POWERLINK Water Brake for Engine or Motor Test

Configuration reference
1. Major components

1.1 SG series Hydraulic Dynamometer

The hydraulic dynamometer controls the butterfly valve opening either through the electric drain valve or the drainage actuator which is controlled by the automatic regulating device. The water pressure in the work chamber inside hydraulic dynamometer is changed in order to change the absorbed power size.
1. Major components

1.2 JC series Torque Sensor and JW-3 Torque Meter
(For motor test)

For the stall test in the motor test stand, because the dynamometer has no speed, so the torque cannot be loaded and cannot be measured. At this moment, the torque sensor is used to measure the static torque in stall test. The torque sensor and torque meter should be used together.
1. Major components

1.3 Dynamometer Calibration device

The static calibration is applied for dynamometer torque sensor.

Calibration device includes the calibration arm and standard counterweights. High accuracy of the calibration arm length, accurate weight hanging position and standard weight ensures the accuracy of the static calibration. The counterweight surface has blackening treatment and metered.
2. Foundation, Mechanical Installation Section

2.1 Shaft Protection Cover

2.2 Cast Iron Base Plate and Dampers

2.3 Drive Shaft and Coupling (For engine test)
Shaft assembly and stall test tool (For motor test)

2.4 FC2480A Engine Mounting Bracket (For engine test)
Test Motor Mounting Bracket (For motor test)
3. Temperature and Pressure conditioning devices

3.1 FC2420T Engine Water Temperature Control Device (For engine test)
FC2420TD Test Motor Coolant Temperature Control Device (For motor test)

FC2420T is used in the engine test bench to adjust the engine coolant temperature. It is used to replace the vehicle engine radiator to keep the engine coolant temperature in a constant range.

FC2420TD is a dedicated temperature control device for cooling dynamometer motor, vehicle motor and its controller. It is an essential auxiliary equipment to ensure the smooth testing of the motor test stand.
3. Temperature and Pressure conditioning devices

3.2 BFY3000 Engine Cylinder Pressure Measuring Unit (For engine test)

BFY3000 uses high-precision, high-speed analog-to-digital converter for sampling. It collects the engine cylinder pressure transient data and calculate a cycle of the average pressure and maximum pressure values. The engine stroke and range can be set by the LCD touch keys. The set values can be permanently saved.

3.3 FC2430T Engine Oil Temperature Control Device (For engine test)

FC2430T is used for engine performance and factory test and also can be used for transmission oil temperature control.
4. **Throttle Actuation** *(For engine test)*

**FC2310 series Throttle Actuator**

FC2310 Throttle Actuator uses DC torque motor as the drive motor. It outputs torque through the gear deceleration and the rod (or reel) installed on the actuator controls the engine throttle opening. Actuator rod full-scale action is 90° angle, linear stroke is 85-140mm and the corresponding throttle is 0-100%. The straight travel distance can be adjusted by the rod slider.
5. **Fuel Consumption Measurement** *(For engine test)*

**FC2210 Fuel Consumption Meter**

FC2210 using integrated design technology, fuel consumption measurement and display are integrated as one for better cost control and achieving engine fuel consumption measurement independently.

- Measurement accuracy: ±0.4% F.S
6. Control Units and Modules

- For fixing mounting Powerlink system components and control, monitoring and measuring equipment.
- Modular design provides extensive system expansion possibilities.
- The industrialized design of the operation ensures the best installation and service environment.
6. Control Units and Modules (For engine test)

6.1 **FC2010 Measuring and Control Unit**

FC2010 Measuring and Control Unit and FC2110 Throttle/Excitation Driving Unit must be used together to measure and control the engine speed and torque.

6.2 **FC2110 Throttle/Excitation Driving Unit**

FC2110 Throttle/Excitation Driving Unit is used in conjunction with the FC2010 for adjustment of the water gate of hydraulic dynamometer.

6.3 **Industrial Personnel Computer**
6. Control Units and Modules (For motor test)

6.4 FC2012 Dynamometer Control Unit

FC2012 uses full digital PID control method to adjust the load speed and torque and control the output of the converter. The actual torque and speed measurement values are received from the torque sensor. The difference between those values and the actual values are compared to adjust the output of the converter until the final target values are achieved.

6.5 Torque Meter

6.6 Industrial Personnel Computer
6. Control Units and Modules (For engine test)

6.7 FC2022 Data Acquisition Module

- Acquisition accuracy <0.3% FS.
- Sampling rate: 10 ms
- 16 channels:
  - PT100
  - K-type thermocouple
  - Pressure transducer
  - Temperature and humidity sensor
  - 4-20mA sensor
  - etc
7. **Accessories (For engine test)**

7.1 **JXJ-1 Rocker Junction Box**

JXJ-1 Rocker Junction Box is suitable for many parameters acquisition test bed. As modules and sensors are installed in the chassis, Rocker Junction Box can reduce the field wiring. Maintenance is very convenient.

Rocker uses expansion bolts to install on concrete walls with the rotation angle $180^\circ$. Four FC2022 Data Acquisition Modules.

7.2 **Emergency Stop Device**

In case any incident happening, this device can effectively protects the engine and the complete test bench system.
8. **Software** *(English interface can be selected)*