HORIBA
Automotive Test Systems

ESPRIT

Autumn 2009

The Newsletter with latest news and information

New MEXA-2000 SPCS

More compact - with many options

MEXA-6000FT Analysis system with FTIR technology

Many years of experience - quality guaranteed

Until the pipe glows...

The University of Applied Sciences in Schweinfurt installs an ultra-modern TITAN engine test stand with exhaust measuring system MEXA 1600D

DYNAS PM Synchronous machine

Extreme low inertia allows accurate vehicle simulation – installed at Darmstadt University

HORIBA on TV

The Swiss demonstrate it: Horiba Dynas3 HD600 test stand with Horiba Mexa 7500-DEGR exhaust measuring system, the perfect combination at EMPA

Dear Customers,

Climate change and the financial crisis have increasingly influenced research and development in the automotive industry. Goals such as reducing fuel consumption and therefore decreasing exhaust emission have received a renewed priority.

The research in the area of products which are needed for those goals continues, requiring innovation from all of us to cope with the demands of the market in the future.

Our new edition of ESPRIT not only includes new product information but also interesting applications of our customers.

As you can see HORIBA has developed into a company that not only offers and realizes products but can also provide engineering, project management and turn key solutions.

We hope you enjoy ESPRIT and we appreciate your interest in HORIBA.

Best Regards,
Jonathan Eaton

NEW - the MEXA - 2000SPCS

Now with substantially smaller dimensions and with Wide Range Continuous Diluter (WRCD)

Smaller Dimensions

With Wide Range Continuous Diluter (WRCD)

Based on the last PMP specifications for integration of Euro 5/6 regulations

Movable Main unit
HORIBA MEXA-2000SPCS

As a supplement to our already existing particle counting system MEXA-1000 SPCS, a further solid particle counting system, MEXA-2000SPCS has been developed for continuous measuring of solid particles within a specified size spectrum in the exhaust of combustion engines.

Because of market requirements for a more compact design, the MEXA-2000SPCS has been equipped with a separate optional calibration unit for the tests which do not have to be carried out daily. In addition, optimisation of the design has led to a more economic version.

The down-sized main unit provides high performance and flexible packaging to adapt to the various testing environments. The main unit and every additional unit are stand-alones, and are also available in a 19″ cabinet. The main unit is mobile. The compact dimensions (a 66% reduction in size) makes possible deployment in all test cells.

As with the MEXA-1000SPCS, the concentration of solid particles is determined by condensation particle counting (CPC).

The VPR of the MEXA-2000SPCS is made up of two diluters with a large dilution range (PND1 and PND2) and an evaporator unit (ET).

In contrast to other systems in the market, HORIBA uses the patented Wide Range Continuous Diluter (WRCD). Unlike a rotary diluter, the WRCD ensures that there will be no dirt in the diluting system and therefore no deajustment of dilution factor, as the Mass Flow Controllers (MFC) are not in contact with the exhaust.

In the first dilution stage (PND1) the sample is diluted with hot air at 191 °C. After this, the sample is heated in the evaporator unit to 350 °C. The process of hot dilution, evaporation and subsequent second dilution removes the volatile components, leaving the particles in a stable state. After this, aerosol is added to the CPC.

This method can also be used to measure tiny particles. For this reason, the method is used in exhaust treatment systems such as particulate filters and catalytic converters.

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Available options

Selector/Cyclone Unit (SCU)

Sample Return Unit (SRU)

Linearity Check Unit (LCU)

Dilution Factor Checker (DFC)

Volatile -particle Generation Unit (VGU)

HORIBA on TV - Live in Switzerland

Development of efficient and low-emission combustion process with tests on the new truck engine test stand at EMPA

The combustion engine department at the Swiss material testing and research institute (EMPA - Eidgenössische Materialprüfungs- und Forschungsanstalt) in Dübendorf near Zürich has a long tradition in the field of experimental work on vehicles and combustion engines. Right into the 1990s, the focus was on „testing“, since Switzerland had its own exhaust emission laws up until 1995, and EMPA predominantly carried out approval tests at this time.

When the EU exhaust emission laws were applied, this testing was no longer needed, and the approval activities related to conversion work and direct imports to Switzerland were passed on to the exhaust testing centre at the Berne University of Applied Science in Biel.

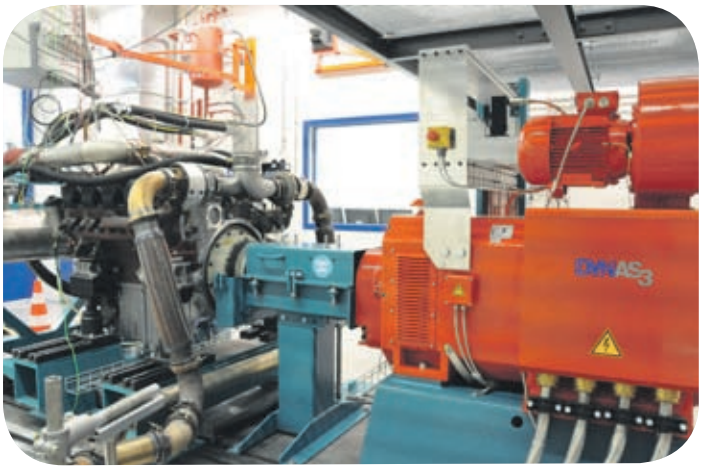
EMPA, which is part of the ETH along with the two universities of Technical Science ETH in Zürich and Lausanne, the Paul Scherrer Institute, the water research institute Eawag and the research institute for forests, snow and countryside WSL, reoriented itself about ten years ago, shifting focus to research, teaching and technology development, while routine work was outsourced to industrial partners or spin-offs.

Today, the focus in the combustion engine department is on industry-related R&D projects in the fields of passenger car gas engines, truck diesel engines and exhaust treatment systems.

In order to better link up the R&D activities of the individual institutions within the ETH better, different competence centres were founded in 2006 and provided with budgets to fund infrastructure and projects.

For many years, EMPA has been operating three exhaust chassis dyno test stands for passenger cars, two engine test stands for passenger cars and one truck engine test stand. Since the existing Schenck Dynas 680 equipped truck engine test stand, which has an upper torque limit of around 2500 Nm, was increasingly reaching its limits for R&D projects on modern highly charged engines, EMPA decided to set up a new, high-torque engine test stand. EMPA has been using Dynas engine test stands for years, and also uses HORIBA‘s STARS automation, with various MEXA 7000 and 9000 systems also in use in the field of conventional exhaust measurement. After careful evaluation of the various alternatives provided by different suppliers, selection was made in favour of a HORIBA TITAN D600 test stand as well as a HORIBA MEXA 7500-DEGR exhaust gas measurement system.

Delivery of the test stand



Installed test stand

The extension of the engine laboratory at EMPA, which includes a new prototyping area for vehicles as well as the new engine test stands, was opened at a ceremony on February 23, 2009. More than 100 invited guests from universities and industry took part, with a V8 truck engine on the new test stand providing the background sound track.

The new test stand now allows tests on engines to be carried out at up to 4000 Nm torque and is to be used for work on diesel, gas and hybrid drives in cooperation with universities and industry. The focus is on R&D projects for pollutant formation in the engine with conventional and alternative fuels, the development of new efficient and low-pollution combustion methods, the application of systems and the integration of new exhaust treatment technologies. Alongside conventional mechanical engineering work on drive systems, the broad chemical/analytical competence at EMPA also provides the opportunity to carry out trace analysis (e.g. gas chromatography, liquid chromatography, mass spectrometry, spectroscopy) as well as state-of-the-art surface analysis (e.g. TEM, REM, EDX).

Filming for the main news bulletin on Swiss television

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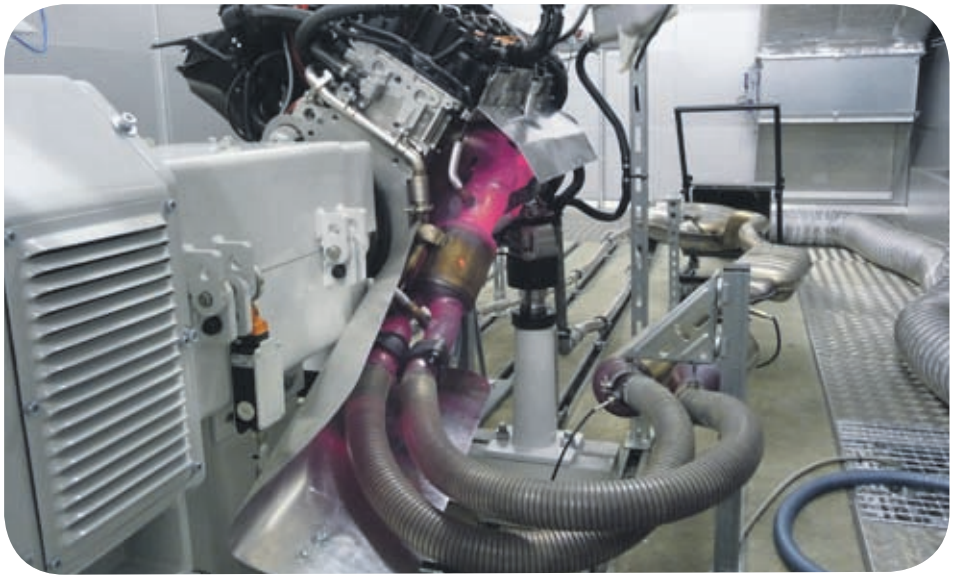
Until the pipe glows ...

The University of Applied Sciences in Schweinfurt installs an ultra-modern engine test stand of the series TITAN with exhaust measuring system MEXA 1600D

The students in the mechanical engineering/vehicle technology faculty at the University of Applied Sciences in Schweinfurt had to wait for two long years. Refurbishment of the combustion engine laboratory was finally completed in summer 2008. The large-equipment application made to the German research



Glowing exhaust system - no rarity in the Fachhochschule Schweinfurt

body (Deutsche Forschungsgemeinschaft DFG) by the head of the laboratory, Prof. Dr. Rolf Schlachter (mechanical engineering faculty) was successful, and against strong competition HORIBA won the public invitation to tender for a dynamic engine test stand.

The latest petrol and diesel engines for both passenger cars and trucks can be tested on the modular TITAN T250 dynamometer, equipped with a Dynas$_3$ HT250. The test stand facility is supplemented by high-precision measuring technology equipment: exhaust measurement and analysis is carried out by the MEXA 1600D with heated filter unit. The engine-specific temperatures and pressures are recorded by state-of-the-art precision measuring modules which are arranged on a pivoting boom directly above the test specimen. A fuel consumption measuring and conditioning system as well as a weather station complete the high-grade test stand equipment.

The automation system STARS makes highly flexible automated test sequences possible. In addition to controlling and coordinating all measuring equipment, it controls and monitors the test and the dynamometer and logs measuring data as well as performing data evaluation and reporting. The dynamic control processes required for this are carried out by the SPARC dynamometer controller.

Prof. Dr. Rolf Schlachter in front of the HORIBA test stand

At the moment, one of the most powerful induction engines is set up on the test stand: the new 3 litre BMW 6-cylinder in-line engine with a controlled intake manifold develops up to 190 kW and provides a constant max.torque of 300 Nm in the 2500 to 4000 rpm range.

This means students have a wide range of cutting-edge testing possibilities available. In the different tests they can become familiar with the experimental part of the development process of a combustion engine.

The economic use of the test stand was of course also considered; one important aspect of the new test cell design was its generous size. Thus application-related development work can also be carried out on the test stand as a service or within the context of cooperation projects.

We wish Prof. Dr. Rolf Schlachter and his students continued success and are proud that he decided in favour of HORIBA's innovative test stand technology.

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3. “STARS” Advanced User Group - Meeting

Almost 30 participants from all over Europe met in Affalterbach in April 2009 for the third meeting of the “STARS Advanced User Group”

The meeting was held of the “STARS Advanced User Group” in Affalterbach, on April 3rd, 2009. Almost 30 participants from all over Europe listened to news of the latest innovations and further developments in the area of STARS automation software.

Furthermore the latest information regarding the Light Duty and Heavy Duty emissions tests suites, LDEET and HDEET, was presented. The suites are comprehensive solutions for the testing of the emissions of cars and commercial vehicles for both development and, in the case of HDEET, legislative testing.

In conclusion the DoE tool and advanced mapping toolset Vega² was introduced that has been developed in cooperation with Ricardo.

A final discussion rounded off the event, which was held in an open forum allowing a useful exchange of experience.

The planning for the next event in the 2010 is already on-going at full speed.

Stock for fast delivery

Dynamometer	Data	on stock
W 190	190KW / 600 Nm / 10.000 U/min	3
WT2-380	380KW / 1200 Nm / 9.000 U/min	5
WT 300	300KW / 1200 Nm / 7.500 U/min	1
WT 470	470KW / 3000 Nm / 4.000 U/min	2
WTS 470	470KW / 2400 Nm / 7.000 U/min	2
WT2 600	600KW / 2000 Nm / 8.000 U/min	4
$DYNAS_3$ LI 460	460KW / 1000 Nm / 10.000 U/min	1
$DYNAS_3$ HD 460	460KW / 2680 Nm / 5.010 U/min	2

Dynamometer	Data	on stock
DT 700-1	700KW / 3000 Nm / 7.500 U/min	2
DT 900-1	900KW / 4000 Nm / 6.500 U/min	3
DT 1200-1	1200KW / 7500 Nm / 5.500 U/min	5
DT 2100-1	2100KW / 15000 Nm / 4.000 U/min	1
DT 6300-2	6300KW / 70000 Nm / 2.500 U/min	1
W 40	40KW / 75 Nm / 17.000 U/min	1
W 130	130KW / 400 Nm / 13.000 U/min	1
WS 230F	230KW / 750 Nm / 10.000 U/min	1
WS 400F	400 KW / 2000 Nm / 5.500 U/min	1
WS 700F	700 KW / 4000 Nm / 5.500 U/min	3

MEXA - 7000 NEWS

Tried-and-tested exhaust measuring technology MEXA 7000 improved in version 3

HORIBA MEXA-7000 V3

The MEXA-7000 series meets all current the emission regulations currently valid and represents the latest technical standard for exhaust measurement. Global sales of almost 4000 units, 550 of which are installed in Germany alone, is clear proof of this.

Version 3 delivers major improvements to the many users of this tried-and-tested exhaust measuring technology. A HOST computer connection (LAN for AK) with detailed communication protocol is standard and suitable for building up a test laboratory network.

The MEXA-7000 series was developed for the continuous measurement of the exhaust gases of all types of engines, from motor vehicles through ships, planes to lawn mowers and chain saws. This mainly applies to petrol and diesel engines. After modification, special fuels such as Bio fuel, CNG, LPG and hydrogen can also be measured. A MEXA-7000 system can measure for example CO, CO2, THC, NO/NOx, O2, N2O, SO2 etc. simultaneously with high dynamics. This applies for different measurment conditions such as raw gas, CVS as well as EGR and tracer measuring techniques.

The flexible, modular design with separate analysis, sample removal, voltage supply and valve unit allows HORIBA to offer you the system configuration that corresponds to your requirements.

Special features of the MEXA-7000 include:

- Modular design
- Compact
- Low operating expenses for electricity thanks to calendar function
- Low calibration gas and operating gas requirements
- Low measuring gas flow of 7 - 14 L/min per line (depending on the analysers used)
- Fast reaction time (Td + T90: ≤ 5 s with 5 m heated line)
- Selection of around 40 analysers, ovens (OVN), 19” and ANR rack analysers
- Modern network technology

We also have a new gas supply rack from the GSR-700 series available to supplement the MEXA 7000 Version 3.

This is a 19” rack that houses the complete 2nd pressure stage from 6 to 20 operating and calibration gases. The direct vicinity to the analysers significantly improves pressure stability.

Short line lengths for the critical gases CO and NO are vital for systems with low emission analysers and are provided for in the GSR concept. The “flushing paths” are kept short, thus minimising gas requirements.

The calibration and operating gases are indicated directly via the MCU of the MEXA-7000. HORIBA of course also provides the complete gas supply and gas monitoring in addition to the GSR.

All in all, the MEXA 7000 series from HORIBA provides you with tried-and-trusted, sturdy, highly accurate equipment, and the new version 3 reflects the input of your numerous proposals and suggestions. We thank all the users who were involved in this process.

The current Version 3 MEXA-7000 offers the following features:

Function	Details
New document function	Manual can be viewed on screen through PDF viewer.
New calendar timer	Settings can be made for every day of the week. The overnight function is also supported by the new calendar function.
New ADC function Analogue-digital converter	Analogue subsidiary signals can be displayed with customer settings in a special window - option.
Simple line selection	Easy access to line selection using the new “select button”.
Standstill flushing	Automatic flushing function to reduce soiling in the sample line or the analyser modules.
Delay setup	Function for adapting the delay time (Td).
Radiator temperature	Indication of radiator temperature for EU and EPA – HDD 07
Alarms can be freely configured	Alarms that stop the measuring process as soon as the respective alarm appears can be selected.
Servicing and TCS monitor function	Analyser servicing and temperature images can be viewed in separate windows during measurement.
Improved overnight functions	NOx converter check, NDIR CO2 interference check and leak-check processes have been added to the overnight run menu.
Improved GDC-703 setting function	“Dividing points” of the GDC-703 required by the customer can be stored in as standards in the MCU (max. 16 standards).
Improved alarm functions	Details of the alarms are indicated in a special window.
FID O2 interference check	FID O2 interference can be checked using a testing gas cylinder (semi-automatic) - option
Calibration warning	Pre-warning appears before the calibration warning is given.
Servicing warning	Servicing intervals of all units can be viewed in a special window.

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High dynamic testing with DYNAS PM and STARS

Laboratory for combustion engines - Faculty of Mechanical Engineering and Plastics Technology Darmstadt University

Targets

The laboratory for combustion engines at Darmstadt University is a facility belonging to the faculty of mechanical engineering and plastics technology. The laboratory aims to deepen students' knowledge in the field of engine technology through practical experience. Following the philosophy that work in conjunction with research provides a good basis for practical and modern teaching, research and development projects are carried out in the laboratory parallel to laboratory work.

Experience

The laboratory can look back on long years of experience in processing research and development projects in the field of engine thermal dynamics and emission technology. For example, studies have been carried out,to optimise the nozzle geometry of diesel engines, the cold-start emissions of petrol and diesel engines and the automatic engine characteristics. In addition, comprehensive knowledge related to the research and development of systems and components for exhaust treatment for both petrol and diesel engines is available.

Equipment

To do justice to its aims, the laboratory has been continually improved over the past 10 years and brought up to the latest test stand and measuring technology standard. This not only allows students to be taught using modern engine technology, it also guarantees that basic knowledge is acquired in the ever more complex area of test stand and measuring technology.
Thus, for example, the loading units for operating combustion engines have been gradually changed over completely from stationary and transient systems to highly dynamic machine and control technology. The laboratory has three highly dynamic test stands which allow the simulation of complex and heavily transient operating states such as those that typically occur during the operation of combustion engines in vehicles. This makes it possible to simulate engine behaviour during vehicle operation. The vehicle is practically simulated in the laboratory.

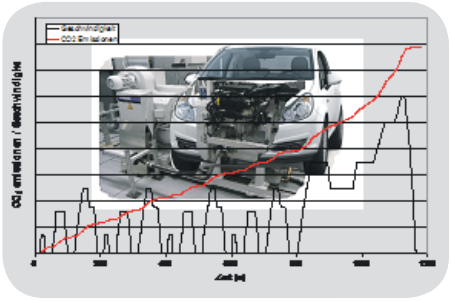
To make reproducible measurement of emissions and consumption values possible, the engines are supplied with air that has been conditioned in terms of temperature and humidity. The increasingly important issues of environment and fuel consumption can only be examined with the help of emission and consumption measuring technology. Here, too, the laboratory has the very latest in measuring technology available, making possible a second-by-second resolution of the measured values.

Test stand

The test stand supplied by HORIBA makes possible the dynamic testing of combustion engines, including simulation of the system environment of vehicle / driver / road.

Data:

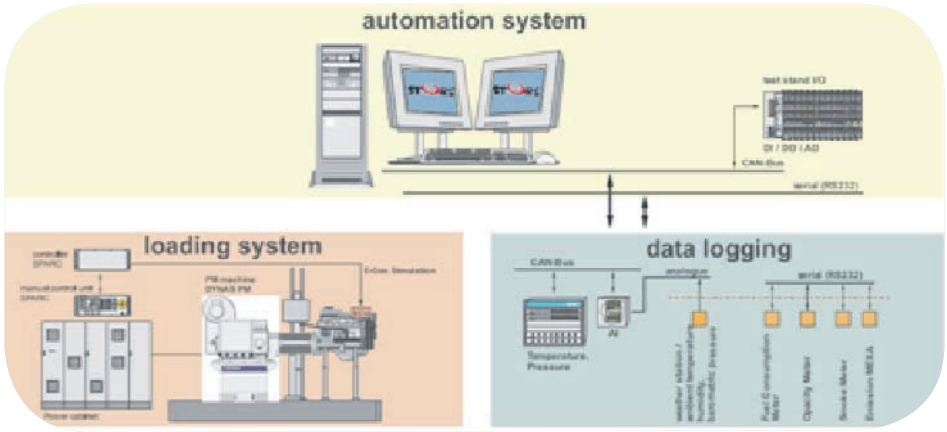
Power:	330 kW
Torque:	450 Nm
Speed:	10000 rpm
Acceleration:	35000 rpm/s
Moment of inertia:	0.136 kgm2



Test stand automation STARS

For test preparation, data management, manual and automatic test processes, process visualisation, test stand monitoring, test and result evaluation, the powerful STARS real time system is deployed. Its many advantages include:

- Powerful real time system
- PC-based automation platform
- Graphic workflows that are easy to operate
- Limiting value monitoring on several levels
- Several dataloggers up to 1 kHz
- Flexible display pages
- ASAM ACI, MCD3 interfaces



Drive unit and loading unit motor using the latest DYNAS PM technology

The PM synchronous machine with very small moment of inertia offers high speed dynamics, real idling simulation (e.g. open clutch), and simulation of realistic start/stop behaviour. The compact design allows it to be connected to an original exhaust system.

Both sides, the Hochschule Darmstadt and HORIBA want to expand the contact and further co-operation.

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SPARC ENGINE

The new software release with new functions and features is now available.

After the launch of the new SPARC Engine controller in mid- 2006, a multitude of new functions and features especially in the area of simulation and new motor concepts for motor testing are now available with the new software release. In addition this version includes new functions in connection with our load installations.

We have also reworked our options policy so that many of the previous options are now available as standard equipment on our controllers. And last but no least we have also changed our logo in order to show that our contollers work more closely and effectively with our automation systems.

The new main points are:

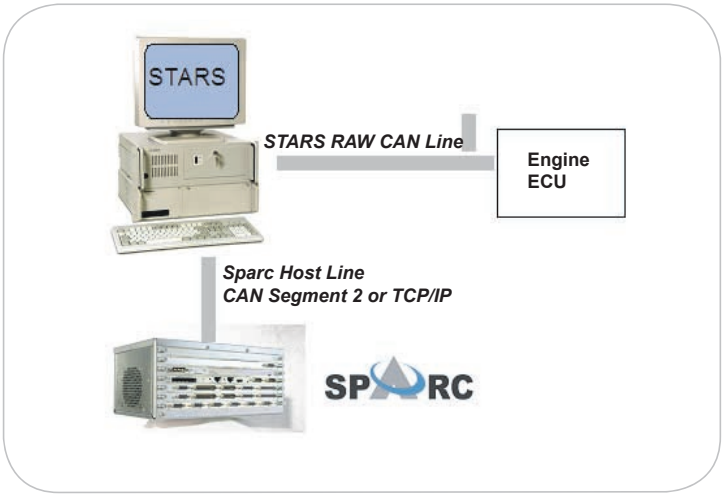
- **Direct control of the motor by use of an autonomous motor controller in the motor control device.**
- **Open interfaces with external "real-time simulation models"**
- **Converter control via CAN**
- **Expanded control of the pneumatic inflow valve with hydraulic brakes**
- **Integration of the proven Dyno monitor concept now also with WT brakes**

Modern internal combustion motors are equipped today with a multitude of control devices which guarantee optimal control of the exhaust emissions, fuel consumption, traction, brakes etc..

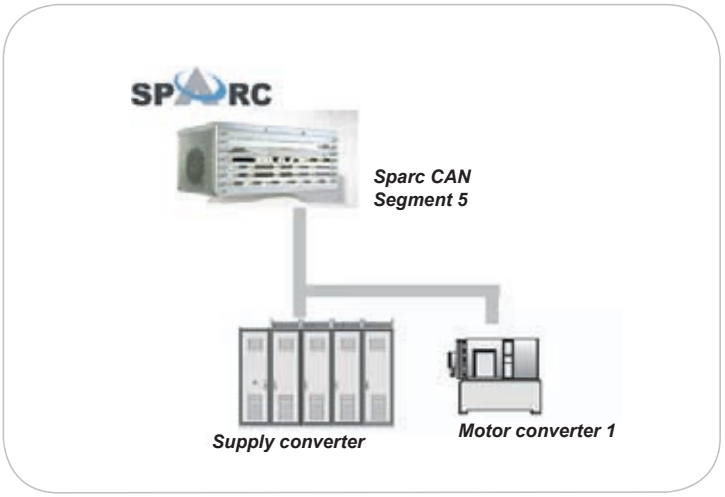
The ECU or EDC especially offer many control and monitoring functions which are also relevant for the motor test stand. These devices are equipped with special internal torque and engine speed governors, which mean that the previous control concepts are no longer applicable.

SPARC now offers especially for such motors the possibility to include these control algorithms in the testing without intervening in the internal SPARC motor controller.

In collaboration with STARS the new SPARC release now offers a significantly more flexible interface for direct motor control. The user is now in a position to react with much more flexibility to changes within the control strategies of a new motor or a new version of a control device as he was with the more inflexible implantation. Thanks to the open system structure of our automation system, we now offer a really open and flexible, future oriented interface without the restrictions on control, plausibility check, and rest bus simulation.



Beginning immediately the following features which were previously only available as options for test stand identification, characteristic loss curve, enhanced monitoring as well, and parameter determination as well as pre-control of motor characteristics are contained in the standard package in connection with the STARS automation. The control occurs immediately via a CAN bus in digital form with our new converters.



Problems like analogue offset or coupling of external disturbances with the control signals are thereby history.

Non-linearities with D/A and A/D conversion no longer play a role.

The signal resolution is immediately a real 16 bit. With a clock rate of 1 msec. per control cycle significantly more dynamic and precise test results are achievable.

The new STARS release opens the door to the world of simulation. It is now possible to integrate customer specific simulation models in real time in the SPARC control structure. This in term makes it possible to refer back to the broad existing internal customer know-how of the simulation world. Integrate your own drivers or automatic transmission models directly in the test stand controller.

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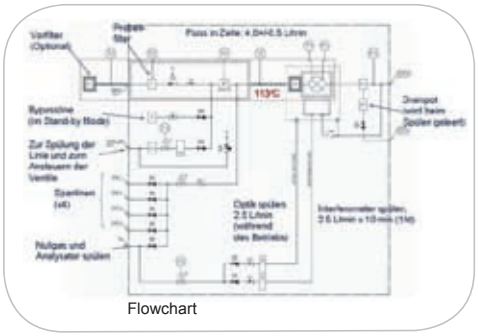
MEXA 6000 FTIR

The MEXA 6000 FTIR – is a multi-component analysis system, which works according to the principle of the Fourier transformed infrared spectroscopy (FTIR)

The MEXA 6000 FTIR is the leading measuring device on the market for measuring a large number of gases extremely accurately using the FTIR method.

Decades of experience and know-how in the area of exhaust gas measuring technology have made this perfection possible. Please test it for yourself!



Flowchart

Components		Measuring ranges	
		Standard	CNG (optional)
Carbon monoxide	CO	0- 200 ppm 0-1.000 ppm 0-5.000 ppm 0- 2 vol% 0- 10 vol%	0- 200 ppm 0-1.000 ppm 0-5.000 ppm 0- 2 vol% 0- 10 vol%
Carbon dioxide	CO_2	0- 1 vol% 0- 5 vol% 0- 20 vol%	0- 1 vol% 0- 5 vol% 0- 20 vol%
Nitrogen oxide	NO	0- 200 ppm 0-1.000 ppm 0-5.000 ppm	0- 200 ppm 0-1.000 ppm 0-5.000 ppm
Nitrogen dioxide	NO_2	0- 200 ppm	0- 200 ppm
Nitrous oxide	N_2O	0- 200 ppm	0- 200 ppm
Water	H_2O	0- 24 vol%	0- 24 vol%
Ammoniac	NH_3	0-1.000 ppm	0-1.000 ppm
Sulphur dioxide	SO_2	0- 200 ppm	0- 200 ppm
Formaldehyde	HCHO	0- 500 ppm	0- 200 ppm
Formic acid	HCOOH	0- 100 ppm	0- 100 ppm
Methane	CH_4	0- 500 ppm	0- 500 ppm 0-2.000 ppm 0- 1 vol%
Ethylene	C_2H_4	0- 500 ppm	0- 200 ppm
Ethane	C_2H_6	0- 200 ppm	0- 500 ppm
Propylene	C_3H_6	0- 200 ppm	--
Propane	C_3H_8	--	0- 200 ppm
1.3-Butadiene	1,3-C_4H_6	0- 200 ppm	--
Isobutene	iso-C_4H_8	0- 200 ppm	--
n-butane	n-C_4H_{10}	--	0- 100 ppm
Isobutane	iso-C_4H_{10}	--	0- 100 ppm
Benzene	C_6H_6	0- 500 ppm	--
Toluol	C_7H_8	0- 500 ppm	--
(NO + NO_2)		(∑ von NO und NO_2)	(∑ von NO und NO_2)

The MEXA-6000FT is a multi-component analysis system that works according to the principle of Fourier Transformed Infrared Spectroscopy (FTIR).

The system is suitable for continual use, both for raw measurements and diluted measurements of limited and non-limited combustion engines components. It can also be used for the development of efficiency of catalytic converters as well as for determining toxic elements in the air.

- Gas treatment with measuring gas pump and filter, heated to 113 °C
- Interferometer (atmospheric)
- Connection of 4 calibration gases and zero gas
- Computer with monitor and keyboard
- AK interface
- Condensation trap
- 19“ rack

Operation is automated to a major extent and can be carried out by a trained operator.Only pure nitrogen (N2) is required as a calibration gas (zero-point calibration). Calibration with a calibration gas is not usually required, but can be carried out if the relevant calibration gases are available.

The FTIR measuring system is supplied ready-calibrated for the specified components - see list above.

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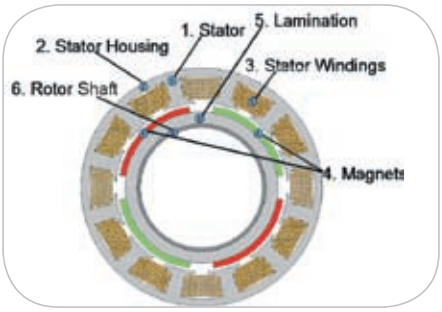
DYNAS PM

The new series of compact high-performance testing machines

Due to the increasing requirements for our dynamometers regarding dynamics and compact size, HORIBA decided to develop a permanent magnet dynamo-



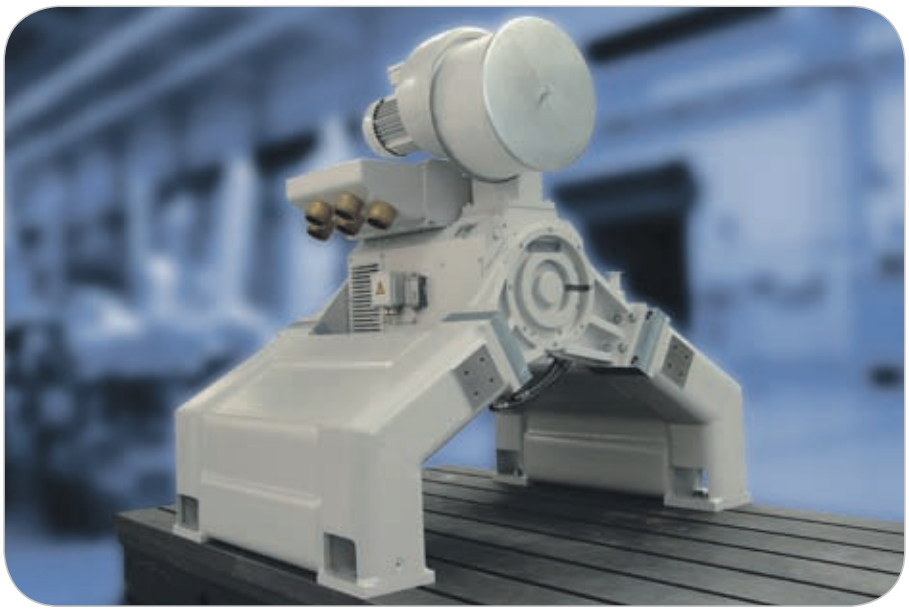
meter series as a second machine series in addition to the well known and accepted DYNAS$_3$ AC-machine series.
The PM machines were developed in order to respond to market demands for a compact series of high-performance test machines for expanded motor tests. The strengths of the PM technology are:

- High performance density: 2 times that of AC motors
- Low inertia: 4 times less than AC motors
- High rate of acceleration: up to 90,000 U./min within one second
- Fast torque response: < 2 ms

The permanent magnet dyno is a synchronous machine with a rotor which is equipped with permanent magnets. This working principle is differentiated from asynchronous machines, in which the rotor current is generated in order to form a magnetic field by induction.

In an engine test bed application a PM-dyno has the following advantages:

- For a vehicle start/stop test in a RLS test, the very low inertia of the dyno improves the performance of the clutch simulation.
- Due to their low inertia the PM machines cover a wider range of motors.
- Because of the shaft versions, equivalent AC motor connections are only deployed for smaller motors.
- The compact size and the small center height of the PM machines allows emission measurements on a test stand with the original exhaust system because it can installed under the PM machines.



DYNAS PM 470 - High End Dynamometer for advanced engine testing

These PM models are currently available:

DYNAS PM 470
- inertia: 0.15 kgm²
- center height: 200 mm
- power (gen): 346 kW
- rated speed/max. speed (gen): 6000/8010 rpm
- rated/max. torque (gen): 550/660 Nm

DYNAS PM 470
- inertia: 0.55 kgm²
- center height: 250 mm
- power (gen): 472 kW
- rated speed/max. speed (gen): 4500/9000 rpm
- rated/max. torque (gen): 1000/1200 Nm

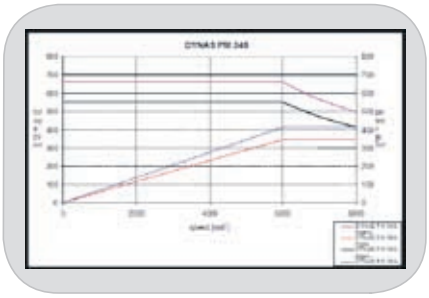


Diagram DYNAS PM 340

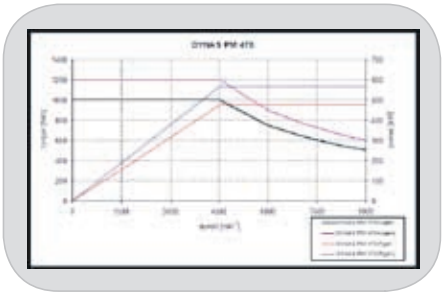


Diagram DYNAS PM 470

More information:

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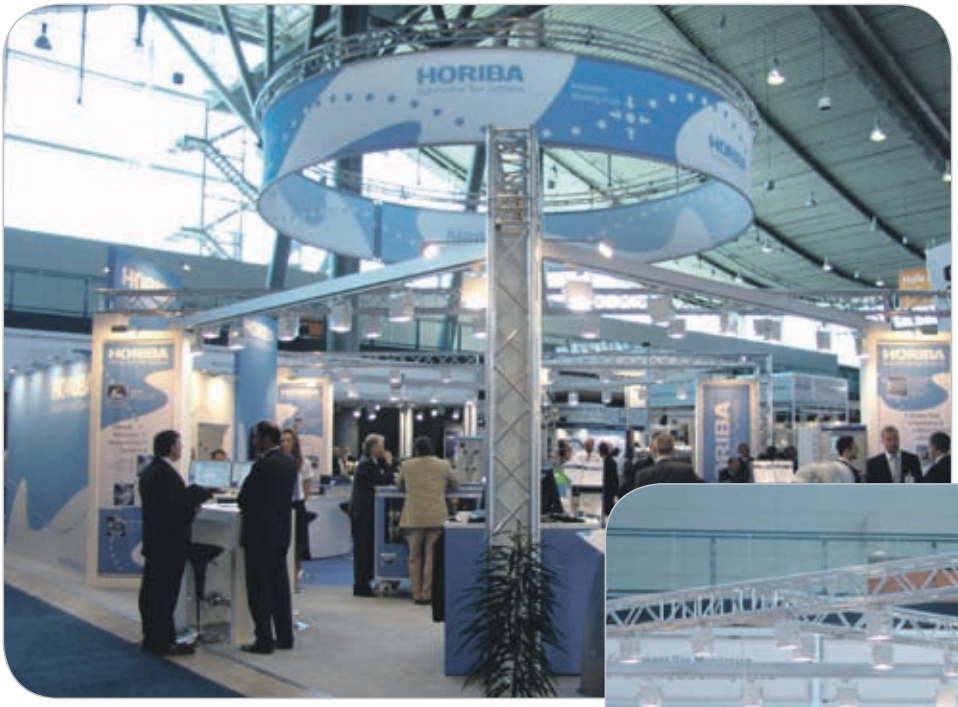
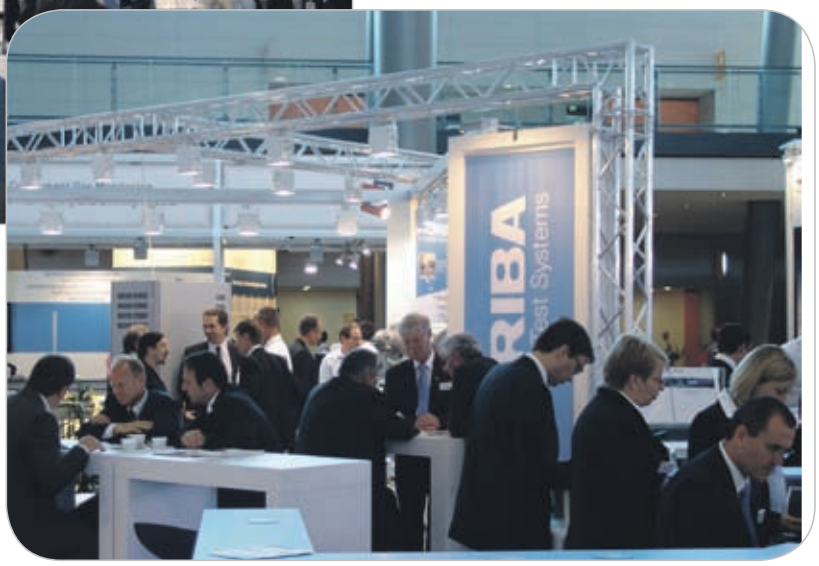
No time for Testing Expo 2009 in Stuttgart?

... no problem. We will gladly show you all the new products in a personal discussion.





This year HORIBA appeared with a new booth design - Open, communicative and with many new products in the portfolio, during the Testing EXPO 2009, 16.06. - 18,06 in Stuttgart. Even if you did not have time to visit us at our exhibition booth, we will be glad to discuss all of our new and existing products directly with you.

- O Heavy Duty Engine Emissions Test Suite for STARS (Engl.)
- O Light Duty Exhaust Emissions Test Suite for STARS (Engl.)
- O Abgasmesssysteme Produktübersicht (Germ.)
- O SPARC Brake SABC Stand Alone Brake Controller (Engl.)
- O Produktkatalog 2009 – Motorenprüfstände (Germ.)
- O VULCAN EMS-CD48L Fahrzeugprüfstand (Germ.)
- O VULCAN - Fahrzeugprüfstand Applikation Abgasuntersuchung (Germ.)
- O Emissions Measurement Systems - Product Overview (Engl.)
- O HORIBA Automotive Test Systems – Unternehmensprofil (Germ.)
- O Lösungen Bremsenprüftechnik – Produktübersicht (Germ.)
- O Solutions for Brake Testing - Product Overview (Engl.)
- O Chassis Dynamometer - Exhaust Emission Application (Engl.)
- O STARS LITE - Ready-to-run automation package (Engl.)
- O DYNAS3 - for Driveline Application and Components (Engl.)
- O Solutions for Driveline Testing - Product Overview (Engl.)
- O Wind Tunnel Balances - Standard and Customized Solutions (Engl.)
- O Services Solutions - For Your Testing Technology (Engl.)
- O Serviceleistungen - Lösungen für Ihre Prüftechnik (Germ.)
- O PTFM-1000 - Pitot Tube Flow Meter (Engl.)
- O Lösungen für Motoren-Prüftechnik – Übersichtskatalog (Germ.)
- O Solutions for Engine Testing - Product Overview (Engl.)
- O Z-Line - Neue Prüfstandskonzepte für die Motorenentwicklung zum Einsatz von originalen Abgassystemen (Germ.)
- O TORQCAL - Automatisierte Drehmomentkalibriereinrichtung (Germ.)
- O TORQCAL - Automated Torque Calibration (Engl.)
- O SPARC - Plate forme de contrôle Performante et intelligente (Fr.)
- O DYNAS3 - Machines asynchrones pour bancs d´essais moteurs (Fr.)

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Dynas User Club formed

After delivering almost 1000 DYNAS machines the Dynas User Club was formed, in order to exchange experience and ideas.

In 1990 the first Dynas dynamometer units were delivered by HORIBA (Schenck) – the change from co-current flow to three phase current drive technology in the application of dynamometers was completed.

Since then almost 1000 pieces were delivered all over the world and are working successfully for customers.
Because of this success story and our concern to meet the requirements of our customers, the idea to form a Dynas User Club was born.

No sooner said than done we sent out invitations and 30 customer partners in Germany showed interest in a membership.

Because of the bad economic situation not all of them were able to attend our founding meeting.

Still it turned out to be an interesting and useful day for all the participants and for us. We presented our recent developments in the field of endurance systems and the innovation works in progress to meet future requirements.

Users swapped experiences, and ideas for improvement, new applications and resulting requirements were discussed and recorded by us for later realization.

Or customers also had the opportunity to see Dynas innovations and whole solutions by means of practical examples in the production line.

All in all it was a very constructive and encouraging day, which we would like to repeat at least once a year from now on.

If you are not yet a member, but are interested in becoming one, Ms. Brigitte Hamer would be delighted to make contact with you.

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Do you have questions, or need more information?
We are here to help you!

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