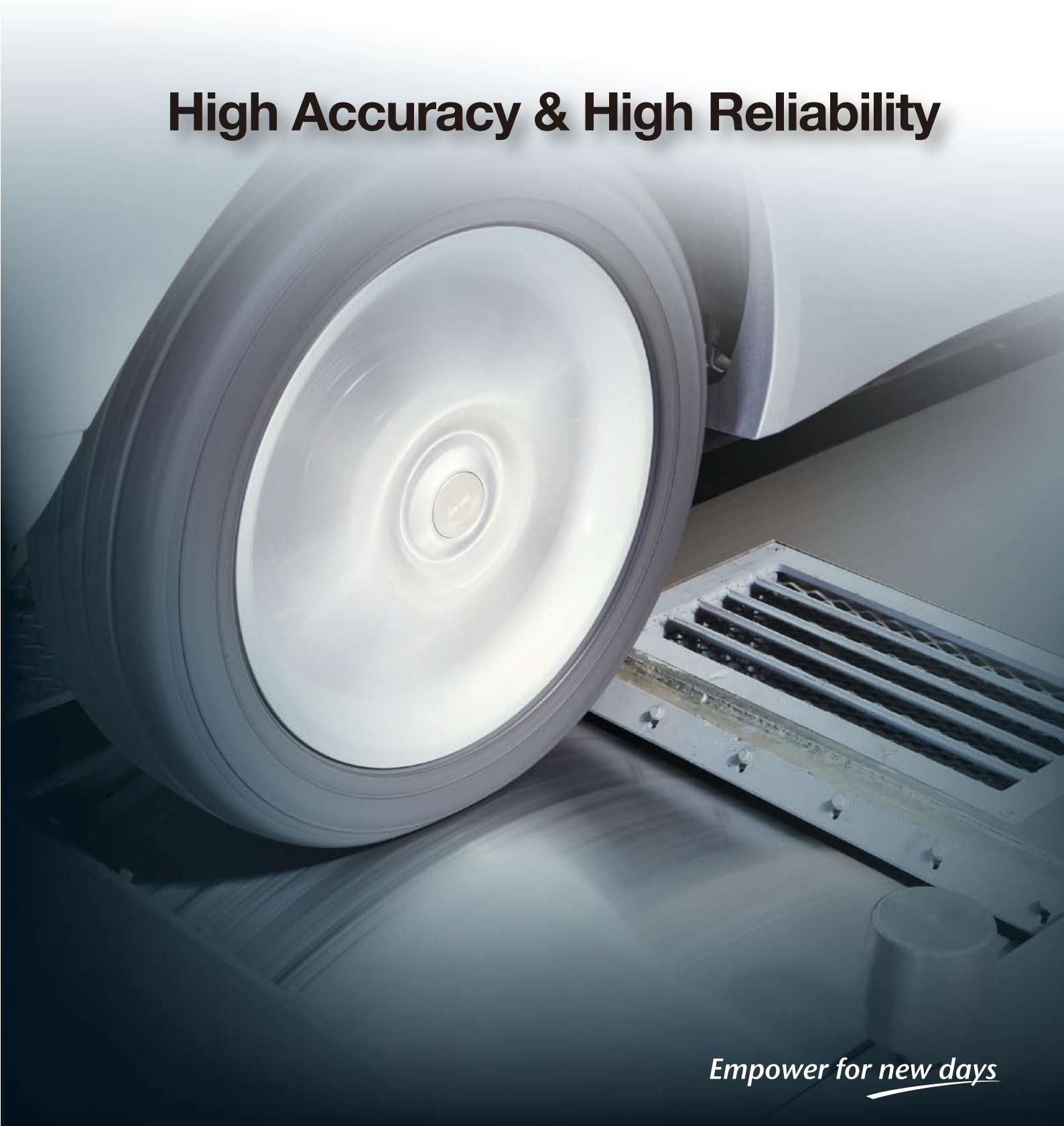
MEIDEN

Meiden Chassis Dynamometer Systems

High Accuracy & High Reliability



Empower for new days

Meiden Chassis Dynamometer Systems assure high accuracy and high reliability.

**Meidensha's chassis dynamometer provides customer high accurate and high reliable test environment for vehicle.
It has been supporting development and evaluation activity of customer in Japan and abroad.**

Features:

Hydraulic frame floating
- It minimize cradle resistance and it brings high accuracy torque measuring.
- Mechanical loss of bearings can be detected by load cell, and be managed with appling Mechanical Loss compensation function.

Front/rear wheel-speed difference within ±0.1km/h
- This system is applicable to worldwide regulations for exhaust emission, fuel economy, noise tests, and environmental tests for the completed 4WD vehicles.

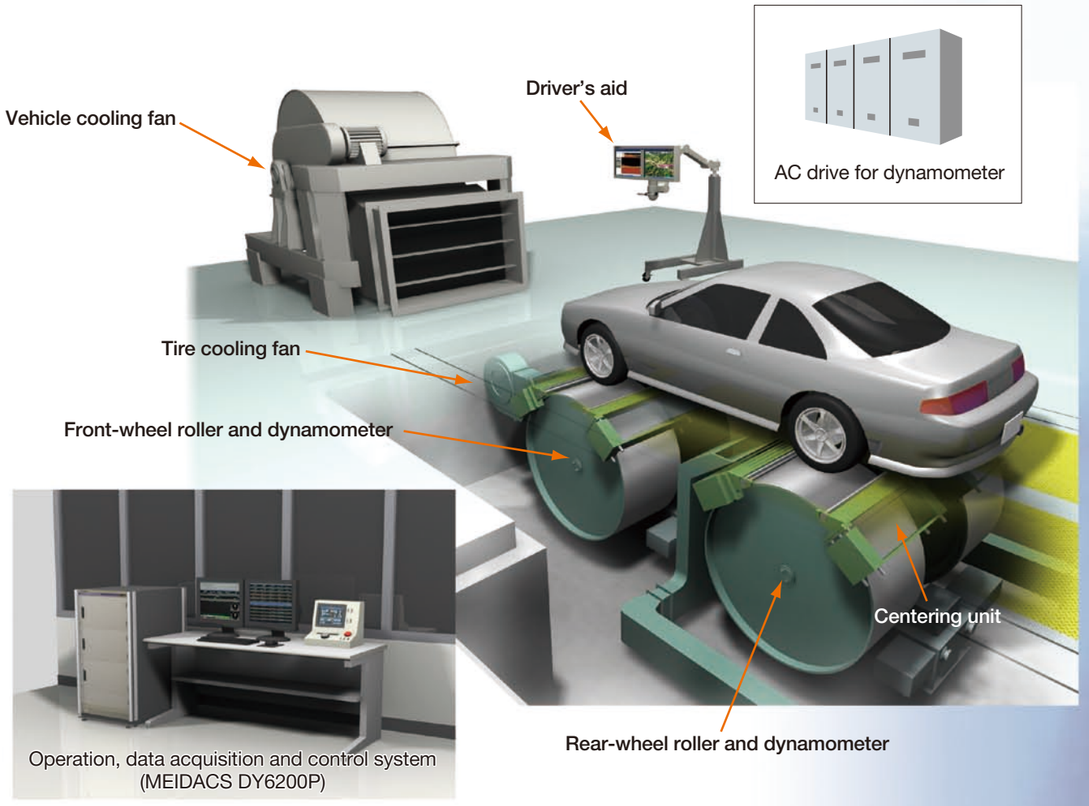
Reliability of electrical inertia simulation
- The reliability of the electrical inertia simulation is assured by the Liner regression method stipulated by the JASO Standard for the driving force for electrical inertia evaluation.

Load reproducibility
- Highly reliable measurements are assured during emission test by the use of a high-accuracy load with a good reproducibility.

Abundance of product lineups
- System upgrading is possible according to the applications and types of cars such as 4WD cars, hybrid cars, and EVs (Electric Vehicles).

Adopted for the type approval at the Drivers Testing Site of the National Traffic Safety and Environment Laboratory.

Basic Configuration



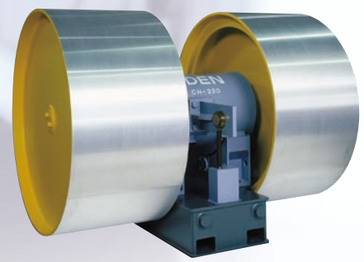
Applications

- **Emission and fuel economy test**
  Applicable to worldwide regulations for emission such as Japan, U.S. EPA, and ECE
- **Environmental test**
  Applicable to the testing under all environmental conditions in the world
  Hot,cold,humidity,high altitude,rainfall, snowfall
- **Noise test**
  Applicable to noise test and road noise test in a simplified anechoic room by adopting the low-noise liquid-cooled type Dynamometer
- **General performance measurements**
  Wide-Open-Throttel performance test enabled with the ratings of high capacity and high load
- **Durability test**
  Applicable to durability test for the evaluation of catalyst deterioration at the time of 100,000-mile running (mileage accumulation)
- **Line check**
  Applicable to sampling test before shipping from vehicle assembling line

Rollers and Dynamometers

**This is an integrated configuration where rollers are overhung at both shaft ends of the dynamometer.
Air-cooled type and low-noise liquid-cooled type are available.
In combination with IGBT type AC drive for dynamometer, high-accuracy and high-response control can be carried out.**

Air-cooled type



Liquid-cooled type

Subsidiary Equipment

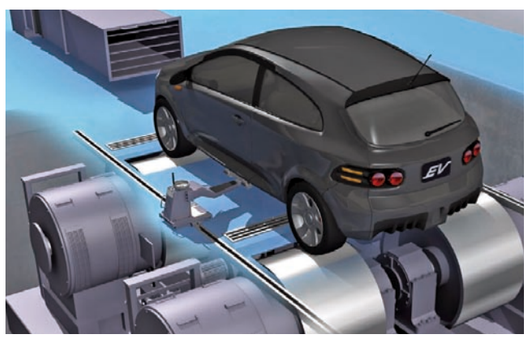
Variety of subsidiary equipment are available.

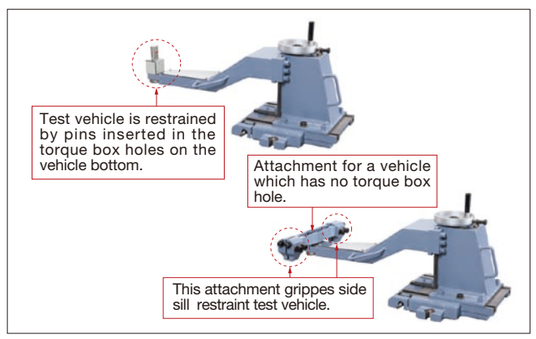
■ Vehicle restrain equipment

Vehicle restrain equipment comes in three types. Each type is designed in consideration of Emission and fuel economy test and it does not give any additional load to the vehicle under test.

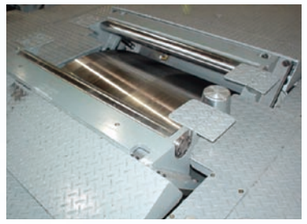
① Tire restrain type (Exclusively used for 2WD)
Non-drive wheel is tied down by belt.

② 4-point pole-chain type (For 4WD)
Test vehicle is restrained from the front and rear directions.





③ Torque box type (For 2WD/4WD)
Test vehicle is restrained by pins inserted in the torque box holes of the vehicle. If the vehicle has no torque box holes, attachments can be used to restrain the vehicle by pinching its side sills.



■ Vehicle Centering Unit

Servo cylinder type lifters, located in front and rear of tire, lift it up to center of vehicle tire position in center of roller.
Small rolls at top of lifters can rotate to adjust facing direction of test vehicle.

■ Vehicle Cooling Fan

Vehicle cooling fan blows same speed of wind as testing vehicle on chassis dynamometer.
Motorized type is availavle as an optional fan which can move in the test room.

■ Tire Cooling Fan

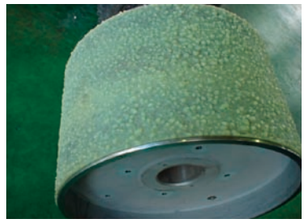
This fan prevents overheating of tires and bursting durling test.
Like the vehicle cooling fan, both vehicle speed follow-up and fixed wind velocity operation are possible. (Optional)

■ Driving Robot

It is possible to be set up within 3 min., and then can performe like human being driving.
It has durability so that it is applicable to mileage accumulation.
Button type IG starter, Stairmatic or Padle shifting are available as optioal functions.

■ Roller Surface Shape

It is possible to simulate the shape and friction factor close to those of the real road when a pad (photo for reference below) simulating the real road surface is mounted on the roller. Knurled processing is also available. (Optional)



■ Powered Roller Cover

This is a safety cover used at the time of the chassis dynamometer warm-up operation. It is also used for roller surface protection when testing is not carried out.

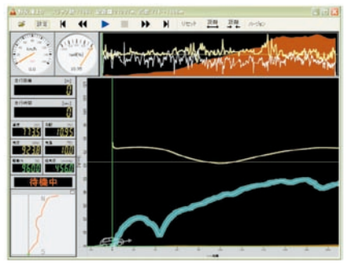
■ Torque Measuring Tool

The torque arm and weight are provided for the convenience of load cell calibration. Optional remote operation type automatic balance and floor mounting type balance are also available.

■ Driver's Aid

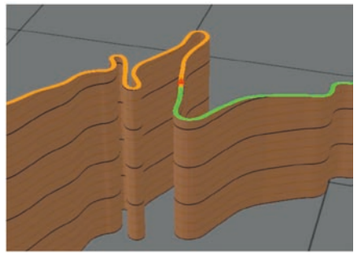
It is possible to reproduce worldwide regulated exhaust emission mode and to simulate road load running.
In addition to time - vehicle speed pattern, the operation for a distance-vehicle speed pattern is possible to carry out.
Contour lines and skeletons on real roads are displayed in 3D mode, including the visualization of road inclinations.

2D display screen (example)



3D contour line display screen (example)

3D skeleton display screen (example)



Operation, data acquisition and control system (MEIDACS DY6200P)

Software Specifications

Item	Major functions		
Road load setup	ECE standard, U.S standard, Japan standard •Road load correction & verification function, mechanical loss measurment function, Road load data & mechanical loss data storage, printing		
Electrical inertia accuracy verification	ECE standard, U.S standard, Japan standard		
Vehicle assist function	•USO6 LPV assist function, deceleration brake assist function, regeneration brake assist for EV		
Display function	Real-time monitoring function •Analog meters, digital meters, bar graphs, trend, road load monitor		
Automatic vehicle driving function (With a drive robot)	•Establishment of driving patterns: Max. number of pattern repetitions 999,999 times. Display of driving pattern setup graphs, step-up conditions •Testing info setup: Vehicle info		
Measurment condition setup	**Average measurement**	**High-speed measurement**	**Continuous measurement**
Measurement starting conditions	Start button	Start button, measurment items (Threshold value upper/lower, up/skip, low skip, width)	
Measurement ending conditions	Stop button	Start button, measurment items (Threshold value upper/lower, up/skip, low skip, width)	
		Time (seconds)	Time (hours)
Measurment items	Items of measurement, operation, and specific meters	100 items max. chosen from items of measurement and operation	Items of measurement and operation
Measurment period	0.1 s	1~999 ms	0.1~99.9 s
Max. measuring times	8,000,000 times/ No. of measurment items However, the max. number of measurment shall be 50,000 times per measurement item.	400,000 times/ No. of measurment items	50,000 times
No. of data files	1/test	999/test	1/test
Others	•Measurment interval (with “times”) •Time (in seconds), interlocked with the completion of fuel cost measurement •No. of measurment items: 250 items max.		
Upper/lower limits supervision	•Supervised items:general measurement data and calculated data. •Supervised stage:upper stage in 2 stage and lower stage in 2 stage •Watchdog timer setup, supervising ON/OFF, supervising OFF group setup •AND supervision condition, supervisiory period:0.1 sec		
Correlation supervision	•Max registered numbers: 10 patterns •Supervised stage:upper stage in 2 stage and lower stage in 2 stage •Watchdog timer setup, supervising ON/OFF, supervising OFF group setup •AND supervision condition, supervisiory period:0.1 sec		
Measurement at alarm condition	For high speed •Measurement period: 10 ~ 90 (ms) at 10 (ms) pitch •Measurement times after the occurrence of error:3000 times Max. •Measurment items: 50 items max.		
	For low speed •Measurement period: 0.1 ~ 99.9 (sec.) •Measurement times after the occurrence of error:3000 times Max. •Measurment items: 20 items max.		
Tabulating	Types of tabulating data: Average measurment data, high-speed measurment data, continuous measurment data (Only designated data under testing conditions) No. of tabulating items (per list): 16 items × 3 lines (=48 items), measurment items arbitrarily at choice Lists are displayed and printed out by Excel.		
External CPU link	LAN (for communication with exhaust gas analyzer), RS-232C, and Driver’s Aid by means of communication Data exchange via common folder.		
Security level	3-stage security level setup on user side Operation range setup at each security level		
Maintenance function	Inertia verification and dynamometer torque zero-point check		
Options	Exhaust gas data test report, slope pattern command function		

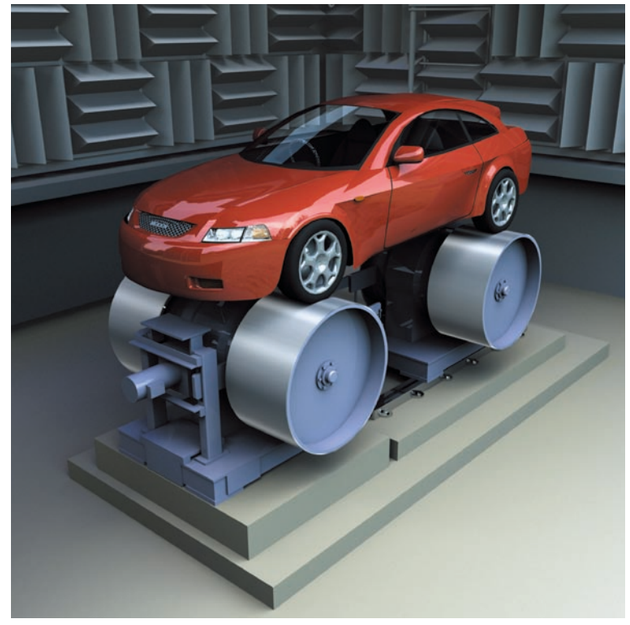
MEIDACS DY6200P

Major Specifications

Specifications \ Models		Air-cooled AC type			Liquid-cooled PM type	
Applications		Ultra-compact EV ~ Compact car	K-car ~ Medium-duty car		For low noise*3, large capacity	
Spec of test vehicle under test	2WD equivalent inertia mass*1	454~2722kg	545~5440kg		350~3000kg	
	4WD equivalent inertia mass*1	680~2722kg	1090~5440kg		700~3000kg	
	Wheel base	1900~4200mm	1900~4700mm		1900~4700mm	
	Max. axle load	20kN	40kN		20kN	
	Max. speed	160km/h	200km/h		250km/h	
Rated absorption power*2	Constant	95kW	220kW		330kW	
	Over load	220kW	370kW		440kW	
Tractive force*2	Constant	3.4kN	10.3kN	7.9kN	15.5kN	11.9kN
	Over load	7.9kN	17.4kN	13.3kN	20.6kN	15.8kN
Rollers	Diameter	ϕ1219.2mm	ϕ1219.2mm	ϕ1591.5mm	ϕ1219.2mm	ϕ1591.5mm
	Inner width	914.4mm	800mm		700mm	
	Outer width	2184.4mm	2200~2750mm		2200mm	
Base inertia		835kg	1361kg		700kg	
Control unit		Dynamometer control panel (THYFREC VT330DY), vehicle cooling fan control panel, Operation, data acquisition and control system (MEIDACS DY6200P), Driver’s Aid				
Accuracy	Speed	±0.1km/h	±0.1km/h		±0.1km/h	
	Torque	±0.1/F.S	±0.1/F.S		±0.1/F.S	

Remarks: *1: In regard to the weight range of the vehicle to be tested, please consult us separately.
*2: The capacity and tractive force can be defined according to the contents of testing.
*3: Noise values [Chassis dynamometer unit] 65dB (A) at 100km/h for 2WD operation and 68dB (A) at 100km/h for 4WD operation
[Setup conditions] Background noise 45dB (A) or below. The roller center shall be located one meter above the floor surface.

•All product and company names mentioned in this paper are the trademarks and/or service marks of their respective owners.



MEIDENSHA CORPORATION

ThinkPark Tower, 2-1-1, Osaki, Shinagawa-ku, Tokyo, 141-6029 Japan
Phone: 81-3-6420-7750 Facsimile: 81-3-5745-3053

http://www.meidensha.co.jp
http://automotive.meidensha.co.jp

Overseas Offices & Group Companies

China

DONGGUAN MEIDEN PACIFIC ELECTRICAL ENGINEERING CO., LTD.
No.1 Side Street 1 of DongFu Commercial Street, MoWu, WanJiang District,
Dongguan City, GuangDong Province, P.C.523041 P.R.China
Phone: 86-769-22285210 Facsimile: 86-769-22285250

MEIDEN ZHENGZHOU ELECTRIC CO., LTD.
No.87 Hehuan Street, Zhengzhou Hi-Tech Industries Development Zone,
Zhengzhou, Henan Province, P.C.450001, P.R.China
Phone: 86-371-67848800 Facsimile: 86-371-67848797

MEIDEN SHANGHAI CO., LTD.
Room 1806, Plaza 336, No. 336 Xizang Road (Middle)
Huangpu-District,Shanghai, 200001, P.R. China
Phone: 86-21-63860358 Facsimile: 86-21-63860058

MEIDEN HANGZHOU DRIVE SYSTEMS CO., LTD.
No.168, Hongxing Road, Qiaonan District,
Xiaoshan Economic & Technological Development Zone,
Hangzhou, Zhejiang, P.C. 311231, P.R.China
Phone: 86-571-8369-6808 Facsimile: 86-571-8369-6818

SHANGHAI MEIDENSHA CHANGCHENG SWITCHGEAR CO., LTD.
No.885, Xingrong RD Industrial Zone, Jiading, Shanghai 201821, China
Phone: 86-21-6916-9911 Facsimile: 86-21-6916-9922

Hong Kong

MEIDEN PACIFIC (CHINA) LTD.
Unit 01-02A, 16/F, Tower 1, Ever Gain Plaza,
88 Container Port Road, Kwai Chung, N.T., Hong Kong
Phone: 852-2503-2468 Facsimile: 852-2887-8046

India

MEIDEN INDIA PVT. LTD.
910, International Trade Tower, Nehru Place, New Delhi-110019, India
Phone: 91-11-46539381 Facsimile: 91-11-46539385

Indonesia

P.T. MEIDEN ENGINEERING INDONESIA
20th Floor, Summitmas I, Jl. Jenderal Sudirman Kaveling 61-62
P.O.BOX 6920/KBY/Summitmas I Jakarta Selatan 12190, Indonesia
Phone: 62-21-520-0612 Facsimile: 62-21-520-0240

Korea

MEIDEN KOREA CO., LTD.
1404 DongHwa Bldg., 71, Yeouinaru-ro, Yeongdeungpo-gu,
SEOUL 150-708 Rep. of KOREA
Phone: 82-2-736-0232～3 Facsimile: 82-2-736-0234

Malaysia

MEIDEN MALAYSIA SDN. BHD.
Unit A-13-13A, Level 13, Menara UOA Bangsar 5,
Jalan Bangsar Utama 1, 59000 Kuala Lumpur, Malaysia
Phone: 60-3-22878188 Facsimile: 60-3-22879188

MEIDEN METAL ENGINEERING SDN. BHD.
Lot 6, Peringkat 3, Kawasan Perindustrain Alor Gajah, 78000 Melaka, Malaysia
Phone: 60-6-556-8790 Facsimile: 60-6-556-8795

Singapore

MEIDEN ASIA PTE. LTD.
5, Jalan Pesawat, Jurong Industrial Estate, Singapore 619363
Phone: 65-6268-8222 Facsimile: 65-6264-4292

MEIDEN SINGAPORE PTE. LTD.
5, Jalan Pesawat, Jurong Industrial Estate, Singapore 619363
Phone: 65-6268-8222 Facsimile: 65-6264-4292

Thailand

THAI MEIDENSHA CO., LTD.
15th Floor, Rasa Tower II, 555 Phaholyothin Road, Chatuchak,
Chatuchak, Bangkok 10900, Thailand
Phone: 66-2792-4200 Facsimile: 66-2792-4299

MEIDEN ELECTRIC (THAILAND) LTD.
898 Moo 2, Bangpa-in Industrial Estate, Udomsorayuth Rd.,
Klongjig, Bangpa-in, Ayudhaya 13160, Thailand
Phone: 66-35-258258～262 Facsimile: 66-35-221388

United Arab Emirates

MEIDENSHA CORPORATION DUBAI BRANCH
Dubai Airport Free Zone, 6WA Room No.606, P.O.Box 54919, Dibai, U.A.E
Phone: 971-4-2146-692 Facsimile: 971-4-2146-699

The United Kingdom

MEIDEN EUROPE LTD.
NYK Complex, Bradbourne Drive, Tilbrook, Milton Keynes MK7 8BN,
England, U.K.
Phone: 44-1908-276000 Facsimile: 44-1908-276010

The United States

MEIDEN AMERICA, INC.
15800 Centennial Drive, Northville Township, MI 48168, U.S.A.
Phone: 1-734-656-1400 Facsimile: 1-734-459-1863

MEIDEN TECHNICAL CENTER NORTH AMERICA LLC
15800 Centennial Drive, Northville Township, MI 48168, U.S.A.
Phone: 1-734-656-1400 Facsimile: 1-734-459-1863

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