

Test systems for the railway industry | PUFIB

INTRODUCTION

The PUFIB multipurpose testing bench can perform biaxial static and dynamic tests (tensile, compression, bending and torque) on complete track set.

TEST STANDARDS

The PUFIB machine allows testing in accordance with the main international standards, including:

- EN 13146-1 (Determination of longitudinal rail restraint), EN 13146-2 (Determination of torsional resistance), EN 13146-4 (Effect of repeated loading), AREMA chapter 5, as well as other standards belonging to entities such as GOST, UIC, AS, etc.

FEATURES AND ADVANTAGES

TESTING FRAME

- High stiffness testing frame with a versail design including a T-Slot base that allows to perform different type of test.
- Main test frame (available for 150 and 300 kN) for axial loading, consisting of 2 columns and a movable crosshead with lateral hydraulic jacks that allow to vary the height of the crosshead.
- Lateral reaction wall allowing the application of transverse loads by means of the secondary actuator of the system.

HYDRAULIC SYSTEM AND ACTUATORS

- It incorporates the new *EcoHydraulic* system, which provides major improvements over traditional hydraulic control systems in terms of efficiency (up to 20% higher), adaptive flow and pressure control depending on the instantaneous test load, giving it a longer life, less maintenance and lower oil consumption.
- Closed-loop control of force and travel by a high-response servo valve.
- Thanks to its integration with the testing software, it is possible to automatically perform safe shutdown operations, check the operating time of the hydraulic plant for scheduled maintenance and digitalize all the alarms of the hydraulic system.
- **Vertical actuator.** Double-acting and double-rod hydrostatic actuator. A contactless sealing bushing allows very low friction and minimum stick slip. It can withstand non-axial loads that may occur during the test.
- **Secondary transverse actuator.** Double acting single rod hydraulic actuator for static and pseudo-static loads with a typical capacity of 50 kN (others available).



CONTROL ESLECTRONICS

- The system incorporates the new *MD5i* control electronics for dynamic control of the main actuator with 24-bit resolution and 10 kHz closing loop frequency for fast and accurate control of test parameters. This means, among other advantages, that minimal variations in force or deformation can be observed during the test.
- The system incorporates the new *MD2i* control electronics for static control of the secondary actuator with 24-bit resolution and 2.5 kHz closing loop frequency.

Force Transducer (Load Cell)

- High stiffness force transducer for static and dynamic testing.

Stroke Transducer

- Magnetostrictive linear position sensor, absolute, non-contact, digital output, with direct mounting inside the piston, resolution 0.5 μm .

Safety

- Perimetral protection with electric safety locks that allow the introduction of the specimens in an easy way and a total security during the test.
- Complete system alarms (Temperature, Oil level, Dirty filter detection, pressure filter, maximum pressure, etc) integrated with control software for safety stops and test protection.
- Hydraulic piston safety lock system that immediately stops the piston in case of electrical failure to protect system and the test sample.

Maintenance and Support

- Intelligent maintenance system, which evaluates the condition and count operating hours to warns the user of all necessary preventive and corrective maintenance actions.

Options:

- The UCRD-8i remote control (optional) allows testing without a computer. 16 Function keys: Up, Down, Stop, open and close jaws, configurable keys (machine control), DigiPoti for precise movement control and a 400x200 pixel colour touch screen.

Technical specifications

MODELS AND FEATURES

MODEL	PUFIB-150/50	PUFIB-300/50
Maximum capacity main actuator	± 150 kN	± 300 kN
Maximum capacity secondary actuator	± 50 kN (others available)	
Force measurement	High stiffness strain gauge force transducer for static and dynamic tests.	
Calibrated measuring range	2% to 100% of the nominal capacity of the load cell	
Class	1 according to EN-ISO 7500 standard	
Resolution in force	5-digit floating point	
Frame	High stiffness by means of 4 columns	
Vertical testing space ¹	1000 mm	1000 mm
Measurement of the piston position.	0-300 mm	0-300 mm
Position transducers (main and secondary)	Magnetostrictive transducer. Inside piston mounting. Resolution: 0.5 micron	
Piston stroke (Main and secondary)	300 mm (±150 mm)	300 mm (±150 mm)
Power supply	3 ph 380 V + N + T, 50/60 Hz (Connection power to be defined according to the hydraulic unit installed) ³	
Test frame dimensions ⁴ (Width x Depth x Height)	3360 x 1660 x 2200 mm	3360x 1660 x 2350 mm
Approx. weight without testing devices	6000 Kg	7100 Kg

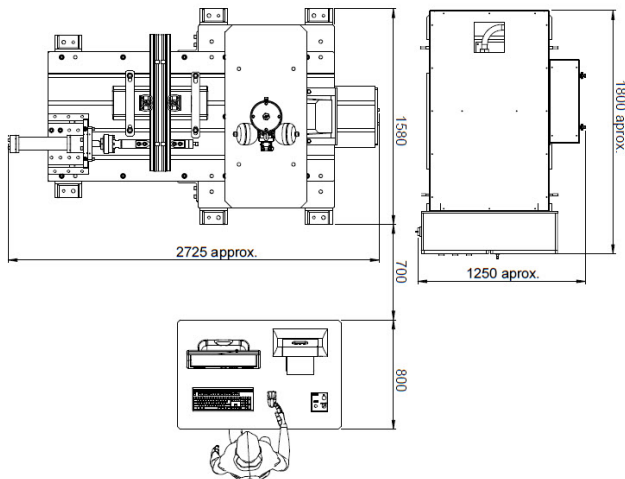
NOTES:

(1) Greater distances are possible on request.

(2) Other strokes available

(3) The characteristics of the hydraulic unit are specific to the application and the needs of each customer.

(4) IBERTEST can design and manufacture other larger frames according to the customer's needs.



Approximate dimensions in plan view, PUFIB-150/50



Longitudinal rail restraint test set-up