

# Foreword to the Special Issue of Dynamometer Systems

🔊 Dynamometer, Simulation, New vehicle development, Emission gas regulations, Vehicle running mode,  
PM motor

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## 1. Preface

Meidensia Corporation seeks the "creation of new technologies." The company is striving to offer its technologies and products to the customers so that its expertise can play an important role in creating a more advanced society and a comfortable environment. Recently, in particular, the company sets up a motto of "be friendly to the earth" and has supplied its products to a variety of industrial fields such as energy, environment, information and communication, and general industries.

In the field of energy, we have developed more advanced and useful systems for power generation, power transformation, and transmission and distribution for the stabilized supply of electrical power. In addition, we have devised many updated systems for the efficient utilization of natural energy, such as mini-hydraulic power generation facilities, photovoltaic power generation, wind power generation, biomass power generation, and so on. The advent of a cogeneration system is also an example. This system assures a very high energetic efficiency. Still more, our attention has also been paid to the microgas turbine power generation systems that work on various kinds of fuel, the emission gas denitrification systems, the power storage systems, and others.

In the field of environment, we are proud of sewage water treatment technologies based on many accumulated achievements endorsed by more than half a century of our manufacturing experience. These systems ensure advanced treatments for the improvement of water quality. Our industrial waste treatment systems do not emit dioxin. All these systems contribute very much to better environment.

In the field of information and communication, we have developed the concentrated plant supervisory control systems, the business data processing systems where the network versatility is actively utilized, the overall building management systems to support the solution of contemporary problems in regard to energy conservation and labor saving.

In the field of general industries, we have supplied various types of dynamometer systems that will be introduced in this special edition. These dynamometer

systems have contributed extremely to the improvement of fuel cost for vehicles, as well as that of exhaust gas performance. In addition, we have supplied high-efficiency motors and speed control equipment, useful for energy and resources conservation, and also offered physical distribution engineering to this field, which can contribute to the creation of rationalized and unattended facilities.

The dynamometer systems introduced in this special issue are indispensable for the development of cars. In addition to the above-mentioned improvements on fuel cost and exhaust gas performance, our systems are in support of in the development of new cars in key challenges concerned with vehicles, such as the reduction of noise, the improvement of safety performance and vehicle controllability, the advancement of cabin comfort, the advancement of car intelligence, and many others.

In the recent dynamometer systems, the latest "simulation technology" has been applied to the improvement of measurement accuracy and the improvement of the simulation of the road condition, in order to promote developments based mainly on the "eco-friendliness" concept.

This special issue of dynamometer systems introduces the dynamometer-system-applied products and part of new technologies, to which the company is addressing itself in conjunction with the keywords of "simulation" and "eco-friendliness."

## 2. New Simulation-Applied Dynamometers and Systems

For the purpose of shortening the test period and reducing the test unit numbers, not only steady state test but transient characteristic test becomes more popular. In the evaluation of the transient characteristics, a new approach by simulation is rapidly becoming popular, where only the object being tested is a real one and all the other parts and components are put into software models through the active utilization of the latest IT applications. Thanks to the adoption of this useful approach, it is now possible to achieve the required evaluation of a vehicle element without any anxiety about the synchronized development of other

closely-linked key elements. This approach has greatly contributed to the improvement of efficient development. To meet these contemporary needs, Meidensha Corporation has developed a new simulation-applied dynamometer: the low inertial hyper-dynamometer (PCDY 11-330) for transient testing applying the permanent niagnet (PM) motor technology and the low-speed PM dynamometer (PMDY-LV220) and the ultra-high-speed dynamometer for EV motor testing, which is a FREC dynamometer applied product.

The liquid-cooled PM dynamiometer has also been developed for the chassis dynamometer series intended for use for car testing. In addition to conventional mode running, it is then possible to realize simulation testing such as tire slippage and others.

### 3. Clean Air Act-Compliant Testing Systems

Environmental problems, and particularly the problems of exhaust gases by large-sized diesel engine vehicles, became a social issue to be addressed. Joint Research Center for advanced Diesel engine system (JRCD) constructed for the National Institute of Advanced Industrial Science and Technology (AIST) (an independent administrative juridical person), to be introduced in this issue, possesses a system projected to solve these problems. This system is composed of

an engine dynamometer subsystem, an ultra-low concentration exhaust gas measuring chassis dynamometer subsystem, and an environmental chassis dynamometer subsystem. This system is designed to be applicable to the new long-term domestic emission gas regulations to be gradually introduced from 2005 to 2011. It is a system installed on the full-turnkey basis. Meidensha Corporation has completed this system with its total capability in the form of a joint venture (JV) organization.

### 4. Postscript

Dynamometer system-applied products and part of their new technologies have been introduced here.

The company will continue to manufacture products for the future to meet the new requirements of its customers based on the middle- and long-term problems that must be solved during the development of next-generation vehicles. In addition, the company will offer various proposals in regard to the manufacturing of more satisfactory products and systems. It is our hope that you will deepen your understanding about our dynamometer system applied products and their new technologies by this edition. We would like to ask every customer for kind guidance and suggestions.