

GT-ROLLER

Q1.1



THE ROAD IS HERE

2016.5.20



GT-ROLLER Q1.1

All cyclists should be able to enjoy sport cycling without regard for the place or time.

We want cyclists to be able to ride as hard as they want indoors regardless of the weather or time of day.

We provide cyclists with a new cycling life that does not differentiate between outdoors and indoors.

“Create a road in your house”

What needs to be provided:

The same ride feel as the outdoors

- Same handling as the outdoors
- Stable performance from super low to high speed
- Can recreate inclines
- Can ride out of the saddle
- Can shift the load backwards and forwards

What is important when riding indoors:

Consideration for the rider and indoor environment

- Fun to ride
- Easy to use by both novice and experienced riders
- Hard to fall
- Low vibration and low noise
- Small and compact

First, the basics of a bicycle

In order to realize the same ride feel as the outdoors, it is necessary to confirm the basic characteristics of bikes.

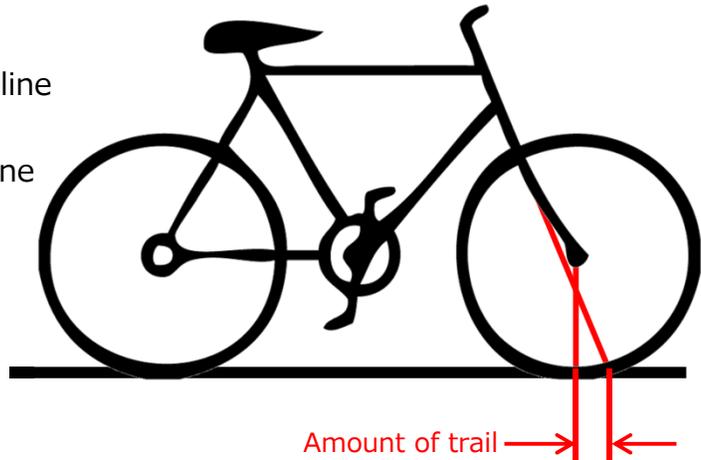
■ Bikes travel in a straight line because they have trail

Large trail :

stronger tendency to travel in a straight line

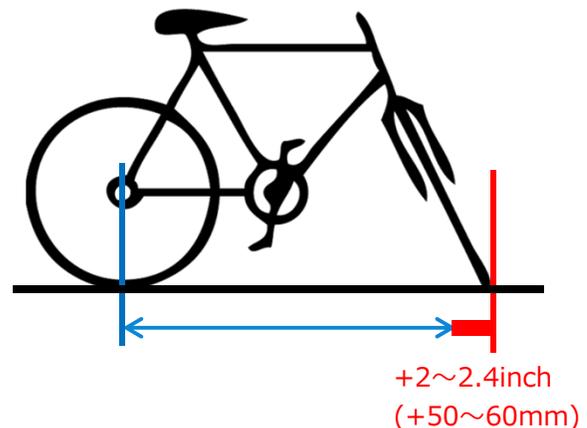
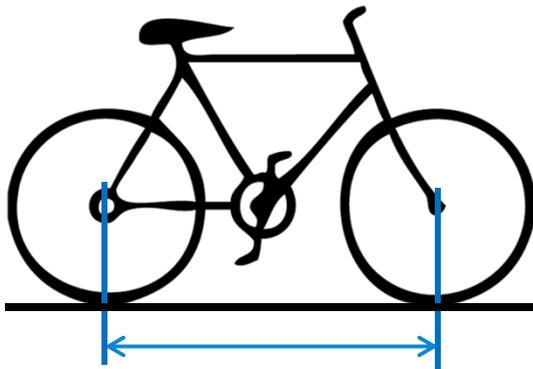
Small trail :

weaker tendency to travel in a straight line



■ When the handlebars are turned, the distance between the points at which the wheels contact the ground changes

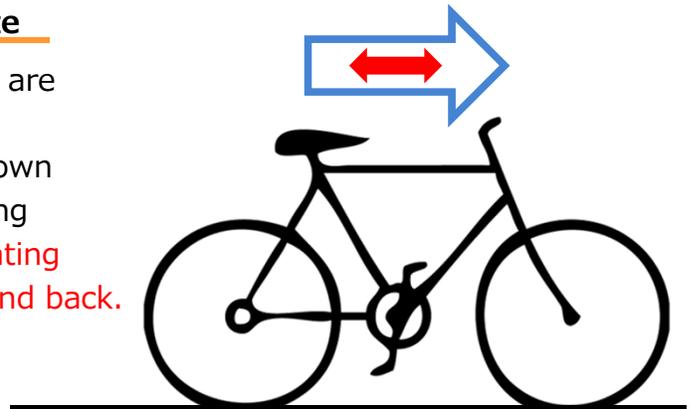
When the handlebars are turned 90 degrees, the distance changes by about 50-60mm in standard road bikes.



■ Bikes repeatedly accelerate and decelerate

Maximum torque is generated when the pedals are around the 3 o'clock position.

Minimum torque occurs near straight up and down. Through the inertia generated from the changing torque and pedaling, bikes travel while accelerating and decelerating several centimeters forward and back.

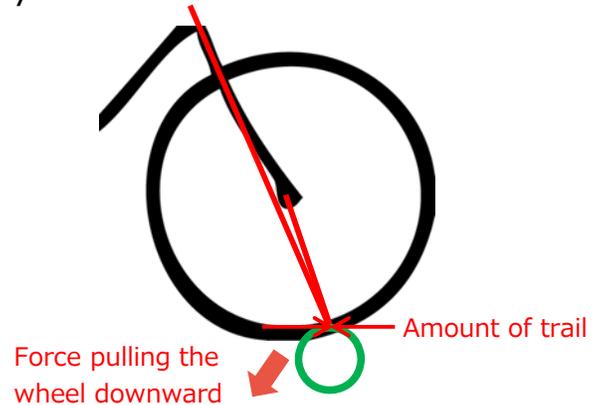


Difficulty of riding on 3-drum rollers

While 3-drum rollers have a feel similar to the actual road, they have their own unique difficulties and present the risk of the wheel losing contact with a drum or falling over. What causes this difficulty?

■ Trail that ignores bicycle design

The front roller is located in front of the wheel axle, and **this tends to reduce the amount of trail**. Also, a **force that pulls the wheel downward is generated**. In short, the handling is completely different than riding outdoors. It is more sensitive.

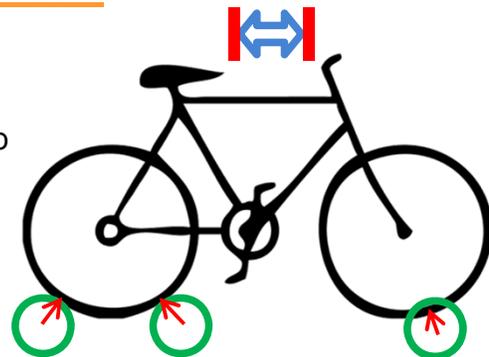


■ Handling characteristics change when the handlebars are turned

When the handlebars are turned, the tire contact points and amount of trail changes. Along with the change in the amount of trail, the force pulling the wheel down also changes. Because of these changes, it becomes difficult to turn the handlebars at all. **If the handlebars are turned a lot, the risk of falling increases.**

■ Effects of the forward and back movement of the bike

On 3-drum rollers, because **the bike is fixed in position, it cannot move forward and back**, and this leads to a rough feel and increases the risk of the bike flying off to the front or back.



■ Advantages and disadvantages

In order to avoid these difficulties, the key is to focus on keeping the load on the rear wheel and lightening the load on the front wheel.

Thus, it is difficult to ride out of the saddle, which increases the forward load, or for the rider to shift the load forward and push down hard on the pedals.

However, rollers do provide the benefit of correcting the riding habit of holding onto the handlebars too tightly and reducing the changes in the torque generated when pedaling. Moreover, they help improve balance.

Also, because they are difficult and present a minor danger, they make riding indoors a little more fun.

Challenge of creating a road inside the house

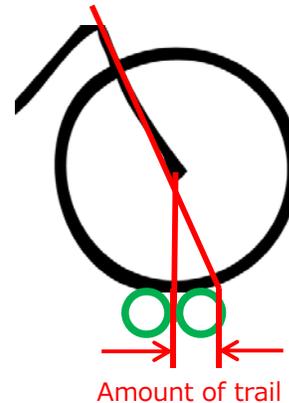
GT-Roller Q1.1 is equipped with 4 rollers.

By controlling these 4 rollers, the GT-Roller Q1.1 enables the bike to perform as it was designed to.

We want you to be able to ride as hard as you want indoors!

■ Respecting the design of the bike

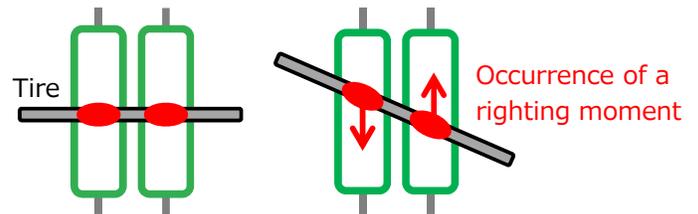
The front wheel is located between 2 rollers, thus recreating the same trail as riding outdoors.



■ Recreating the tendency to travel in a straight line

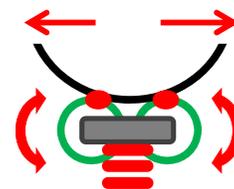
When riding outdoors, there is a tendency to travel in a straight line (righting moment) generated by resistance from the road surface.

The two contact points create a tendency to travel in a straight line (righting moment) that is similar to riding outdoors.



■ Controlling the contact pressure

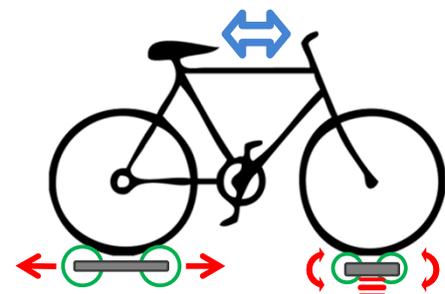
Even when the handlebars are turned or the bike moves forward or back, the rollers are designed to maintain even contact pressure, thereby maintaining a stable tendency to travel in a straight line (righting moment).



■ Controlling the forward and back movement

The rear slide unit controls the forward and back movement of the bike.

This prevents the bike from flying off of the rollers and enables natural pedaling.



GT-Roller Q1.1

The GT-Roller Q1.1 is a compact indoor trainer equipped with a wide range of functions and provides an excellent real road feel and safety.

**OK!
OK!**

No special skills are required.

The bike can be ridden in the same way as when riding outdoors.

Skilled riders will be as skilled as ever, and average riders will be able to ride as they always do.



The rollers provide a stable ride feeling over a wide range of speeds from under 10km/h to more than 50km/h. It can also be used for high load, low cadence training, which used to only be possible with stationary trainers.



Stable not just when riding in the saddle but also when standing and swinging the bike widely side to side. It makes a diverse range of riding styles possible.



Can simulate inclines of 0-10%. It can use used for everything from flat road training to hill climbing.



Stable handling. Stable forward and back movement. It is still possible to fall, but these rollers are very safe.



Equipped with a mechanism that absorbs large vibrations while controlling the 4 rollers.

It is no fun to ride if there is excessive vibration.



The 3 piece frame and locking mechanism make it the thinnest rollers in the world*.

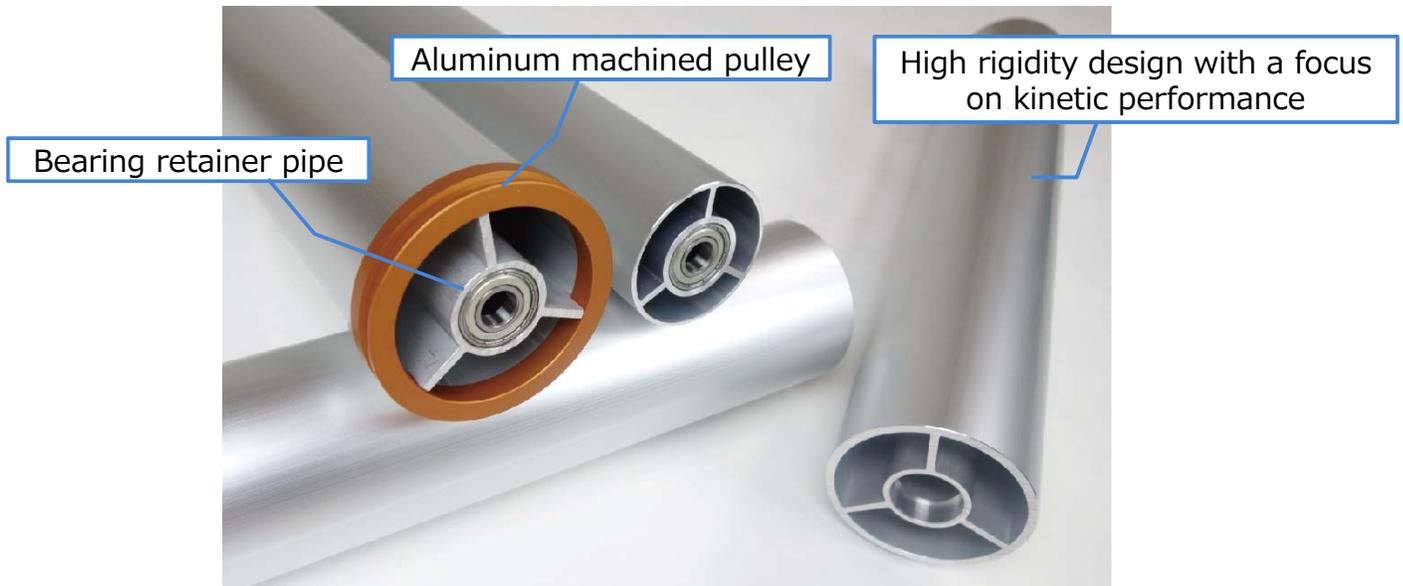
It can be stored away in a gap only 3.94inch(10cm) wide.

*As of May 2016. Survey conducted by Growtac

Double "O"tube

GT-Roller Q1.1

The performance of the rollers is an extremely important aspect that is directly linked to the ride feel



The rollers provide a low vibration, even ride feel, and similar to riding outdoors, they have enough momentum to enable the wheels to keep rotating even when the rider stops pedaling. The rollers are an extremely important component that directly affects the ride feel. For this reason, we spent 2 years developing the Double "O" tube.

Only those rollers that have passed our **extremely strict criteria** are used. The $\Phi 60\text{mm}$ front rollers have an axial runout of **0.10mm or less**, and the $\Phi 80\text{mm}$ rear rollers have an axial runout of **0.15mm or less**.

(This is more than 3 times more precise than typical 3-drum rollers)

Also, the front rollers, which spin at high rpms, have been balanced on two planes to realize even lower vibration.

However, even if the rollers have excellent static properties, they are useless if they have poor kinetic properties when rider's weight and power is applied to them.

For this reason, we eliminated the low precision, flimsy plastic bearing cap that is generally found in other rollers and instead used 6000 series aluminum to create a bearing retainer pipe and attached it in the center of the roller with 3 spokes. This new design ensures extremely high rigidity.

In particular, the rear rollers are 5mm thick, thereby eliminating resonance.

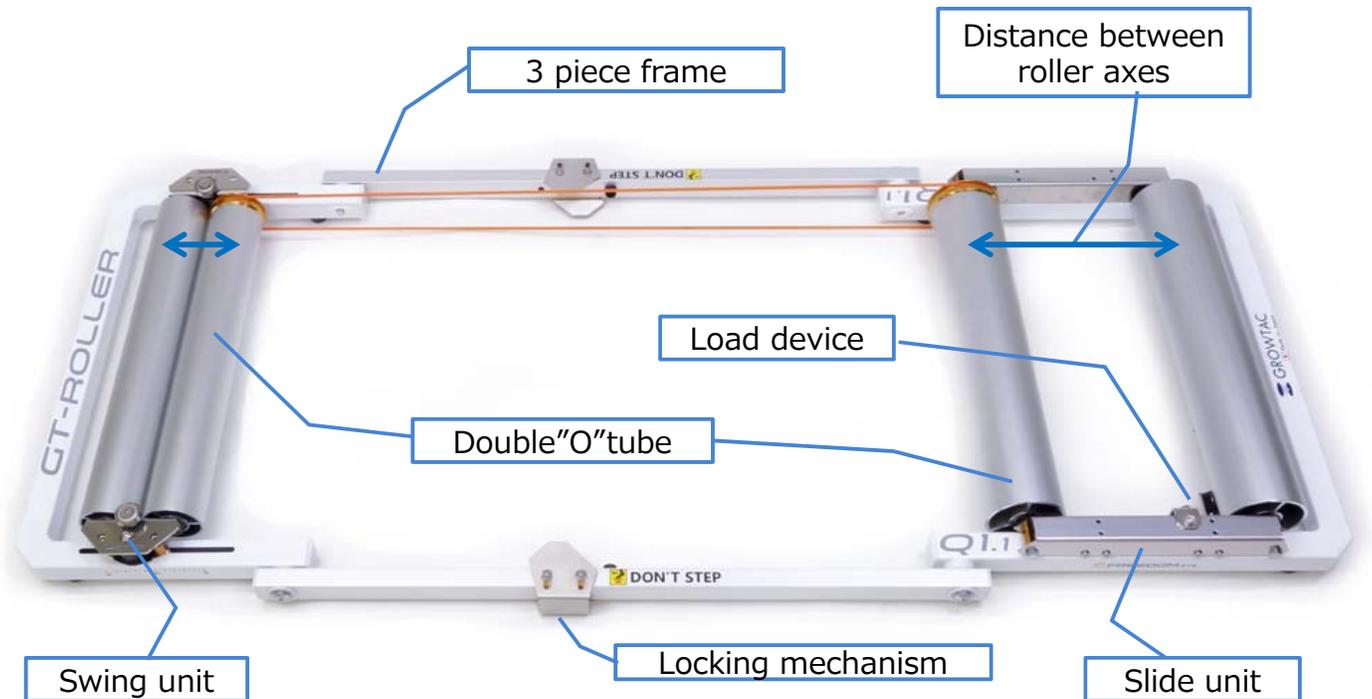
The Double "O" Tube, which has the highest specs in its class, is essential for a comfortable ride.

*Products using rollers that are $\phi 100$ or less

FREEDOM.system

GT-Roller Q1.1

FREEDOM.system is the name of the system that comprehensively activates the individual mechanisms that make up the GT-Roller Q1.1 and provides the rider with an excellent real road feel, safety and comfort.



Optimization of the ride feel

An indoor trainer is not a piece of equipment that is satisfactory as long as it works. Rather, it is a piece of sports equipment. Harmony with the rider is the most important feature.

FREEDOM.system is not just an excellent function, but it also tunes each mechanism on the rollers in order to provide a comfortable riding experience. The distance between the roller axes is extremely important in relation to the behavior of the bike when the handlebars are turned.

The harness of the elastomer in the swing unit and strength of the spring in the slide unit have a large impact on stability.

In addition, a number of other elements, such as the weight of the rollers and frame rigidity, have been complexly adjusted to realize a ride feel and stability that is similar to the outdoors.

Front elevator function

With the high stability and 3 piece frame, the front end can be lifted up, making it possible to simulate inclines up to 10%. It is also possible to ride out of the saddle while the front end is lifted.

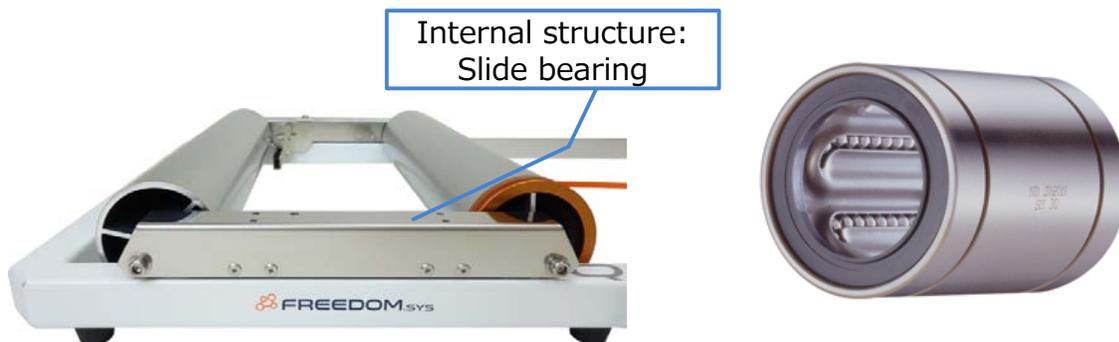
With the optional electronic load unit and motorized elevator, the incline and load can be adjusted automatically.



Slide unit

The slide unit controls the forward and back movement of the bike. The smooth sliding action even under heavy loads achieves a feeling similar to the real road.

The internal structure is made up a slide bearing, which is often used in industrial equipment, and a spring that has been adjusted to provide a feel similar to riding on a real road.

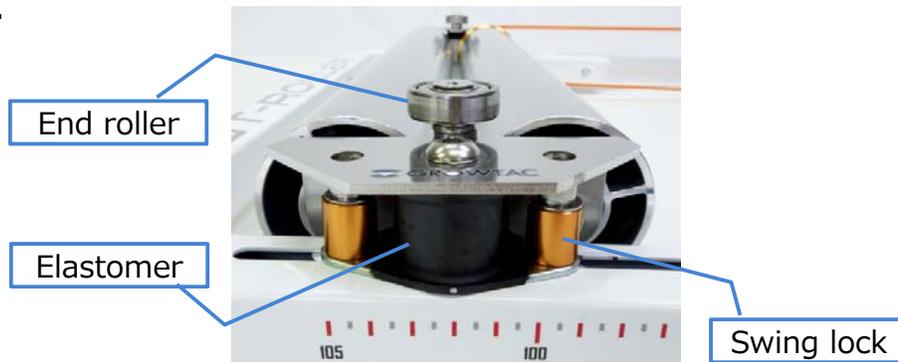


Swing unit

The 2 rollers are supported by an elastomer, and because the elastomer is able to swing, the rollers track the front tire.

This swing movement maintains the equal contact pressure with the tire and realizes handling equivalent to riding outdoors.

The swing locks after moving a certain amount to prevent the bike from flying off of the rollers. Also, the end rollers prevent the tire from sliding off to the right or left.



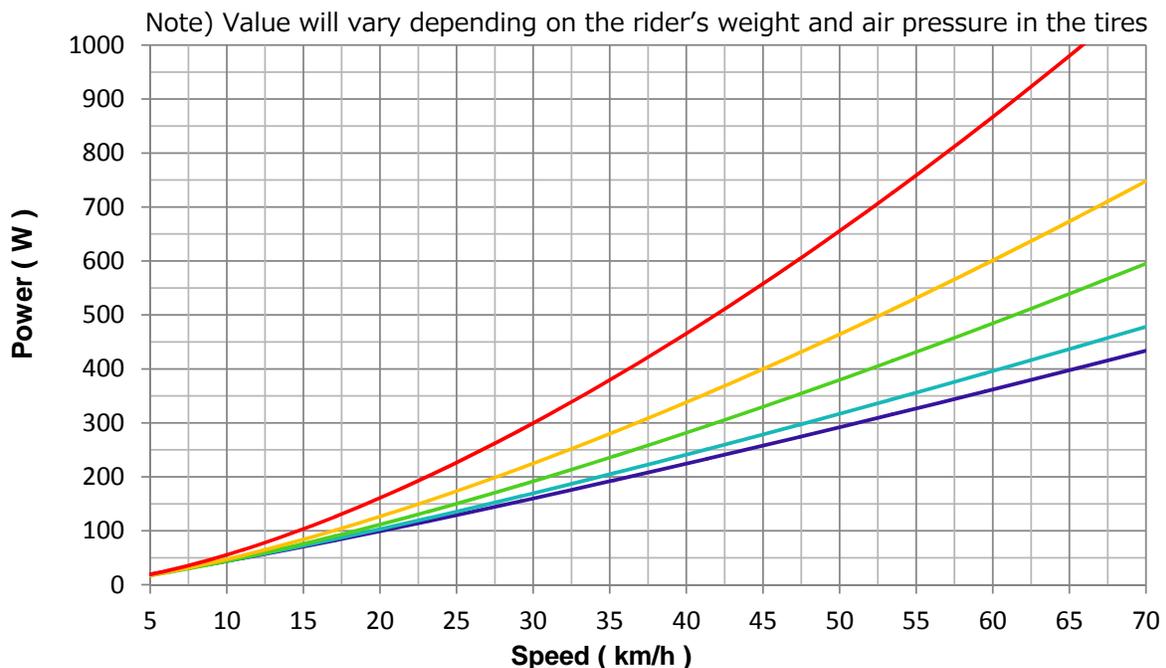
Load unit



A manual load device with 5 different settings is standardly equipped.

An optional electronic load unit that can be wirelessly operated from the handlebars is also available.

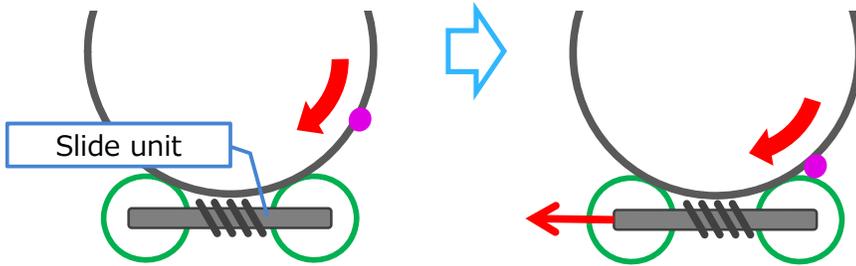
Load characteristics



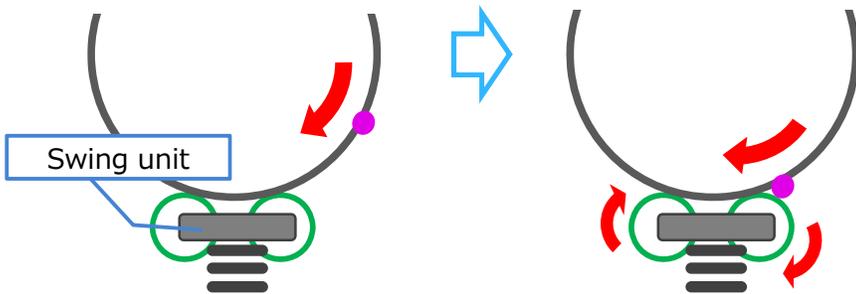
Vibration reduction function

The slide unit and swing unit also have an additional role. They absorb the vibrations caused by roughness and uneven rigidity in the tires and wheels, thus realizing low vibration.

Example: Rough area in the tires

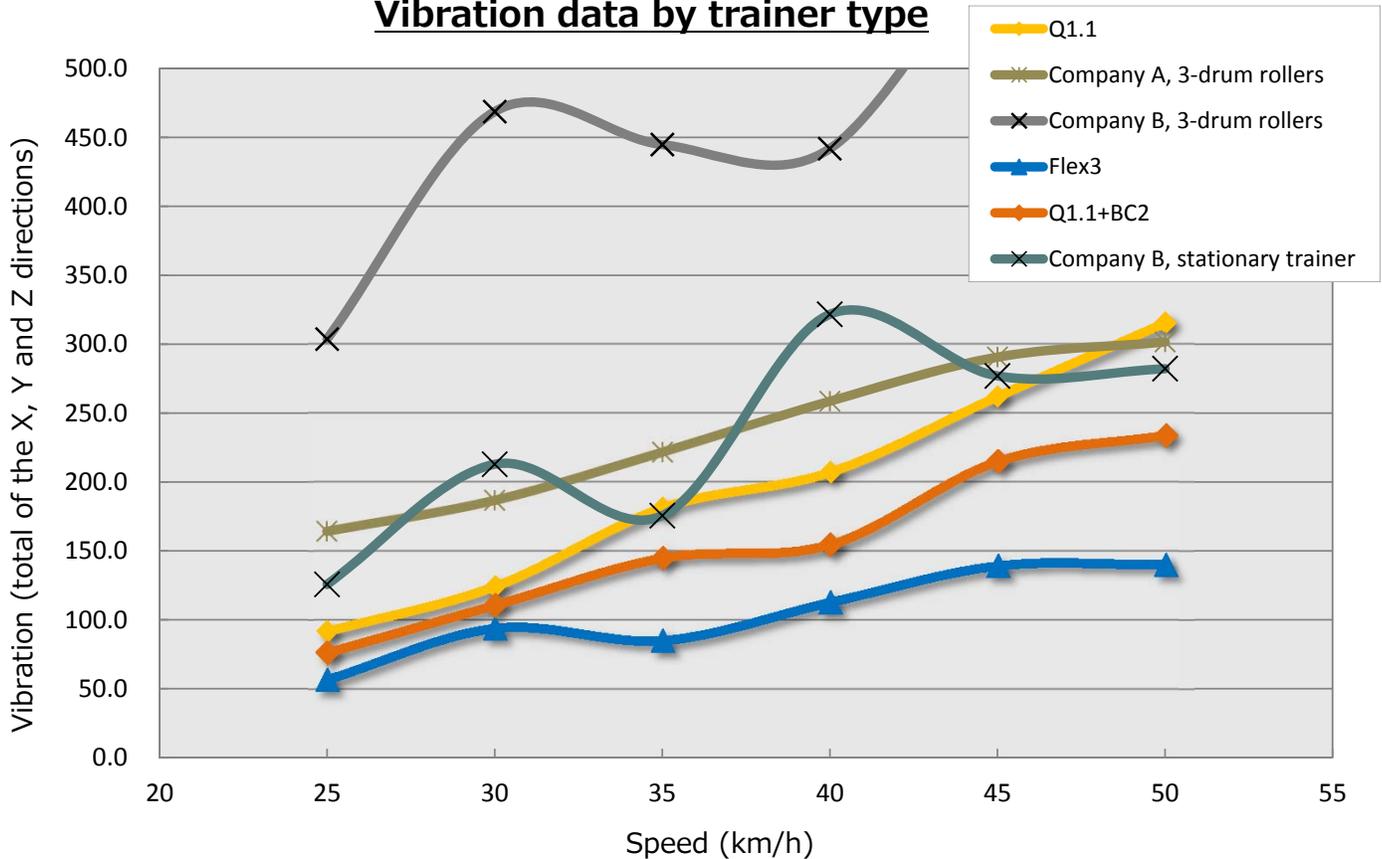


When the rough part contacts the rollers, the unit simultaneously slides, and the vibration is absorbed by the suspension action of the spring

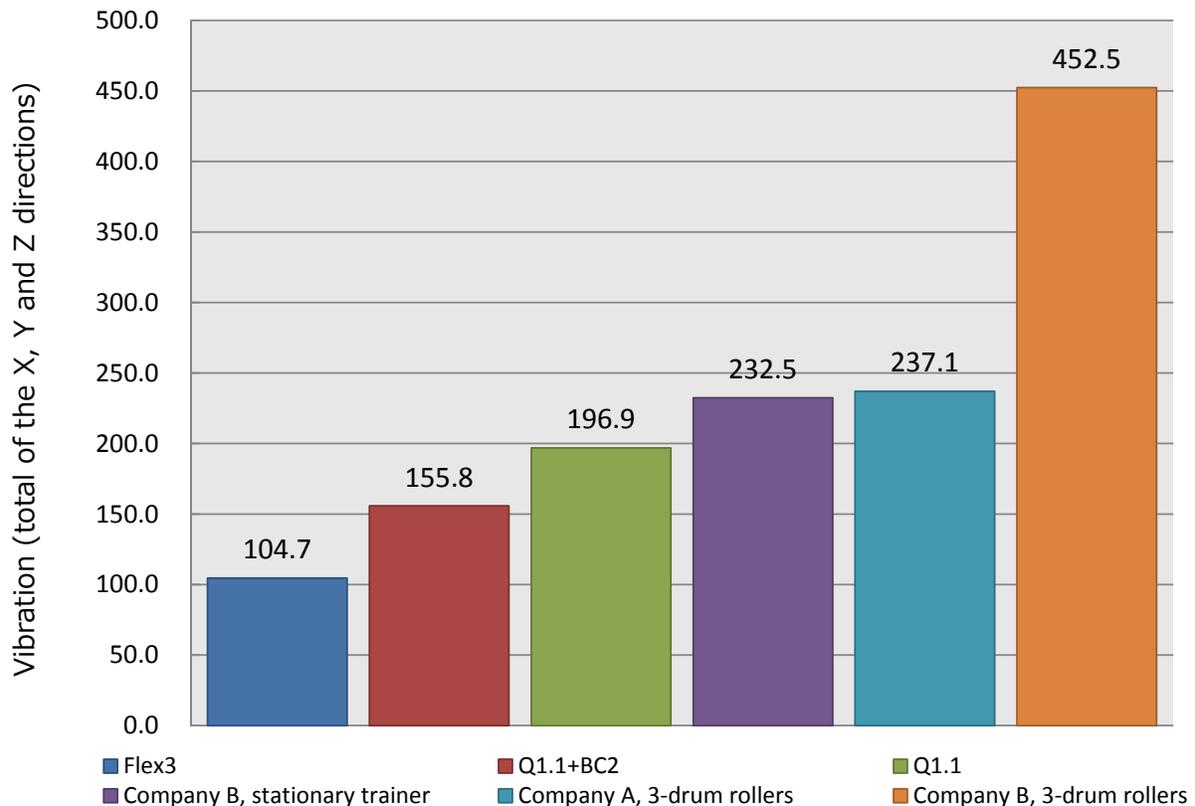


When the rough part contacts the rollers, the forward roller simultaneously rotates downward, and the other roller rotates upward and pushes on the tire. The vibration is absorbed by the elastic force of the tires and elastomer in the swing unit

Vibration data by trainer type



**Vibration data by roller type at an average speed of
25~55km/h**



Measurement location:

Growtac test flooring (simulated wooden flooring)

Measurement speed: 25km/h-50km/h

※ BC2: BRUCAT2



Vibration sensor was placed on the floor beneath the bottom bracket

Results of the vibration test

It was possible to confirm that the GT-Roller Q1.1 has the lowest vibration among the 3-drum rollers tested.

However, it was surpassed by the Flex3 stationary trainer in terms of noise.

※ The waveform and amplitude will vary depending on the type of tires, usage location and structure of the floor.

This graph is just one example.

Folding function

With the unique 3 piece frame, it is possible to compactly fold the rollers. The folded rollers are the thinnest in the world* at 3.94inch(10cm). The locking mechanism locks the three frames together, making the rollers safe and easy to carry.

* As of May 2016. Survey conducted by Growtac



Folding the rollers is as easy as lifting the front end up



The three frames are locked together by the locking mechanism, so the rollers are safe and will not open unintentionally while carrying.

Optional accessories (planned)

Four optional accessories are available. It is possible to upgrade in accordance with the planned use.

Control unit

Wireless control of the electronic control unit and motorized elevator.
Can be operated while riding.
Equipped with a wide range of functions including fixed watt mode, incline and load linked to a cycling app.

Internet
PC

ANT+ unit

Supports ANT+ standards, such as ZWIFT

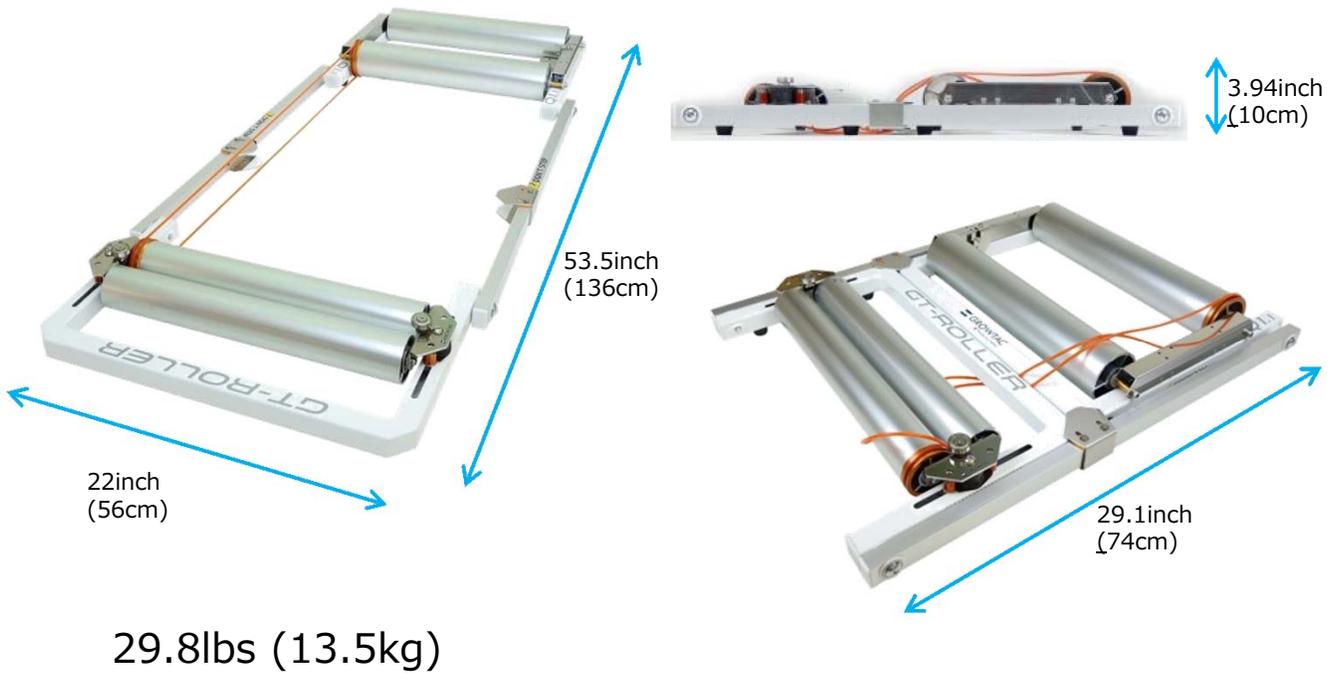
Electronic load unit

Generates a powerful 400W of resistance at 20km/h.
It enables a wide range of training and can simulate real inclines.

Motorized elevator

A motor lifts the front end up to simulate inclines of 0-10%.

Size



 **GROWTAC**
GROWTAC Co.,Ltd.
6-5-11 Minamioi,Shinagawa,
Tokyo,140-0013,Japan
info@growtac.com

