



Chassis Dynamometer System

ROTOTEST VPA-RX88 4WD

Overview

The ROTOTEST VPA-RX™ chassis dynamometer is in reality a supreme engine dynamometer fitted to each drive wheel hub. The ROTOTEST VPA-RX™ chassis dynamometer revolutionizes the way complete vehicle testing is performed by allowing more to be done in less time and with less resources. But unlike a traditional chassis dynamometer (roller type) the ROTOTEST® dynamometer (hub type) is also an advanced true measurement™ instrument. This is accomplished by a front-end mounted torque transducer, a high resolution speed sensor and direct-coupling to the vehicle's hubs. The patented ROTOTEST® dynamometer concept is comparable to a "rolling road", but is far superior in precision and test possibilities as there is no slip between hubs and dynamometer (normally experienced between wheels and rollers), negligible system inertia and thanks to the accurate measuring system that is independent of the absorption system. Another great advantage of the ROTOTEST® chassis dynamometer is its portability. The complete test system can be easily transported to a new test site and set-up in minutes, the only requirement being a flat surface. The ROTOTEST VPA-RX™ range is based on the technology of the industry recognized ROTOTEST VPA-R™ range of dynamometers.

Description

The turn-key **ROTOTEST VPA-RX88™** 4WD Chassis Dynamometer System is delivered complete with dynamometer units, four Hurricane Cooling Units™ for dynamometer cooling and head wind, a control cabinet (SCU) with UPS, operator PC and real-time controller, and necessary cabling and hoses.

The ROTOTEST VPA-RX88 is designed for testing of vehicles in the high performance class. All parts in the system are designed for maximal endurance and for minimal service requirements.

The dynamometer is operated with the intuitive ROTOTEST DynoVision™ and measurement & reporting are conducted with the versatile and expandable ROTOTEST Datmon™. Both software applications are shared among all ROTOTEST® dynamometer models. Data values are displayed in real-time as analogue and digital values and sweep charts. Measurements are stored in an open, readily available format to allow customized analysis. Reports are generated in tables or graphs with optional automatic correction to selectable performance standards.



Exact model may be different than shown. Optional equipment may be shown.

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Characteristics

As part of the ROTOTEST VPA-RX™ range of dynamometer models, the characteristics of the ROTOTEST VPA-RX88™ model include:

- High level capacity to handle the high performance class in 2WD and 4WD
- Powerful and with a capacity to meet even the most stringent requirement
- Option rich

Standard features

Measurement

- True Measurement Technology™
- Direct Torque Measurement™
- Dead Weight Calibration
- ROTOTEST Torque Transducer™
- High-Definition Speed™

Test vehicle cooling

- Integrated Head Wind
- Straight Air Flow

Hydraulic system

- ROTOTEST® Ultra Fast Hydraulic Valve™
- Hydraulic Common Rail
- Compact Hydraulic System
- Advanced System Fluid
- ROTOTEST® Multi Gear Pumps™

Dynamometer mounting

- Perfect Dynamometer Connection™
- Advanced Dynamometer Suspension™
- Adjustable Pivot Centre
- Contractible Torque Arm

System control

- Natural Torque Distribution™, NTD Basic

Portability

- Portable Dynamometer System™
- Light weight dynamometer units
- All units wheel supported
- Transport Optimized Design

Functional design

- Negligible Parasitic Losses
- Ultra Low Inertia
- Tyre Safe™

- included as standard

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Specification overview

Maximum system performance

| | |
|---|----------------------------------|
| Power (maximum absorbed) | |
| 2WD | 800 kW / 1073 bhp |
| 4WD (50/50 split) | 1600 kW / 2146 bhp |
| Maximum Cooling Capacity (at 25°C), head wind | |
| 2WD | 480 kW, 2000 m ³ /min |
| 4WD (50/50 split) | 960 kW, 4000 m ³ /min |
| Torque (maximum absorbed at hubs) | |
| 2WD | 4200 Nm / 3098 lb-ft |
| 4WD (50/50 split) | 8400 Nm / 6196 lb-ft |
| Speed (maximum hub speed) | |
| 2WD | 2700 rpm |
| 4WD (equal) | 2700 rpm |
| Vehicle speed (equivalent, wheel dia 650 mm) | |
| 2WD / 4WD (equal) | 330 km/h / 205 mph |

Maximum axle load 3500 kg

Measuring accuracy

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|---------------------------|-------------------------------|
| Torque uncertainty | < 1% of measured value |
| Speed uncertainty | 0.1 rpm |
| Measurement repeatability | < 0.05% |

Operating environment

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|---------------------------|----------------------------|
| Ambient temperature range | +15 °C to +40 °C |
| Relative humidity | 10% to 90%, non-condensing |
| Altitude | < 1000 m above sea level |

System details

Main parts

| | |
|--------------------------|--|
| Dynamometer units | 2 axles of VPA-RX8 |
| Hurricane Cooling Units™ | 4 of HCU44 |
| System Central Unit | 1 of SCU4 with Uninterruptible Power Supply, UPS |
| Software (English) | 1 single-seat license for ROTOTEST DynoVision™ Professional |
| | 1 single-seat license for ROTOTEST Datmon™ Professional |
| Standard accessories kit | included , contains <ul style="list-style-type: none"> • Operators PC, monitor & keyboard • Electrical cables • Torque rod for calibration • Complete system fluid fill • Wheel Adapters, 4 stud • Wheel bolts M12x1.5 bolts • User and service manual (English) |

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ROTOTEST® DynoVision™ Test modules

Constant Speed

included, ROTOTEST® DynoVision™ Test Module that controls speed to a pre-set value independent of load.

Sweep

included, ROTOTEST® DynoVision™ Test Module that controls acceleration between two pre-set speeds.

Constant Torque

included, ROTOTEST® DynoVision™ Test Module that control torque to a pre-set value independent of speed.

Test cell (site) requirements

General

| | |
|-------------------------|--|
| Installation type | Above-ground, completely on-wheels, manoeuvrable by a single person. |
| Electrical power supply | single, 1 phase, 240 VAC (8A) or 120 VAC (16A) |
| Cooling water supply | None (air-cooled) |
| Pressurized air supply | None |

System options

| | |
|--|--|
| Sound Insulation Enabled Option | Enables use of ROTOTEST® Sound Insulation Accessory. |
| NVH Option | Enables analysis of high speed torque signal for Noise, Vibration and Harshness. |
| HCU cooling upgrade | Additional cooling elements for Hurricane Cooling Unit™, HCU to increase dynamometer cooling capacity and increase continuous power absorption capability. |
| Suspension shock-absorber upgrade (adjustable) | Upgrades dynamometer suspension system with Three way adjustable Ohlins shock-absorber. |
| Temperature range upgrade | Extends operational temperature range down to 0 °C. |
| System Central Unit, SCU Options | |
| Integrated Head Wind Enabled Option | Enables connection of ROTOTEST® Storm™ electrical fan to simulate head wind. |
| Drive Enabled Option | Enabled use of ROTOTEST® Drive Accessory. |
| SCU cooling upgrade | Additional cooling capacity of System Central Unit, SCU cabinet. |
| UPS capacity upgrade | Upgrades the Uninterruptible Power Supply, UPS for extended battery operation. |
| Flat panel display rack mounted on SCU cabinet | Flat panel mounting for 2 monitors on top of System Central Unit, SCU cabinet. |
| Flat panel size upgrade | Upgrades monitor to larger size. |
| SCU 4WD upgrade | Upgrades a 2WD System Central Unit, SCU to 4WD. |

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SCU-dynamometer cable length extension Extended cable length for flexibility in positioning the System Central Unit, SCU.

ROTOTEST® DynoVision™ optional Test modules

Transmission Package ROTOTEST® DynoVision™ Test Module that adds two additional test modes for individual speed or torque control of the dynamometers.

One Wheel Drive, 1WD ROTOTEST® DynoVision™ Test Module that allows tests to be conducted using a single dynamometer unit (one wheel).

ROTOTEST® DynoVision™ optional Modules

Calibration Report ROTOTEST® DynoVision™ Report Module that Documents all details relating to calibrating procedure.

Project Manager ROTOTEST® DynoVision™ Report Module that Documents time and operating time for specific projects.

CANOut™ Professional ROTOTEST® DynoVision™ Module that enables distribution of dyno data on a CAN bus (100 Hz). Used for example to connect dyno with ECU for analysis in ECU software. Used with isolated CAN-USB hardware interface.

ROTOTEST® Datmon™ optional Modules

DatCAN™ Professional ROTOTEST® Datmon™ Module that enable logging of data on a CAN bus (100 Hz). Used with Isolated CAN-USB interface. Used for example to display ECU data together with dyno data in ROTOTEST® Datmon.

LogOBD™ ROTOTEST® Datmon™ Module that enable Logging of generic signals from vehicles with On-Board-Diagnostic, OBD system. Use with Bluetooth OBD device.

System Accessories

ROTOTEST® Sound Insulation Sound insulation covers for dynamometer units for low noise requirements such as in semi-anechoic chambers. *Requires Sound Insulation Enabled Option.*

ROTOTEST® Calibration weights Specially designed calibration weights for optimal result during dynamometer torque calibration.

ROTOTEST® WCC – Water Cooling Cube Water/Oil cooling unit that replaces the air-cooling system. Used in NVH applications to eliminate fan noise or to minimize power dissipation into the test cell.

System Central Unit, SCU 2WD Free standing System Central Unit, SCU. Enables for example a 4WD system to be used as two independent 2WD systems.

HCU Protecting steel meshes (pair) Protects Hurricane Cooling Unit™, HCU during transport and handling. Recommended for portable use.

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Measurement & Connectivity Accessories

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| ROTOTEST® Datacq™ | Data acquisition system. Completely modularized to suit any logging requirement. |
| Isolated CAN-USB interface | Used in conjunction with CAN related modules. |
| Bluetooth OBD device | Used in conjunction with LogOBD™ module. |

Mounting Accessories

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|---------------------------------------|---|
| ROTOTEST® Wheel adapters, slotted | Slotted wheel adapters for ease-of-fit in multi car test production. |
| ROTOTEST® Wheel adapters, multi hole | Long-life wheel adapters with multiple PCD patterns. |
| ROTOTEST® Wheel adapters, custom made | Custom made wheel adapters with specific centre bore for perfect fit and minimal run-out. |
| ROTOTEST® Adapter Nuts and Bolts | ROTOTEST® precision shoulder nuts and bolts for attaching the ROTOTEST® wheel adapter to the vehicle wheel hub. The bolts and nuts are hardened for corrosion protection and long service life. |

Test Cell Accessories

ROTOTEST® Storm™



Electrical blower for head wind simulation of on-road conditions.
Requires Integrated Head Wind Enabled Option.

ROTOTEST Drive™



Electrical hub units for synchronizing speeds of non-driven wheels with driven wheels.
Requires Drive Enabled Option.

Spot cooling fan



Electrical radial fan (2.2kW) on wheels for spot cooling.

Exhaust extraction fan



Electrical exhaust extraction fan (2.2 kW) for stationary use in test cell. Minimum exhaust extraction tube diameter 250 mm.

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Services

ROTOTEST® Preventive Care & Maintenance Contract

- 1 on-site visit per year with preventive maintenance and safety and performance inspection.
- Selection, delivery and cost of materials for preventive maintenance
- Labour and travel expenses associated with preventive maintenance
- Detailed report of any issues found
- Updates of software and firmware (where applicable)
- Online support

Specification references

Parts

| | |
|---|--------------------------------|
| Dynamometer units | Specsheet-VPA-RX8 |
| Hurricane Cooling Units™ | Specsheet-HCU44 |
| System Central Unit, SCU | Specsheet-SCU |
| Mounting accessories, wheel adapters etc. | Infosheet-Mounting-Accessories |
| Standard accessories kit 4WD | Specsheet-StdAcc4WD |

Modules

| | |
|-----------------------|-----------------|
| Standard test modules | Specsheet-StdTM |
|-----------------------|-----------------|

Please contact a member of Rototest sales team for further information.



Rototest International AB

Salemsv 20
SE-144 40 Rönninge
SWEDEN
www.rototest.com
Tel: +46 8 532 55 890

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