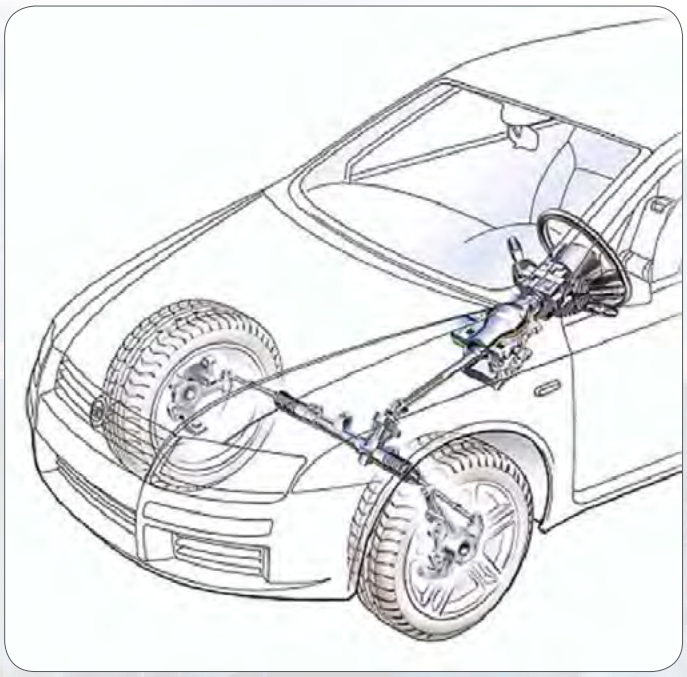
SERVOTEST

Steering Test Rigs

Steering Test Rigs

The World of Steering Test Machines

Steering column assemblies, are by their nature extremely safety critical, thus the ability to test them accurately and repeatedly is extremely important. There is also a need for the system to be flexible to simulate different in-car positions and environmental conditions. Servotest offers a range of 3 to 5 DOF systems to satisfy the requirements of steering system manufacturers.
New technologies are continually introduced into the hardware, instrumentation and software to keep the equipment at the forefront of the industry. All the equipment complies with International Standards including CE, MIL, ASTM, IEC, ISO and BS.



A world of experience…

Servotest is a World Class Test and Motion Simulation Company for multi national corporations, smaller specialist companies and Government Departments. Since the 1950's our engineers and equipment have been at the forefront of our industry. Product and Service quality is maintained by a program of continuous training and development of our engineers and equipment. We operate in all of the key industry sectors for our marketplace, including Automotive, Marine, Civil Engineering, Aviation, Defence, Aerospace and Traction. The company holds both ISO14001 and 9001 Quality accreditation marks and is a member of many national and international trade organizations. Our core customers include: BMW AG, CAERI, CAM GEARS, DAEWOO, DITAS TURKEY, FAW, FORD, JAGUAR, LUCAS, TRW.


Registration Schedule

SCOPE OF REGISTRATION

Design, Development & Manufacture of Servo Hydraulic Test & Motion Systems

Company Name: Servotest Testing Systems Ltd

Sites Registered: Unit 1 Brita Way, Thorpe Industrial Estate, Egham, Surrey, TW20 8RE

Standard: ISO 9001:2008

EAC: 18

Date of Re-Registration: 07/10/2013

Expiry Date: 01/08/2016

Certificate Number: AJA07/12025

Chief Executive - AJA Registrars Ltd


Registration Certificate

This is to certify that the Management Systems of

Servotest Testing Systems Ltd

have been assessed by AJA Registrars and registered against the requirements of

ISO 9001:2008

Certificate No. : AJA07/12025 Date of Original Registration : 15/08/2007

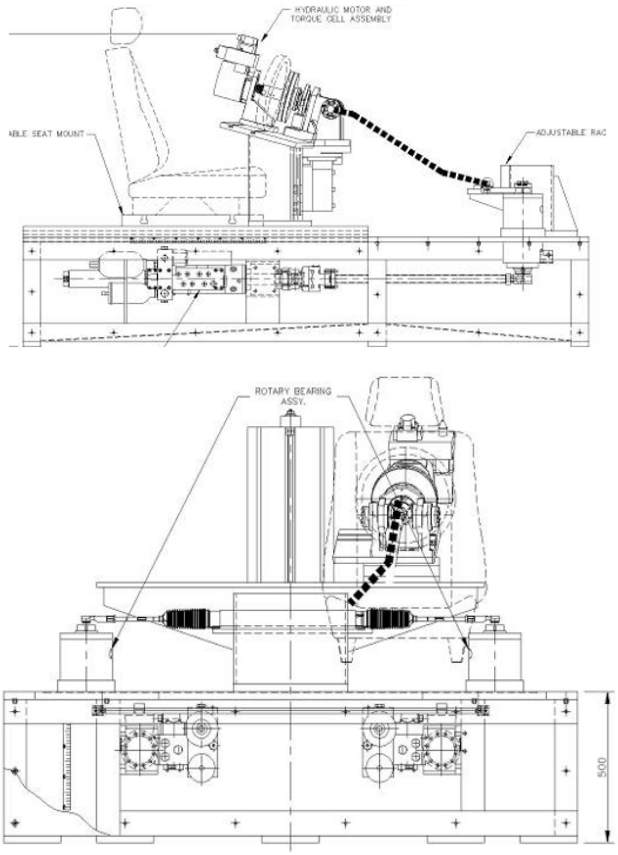
Expiry Date : 01/08/2016 Date of Re-Registration : 07/10/2013

Chief Executive - AJA Registrars Ltd

Servotest HyPAS Test Machine Range

The HyPAS-TM range is capable of subjecting the test samples to various loads and stresses such as:

- Torsional Vibration
- Torsional Impact
- Parking Cycles
- General Driving Cycles
- Axial Motion
- Temperature Cycling



HyPAS-TM Features

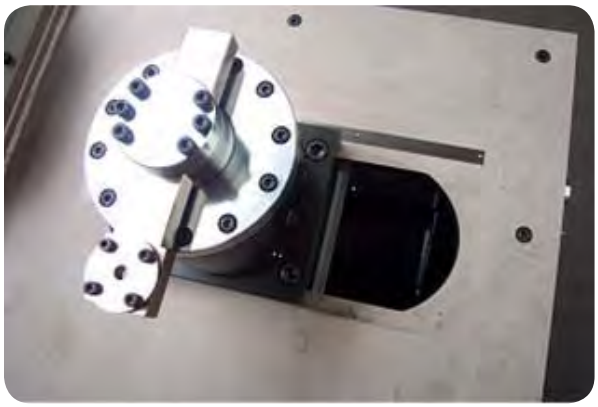
- Produces Readable, accurate and reliable data.
- Allows 3, 4 or 5 Axis simulation.
- Fully adjustable test machines to simulate different HyPAS systems from passenger cars to trucks.
- Adaptable design, accommodating Environmental chambers and Power Assisted Steering pump drives.
- Easy to use Windows based software to control the tests with block programmed or real time history loading sequences.

HyPAS-TM3

The 3 axis endurance test machine is designed to evaluate rotational and end load endurance limits. Machine assembly consists of support frame, bedplate and hydrostatic actuators. Load and motion inputs achieved through a combination of linear and rotary servohyraulic actuators.

Support framing assembly consists of a base frame 2000 mm wide x 2900 mm long, supporting a 2000mm x 1000mm steel Lower Frame and Bedplate for mounting the steering rods and a stiff fabrication forming the tilting rack and top plate assembly- 2200 mm long x 1600 mm x20mm (with M10 surface holes for mounting the rotary Actuator).

TA-100 (+/-720), 100Nm Rotary Actuator transmits torque through the Steering Column. Alignment with the steering electric drive (mounted on the tilting rack) and link rods is attainable through angular adjustment of the tilting rack over a range of 0-35° to the horizontal. Tilt rack is adjustable with a Screw jack and can be locked into position via bolts in sliders.

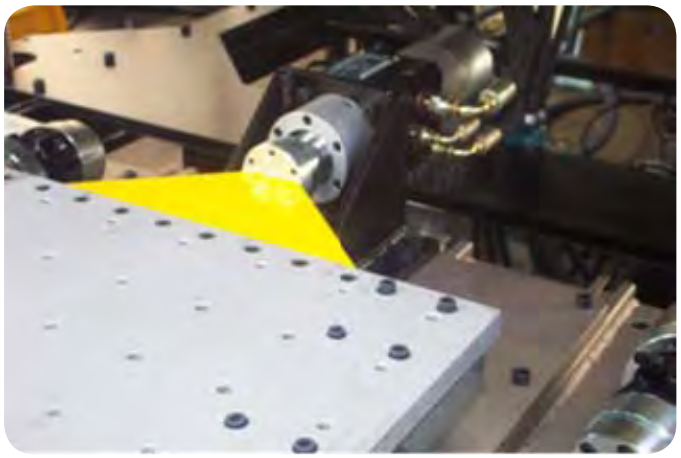


Two off Servotest Hydrostatic Linear actuators apply end loads via a bell crank mechanism mounted on two large bearings housed under bed plate. The actuators are mounted under the tilting table to optimise customer space requirements for the test rig.

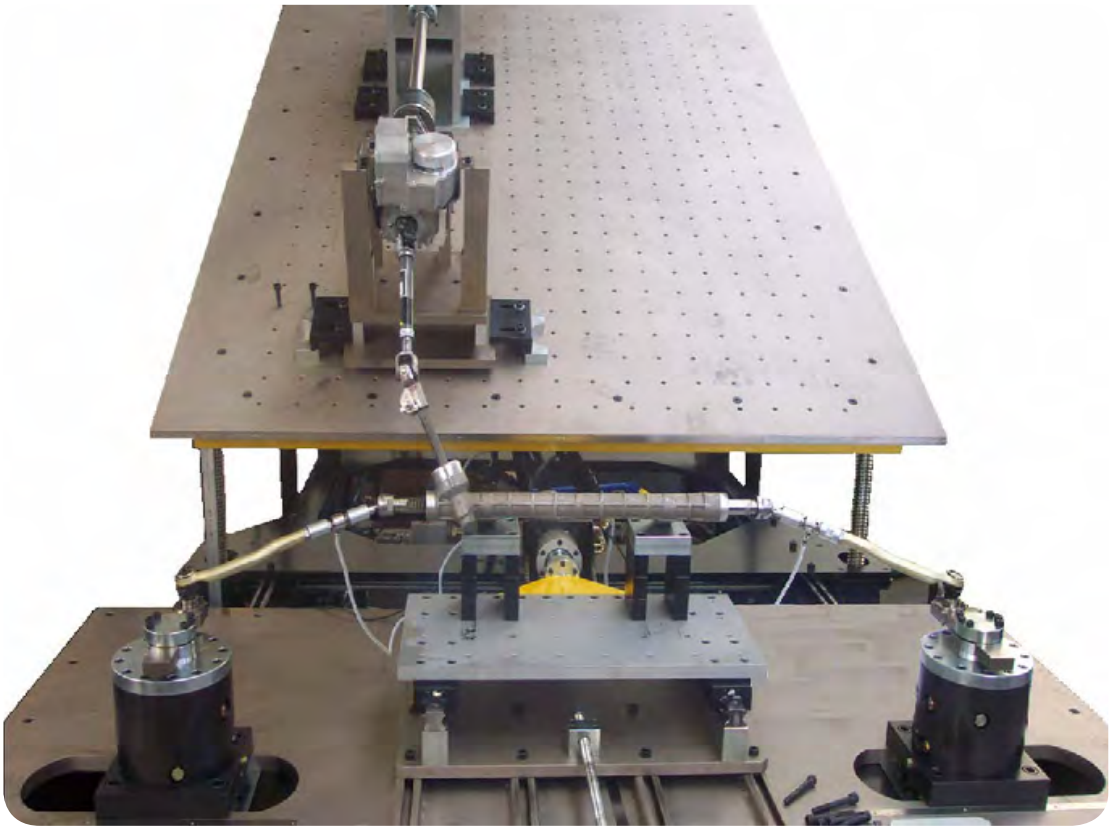
Servotest use Von-Ruden hydraulic motors, as they are widely accepted as the lowest friction, but most reliable roller-vane units on the market. They are then equipped with our own encoder unit on the tail-housing, dynamic torque cell box on the output shaft, and cross-manifold with close-coupled accumulators and MOOG 760 series servovalve – custom made to Servotest's specification.

HyPAS-TM4

Based on the HyPAS-TM3 system the HyPAS-TM4 system draws commonality in design and architecture of the HyPAS-TM3 unit thus allows for reduction in design and manufacturing costs. However as well as rotational and lateral /end loading the HyPAS-TM4 allows for steering column shock testing or frontal impact loading. This is represented by an additional 10KN -25mm linear actuator, and wobble plate (picture on the right) to provide fore/aft motion of the platform, resulting in a 4 axis simulation of the loads seen in actual steering



HyPAS-TM4 features Endurance test capacities with real time history data which can be exactly replicated on different locations (i.e. clients may perform the same validation test on many machines).



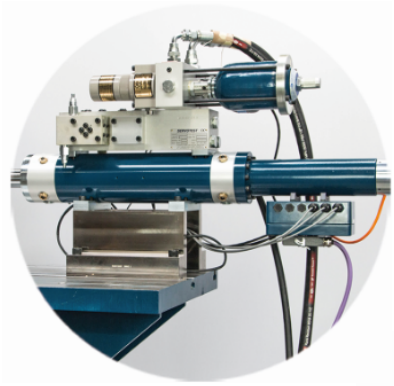
HyPAS-TM5

5 Channel steering rack test rig, with 1 off rotary Von Ruden hydraulic motor on pedestal inputting steering wheel inputs and two special combined linear rotary actuators which provide side load on the track end loads and vertical bounce.

The test rig is designed to perform endurance & simulation tests, on both mechanical and hydraulic steering boxes.

A three degree of freedom fixture allows the mounting of the specimen in the same position like in reality on the car, and therefore the reproduction of the same kinematics by properly dimensioning and positioning the steering arm and the steering drive head. The system can control the rotation of the pinion, the jounce motion and side load / displacement on each individual side of the rack.

The HyPAS-TM5 utilises 2 off Rotary/Linear actuators, which are a new concept in actuator designs, developed by Servotest, and designed especially for the HyPAS-TM Steering Test Machines range.



HyPAS-TM+

Servotest offer optional additions to expand the HyPAS-TM capability simulating a wide range of real world service conditions.

Power Assisted Steering “PAS” Pump

Power Assisted Steering pump drives for independent testing of pumps or for integration with HyPAS-TM3, TM4, & TM5 rigs.

PAS pump units allow for the testing of the pumps and /or testing the PAS steering system using the supply from the actual pump.

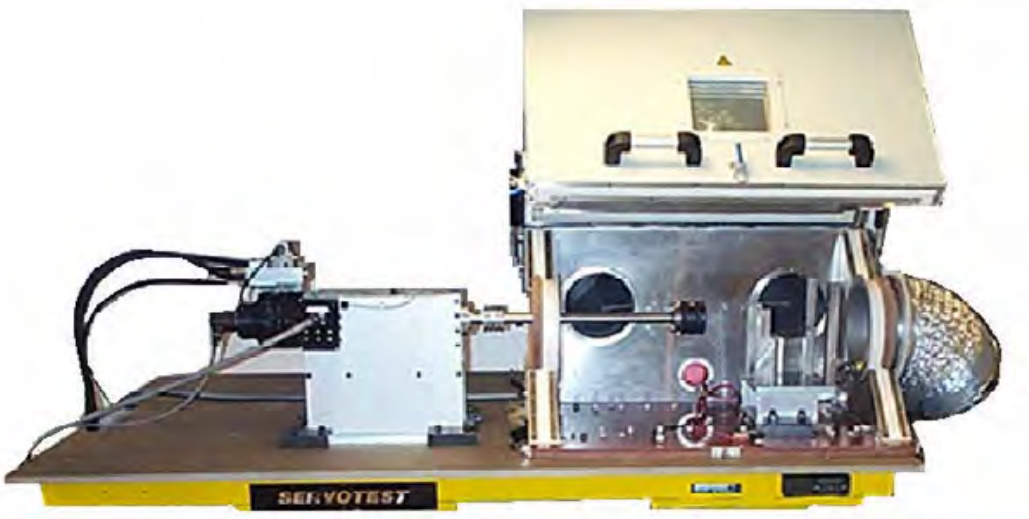
PAS pump drive systems to different temperature, speed and flow specifications can be offered.

EC Unit

The system is exceptionally versatile & flexible allowing load simulation under a wide spectrum of environmental conditions.

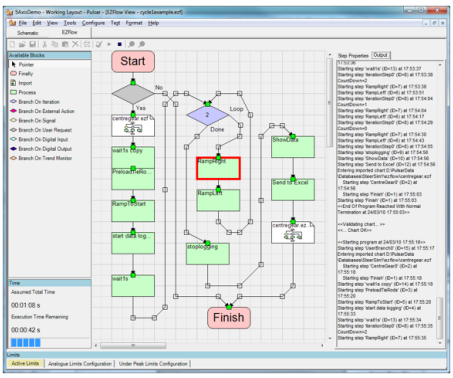
The electric steering drive is housed in an EC-Unit - Environmental Chamber to simulate the full range on in-service temperatures during life fatigue testing.

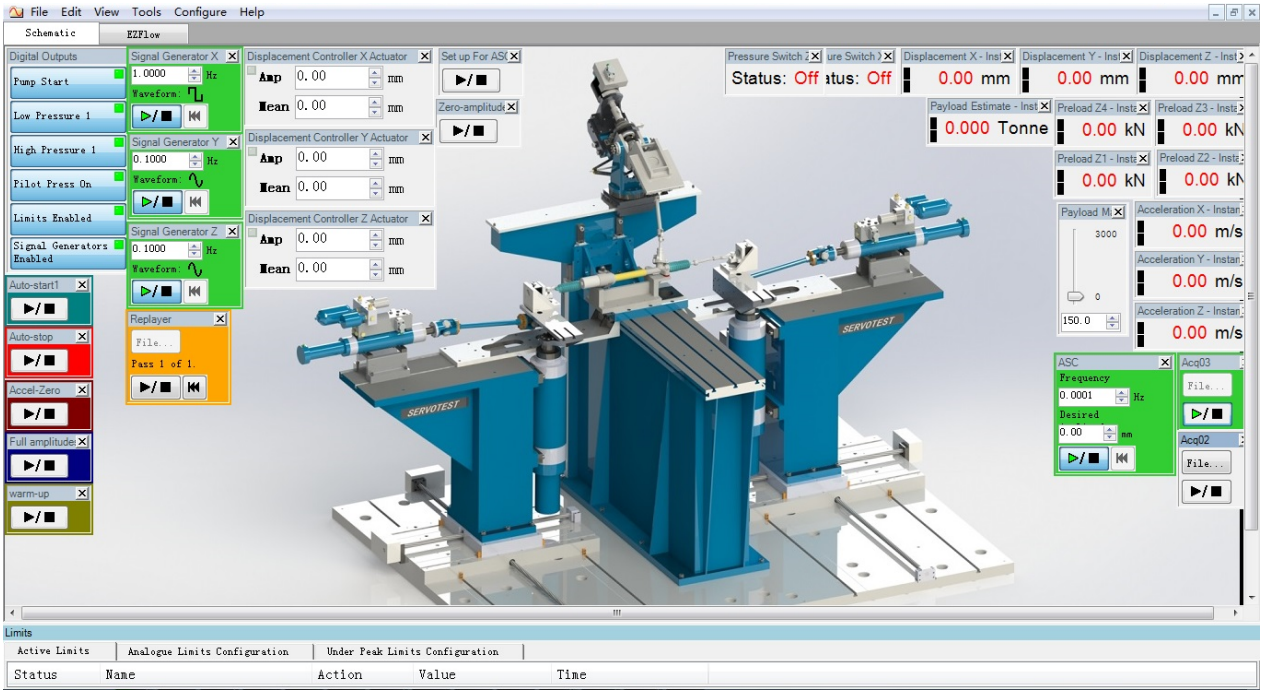
Minimum Temp range: -40

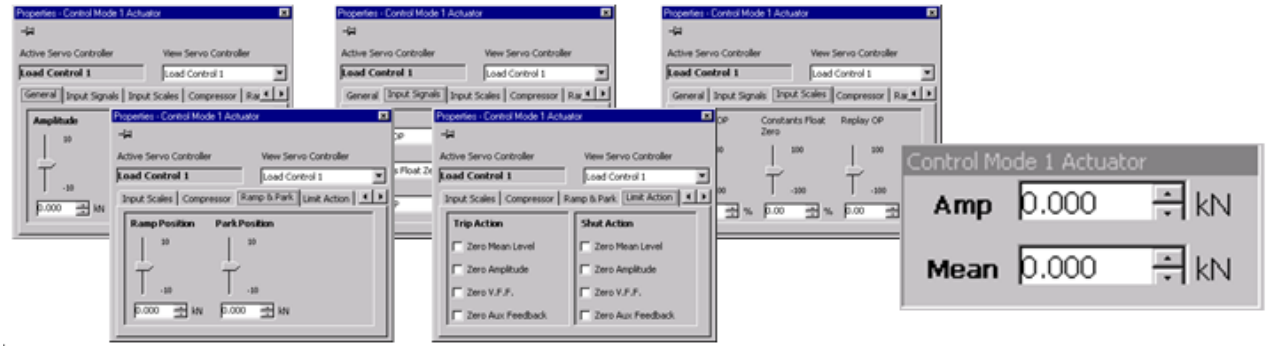


HyPAS-TM – PULSAR Digital Controller

HyPAS-TM Range operates on PULSAR - Servotest Digital control solution using the latest state-of-the-art technology in digital control for servohydraulic test and simulation systems. Based on a revolutionary I/O system (using distributed fibre-optic technology) the system employs state-of-the-art real-time control techniques to ensure optimum accuracy.







External communication and monitoring of other devices is achievable through Analogue input channels, and spare analogue input channels for the connection of measuring equipment such as thermocouples.

HyPAS-TM3 Specification

Number of axis	3
Actuators:	
Linear	2 off 25KN linear actuator: ±125 mm Static Capacity ± 34 KN at 210bar Dynamic capacity ± 25 KN at 155bar
Rotary	1 off Rotary Actuator Minimum Continuous running torque: 126Nm Rated pressure: 210 bar / 280 bar Minimum Continuous running torque: 126Nm Max continuous speed: 1,500 rpm (1,734 deg/s)
	Each Actuator is equipped with: • Integral coaxially mounted displacement transducer (LVDT) / Rotational equivalent • 2 stage high response 38l/min servovalves • 30 KN Load Cell / Torsion Cell Rated to +/-300 Nm torsion, +/-10 KN axial • High Force Self Aligning Bearings
Performance	Maximum achievable velocity= 0.56(m/s) for a range of frequencies from 1 to 11 Hz Please Note Frequency Response shown above is independent of power supply
Hydraulic Power Supply	From 25HP (19KW) powerpack unit powers the HyPAS-TM3 test machine, providing variable delivery, 40 l/min @210 bar (3000 PSI) hydraulic pump. Complete with Solenoid Distribution manifold, hoses and fittings.
Dimensions:	
Overall Machine	2.6 L x 2.0 D x 2.0 H
Horizontal Bed	1900 x 1000 x 50mm
Tilting Rack	2200 x 1400 x 50mm
Test Bed Rack	200 x 1700 x 40mm
Max Tilting Rack Adjustment	40 degrees
	Tilting Rack Height and rake adjustable via 50KN electric screw jacks. Flexible mounting positions via grid of holes of M12 drilled and tapped holes on a 100 mm matrix.

HyPAS-TM4 Specification

Number of axis	4
Actuators:	
Linear	2 off 25KN linear actuator: ±125 mm Static Capacity ± 34 KN at 210bar Dynamic capacity ± 25 KN at 155bar 1 off 10KN Wobble Actuator: ± 12.5mm Static Capacity ± 13.5 KN at 210bar Dynamic capacity ± 10 KN at 155bar
Rotary	1 off Rotary Actuator Minimum Continuous running torque: 126Nm Rated pressure: 210 bar / 280 bar Minimum Continuous running torque: 126Nm Max continuous speed: 1,500 rpm (1,734 deg/s)
	Each Actuator is equipped with: • Integral coaxially mounted displacement transducer (LVDT) / Rotational equivalent • 2 stage high response 38l/min servovalves • 30 KN Load Cell / Torsion Cell Rated to +/-300 Nm torsion, +/-10 KN axial • High Force Self Aligning Bearings
Performance	Maximum achievable velocity= 0.56(m/s) for a range of frequencies from 1 to 11 Hz Please Note Frequency Response shown above is independent of power supply
Hydraulic Power Supply	From 25HP (19KW) powerpack unit powers the HyPAS-TM4 test machine, providing variable delivery, 40 l/min @210 bar (3000 PSI) hydraulic pump. Complete with Solenoid Distribution manifold, hoses and fittings.
Dimensions:	
Overall Machine	2.6 L x 2.0 D x 2.0 H
Horizontal Bed	1900 x 1000 x 50mm
Tilting Rack	2200 x 1400 x 50mm
Test Bed Rack	200 x 1700 x 40mm
Max Tilting Rack Adjustment	40 degrees
	Tilting Rack Height and rake adjustable via 50KN electric screw jacks. Flexible mounting positions via grid of holes of M12 drilled and tapped holes on a 100 mm matrix.

HyPAS-TM5 Specification

Number of axis	5
Actuators:	
Linear/Rotary	**Linear jounce** 2 off 22KN linear actuator: ±125mm Static capacity: ± 27KN at 280 bar Dynamic capacity: ± 22KN at 225 bar Max jounce motion velocity:±4m/s 100mm diameter piston rod for extremely high lateral stiffness Complete with fully integral coaxially mounted LVDT displacement transducer Complete with high response three stage servovalve for road spectrum replication **Linear side load** 2 off 22KN linear actuator :±125mm Static capacity:±27KN at 280 bar Dynamic capactiy:±22KN at 225 bar Max side load velocity ±1m/s Complete with fully integral coaxially mounted Temposonic displacement transducer (0.02% linearity before compensation) Complete with 3D load cell for exactly steering force replicating Complete with local laser transducer measuring rack displacements Complete with zero backlash high force self-aligning bearings **Rotary actuator** 1 off rotary actuator Max continous running torque:±255Nm Rated pressure:210bar/280bar Complete with high resolution RVDT position transducer and accurate torque cell **Adjustment** Mounting pillar for steering inputs fully adjustable for left or right hand drive and for steering angles ranging Motorised base frames X-Y position adjustment to accommodate different vehicle steering gear geometries
Hydraulic Power Supply	From 192HP (142.5KW) powerpack unit powers the HyPAS-TM5 test machine, providing variable delivery, 225 l/min @280 bar hydraulic pump. Complete with Solenoid Distribution manifold, hoses and fittings.
Dimensions:	
Overall Machine	6m L x 3.2m W x 3.2m H
Local Control	**On site control system:** A hand held tablet PC is provided which is connected to the main Pulsar controller by WIFI. It duplicates all of the control and monitor functions of the Pulsar with a wireless connection and operator enters commands via a touch screen.

SERVOTEST

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