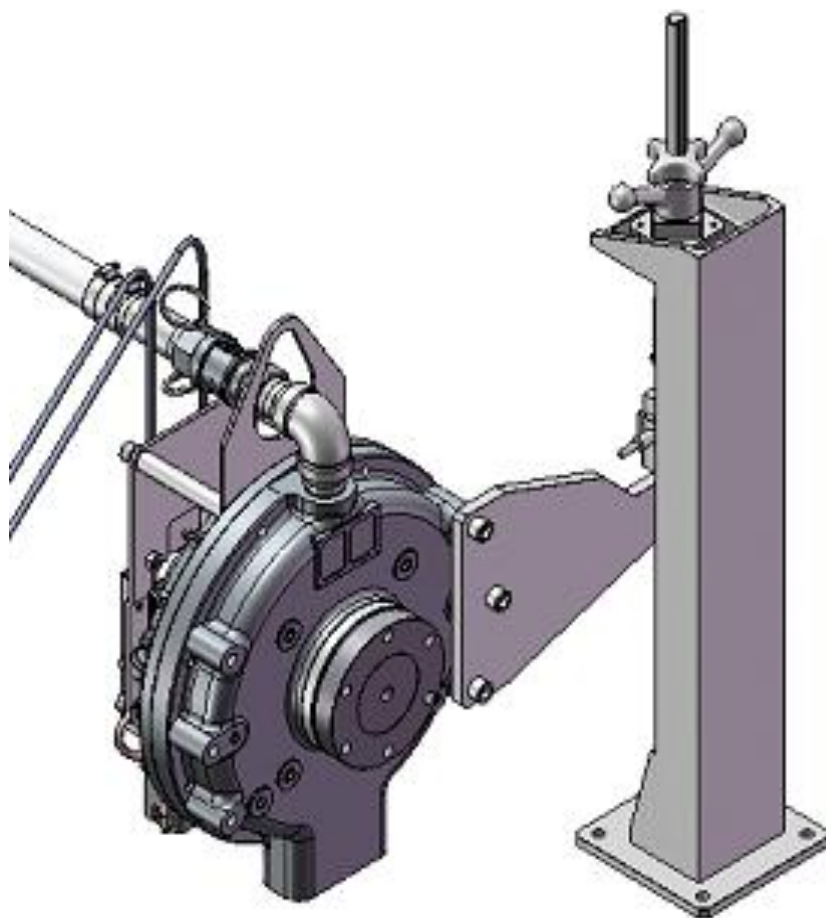


~Advanced Test System and Test Bench Engineering Professional~

Tokyo Plant Co., Ltd.

Product catalog



Portable type Hydraulic Dynamometer

 TOKYO PLANT Co., Ltd.
東京プラント株式会社

Last update 2026/8/17

Copyright © Tokyo Plant Co., Ltd.

■ Outline

We are the only manufacturer in Japan that develops, designs, produces, and sells portable-type hydraulic dynamometers, with more than 40 years of product history. Thanks to their high portability, low introduction cost, and capability to perform engine load performance testing, our products are highly regarded and have been adopted by many customers both in Japan and overseas.



■ Track Record

Total units delivered: Over 500 units (No.1 market share in Japan)

Destinations: Japan and more than 10 countries overseas

■ Major Customers (in no particular order)

TOYOTA, NISSAN, HONDA, Mitsubishi Motors, ISUZU, Fuji Heavy Industries, Yamaha Motor, Calsonic Kansei, Aisin Seiki, Yanmar, Kubota, Mitsubishi Heavy Industries, Komatsu, Shimadzu Corporation, Hitachi, Kawasaki Heavy Industries, CAT, NGK, Riken, Cataler, Ividen, Mitsui Engineering & Shipbuilding, Komatsu Zenoah, Mitsuboshi Belting, Daido Kogyo, Bando Chemical, Toho Gas, various universities, technical colleges, domestic and overseas research institutions, and multiple racing teams.

(Over 200 companies in total)

■ Main application of the products

Engine Performance Testing

Evaluation of output, torque, efficiency, and overall performance characteristics of various engines.

Durability and Endurance Testing

Long-duration operation to assess wear, reliability, and lifecycle performance.

Emission and Environmental Testing

Measurement and analysis of exhaust emissions under controlled load conditions.

Research and Development

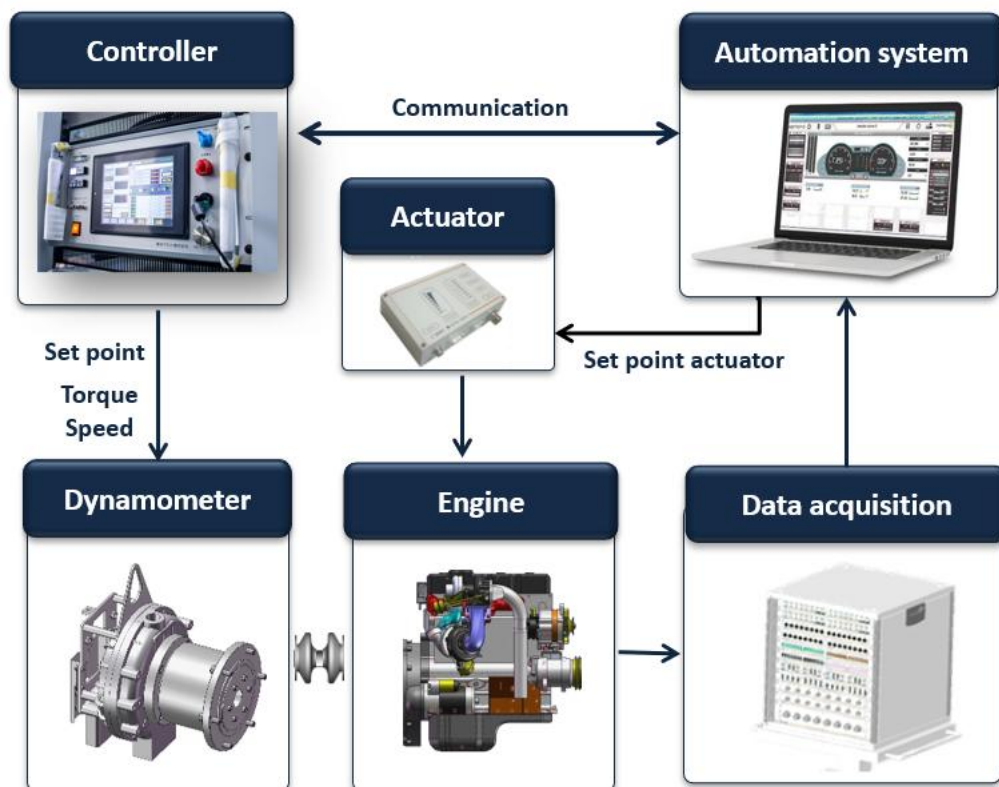
Use in OEM and academic R&D facilities for prototype evaluation, calibration, and advanced engineering studies.

Quality Assurance and Production Line Testing

Verification of engine performance during manufacturing and final inspection.

Maintenance and Overhaul Facilities

Performance checks and diagnostics for large engines after overhaul or repair.



We are able to propose the optimal dynamometer, measurement system, and auxiliary equipment tailored to each customer's needs. If required, we can also support the selection of automation systems, data-acquisition sensors, test bench layout, shafts, and dampers. Please feel free to contact our Sales Department with your requirements. We will provide the most suitable proposal that aligns with your budget and technical expectations.

■ Key features

Low cost Easy operation	• The dynamometer can be directly coupled to engine flywheels, motor shafts, and similar rotating components. • Depending on the unit under test, it may eliminate the need for difficult alignment work or shaft couplings. • By simply setting the water flow rate and operating the easy-to-turn control handle, the entire measurement range can be adjusted. • Engine speed and torque are provided as standard digital read outs. • Analog voltage outputs for speed and torque are also available. • To prevent incorrect cable connections, all interfaces use connector-type terminations.
Super compact Light weight	• The installation footprint inside the test cell can be minimized. • Because the unit is lightweight and portable, it can be easily carried, and when not in use, it can be stored in a warehouse, on a shelf, or in other compact spaces.
A wide range of optional features (paid option)	• With the automatic control system, constant-speed control, constant-torque control, and programmed operation control can be performed. • The unit can also be used in a vertical orientation. • Thanks to the portable mounting stand, a rail base is not required. If local environmental regulations permit, the system can be installed outdoors as well.

■ Principle of operation and product structure

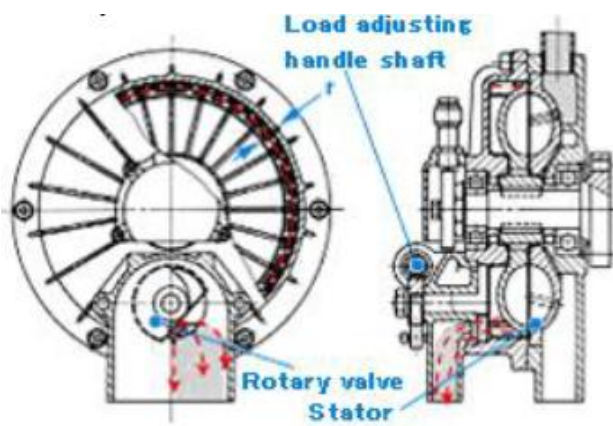


Fig. 1

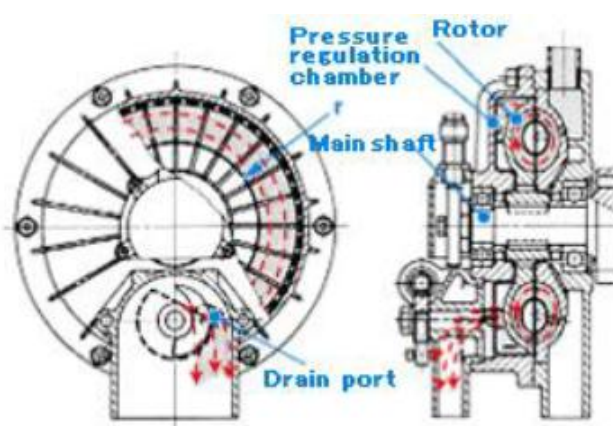
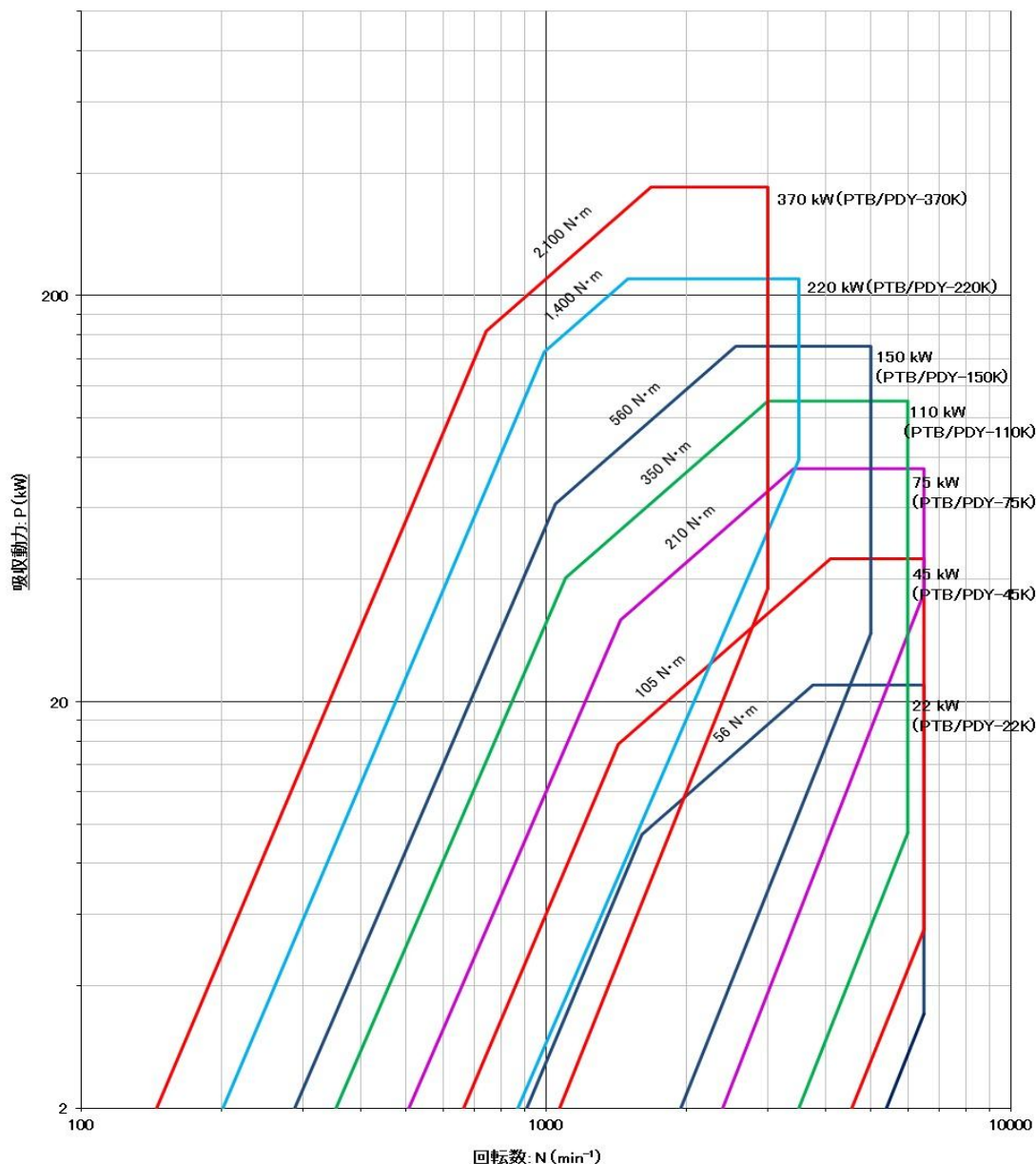


Fig. 2

1. When water is supplied to the dynamometer driven by the engine, it flows as indicated by the arrows. The output of the engine is absorbed through fluid friction generated inside the rotor chamber. This fluid friction converts mechanical energy into thermal energy, causing the water temperature to rise.
2. The braking torque is adjusted by varying the amount of water retained inside the rotor chamber, thereby increasing or decreasing the water resistance. In the portable-type hydraulic dynamometer, the load adjustment handle rotates the control valve (Pat), changing the position of the discharge port and thereby altering the radial water level r inside the pressure chamber to regulate the braking torque.
3. Figure 1 illustrates the condition where the braking torque is at its minimum. In this state, most of the water entering from the inlet passes through the rotor chamber and is discharged immediately.
4. Figure 2 shows the condition where the braking torque is at a moderate level. Compared with Figure 1, the radial water level has increased, resulting in a greater amount of retained water inside the rotor chamber.

■ Product lineup

○PTB/PDY type / Non-reversible: the controllable rotation direction is limited to one direction. This product lineup is ideal for testing medium- to large-sized diesel engines.



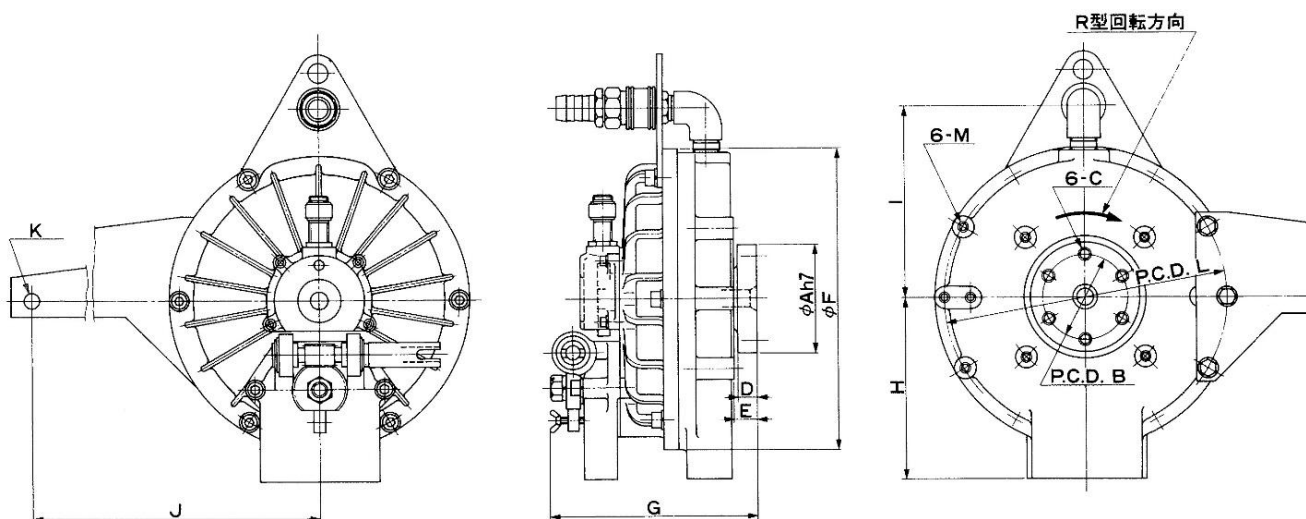
Model	Max power kW	Max torque Nm	Max speed min ⁻¹	Constant Torque range N.m	Moment of inertia kg.m ²	Required Water volume L/min
PTB-22K	22	56	6,500	1,610~3,750	0.0016	9
PTB-45K	45	105	6,500	1,430~4,090	0.0032	18
PTB-75K	75	210	6,500	1,450~3,410	0.006	30
PTB-110K	110	350	6,000	1,110~3,000	0.0107	45
PTB-150K	150	560	5,000	1,050~2,550	0.0325	60
PTB-220K	220	1,400	3,500	1,000~1,500	0.075	90
PTB-370K	370	2,100	3,000	750~1,680	0.17	150

※Cooling Water Flow: Theoretical water supply volume calculated at a supply temperature of 30 °C and a discharge temperature of 60 °C.

※Specification Changes: Specifications are subject to change without prior notice due to improvements or updates.

■ Product lineup

○PTB/PDY type : Dry weight and principal dimensions



Model	Weight kg	Principal dimensions												
		A	B	C	D	E	F	G	H	I	J	K	L	M
PTB-22K	7	80	60	M8 x 1.25	15	18	190	200	120	156	358.1	6.1	176	M6 x 1.0
PTB-45K	10	90	70	M10 x 1.5	15	18	218	213	132	169	358.1	6.1	200	M8 x 1.25
PTB-75K	12	90	70	M10 x 1.5	16	19	250	228	150	170	358.1	6.1	232	M8 x 1.25
PTB-110K	17	110	85	M10 x 1.5	16	20	300	250	180	196	358.1	6.1	280	M10 x 1.5
PTB-150K	23	130	110	M12 x 1.75	20	23	335	265	200	209	358.1	12.1	310	M12 x 1.75
PTB-220K	38	150	120	M16 x 2.0	25	30	416	320	230	275	500	12.1	386	M12 x 1.75
PTB-370K	70	180	145	M20 x 2.5	25	30	475	356	280	294	500	12.1	440	M16 x 2.0

The specifications listed above are the same for both the PTB and PDY models; however, the PDY model allows the installation of a flywheel adapter.

※Weight: Determined according to the base-frame specifications.

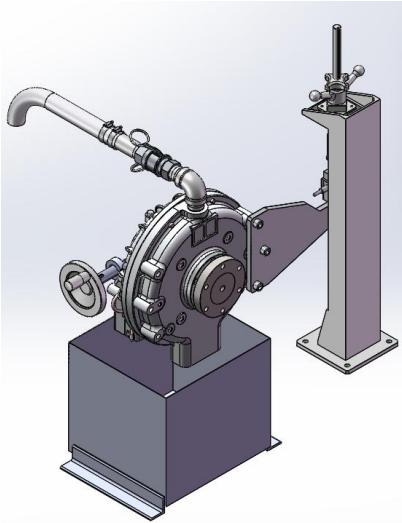
※Specification Changes: Specifications are subject to change without prior notice due to improvements or updates.

■ Specification by type

○A type : Manual direct-operation handle

Key features)

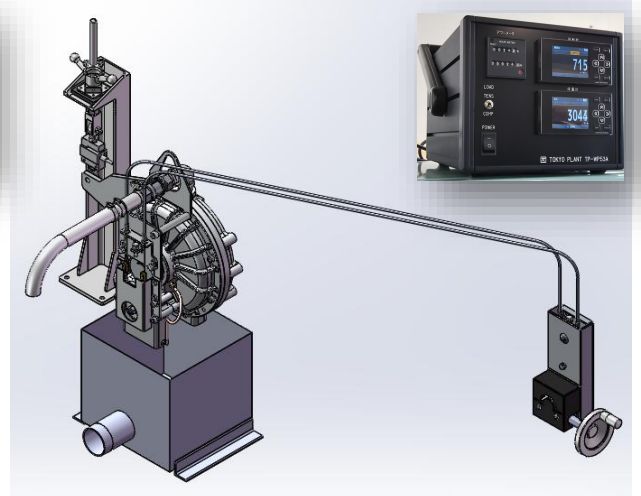
Insert the plug-in type load-adjustment handle into the dynamometer body, and manually operate the rotary load-control valve directly.



○B type: Manual remote-operation handle

Key features)

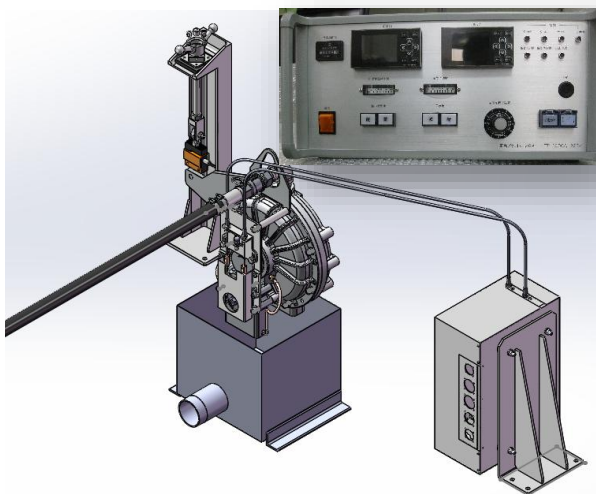
The remote-control unit is connected to the dynamometer body via a remote-operation wire. In this configuration, the rotary load-control valve is manually operated through the remote-operation wire.



○C type: Manual control controller

Key features)

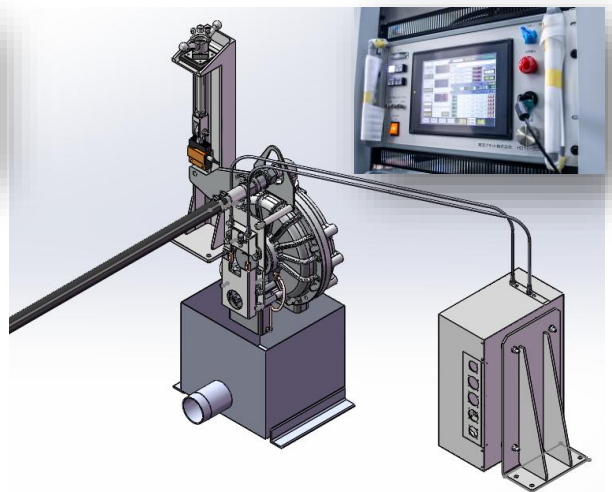
The remote-control unit is connected to the dynamometer body via a remote-operation wire. In this configuration, the rotary load-control valve is manually controlled from a remote location using push-button switch operation.



○D type: Automatic control controller

Key features)

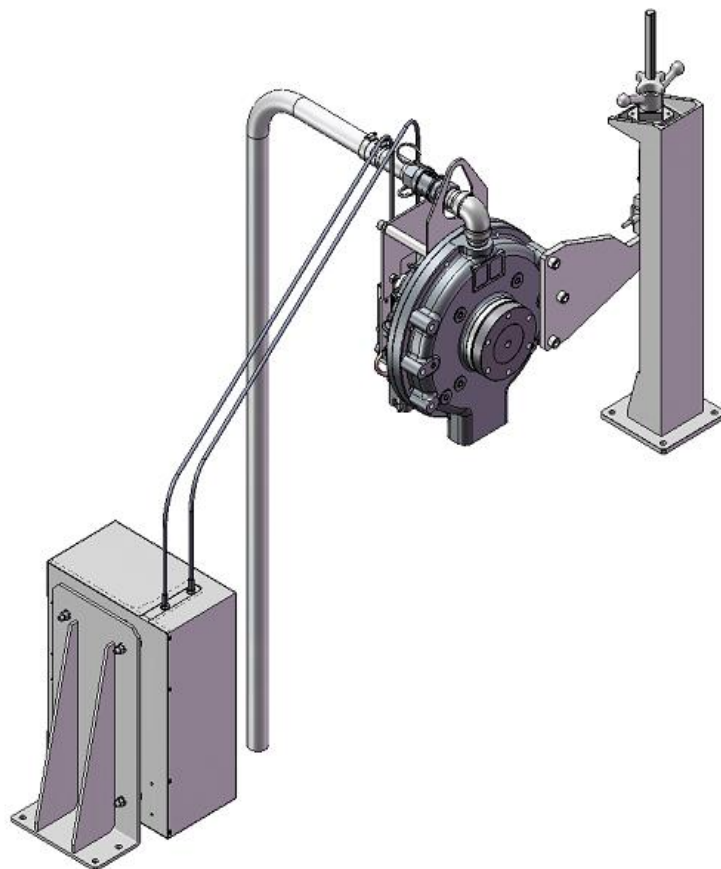
The remote-control unit is connected to the dynamometer body via a remote-operation wire. In this configuration, the rotary load-control valve can be manually controlled from a remote location using push-button switch operation. Additionally, constant-speed control and constant-torque control can be selected, enabling the controller to automatically regulate the load to the target values set by the operator.



For further details about this product, please contact our Sales Department.

■ Product Configuration : A~D type

○System configuration (The figures below show the C and D types.)



○Specifications list

Specification Structure / Type	A	B	C	D
1) Portable Dynamometer Unit (Standard Specifications)	○	○	○	○
2) Dynamometer-Side Coupling Flange	○	○	○	○
3) Load Cell (Torque Sensor)	○	○	○	○
4) Load Cell Mounting Frame	○	○	○	○
5) Rotation Sensor	○	○	○	○
6) Manual Direct-Operation Handle (B-type: Manual Remote-Operation Handle)	○	○		
7) Rotation Speed and Load Indicator	○	○	○	
8) Load-Cell Signal Cable	○	○	○	○
9) Signal Cable for Rotation Sensor	○	○	○	○
10) Remote Load-Control Actuator			○	○
11) Handheld Remote Controller for Load Operation			○	
12) Manual Control Controller			○	
13) Automatic Control Controller				○

※7)、8)、9) Please specify the required length.

For further details about this product, please contact our Sales Department.

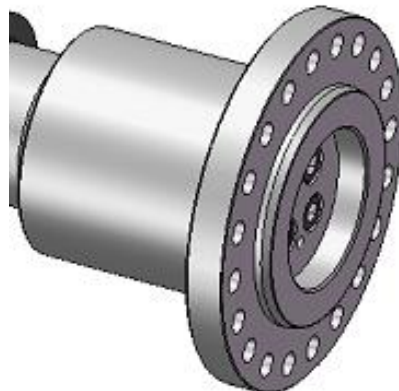
■ Product Configuration : A~D type

1) Portable dynamometer Main unit



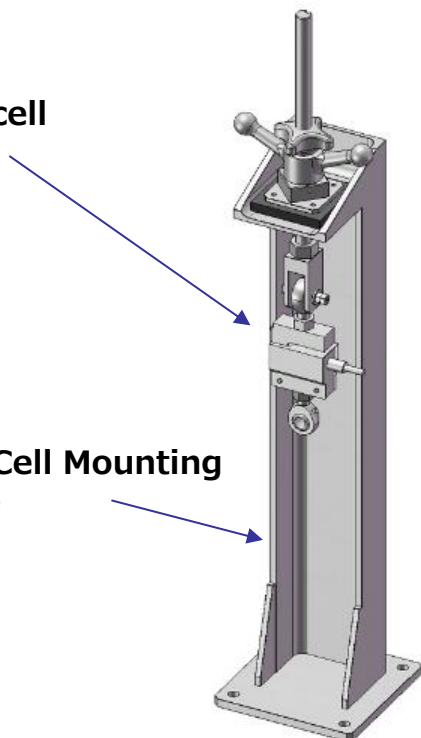
These specifications are common to all products.
The rotation direction is single-direction only.
A rotation sensor is included with the main unit.

2) Dynamometer-Side Coupling Flange



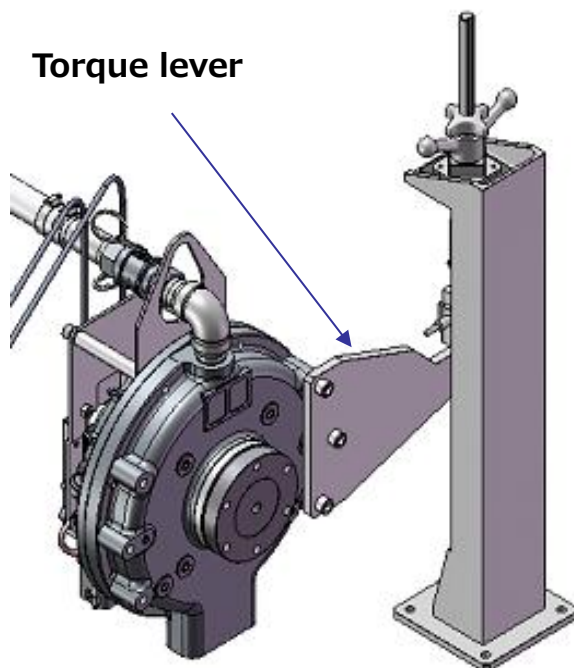
This is the coupling flange that is mounted on the dynamometer main unit.
The detailed specifications will be finalized during the technical review.

3) Load cell



4) Load Cell Mounting Frame

Torque lever

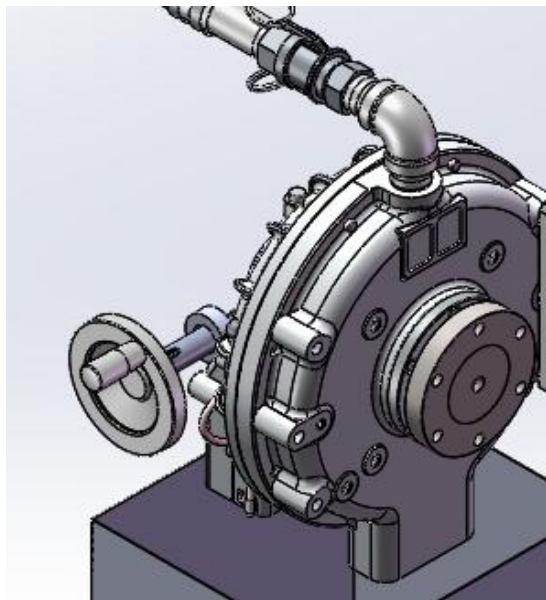


The load cell connects to the torque lever attached to the dynamometer main unit.

For further details about this product, please contact our Sales Department.

■ Product Configuration : A~D type

6) Manual Direct-Operation Handle



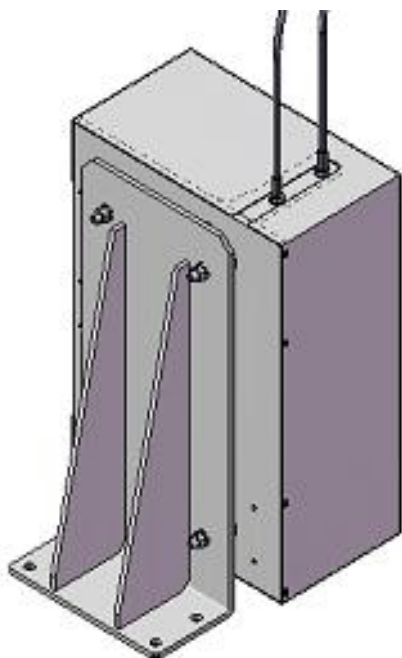
It is mounted directly on the dynamometer main unit, and the handle rotation controls the dynamometer's load valve.

7) Rotation Speed and Load Indicator



The torque value is derived from the load-cell signal of the dynamometer, and the pulse signal from the rotation sensor is used to display the rotational speed on the indicator.

10) Remote Load-Operation Actuator



This actuator is required for the C-type and D-type models. It operates according to command signals from the dynamometer controller and controls the dynamometer's load valve.

11) Handheld Remote Controller for Load Operation



It controls the dynamometer's load valve. The main power switch is provided on the side of the actuator.

■ Lineup of Optional Products

○Dynamometer controller(Automatic type)



This controller is a dedicated controller for hydraulic dynamometers. It is a measurement and feedback-control system that performs testing of the specimen using a hydraulic dynamometer. It is equipped with rotation-speed and torque measurement functions, control functions for manual or automatic control of the unit under test's rotation speed and torque, and alarm functions that detect and handle system abnormalities.

○Main specifications

Model	HDYC-1000
Control mode	Manual Control —The load-valve opening of the water dynamometer is adjusted according to the encoder dial setting operated manually, thereby regulating the engine torque and speed. Constant-Speed Control —Feedback control is executed to maintain the specified rotational speed. Constant-Torque Control —Feedback control is executed to maintain the specified torque. Marine-Characteristic Control —Load is calculated from the torque coefficient proportional to the square of the rotational speed, and cubic-characteristic control is performed. External Control —Programmed operation and measurement are performed from an external upper-level control system.
Accuracy	Depending on the condition of the engine and dynamometer, the PID tuning settings, and the influence of cooling-water pressure, the control accuracy may not fall within the specified range.
Alarm set and monitor	Emergency Stop —When an abnormal condition occurs, pressing the emergency button stops the control operation. Overspeed Protection —Monitors the upper limit of the dynamometer's maximum rotational speed. Overload Protection —Monitors the upper limit of the dynamometer's maximum torque. Cooling-Water Inlet Temperature Monitoring —Monitors the cooling-water temperature of the dynamometer (35 °C). Discharge-Water Temperature Monitoring —Monitors the discharge-water temperature of the dynamometer (60 °C). Bearing Temperature Monitoring —Monitors the bearing temperature of the dynamometer (80 °C). External Alarm Input —Monitors externally connected equipment via contact-signal input.
Input/Output	Analog voltage input/output (0–10 V), analog current output (4–20 mA), and Form-A contact.
Power supply	Three-phase AC 200 V, 50/60 Hz, 15 A
Main	Main Unit: W480 × H249 × D430 mm When Stored in Rack: W520 × H543 × D600 mm
Weight	Approximately 50 kg including the main unit, storage rack, and power panel

■ Lineup of Optional Products

○Dynamometer controller(Manual control type)



This controller is a measurement and manual-control system designed for testing specimens using a hydraulic dynamometer. It is equipped with rotation-speed and torque measurement functions, manual control functions for regulating the unit under test's speed and torque, and alarm functions that detect and process system abnormalities. The system allows for easy and intuitive operation.

○Main specifications

Model	TP-1000A
Control mode	Manual Load Control By pressing the operation buttons, the load-control motor drives the load valve to open or close, thereby increasing or decreasing the absorbed torque.
Accuracy	Speed Measurement Display —Complies with the specifications of the display manufacturer. Torque Display Accuracy —Complies with the specifications of the display manufacturer. Note: Depending on the condition of the engine and dynamometer, as well as the influence of cooling-water pressure, the measurement accuracy may not fall within the specified range.
Alarm set and monitor	Dynamometer Oil Lubrication —The oil flow rate is monitored by a flow indicator. Alarm Response Procedure When an alarm occurs, return the engine to idle and keep pressing the load-decrease button to reduce the load to its lower limit.
Input/Output	Analog voltage input/output (0–10 V) and contact-signal input
Power supply	Three-phase AC 200 V, 50/60 Hz, 15 A
Main	Main Unit: W480 × H249 × D430 mm When Stored in Rack: W520 × H543 × D600 mm
Weight	Main Unit: approximately 20 kg (approximately 50 kg when including the storage rack and power panel)

■ Product Configuration : PDY type

○ Specifications list

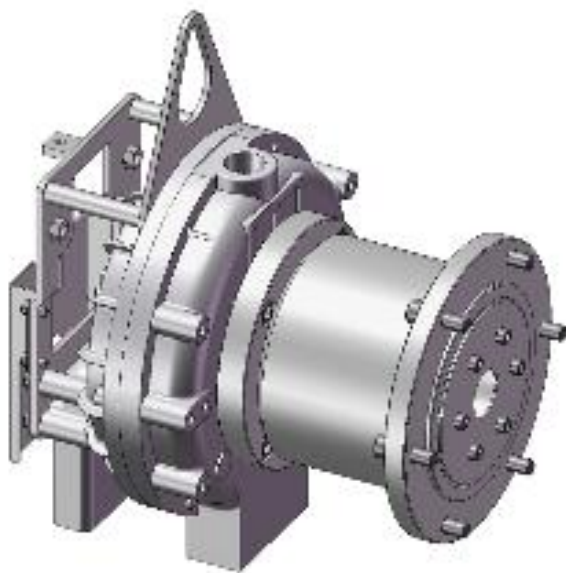
Specification Structure / Type	A	B	C	D
1) Flywheel Adopter	○	○	○	○
2) Angle Plate	○	○	○	○
3) Intermediate Shaft Unit	○	○	○	○
4) Torque flange(Torque meter)	○	○	○	○
5) Shaft , Dumper	○	○	○	○
6) Portable Bench System	○	○	○	○

※○: All items are paid, custom-made options.

※For details of item (6), please refer to the catalog of the Portable Bench System.

○ Optional function

1) Flywheel Adopter

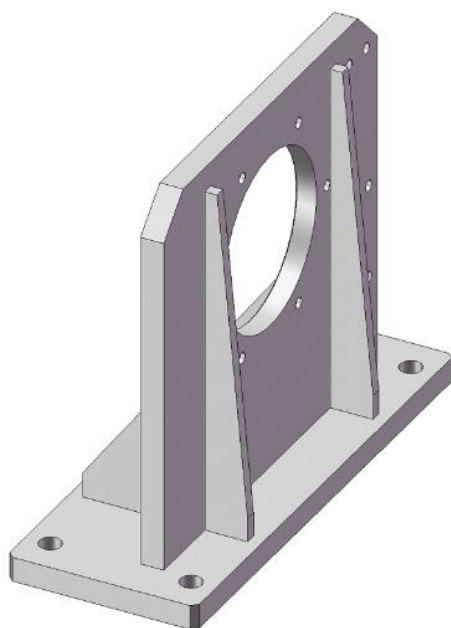


With the flywheel adapter, the customer's engine flywheel can be directly coupled to the portable water dynamometer. The flywheel adapter is a custom-designed component.

For further details about this product, please contact our Sales Department.

■ Product Configuration : PDY type

2) Angle Plate

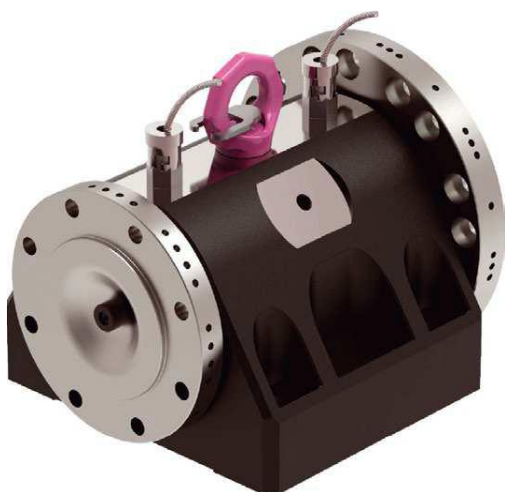


It can accommodate various shapes, including L-shaped configurations. The angle plate is custom-designed

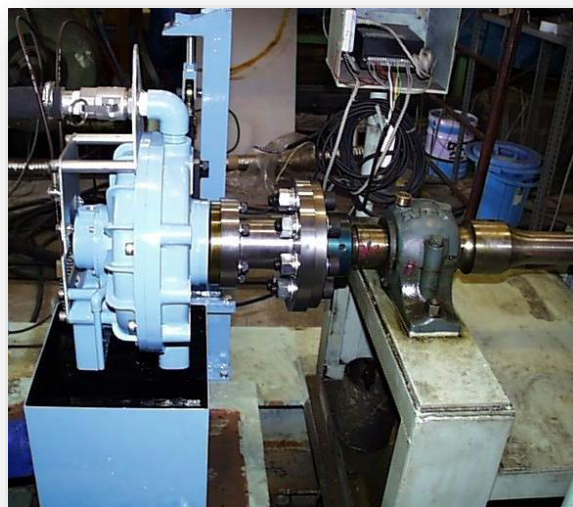


examples of fabricated angle plates.

3) Intermediate Shaft Unit



It absorbs alignment changes caused by thermal expansion and vibration, preventing damage to both the engine and the dynamometer.

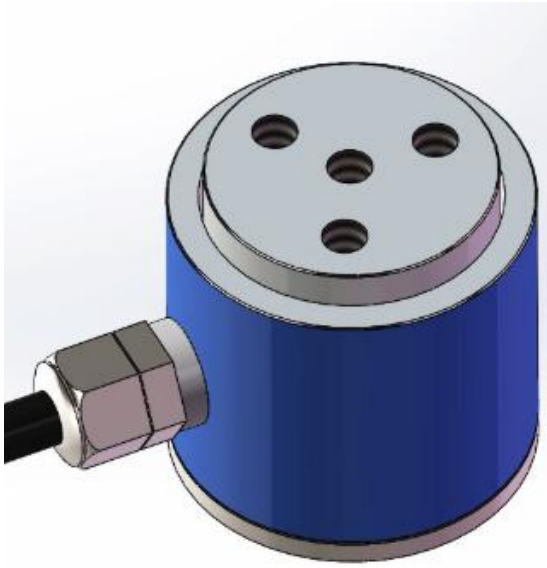


examples of fabricated intermediate Shaft unit

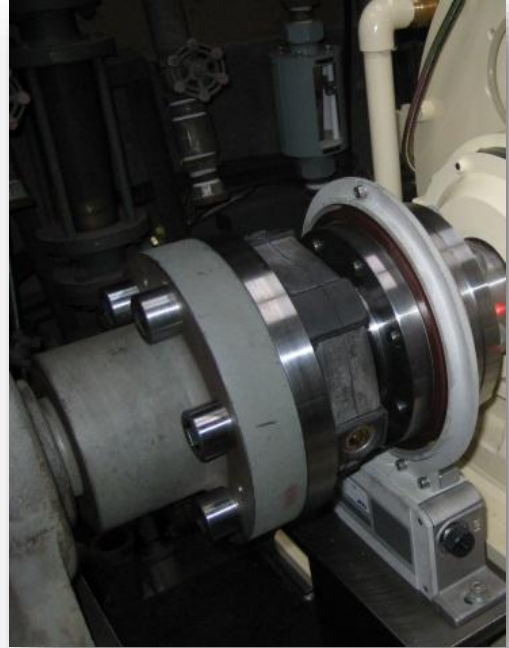
For further details about this product, please contact our Sales Department.

■ Product Configuration : PDY type

4) Torque flange(Torque meter)

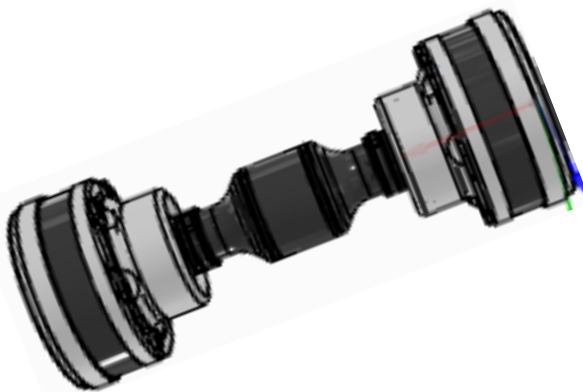


It detects the torque of the unit under test with high accuracy(in accordance with the manufacturer, model, and specifications).



examples of delivery torque flange

5) Shaft, Dumper



examples of delivery shaft and dumper

For further details about this product, please contact our Sales Department.

■ Product Configuration : PDY type

4) Portable Bench system

Product Overview)

This is a simplified test bench system.

The portable water dynamometer and the engine-mounting frame are integrated into a single water tank, allowing the system to be configured as a portable type. Since a rail base plate is not required, the initial cost at test-bench installation can be significantly reduced.

This solution is ideal for customers who wish to conduct engine testing at low cost, particularly in situations where installing a cooling tower or setting up a full test cell is difficult. It can also be used outdoors as a portable type.

(Compliance with environmental protection regulations is required.)



The manufacturing specifications will be finalized through discussions with the customer.

For further details about this product, please contact our Sales Department.

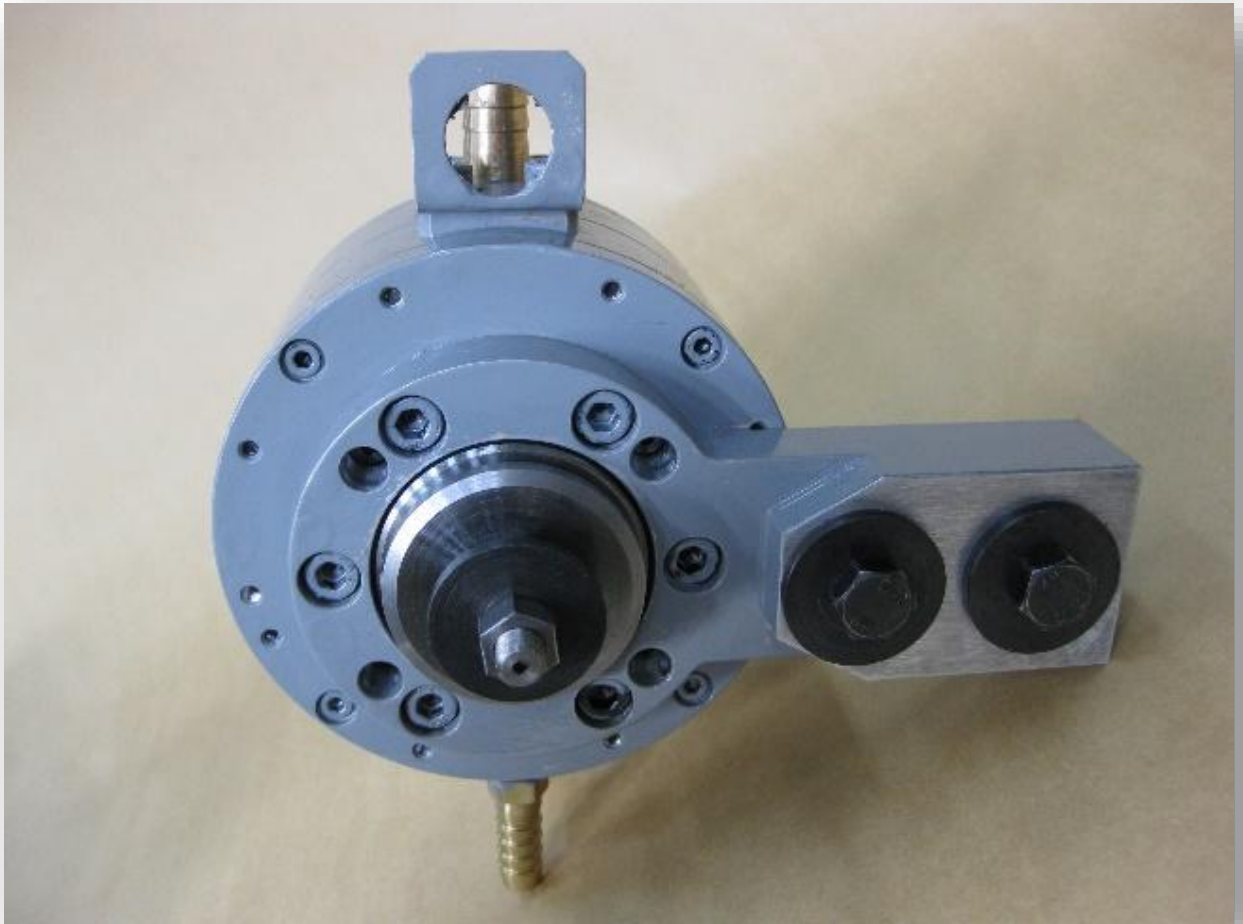
■ Custom Examples HDY type

Product Overview)

This model is designed for high-speed rotation, with an operating speed range of 8,000 to $X \text{ min}^{-1}$.※

The maximum rotational speed will be determined through separate discussions. There are manufacturing examples covering an output range from 10 to 120kW. It is ideally suited for testing high-speed gasoline engines and similar applications.

※The manufacturing specifications will be finalized through discussions with the customer.



For further details about this product, please contact our Sales Department.

■Paid Optional Products

○Automation system MORPHEE



MOPRHEE main screen (Reference)

Product Overview

This system provides essential functions for test benches, including data acquisition, programmed operation, and test-sequence configuration. In addition to these core capabilities, it implements a comprehensive set of advanced features such as automation, integration with ECU calibration workflows, and real-time model execution on the test bench.

These functions enhance the reliability of testing on the bench and contribute to reducing workload in bench testing, vehicle testing, and calibration processes.

MORPHEE is developed and distributed by ENORISE.

○Sensor terminal box (MIO)



Product Overview

In engine and drivetrain bench testing, highly robust and scalable I/O modules are essential.

The sensor relay box allows flexible configuration of modules and signal types—such as temperature, pressure, analog, digital, and contact signals—based on the customer's specific requirements.

○Product Overview

We provide various utilities required for test benches according to customer requirements.

To reduce engine torsional vibration, we also perform optimal selection of shafts and dampers.



Engine Mounts and Mobile Universal Base



Shafts, Dampers, Custom Adapters, and Safety Covers for Shafts

■ Maintenance and after-sales service

Even people who pay close attention to their daily health can only make a rough judgment about how they feel on a given day; without the support of a specialist, it is impossible to accurately understand the internal condition of the body.

Similarly, test equipment experiences slight wear on numerous components each time a test is performed. The oil used to minimize this wear also deteriorates and is consumed over time and with repeated operation. Because test equipment does not possess the natural ability to regenerate, its condition must be checked through regular maintenance. By performing the necessary servicing, the equipment can be kept in optimal condition.

Regular maintenance is essential to ensure accurate data measurement on test equipment.



Regular maintenance prevents failures before they occur.

Especially in continuous endurance testing or other harsh operating conditions, bearings and various seals wear out more quickly and therefore require periodic replacement. After maintenance is completed, we perform detailed inspections—such as calibration checks and operational tests—before shipment to ensure the equipment's condition. Only test systems that meet our strict quality standards are delivered back to the customer.



Recommendation for Regular Inspections

To ensure continuous and accurate data acquisition on test benches, we recommend performing regular inspections once every six months to one year, in addition to routine maintenance. Our engineers can provide on-site service anywhere in Japan and worldwide. (Regular maintenance and periodic inspections are offered as paid services.)

■ Spare Parts and Calibration Services

We can supply individual spare parts for dynamometers, including load cells, rotation detectors, and other sensors. We also provide calibration services for load cells and display units, with pickup and return handling. Please contact us when calibration is required according to your internal maintenance schedule. (Advance reservation is necessary.)



■ Related products

○ Tanaka's Hydraulic dynamometer

The Tanaka-type Hydraulic dynamometer is recognized worldwide as a leading dynamometer and has been featured in numerous technical publications, including the Automotive Engineering Handbook.

It is highly regarded for its durability, precision, rapid response, and low inertia, and is used by many customers both in Japan and overseas.

Our product lineup covers a wide output range from 88 kW to 20,000 kW, including models designed for low-speed, high-speed, and high-torque applications.



For further details, please refer to the product catalog for our hydraulic dynamometers.

■ Rental and Refurbished hydraulic dynamometers

Reducing Initial Costs

To meet customer needs, we offer rental services and refurbished (rebuilt) dynamometers.

Typical Customer Requirements

Sudden testing schedules requiring immediate access to a dynamometer.

Insufficient budget allocation.

Preference to expense the cost rather than capitalize the asset.

Rental

Maximum rental period: 2 years

Inventory is limited; please contact us for availability each time.

Refurbished Units

Fully overhauled products (nearly equivalent to new condition)

One-year warranty included

Note: Coupling flanges and mounting bases (height adjustment) must be newly manufactured.

Calibration Certificate

A calibration certificate for the dynamometer—required for ISO compliance and similar standards—will be provided.

Inquiry Process

Please feel free to contact our sales representatives by phone, email, or through our website.

○Frequently Asked Inquiries

Planning

Please share your plans for test cell and test bench commissioning, equipment upgrades, or modifications.

Quotation

Please provide information on the intended use of the dynamometer, test contents, engine specifications, measurement items, test patterns, and schedule.

Repair inspection

Please provide the model and serial number of the product you are using, as well as your preferred date and time for the requested service.

Technical questions

If you have any questions regarding the product's structure or operating principles, please let us know. We will connect you with our technical specialists.

Products Handling

If you have any questions regarding product operation or usage, please let us know. We will connect you with the product specialist.

Other inquiries

If you have any requests, comments, or questions, please let us know. We will connect you with the appropriate product specialist.

Any information you provide during inquiries or discussions will be handled with strict confidentiality. We take full responsibility for ensuring that all such information is securely managed within our company.



Contact Information

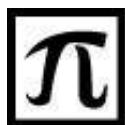
Tokyo Plant Co., Ltd. – Sales Department

515-5 Miyazawa-cho, Akishima, Tokyo 196-0024, Japan

TEL: +81-42-546-6500 FAX : +81-42-546-6600

URL : www.tokyo-plant.co.jp

E-mail: sales@tokyo-plant.co.jp



Since 1948