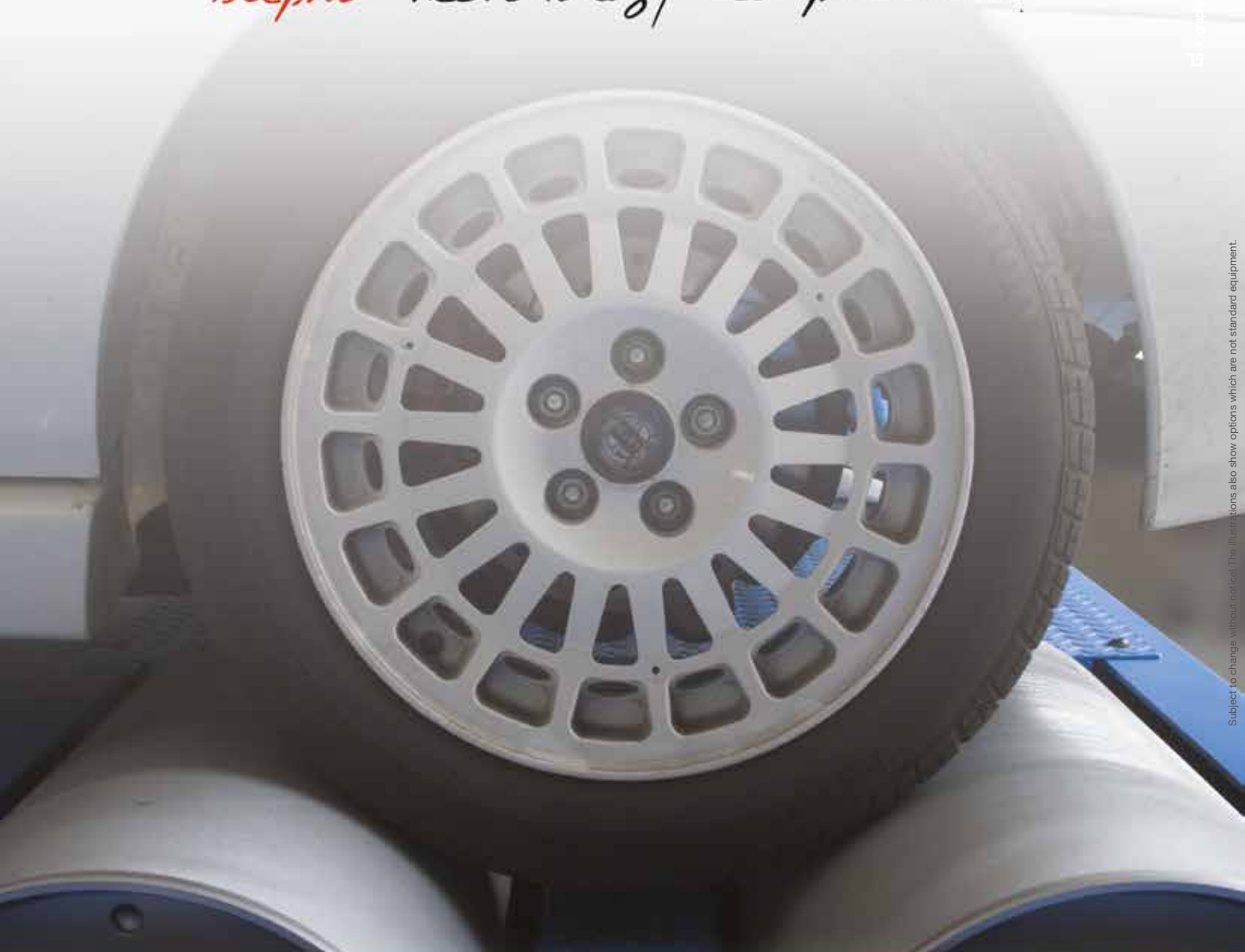
The ventilation system, like the exhaust gas intake system, is suitably silenced through silencers with sound absorbing partitions in order to insulate all possible noise. Every structure access point and visual element is produced with extreme attention to detail; the thresholds and stops are suitably lined with seals for total insulation. The cabin can be equipped with LPG and Methane sensors and corresponding alarm. The cabin is a turn-key product; supply includes electrical system, lighting and electrical system control panel.



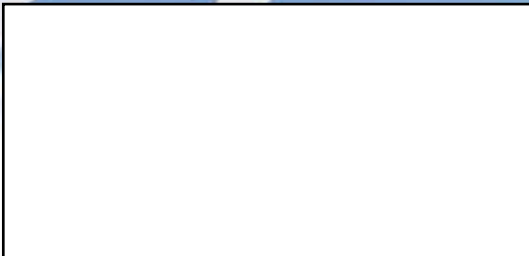
# bapro

## CHASSIS DYNAMOMETERS

*bapro Technology as passion!*



AUTHORIZED DEALER



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