

Chassis Dynamometer **TYPE-i**



CHASSIS DYNAMOMETER **TYPE-i**

High accuracy and high reliability **MEIDEN Chassis Dynamometer System**

Chassis dynamometer optimized for light to medium duty vehicle supports testing and R&D achievement.

◆ Features

Emission test, environment test are possible with excellent dynamometer control.

High speed and high accuracy dyno. control make possible fine front & rear tire speed synchronizing control and precise inertia simulation.

Japan, U.S., and EURO, each style of electric inertia simulation verification function is supported.

To keep accuracy and reliability of road load simulation when emission mode test.

Various vehicles are target.

From compact car like electric vehicle to medium size vehicle like pick-up truck can be tested.

Frame hydraulic floating mechanism for dynamometer cradling.

No cradle bearing and very small cradling resistance for high accurate torque measurement.

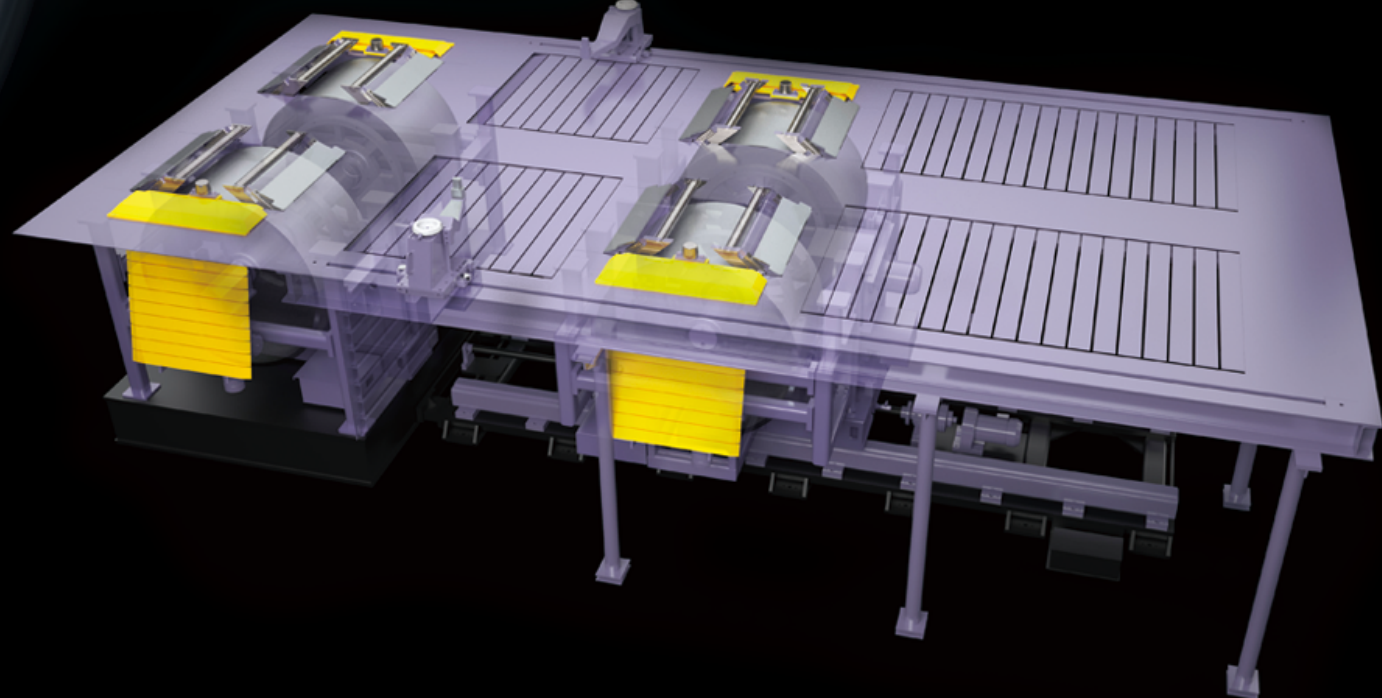
Mechanical loss of rotary bearing can be measured and compensated.

Compact design

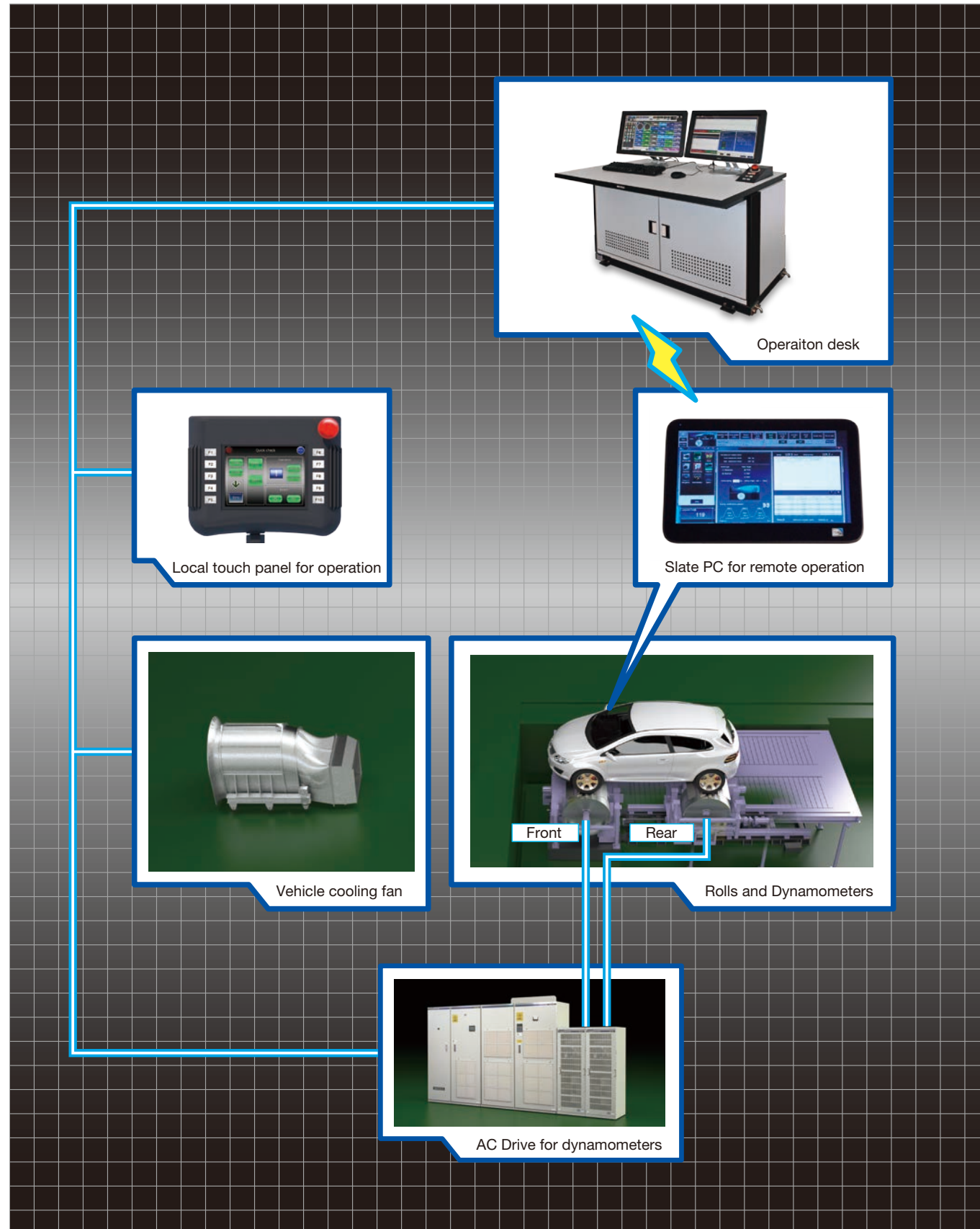
All components are equipped and it is a complete package of chassis dynamometer.

◆ Typical applications

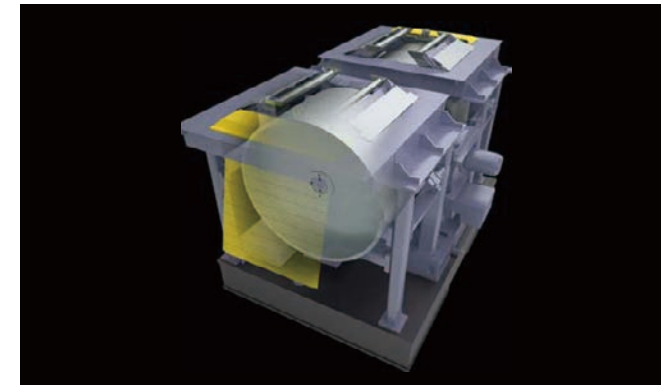
- **Fuel economy & emission test**
Fully compliant with Japanese, U.S. EPA, and EURO 5, 6 mode.
- **General performance test**
Power performance test is possible with large capacity dynamometer.
- **Durability test**
Catalyst performance loss evaluation after 100,000 miles running is the typical one.
- **Line-off investigation**
Sampling check before shipping at the end of vehicle assembling line.



System Block Diagram



Main components



■ Roll and Dynamometer

Dynamometer is located between left and right roll and it saves installation space. Small mechanical loss of rotary bearing can be measured and managed because of the frame floating mechanism. Installation and final checking term at site will be very short because components around roll are equipped on the dynamometer base and be shipped after shop test.



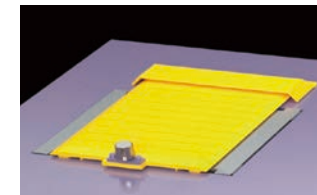
■ Operation desk with bench computer system

All unit and component is equipped in the operation desk. All operation, measuring and monitorin work will be carried out through the monitor on the desk.



■ Vehicle centering device

Small rollers located front and rear of roll raising up from under the pit cover toward center of test vehicle tire and adjust tire position on the right center of roll. It can lift up the tire until tire does not touch the roll completely.



■ Roll cover

Small rollers at front and rear of roll, push out toward center of vehicle tire, and put tire on the right above the roll. The small rollers can lift it up completely until tire does not touch the roll.



■ Vehicle restraint system - 4poles & chain type

4WD vehicle is tied up by chains to 4 poles located front and rear of the vehicle. Rear side poles and chains will be used for 2WD vehicle as a safety device against rush outing the vehicle.



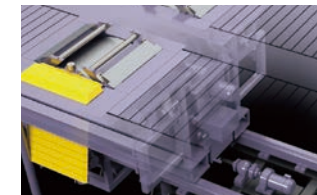
■ Vehicle restraint system - Torque box type

Can be applied to a vehicle which has torque box. It is an easy setting and space saving device.



■ Tire restraint device

It restrains un-driven tire of 2WD vehicle. The tire is tied down by belt to the tire stoppers at front and rear of it.



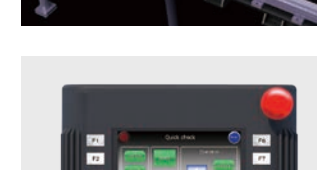
■ Moving device

It can move rear side rolls and dynamometer to the rear tire position for each different wheel base vehicle.



■ Vehicle cooling fan

A constant wind speed type or a variable wind speed type can be used. The variable one maintains the speed as a test vehicle speed, and follows it.



■ Touch panel unit for local operation

Moving-device, centering-device, etc. are operated by this touch panel unit. Some measuring value can be displayed on it.



■ AC Drive for dynamometer

High response and high performance AC drive using high speed and large capacity switching element IGBT.

Specification

Target vehicle and ratings

		Electric Vehicle Compact size PSG. Car* Standard size PSG. Car*	Compact size PSG. Car Standard size PSG. Car* Midsize PSG. Car*	Compact size PSG. Car* Standard size PSG. Car* Midsize PSG. Car* (Wide tread)
Vehicle specification				
Vehicle weight	2WD	450 ~ 3,200kg	450 ~ 5,444kg	450 ~ 5,444kg
	4WD	450 ~ 3,200kg	900 ~ 5,444kg	900 ~ 5,444kg
Axle weight	Per axle	20kN	20kN	20kN
Wheel base		1,850 ~ 4,700mm	1,850 ~ 4,700mm	1,850 ~ 4,700mm
Tread		1,200 ~ 1,700mm	1,200 ~ 1,700mm	1,200 ~ 2,000mm
Tire width		130 ~ 225mm	130 ~ 270mm	130 ~ 270mm
Tire diameter		ø470 ~ ø800mm	ø470 ~ ø900mm	ø470 ~ ø900mm
Height of hock		F.L.+150 ~ +650mm	F.L.+150 ~ +650mm	F.L.+150 ~ +650mm
Max. speed		250km/h	250km/h	250km/h
Max. test vehicle weight	Mode (Max. acceleration)			
	MAD (0.45g)	2,850kg	3,500kg	3,500kg
	US06 (0.365g)	3,200kg	3,860kg	3,860kg
	LA4 (0.17g)	3,200kg	5,444kg	5,444kg
	EUDC (0.106g)	3,200kg	5,444kg	5,444kg
Roll and dynamometer				
Model		Model S	Model M	Model Mw
Dynamometer capacity	Abs. / Mot. constant (1 min. short time rating)	150 / 110kW (280 / 190kW)	150 / 110kW (280 / 190kW)	150 / 110kW (280 / 190kW)
	Speed	100km/h	100km/h	100km/h
Tractive force at roll surface	Abs. / Mot. constant (1 min. short time rating)	5,400 / 3,960N (10,080 / 6,840N)	5,400 / 3,960N (10,080 / 6,840N)	5,400 / 3,960N (10,080 / 6,840N)
	Roll dimension			
	Diameter	ø1,219.2mm (ø48 inch equiv.)	ø1,219.2mm (ø48 inch equiv.)	ø1,219.2mm (ø48 inch equiv.)
	Inner distance / Outer distance	800 / 2,200mm	800 / 2,200mm	800 / 2,750mm
Mechanical inertia moment	Per 1-axle for 2WD	681kg (1,500lbs equiv.)	1,361kg (3,000lbs equiv.)	1,361kg (3,000lbs equiv.)
	2-axes total for 4WD	1,361 kg (3,000lbs equiv.)	2,722kg (6,000lbs equiv.)	2,722kg (6,000lbs equiv.)
Electric inertia simulation range	1-axle for 2WD (Fixed inertia ratio)	-231~2,519kg (-34~370%)	-911~4,083kg (-67~300%)	-911~4,083kg (-67~300%)
	2-axes total for 4WD (Fixed inertia ratio)	-911~1,839kg (-67~135%)	-1,822~2,722kg (-67~100%)	-1,822~2,722kg (-67~100%)
Total inertia moment	1-axle for 2WD	450 ~ 3,200kg	450 ~ 5,444kg	450 ~ 5,444kg
	2-axes total for 4WD	450 ~ 3,200kg	900 ~ 5,444kg	900 ~ 5,444kg

PSG. Car* : Passenger Car

Function

Item	Description	
Operation and setting (Touch panel)	Dynamometer	Drive system selection of vehicle*, Dyno. control setting, Alarm stop, Alarm reset
	Vehicle cooling fan	Wind speed setting : Manual / vehicle speed following
	Transferring right of Operation	Possible to transfer the right of operation to the local operation unit
Warming up running	Warming up object	Dynamometer only or Dynamometer with vehicle
	Driving method	Motoring by chassis dynamometer, Driving by vehicle (need a driver)
	Setting item	Warming up time, Warming up speed, Warming up complete criteria (stable level of tractive force)
Vehicle data management	Vehicle name, Vehicle mass, Drive system, Mechanical loss, Road load data of each vehicle	
Road load setting	US method (SAE J2264 compliant)	-Target road load : Cost down time setting method, Table parameter setting method (kW/HP/PS), or ABC method(Equation method) -Road load correction & verification by cost down method (corrects coefficient of quadratic expression), "Quick check" - Pre-test Calibration check -Data saving, printing out
	Euro method (Regulation No.83 compliant)	-Target road load : Cost down time setting method, Table parameter setting method (kW/HP/PS), or ABC method(Equation method) -Road load correction & verification -Mechanical loss measuring of chassis dynamometer with vehicle Data saving, printing out
	Japanese method (TRIAS compliant)	-Target road load : Cost down time setting method, ABC method(Equation method), or "F" force input method -Road load correction & verification -Mechanical loss measuring of chassis dynamometer with vehicle Data saving, printing out
Electric inertia simulation verification	US method	Measured by simulation error method
	Euro method	Regulation No.83, Annex 4, Appendix 4
	Japanese method	JASO E011 method
Vehicle assist function	US06 load reduction function	For low power vehicle, reduces dynamometer load during "Acceleration Window", high acceleration block time of US06 running schedule.
	Brake assist function	Increases dynamometer load to assist vehicle braking during deceleration to prevent brake fade.
	Assist function for EV	On 2WD chassis dynamometer, dyno. reduces load to assist power feed back braking of EV when it is decelerating.
Slope schedule running	Scheduled running, Time base step up, Distance base step-up, Interface for a driver's aid system	
Display	Fixed items	Vehicle driving condition, Chassis dynamometer condition, Vehicle cooling fan condition, Control mode, Assist condition indication
	Definable items (Real time monitoring)	Analog meter, Digital meter, Bar-graph, Trend graph, Road load monitor User defining meter
Monitoring	Upper / Lower limit monitoring	Upper/Lower monitoring (High level, High-High level, Low level, Low-Low level)
	Trouble event recording	Settings : Measuring item, Sampling speed, Pre-trigger items, Post-trigger items
	Trouble log	Upper/Lower limit alarm, System trouble log & history
Data logging	Sampling speed	1~1000msec
	File conversion	CSV file
Interface	Ethernet: 3 ports, USB: 1 port, RS-232C: 2 ports	
Maintenance function	Mechanical loss measuring of Chassis dynamometer	Coast down method, Motoring method
	Inertia verification	Fixed inertia moment, Electric inertia simulation
Unit system	SI unit system, Yard-Pound : Only for speed and weight	
Language	Japanese, English, Chinese will be released in 2013.	
Optional items	<ul style="list-style-type: none"> •General measuring items •Engine speed, Atmos. press., Dry / Wet temp., Temperature, Pressure •Analog output to BNC connector •Local operation unit using a Slate PC •Interface for Driver's Aid System*2 •Interface for Drive Robot System*2 	

*1 : For 4WD system

*2 : Additional controller is required

Optional item



Driving Robot, seat mount type

Setting up on a seat in 3 minutes. Human like driving. It's durable for long time durability test. Applicable for button type ignition, star-match, and paddle shift.



Driver's Aid

Displays running pattern of emission mode on the monitor to guide driver. On road running data can be recorded and replayed on it.



Tire cooling fan

Cool down tire to prevent over heat or bursting. One speed type or variable speed type is possible.



Slate PC for remote operation

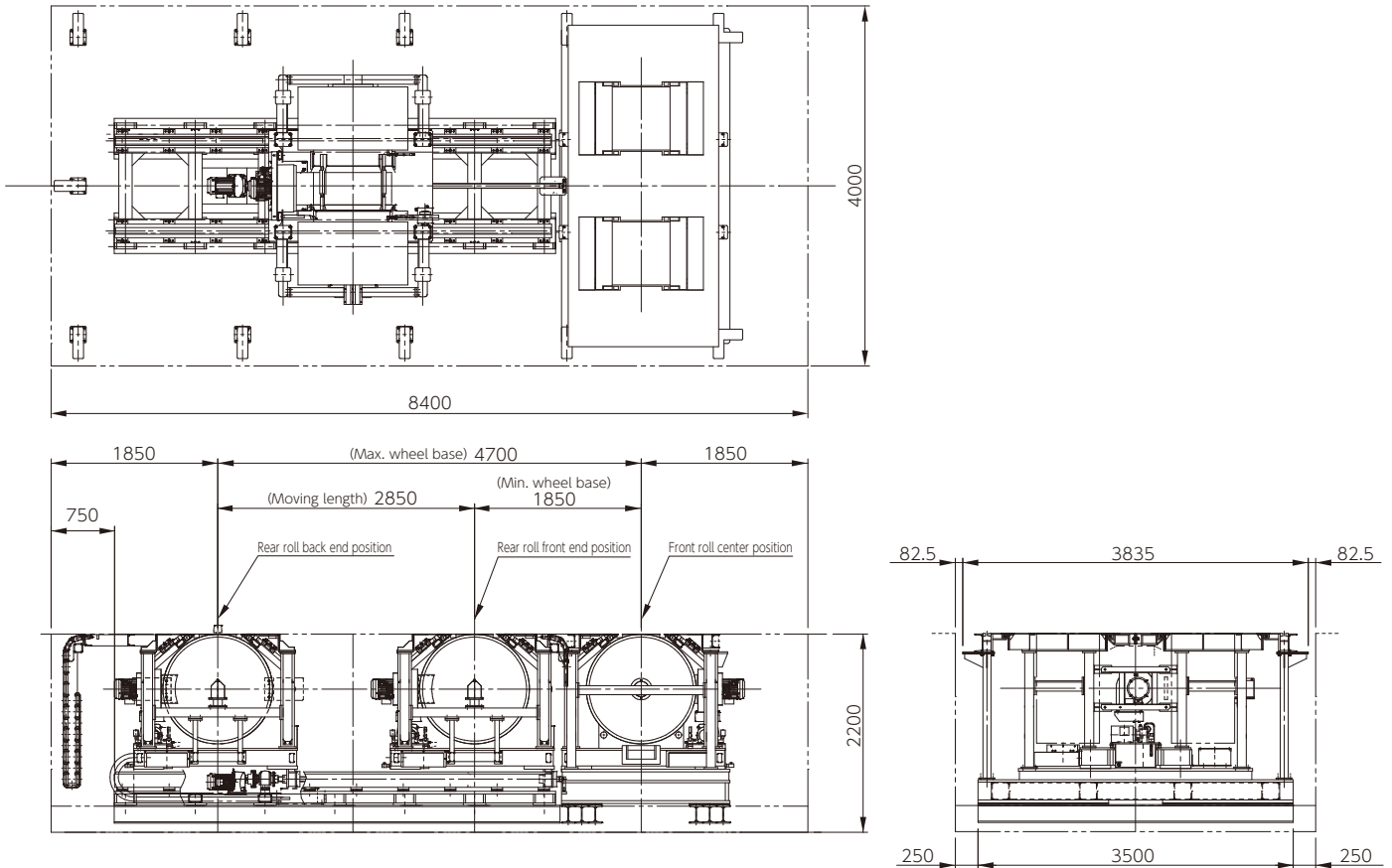
Full operation is possible from anywhere in the covering area.

Monitor display on Operation desk

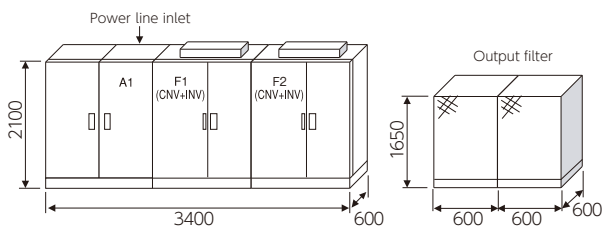


Dimensions (unit in mm)

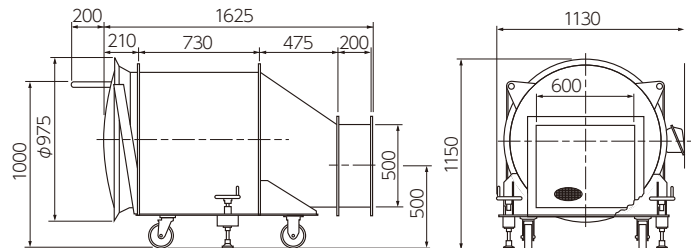
◆ Chassis dynamometer



◆ AC Drive for dynamometers



◆ Vehicle cooling fan



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