

## Other Products using Force Plate

### Mobile Force Plate : M3D-EL-FP

Compact and slim Force Plate which can be attached to a shoe or a pedal. There are two sizes available along with wired (USB) or wireless (wireless LAN) options.

Wireless

M3D-EL-FP-R



Sampling frequency: 100Hz  
Max: 4 units

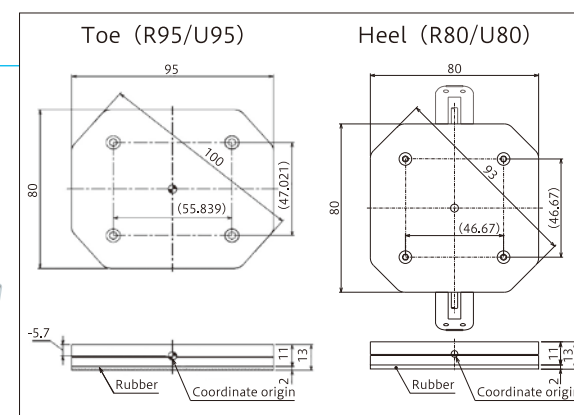
Wired

(USB cable)

M3D-EL-FP-U

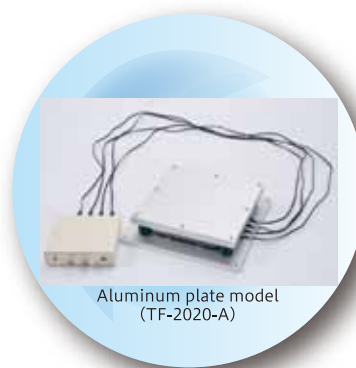


Sampling frequency: 1KHz  
Max: 4 units

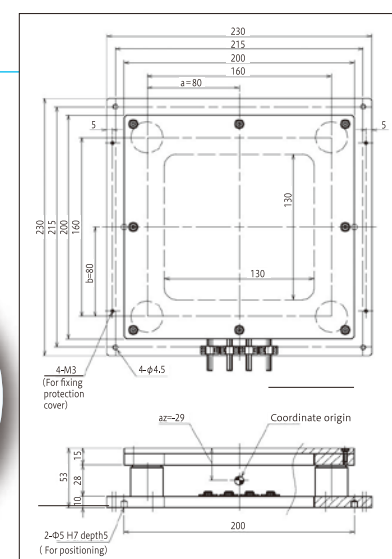


### Tactile Force Plate TF-2020

TF-2020



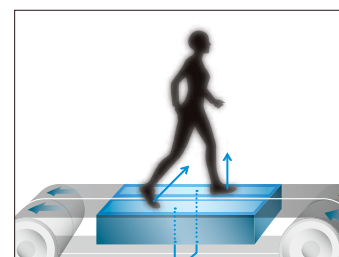
TF-2020 Force Plate is designed for the measurement of 6-axis haptic (Fx, Fy, Fz, Mx, My, Mz) up to 10N in full-scale using the dedicated software. A picture of a contact surface can be taken with a clear acrylic top plate model.



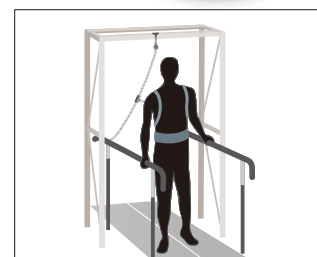
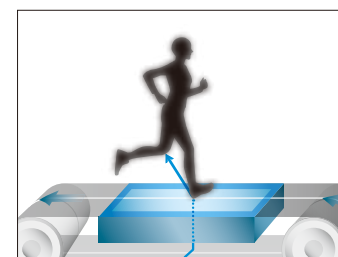
### Force Plate Integrated Treadmill



- 2 Force Plates are built-in under the dual belt.
- Accurate movement of the dual belt using the software.
- A standard feature of analog output (Force Plate, belt speed) enables the combined usage of digital (dedicated software) and camera systems (motion capture).



Both "Walking" and "Running" can be measured.



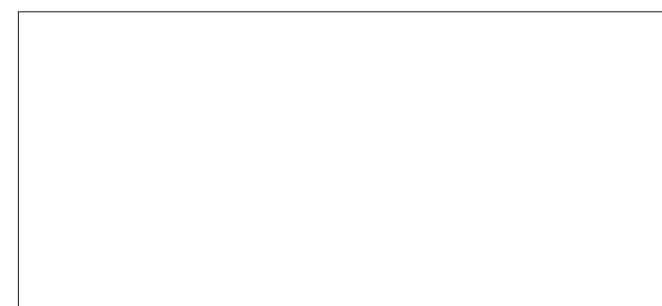
Suspension device with emergency stop function.

Please feel free to contact us for a variety of measurement needs.  
(e.g.) Special shaped sensors / Measurement system with 3-axis force sensors.



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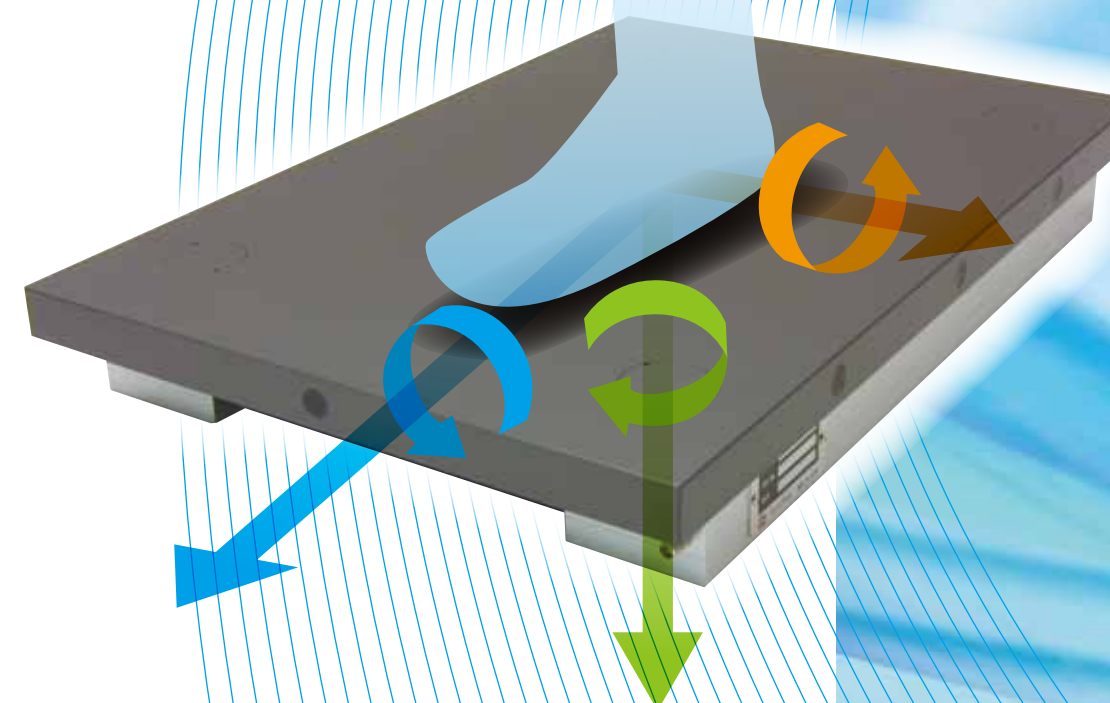


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 **Tec Gihan**

# Force Plate

Accurate • Reliable • Easy to Use



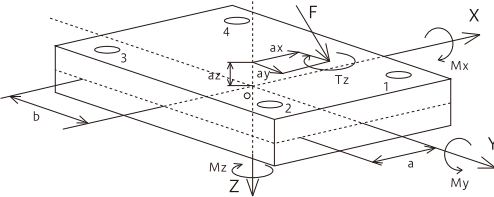


Accurate•Reliable•Easy to Use

High precision measurement of six force components (Fx, Fy, Fz, Mx, My, Mz)

Our Force Plate uses a strain gauge and features excellent linearity and temperature characteristics, allowing calibration with a static load. Minimal zero-drifting enables stable measurement.

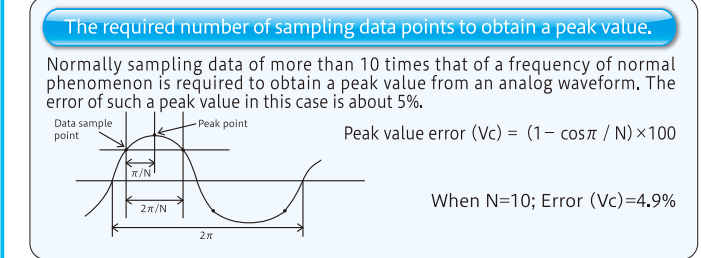
Our unique technology is applied to the design and combinations of the internal sensors and top plates, which are the key features of Force Plate.



◆ Responsiveness of Force Plate

Natural frequency of TF-4060 Force Plate is 420Hz and the responsiveness is approximately 1/3 of that. The TF-4060 has sufficient responsiveness for measurement

of the human body and motion. In order to maximize this feature, the sampling frequency for a digital connection can be up to Max. 10kHz.



Relation between measurement and data sampling

Measurement phenomenon (Mainly human body)	≦ 100 Hz
Responsiveness of Force Plate (1/3 of natural frequency)	≧ 100 Hz
Sampling frequency	≧ 1000 Hz

※An applied sensor and a measuring object need to be considered to set the number of data to collect.

※Please contact us for a higher natural frequency model. A honeycomb-structured top plate is available for this purpose.

Reliable

Force Plate is calibrated by applying actual force using the dedicated calibration equipment. The inspection standards such as load cells and weights used for the calibration are based on Japanese National Standards. All the manufacturing processes including development and calibration are performed domestically in Japan, and all products passed reliable tests. We ensure sufficient support is provided from proposal to installation and provide after service for all our measurement systems.



Simple

● Remote control

Force Plate can be regulated using a remote controller (zero-adjustment, range settings). Three measurement ranges are available according to test purposes.



● Simple installation adjustment monitoring

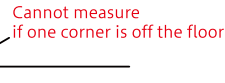
An accurate level adjustment is required; Force Plate must be installed on the level; integrated sensors are to receive load equally. With the software, these installation adjustments can be easily performed by applying load at the center of the Force Plate, monitoring Z-direction force output of the sensors mounted at the corners.

※A level meter helps to make the surface of Force Plate horizontal. However, it is also necessary to adjust an installed ground level to the floor.

※Level adjustment while monitoring actual load is a very accurate method generally applied to industrial equipment such as load meter installation of a large tanker.



Adjustment monitoring of the received load balance by the sensors enables secured installation to the floor and level adjustment in microns.



Cannot measure if one corner is off the floor.

● Digital and interference-corrected analog outputs

TF-4060 model has an embedded amplifier inside the Force Plate to reduce size as well as to realize a variety of measurement styles. Analog output includes 6 interference-corrected components (Fx, Fy, Fz, Mx, My, Mz), which allows easy coordination with motion analysis systems.



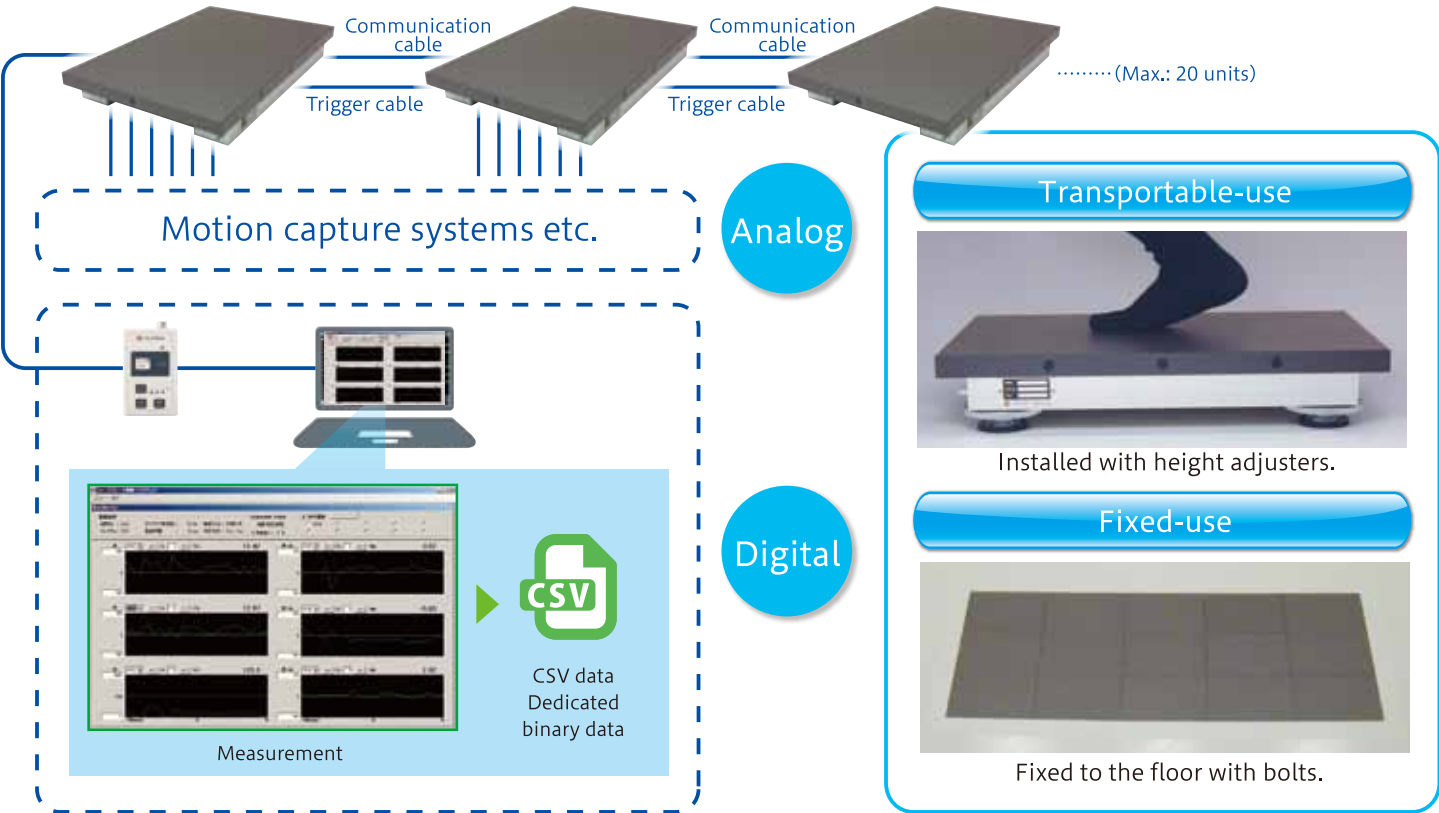
Digital output

Analog output

Simply connect to a computer.

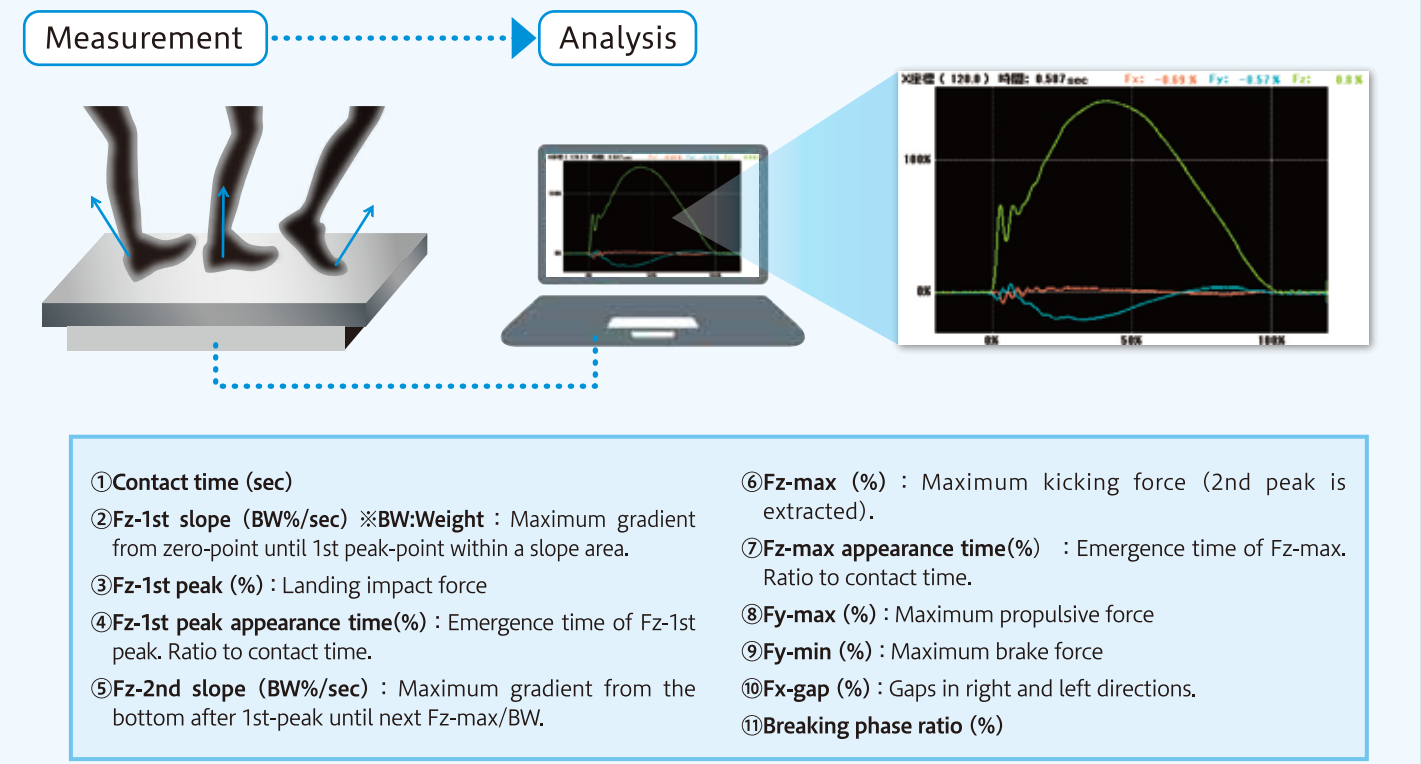
Measurement using motion capture systems.

System Configuration



Optional Software (Sold separately)

Dynamically analyzes motion series from landing of the foot on the ground (Force Plate) until kicking up of the heel.



LINEUP

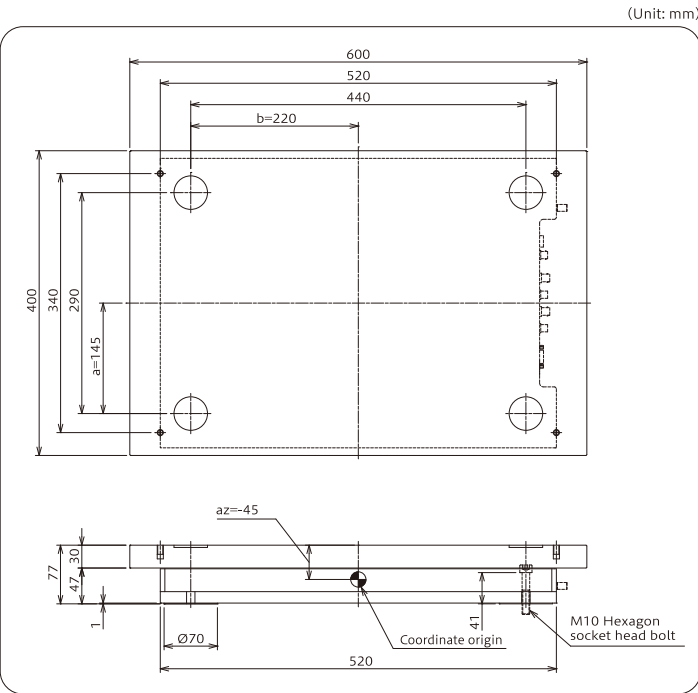
Standard Type : TF-4060

Built-in Amplifier



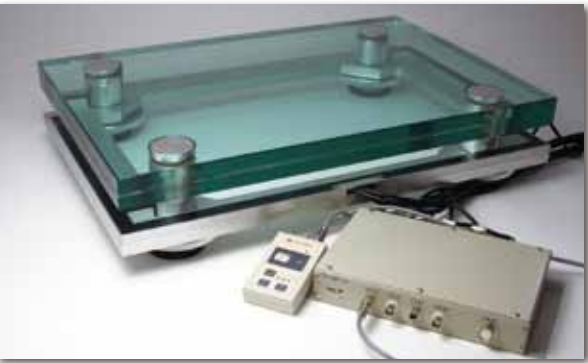
Standard model Force Plate. Signal amplifier is integrated in the main unit.  
Features of built-in amplifier are  
1) reduces disturbance noise  
2) portable  
3) the Force Plate can be directly connected to a computer since an A/D converter is also integrated.

Model	TF - 4060		
【Performance】	1	2	3 (Rated capacity)
Measurement range			
Fx (N)	±1000	±2000	±3000
Fy (N)	±1000	±2000	±3000
Fz (N)	+3000	+6000	+10000
Mx (N・m)	±600	±1200	±2000
My (N・m)	±450	±900	±1500
Mz (N・m)	±200	±400	±600
Non-linearity	±0.5 RO or less		
Hysteresis	±0.5 RO or less		
【Mechanical characteristics】			
Allowable overload	150%(Up to the rated capacity of range 3)		
Natural frequency	Z =420Hz		
Power supply	12V DC, AC adapter included.		
External dimensions	400 (W) ×600 (D) ×77 (H) mm		
Weight	31kg		
【Functions】			
Output	Digital and analog outputs of 6-force components after mutual interference corrections. (±10V/full-scale of each range)		
Synchronized operation	Max. 20 units can be synchronized (digital).		
Trigger functions	Contact input, Level trigger input		
Remote controller	Auto-balance, Measurement range switching		



Transparent Glass Top Model : TF-4060-G

Amplifier Separated



Transparent glass surface Force Plate.  
39mm thickness tempered glass is adopted for the top plate.  
White LEDs can be arranged around it (option).  
Can clearly show contact with the sole of the foot.

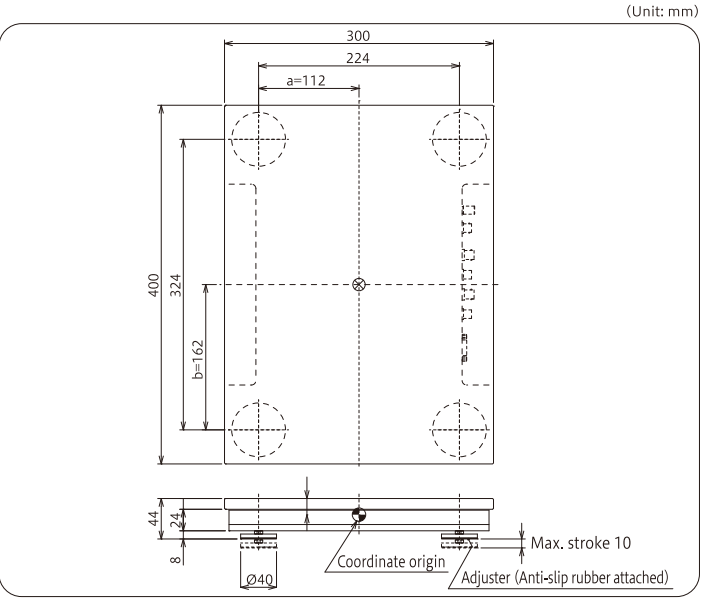
Compact Low Capacity Type : TF-3040/TF-3020

Built-in Amplifier

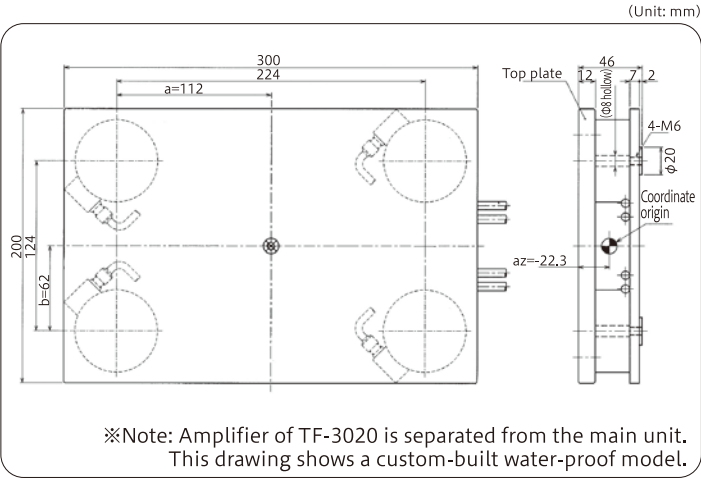


Low capacity Force Plate.  
Smaller than the standard type and easy to carry.  
Suitable for measurement of a small force such as a child's standing-up motion.

Model	TF – 3040		
【Performance】	1	2	3 (Rated capacity)
Measurement range			
Fx (N)	±100	±200	±300
Fy (N)	±100	±200	±300
Fz (N)	+300	+600	+1000
Mx (N·m)	±45	±90	±150
My (N·m)	±30	±60	±100
Mz (N·m)	±20	±40	±60
Non-linearity	±1.0 RO or less		
Hysteresis	±1.0 RO or less		
【Mechanical characteristics】			
Allowable overload	150%(Up to the rated capacity of range 3)		
Natural frequency	Z-axis = 320Hz		
Power supply	12V DC, AC adapter included.		
External dimensions	300 (W) ×400 (D) ×44 (H) mm		
Weight	7kg		
【Functions】			
Output	Digital and analog outputs of 6-force components after mutual interferences corrections. (±10V/full-scale of each range)		
Synchronized operation	Max. 20 units can be synchronized (digital).		
Trigger functions	Contact input, Level trigger input		
Remote controller	Auto-balance, Measurement range switching		



Model	TF - 3020		
【Performance】	1	2	3 (Rated capacity)
Measurement range			
Fx (N)	±100	±200	±300
Fy (N)	±100	±200	±300
Fz (N)	+300	+600	+1000
Mx (N·m)	±18	±36	±60
My (N·m)	±30	±60	±100
Mz (N·m)	±20	±40	±60
Non-linearity	±1.0 RO or less		
Hysteresis	±1.0 RO or less		
【Mechanical characteristics】			
Allowable overload	150%(Up to the rated capacity of range 3)		
Natural frequency	Z-axis = 480Hz		
Power supply	12V DC, AC adapter included.		
External dimensions	300 (W) ×200 (D) ×46 (H) mm		
Weight	4kg		
【Functions】			
Output	Digital and analog outputs of 6-force components after mutual interferences corrections. (±10V/full-scale of each range)		
Synchronized operation	Max. 20 units can be synchronized (digital).		
Trigger functions	Contact input, Level trigger input		
Remote controller	Auto-balance, Measurement range switching		



※Note: Amplifier of TF-3020 is separated from the main unit.  
This drawing shows a custom-built water-proof model.



LINEUP

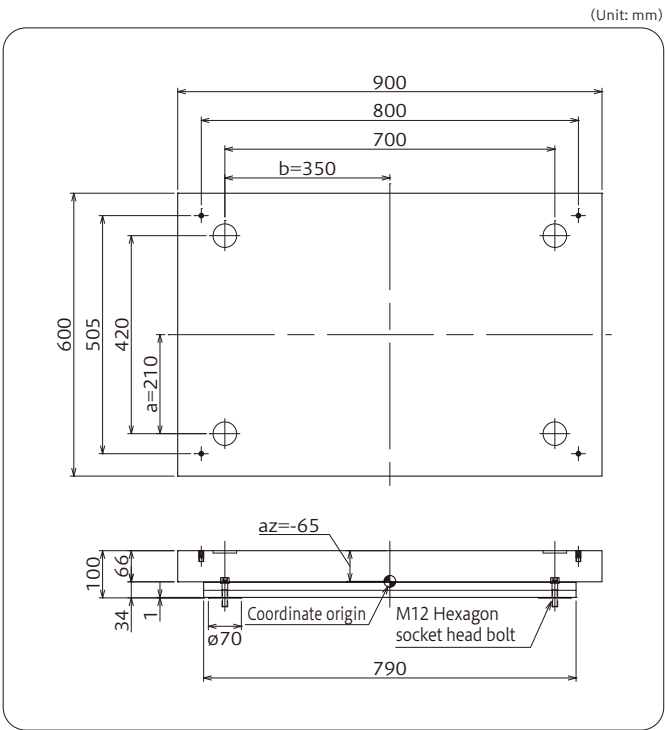
Large Type : TF-6090

Built-in Amplifier



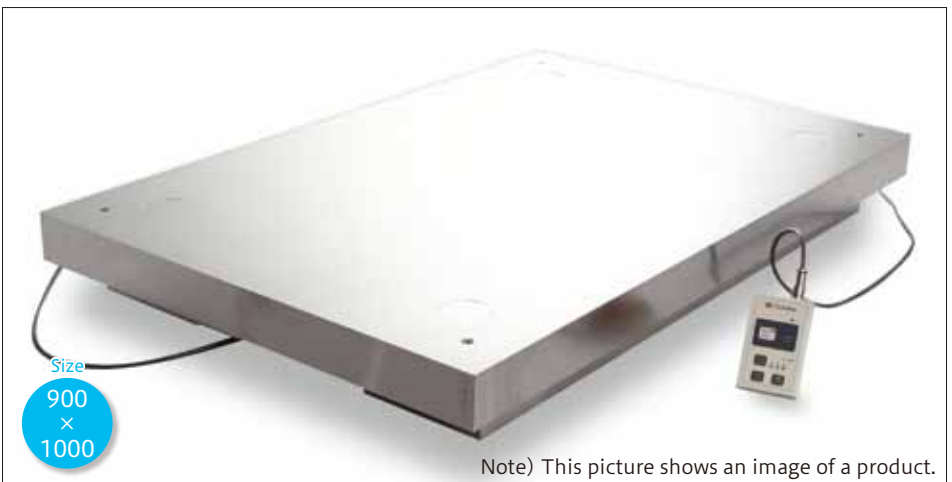
Same specifications as the standard type TF-4060 but larger in size. Suitable for a measurement of larger step movements such as those in sports.

Model	TF - 6090		
【Performance】	1	2	3 (Rated capacity)
Measurement range			
Fx (N)	±1000	±2000	±3000
Fy (N)	±1000	±2000	±3000
Fz (N)	+3000	+6000	+10000
Mx (N·m)	±1050	±2100	±3500
My (N·m)	±750	±1500	±2500
Mz (N·m)	±300	±600	±900
Non-linearity	±0.5 RO or less		
Hysteresis	±0.5 RO or less		
【Mechanical characteristics】			
Allowable overload	150% (Up to the rated capacity of range 3)		
Natural frequency	Z-axis = 360Hz		
Power supply	12V DC, AC adapter included.		
External dimensions	600 (W) × 900 (D) × 100 (H) mm		
Weight	48kg		
【Functions】			
Output	Digital and analog outputs of 6-force components after mutual interferences corrections. (±10V/full-scale of each range)		
Synchronized operation	Max. 20 units can be synchronized (digital).		
Trigger functions	Contact input, Level trigger input		
Remote controller	Auto-balance, Measurement range switching		



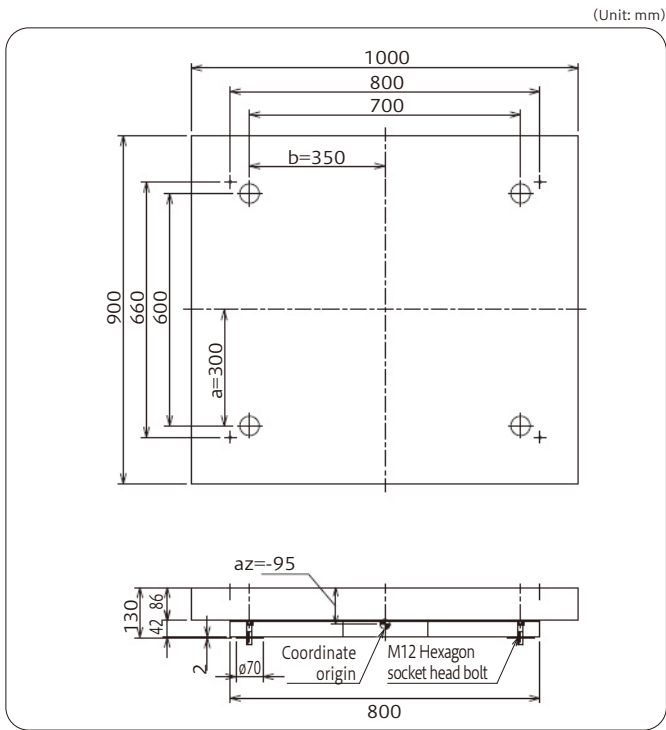
Extra Large Type : TF-90100

Built-in Amplifier



Extra large-sized Force Plate intended for usage in an athletics stadium. Available for individual use to a measurement system setup for athletics using multiple force plates.

Model	TF - 90100	
【Performance】		
Measurement range		
Fx (N)	±3000	
Fy (N)	±3000	
Fz (N)	+10000	
Mx (N·m)	±3500	
My (N·m)	±3000	
Mz (N·m)	±1000	
Non-linearity	±1.0 RO or less	
Hysteresis	±1.0 RO or less	
【Mechanical characteristics】		
Allowable overload	150%	
Natural frequency	Z-axis = 340Hz	
Power supply	12V DC, AC adapter included.	
External dimensions	900 (W) × 1000 (D) × 130 (H) mm	
Weight	68kg	
【Functions】		
Output	Digital and analog outputs of 6-force components after mutual interferences corrections. (±10V/full-scale of each range)	
Synchronized operation	Max. 20 units can be synchronized (digital).	
Trigger functions	Contact input, Level trigger input	
Remote controller	Auto-balance, Measurement range switching	



Examples of application (custom-built products).



Examples of application

National Institute of Fitness and Sports in KANOYA (SP lab)

