



# TENDO Unit

*YOUR INTELLIGENT WEIGHT TRAINING*

**HARDWARE**

**USER MANUAL**



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# TENDO POWER ANALYZER V- 620

*A microcomputer system for strength diagnostic and feedback monitoring of weight training.*

Thank you for purchasing the Tendo Unit

The purpose of the manual is to guide you through the first basic steps necessary to set up the system and give you an idea of how to begin.

## What is included?

- Microcomputer Unit
- Sensor Unit
- Data Cable
- Tripod
- Rechargeable Batteries (4x of AA size, type NiMH)
- Built-in Battery Charger
- AC / DC Power Supply Adapter
- Manual
- Carrying Bag
- iButton Reader for identification of athletes with iButton IDs while using Tendo Power Analyser computer software



## What is optional?

- *TENDO Bluetooth set* - wireless connection to the computer and full access to Tendo Power Analyzer computer software
- *iButton ID*
- *TENDO JumpMat*



## 1. TECHNICAL DESCRIPTION

System consists of 2 functional components: Sensor Unit and Microcomputer Unit

SENSOR UNIT

MICROCOMPUTER  
UNIT

Standard



WL



The Sensor Unit is connected to a weight by a kevlar cord with a velcro strap.

In weight exercises, muscles lift a mass  $m$  by applying a force  $F$  at a velocity  $v$ , produce average power  $P$ .

$$F = m \times g$$

$$P = F \times v$$

System measures vertical Average and Peak Velocity of the weight lifted.

Using the known mass the system also calculates Average Power, Peak Power and Peak Force in the concentric phase of weight training.

To calculate Peak Power and Peak Force system uses equation:

$P = F \times v$  , where  $F = (m \times g) + (m \times a)$  ,  $g$ -acceleration of gravity and  $a$ -acceleration.

The system also measures downward average velocity and rest time between reps and sets.

[www.tendosport.com](http://www.tendosport.com)

## 2. INSTALLATION STEPS

### 2.1 BATTERY INSTALLATION

New rechargeable batteries are pre-installed in a battery compartment.



Before the microcomputer is operated, it is necessary to **pull out a safety plastic strip from the battery compartment** to release the battery contact.

Afterwards, ***tighten the 2 battery compartment screws using a Phillips screwdriver.***



Battery compartment has a magnet for quick attachment to a rack or a tripod.

Rechargeable batteries come pre-charged, ready for use.

**! Use NiMH, AA size rechargeable batteries, 2000 - 2500 mAh only.**

### 2.2 HOW TO ATTACH MICROCOMPUTER TO A TRIPOD OR A RACK

The microcomputer unit is equipped with a neodymium magnet for a quick attachment to a rack or a tripod. Just place the microcomputer unit on a desirable place, be it a metal rack or a metal plate of your tripod and train,

#### Attachment to a Tripod

Unfold the tripod and attach the microcomputer magnet to the tripod's metal plate.

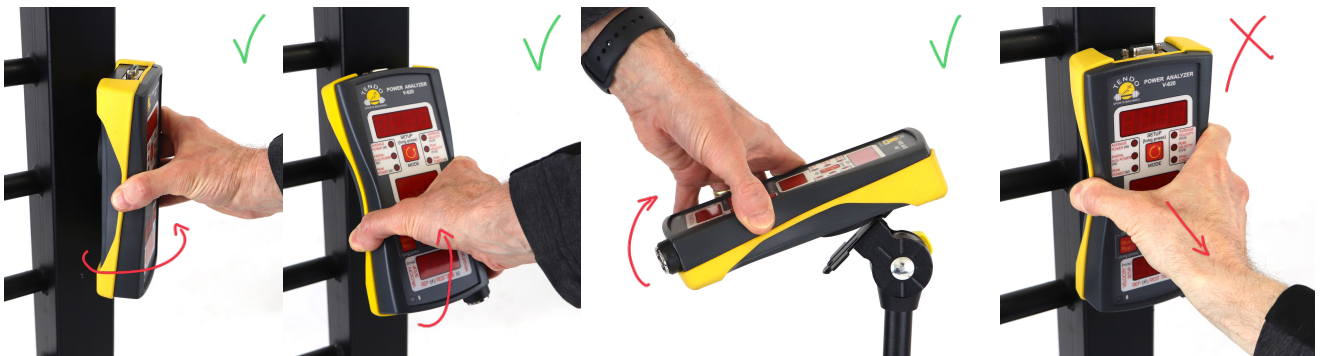


## Attachement to a Rack

Attach the microcomputer unit to a rack via the magnet on the back of your microcomputer unit. Place the Unit on the rack, facing forward or sideways.



**For quick microcomputer release from a rack or tripod**, turn the microcomputer to the side or pull the unit from down side to up. For the microcomputer release from the tripod, hold the neck of the tripod to prevent its damage.



## 2.3 CONNECTING MICROCOMPUTER AND SENSOR UNIT



Plug the male connector of your Data Cable into the connector at the bottom of the microcomputer. The microcomputer unit is compatible with both Tendo Unit sensors: standard and WL.



Plug the other end of the Data Cable into the appropriate connector on your Sensor

## 2.4. WHERE TO ATTACH SENSOR UNIT?

Fasten the cord of your sensor unit to a bar, dumbbell or top weight of a weight stack with the Velcro strap. Position the cord so that, during the exercise, the trajectory of the cord will be as close to perpendicular to the floor as possible. See examples below.



Outer end of bar



Grip section



Waist belt



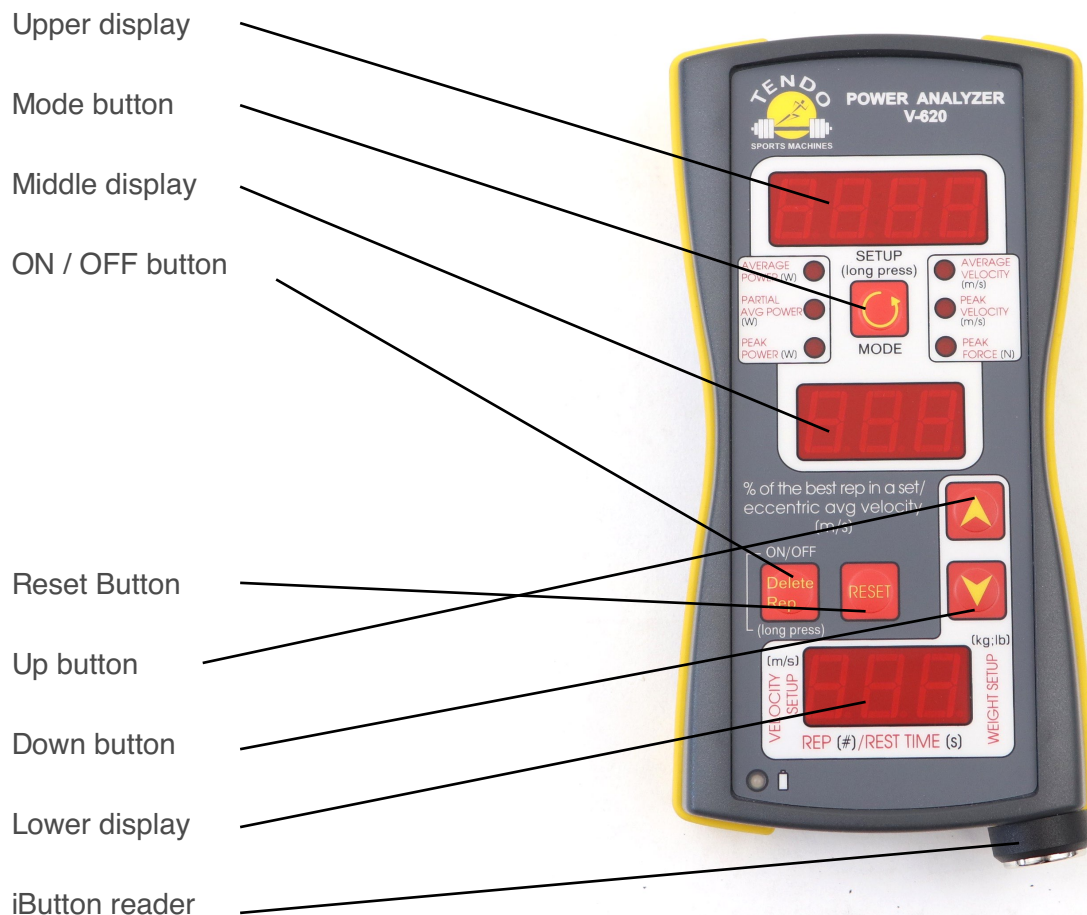
Weight stack



Leg press machine



### 3. HOW THE MICROCOMPUTER OPERATES



After switching ON the unit (press the ON/OFF button for 3 seconds, until you hear a short beep:

- set weight of the barbell or weight stack using Up/Down buttons (*if the Velocity Based Training [VBT] mode is turned OFF*)
- or set target velocity using Up/Down buttons (*if the Velocity Based Training [VBT] mode is turned ON*)

If imperial units of weight are turned on, the middle display shows “Lb”, meaning the weight of the barbell is to be set in pounds.

#### • **POWER Mode** (*VBT Mode is turned OFF*):

##### **No data were measured:**

- Upper display shows “Load”
- Middle display shows “Lb” (if Imperial units are turned ON)
- Lower display shows value of the set weight

**Data were measure:**

- Upper display shows average / peak power, partial average power, average / peak velocity, and peak force.
  - Middle display shows a percent value of the best repetition in particular set and eccentric average velocity, if turned on.
  - Lower display shows repetition number and rest time, if turned on.
  - Preset parameter (avg / peak power, avg / peak velocity, partial avg power, peak force) in the first repetition will be set to 100%. Subsequent reps will be displayed as percentage of the maximum. However, should any subsequent repetition be higher than previous 100%, it will be considered as the new 100%. All subsequent reps will be compared to the new maximum. If there is a multi-weight exercise set (different weight settings without resetting the weight between the weight changes), all reps will be compared with the absolute best repetition.
  - Up to 500 reps can be stored and retrieved from the microcomputer's memory.
  - Reset button clears memory and recalls weight input setting.
- **VBT Mode** (*Velocity Based Training Mode is turned ON*)

**No data were measured:**

- Upper display shows "Targ" (as target), middle display shows "VEL" and lower display shows value of the set target velocity for VBT.
- This alternates with "Load" in the upper display, "Lb" in the middle display (if Imperial units are turned ON) and value of the set weight in the lower display

**Data were measured:**

- Upper display shows average / peak power, partial average power, average / peak velocity, and peak force.
- Middle display shows a percent value for target velocity for each repetition in particular set and eccentric average velocity, if turned on
- Lower display shows target velocity setting, repetition number and rest time, if turned on
- Preset target average velocity is set as 100%
- Subsequent reps will be displayed as percentage of this 100% (Target Velocity) and all repetitions will be compared with Target Velocity
- Reset button clears memory and recalls target velocity setting

If the VBT Mode is turned ON, it is necessary to set a correct value of the barbell weight for correct Power and Force calculation. Weight can be set in Setup Mode by pressing Mode button.

#### 4. WHAT IS MEASURED AND CALCULATED

- **Average power measured in Watts [W]** – for full range of motion.
- **Partial average power measured in Watts [W]** – average power for limited (pre-set) range of motion from 0 to 100% of range of motion.
- **Peak power measured in Watts [W]** – the highest possible power in full range of motion. If the value of Peak Power is over 9,999W, the microcomputer displays the value in kW (e.g. 10.35 = 10,350W)
- **Average velocity measured in meter per second [m/s]** – for full range of motion.
- **Peak velocity measured in meter per second [m/s]** – the highest possible speed.
- **Peak Force measured in Newtons [N]** – maximum force for limited (pre-set) range of motion from 0 to 100% of range of motion.
- Microcomputer also measures **a rest time between reps or sets measured in seconds**. After 10 seconds of the rest time, the microcomputer shows time from the last repetition or set.
- **Eccentric average velocity** (average velocity in downward movement) measured in meter per second [m/s]
- **Rest Time and Eccentric Velocity** can be turn on or turn off in setting mode.

#### 5. SENSOR UNIT'S RANGE OF MOTION

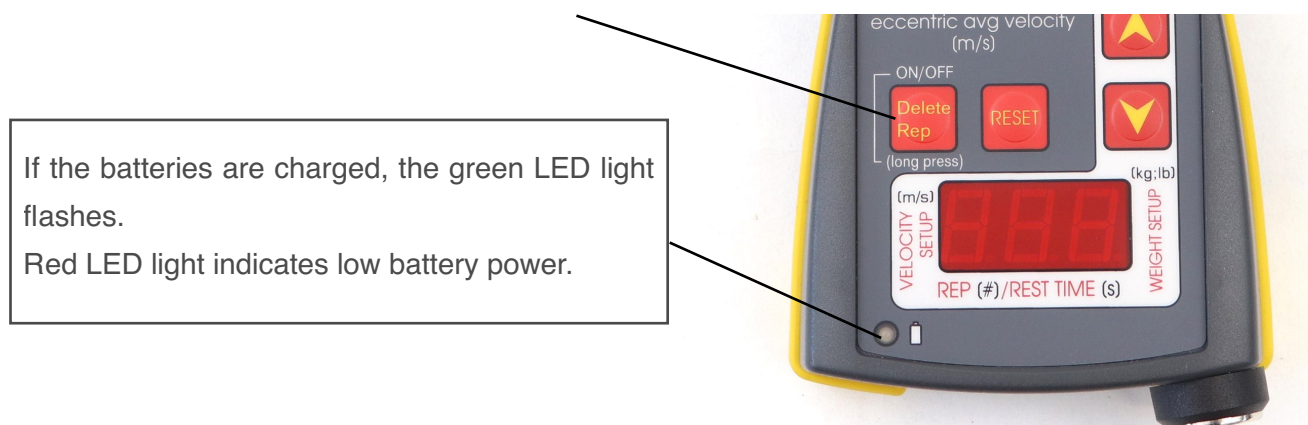
The sensor unit uses durable kevlar cord, 2.7 meters (8.85') long.

The length of string makes it applicable for almost any power or Olympic lifts and all vertical jumping applications.

#### 6. MICROCOMPUTER UNIT SETUP

##### 6.1 ON / OFF

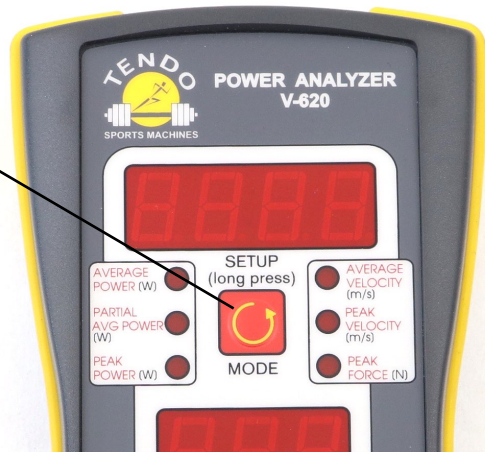
To turn the power on or off, press the ON/OFF button for 3 seconds, until you hear a short beep.



## 6.2 ENTER SETUP MODE

Press the Mode Button for 3 seconds, until you hear a short beep.

To scroll down the setup menu, press the Mode button



### Identifying the parameters in the Setup Mode:

- **Load** (Weight) – microcomputer indicates on upper display „LoAd“
- **VBT** (Velocity Based Training Mode) - microcomputer indicates on upper display “Ubt” and middle display shows “ON” if the mode is turned on or “OFF” if the mode is turned off
- **Filter** (minimum movement threshold) - microcomputer indicates on upper display „FILt“
- **Audio signal - Upper Limit** – microcomputer indicates on upper display „A-UP“  
 - **Lower Limit** – microcomputer indicates on upper display „A-LO“
- **% limit for Partial Avg. Power and Peak Force** (from 1 to 100%) – microcomputer indicates on upper display „P-AP“
- **Rest time** (ON/OFF) – microcomputer indicates on upper display „r-t“
- **Eccentric average velocity** (ON/OFF) – microcomputer indicates on upper display „ECS“
- **Lbs** (ON/OFF) - microcomputer indicates on upper display “Lb” if the input weight setting in pounds is turned on

Use the Up and Down button to change settings.





### 6.3 EXIT SETUP MODE

Press Reset Button and all changes will be saved.

If you do not press Reset Button, the microcomputer exits from setup mode automatically after 30 seconds, without saving new settings.

### 6.4 WHAT CAN BE SET UP IN SETTING MODE

- Load
- VBT (Velocity Based Training Mode)
- Audio signal Lower/Upper Limit
- Filter - Minimum Movement Threshold 0 - 150 cm
- % limit for Partial Avg. Power and Peak Force
- Rest time
- Eccentric velocity

#### 6.4.1 LOAD

It is possible to change a weight setting, even if data are measured, without resetting the microcomputer unit.

*Use Up and Down buttons to change settings.*

#### 6.4.2 VBT - VELOCITY BASED TRAINING MODE

If the VBT is turned ON, the system is switched to a mode where Target Velocity can be set. The value of the Target Velocity is shown on lower display.

- To turn ON the VBT Mode - press Up button in Setup Mode
- To turn OFF the VBT Mode - press Down button in Setup Mode

#### 6.4.3 AUDIO SIGNAL LOWER/UPPER LIMIT - SET YOUR TRAINING RANGE

- **Upper limit** means every measured value of the selected parameter (power, velocity, force) which is above setting percent values of upper limit will be indicated by double beep.
- **Lower limit** means every measured value of the selected parameter (power, velocity, force) which is below a setting percent values of lower limit will be indicated by short beep.

### Setting range:

#### **Power Mode:**

Lower Limit range from 0% to Upper Limit.

Upper Limit range from 100% to Lower Limit.

#### **VBT Mode:**

Lower Limit range from 0% to 100%.

Upper Limit range from 100% to 200%.

#### *Recommended setting for VBT mode:*

Upper Limit = 105% - each value above 105% will be indicated by a double beep

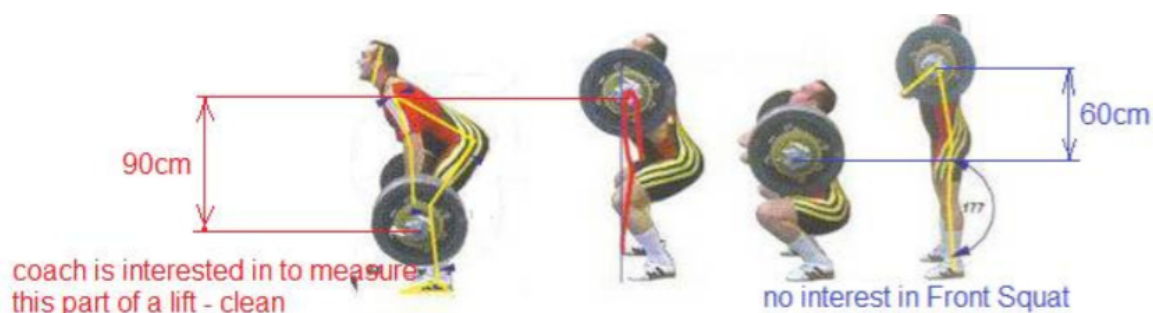
Lower Limit = 95% - each value below 95% will be indicated by a short beep

*Use Up and Down buttons to change settings.*

### 6.4.4 FILTER - MINIMUM MOVEMENT THRESHOLD

Purpose of the filter is to hide unwanted movements. This means that all the movements with the range of motion less than the setting value of the filter, will not be shown on display.

*For instance: taking barbell from the rack, or short movement while holding a barbell, etc.*



Filter setting to e.g. 70cm and the Tendo Unit displays just 1 repetition - for Clean.  
Filter e.g. 35cm and the Tendo Unit displays 2 repetitions - for Clean and Front Squat.

**Setting range** - from 0 to 150 cm

*Use Up and Down buttons to change settings.*

**FILTER is a limit from 0 to a certain predefined value of the range of motion in centimetres** (10 centimetres = 0.1 meter), **which microcomputer does not show.**

**! The exercise range of motion has to be longer than the value of the Filter.**

- For **most of the exercises** we suggest to set Filter to 35 cm (less than length of the motion).
- For **exercises with very short amplitude** (e.g. toe raise) we suggest to set Filter to 10 cm.
- For **exercises with very long range** (Olympic lifting exercises) we suggest to set Filter to more than 80 cm.

\* The microcomputer system always measures from the lowest position to the top. The Filter does not have any influence on the measured range. The Filter just causes to not show measurement results for motions shorter than the setting value of the Filter.

**Remember:** The value of Filter has to be set less than length of the motion.

It is important to set up the right value of the Filter for weightlifting exercises (see table 1).

*Table 1*

Exercise name	Power Snatch	Power Clean	Jerk	Clean Pull	Snatch Pull	Hang Clean	Hang Snatch
Filter value	70-90 cm	70-90 cm	30-40 cm	70-90 cm	70-90 cm	30-40 cm	30-40 cm

Exercise name	Squat	Bench press	Toe raise				
Filter value	30-40 cm	30-35 cm	8-12 cm				

#### 6.4.5 % LIMIT FOR PARTIAL AVG. POWER AND PEAK FORCE

**Partial Average Power** is a value of average power, which is measured from start (0) to a certain predefined percent value of the range of motion. Default setting is 50%.

**Setting range** - from 1 to 100%

**Peak Force** measurement has the same range setting as Partial Avg. Power.

It means the system finds peak force for setting range, from 0 to a certain predefined percent value of the range of motion. Default setting is 50%.

*Use Up and Down buttons to change settings.*

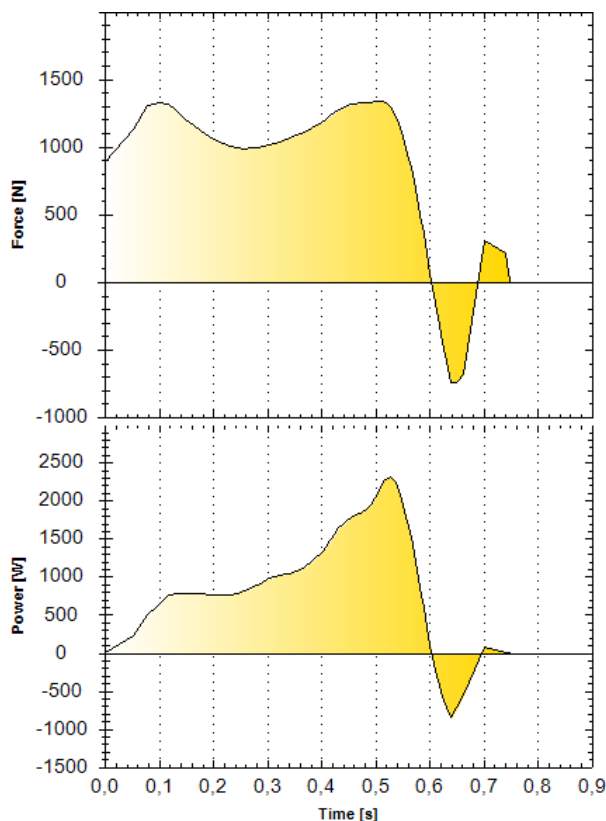
**Why should you measure Partial Average Power?**

Sometimes average or peak power are not sufficient parameters for assessment of athlete's qualities in weight training. Many athletes in effort to reach maximum power value try to accelerate at the end of the movement. This way, athletes reach high average and peak power values, but those parameters are misrepresenting the actual results. Simply said, being fast at the end of a movement is too late. These athletes do have high average and peak power values but with a low rate of force development. The rate of force development is a key factor in sports performance where explosiveness is required. The partial average power will help you to emphasise the rate of force development in your training and ensures the development of the explosive power.

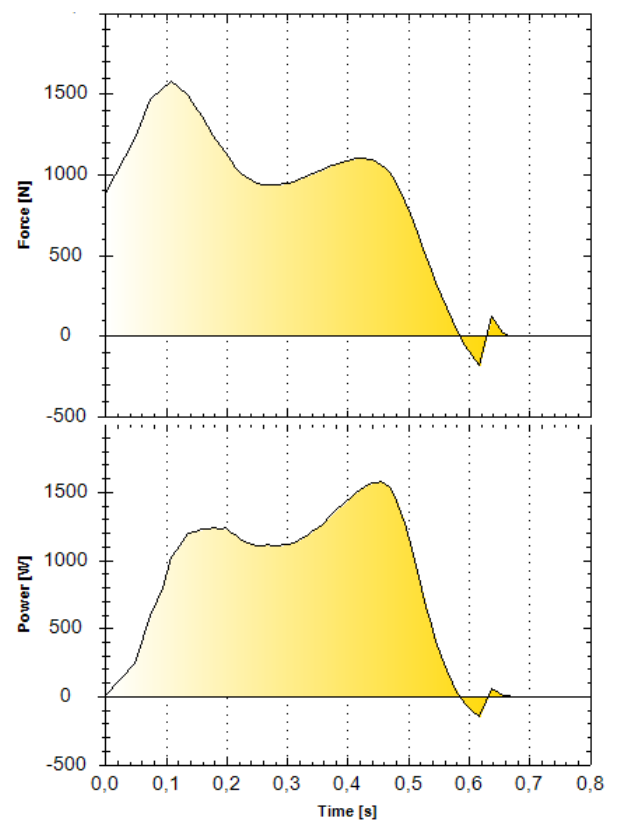
**Example** – *Back Squat measured on waist*

	Ice hockey player	Olympic weightlifter
<b>Body weight</b>	100kg	100kg
<b>Vertical jump height</b>	50cm	56cm
<b>1RM Back Squat</b>	160kg	230kg
<b>Average power</b>	954W	975W
<b>Peak Power</b>	2316W	1579W
<b>Partial Avg Power (40%)</b>	803W	1073W
<b>Peak Force up to 0.25</b>	1320N/0.15	1574N/0.115

**Ice Hockey player**

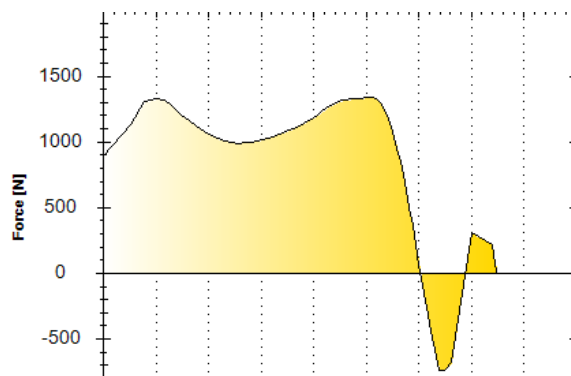


**Olympic Weightlifter**



### Why should you adjust % Range for Peak Force measurement?

In some exercises there can be two positions for peak force. One at the beginning of the movement and another at the end. To filter out the undesirable peak at the end of the movement, just shorten the range for the measurement of the Peak Force.



Force x time graph for back squat

#### 6.4.6 REST TIME MEASUREMENT

Microcomputer also measures a rest time between reps or sets. After 10 seconds of the rest time (Sensor Unit inactivity), the microcomputer will show time from the last repetition or set.

The rest time is shown on lower display if the rest time is turned on. The rest time is measured up to 999 seconds.

After 180 seconds of the microcomputer inactivity, the lower display is turned off, to save battery power. Any activity of the system turns on the displays.

*To turn on the rest time, press Up button in setting mode.*

*To turn off the rest time, press Down button in setting mode.*

If there are not data and rest time is turned on, press Mode button or Up/Down button to recall weight setup.

#### 6.4.7 ECCENTRIC AVERAGE VELOCITY (ECS - ECCENTRIC SPEED)

The system measures average velocity in downward movement if ECS – Eccentric Speed is turned on.

*To turn on the ECS – Eccentric Speed, press Up button in setting mode.*

*To turn off the ECS – Eccentric Speed, press Down button in setting mode.*

#### 6.4.8 IMPERIAL UNITS SETTING FOR LOAD

The system enables to set the weight in pounds, if “lb” is turned on.

*To turn on lbs – lb, press Up button in setting mode.*

*To turn off lbs – lb, press Down button in setting mode.*

If the weight setup in pounds is turned off, the weight is entered in kilograms and the system uses kilograms for power and force calculation.

***Factory setting for weight is set to “lb - OFF”. It means that the system uses kilograms for power and force calculations.***

### 7. FACTORY SETTINGS

**Load:** 50kg

**VBT Mode:** OFF

**Filter:** 35 cm

**Audio signal upper limit:** 100%

**Audio signal lower limit:** 90%

**Partial Average Power and Peak Force range:** 50% **Rest Time:** OFF

**Eccentric Average velocity (ECS):** OFF

### 8. BATTERIES

#### 8.1 HOW TO CHARGE BATTERIES

The microcomputer has a built-in battery charger. To charge batteries, please use AC / DC Power Supply Adapter (included in the package).

The Power Supply Adapter Input: 110 – 230V AC, 50-60 Hz, Output: 12V DC, 1.2A

***! Use the NiMH, AA size rechargeable batteries, 2000 - 2500 mAh.***

#### **Power Supply Adapter setup:**

- Plug the connector into the appropriate socket at the bottom of the microcomputer
- Plug the power supply adapter to the 110 – 230 V AC outlet

**Precautions:**

- Do not exceed the rated operating parameters
- The device may interfere with radio and television sensitive equipment located nearby
- There is a risk of the harmless electric shock, fire or equipment failure. Do not disassemble or repair the device and do not touch the interior parts of the device.
- Do not disassemble the housing
- Dangerous voltages may still exit in the power supply even after few minutes from off the power.
- Damaged power cord must be immediately replaced by a qualified technician.
- Do not use the device if it emits smoke, an abnormal smell or strange sounds.

**The battery indicator light while charging the unit:**

The battery indicator light emits a light only if the microcomputer is turned on.

- *red light indicates* – low voltage - the batteries need to be charged
- *flashes green light* – charging process
- *solid green light indicates* – the batteries are charged – end of the charging process

**8.2 BATTERY EXCHANGE**

To open the battery compartment, located at the back side of the microcomputer, unscrew 2 screws from the battery compartment cover.

Referring to the insert drawing, place the batteries into compartment.

Press 4 batteries into the battery compartment. Make sure that the positive ends of the batteries (marked "+") are touching the springs (marked "+") in the battery compartment.

**! Use the NiMH, AA size rechargeable batteries, 2000 - 2500 mAh.**

If the batteries are located correctly in the battery compartment, after the microcomputer is turned on, the battery control LED light flashes.

**! If the microcomputer is turned on and the battery control LED is red (low battery power), the batteries need to be charged.**

**! It is possible to use the Power Analyzer even if the batteries are charging.**

**9. HOW TO USE THE SYSTEM****9.1 ON / OFF, WEIGHT ADJUSTMENT, REST TIME MEASUREMENT**

To turn on the unit, press the "ON/OFF" button for 3 seconds, until you hear a short beep.

When the unit is turned on and VBT mode is turned off, the lower display will begin displaying weight.

To adjust the weight of a barbell or a weight stack, use Up/Down buttons. (*press and hold for fast change*).

If VBT mode is turned on, the lower display will begin displaying value of the Target Velocity.

To adjust the target velocity, use Up/Down buttons (*press and hold for fast change*).

After 10s of inactivity, the lower display begin displaying rest time (if rest time is turned on).

If the Eccentric Speed is turned on, upper display will begin displaying ECS.

## **9.2 POWER, VELOCITY, FORCE MEASUREMENT**

*If the VBT Mode is turned OFF*, after each repetition, the repetition number begins to display on the lower display, actual value of average power, partial avg power and peak power, average velocity, peak velocity and peak force on the upper display and percent value of the best repetition on the middle display.

***! It is possible to change the weight setting, even if reps were previously measured, without resetting the microcomputer unit. Go to Setup menu and change the weight using Up and Down buttons. To quit Setup menu and save new settings press Reset button.***

***The microcomputer will show you the exercise set data with different weight setting.***

***To view particular repetition, press Down or Up button. Prior the repetition with changed weight, upper display will show "LoAd" and middle display will show new changed weight for the following repetition.***

*If the VBT Mode is turned ON*, after each repetition, the repetition number and Target Velocity setting is displayed on the lower display, the value of average velocity on the upper display and percent value of the target velocity on the middle display.

If a preselected parameter (average velocity) is changed, the value of the newly chosen parameter (average power / partial avg power / peak power / peak velocity / peak force) is shown on the upper display and the percent value of the best repetition on the middle display.

***! If the VBT Mode is turned ON, it is necessary to set correct value of the weight of the barbell for correct power and force calculation.***

Go to Setup menu and change weight by Up and Down buttons. To quit Setup menu and save new settings press Reset button. The microcomputer will calculate correct data for all parameters.

To view a particular repetition, press Down or Up button. Prior the repetition with changed weight, upper display will show "LoAd" and middle display will show new changed weight for the following repetition.



***! If there are no measured data and VBT mode is turned OFF, it is still possible to change the weight simply using Up and Down button without necessity to enter to the Setup menu.***

***! If the VBT mode is turned ON, it is possible to set the weight ONLY in the Setup menu.***

To scroll down the parameters in the upper display, press Mode button.

### **9.3. DELETING DATA**

Press "RESET" to recall delete process for all data.

The upper display shows "rSt" and the middle display shows "ALL". To delete all data, press Reset button again.

To leave deleting process after the Reset button was pressed, press Up or Down button.

### **9.4 DELETING SELECTED REPETITION**

Select repetition using Up and Down button.

Press Delete Rep (ON/OFF) button and recall delete process for the selected repetition.

The upper display shows "dEL." and lower display shows "Rep". To delete the selected repetition, press Delete Rep (ON/OFF) button again.

To leave deleting process after the ON/OFF button was pressed once, press Up or Down button.

### **9.5 BATTERY SAVER**

The microcomputer has a built-in battery saver to prolong the battery life. After 2 minutes of microcomputer rest period, the battery saver is turned on (6 LED Mode lights flashing clockwise) and the microcomputer switches off the displays. The battery saver is turned off automatically by pulling the Sensor Unit cable, or pressing any button. If the rest time is turned on, lower display shows rest time. After 3 minutes of microcomputer inactivity, the battery saver will turn off the lower display as well.

## **10. MEMORY**

### **10.1 DATA STORED IN THE MICROCOMPUTER MEMORY**

If there are data in the microcomputer unit before turning the unit off, the data will be saved in the microcomputer's memory until "RESET" is pressed. After the microcomputer is turned on again, [www.tendosport.com](http://www.tendosport.com)

the upper display shows "nnn". This indicates that there are data to be recalled. To recall data press the Up or Down button.

- **Press Reset to recall delete process for all data.** Upper display shows "rSt" and middle display shows "ALL". To delete all data, press Reset button again.
- **Press ON/OFF button to recall delete process for the last repetition.** Upper display shows "dEL.". To delete the last repetition, press Reset button, again.
- **To exit from deleting process** after the Reset or ON/OFF button is pressed, just press Up or Down button.

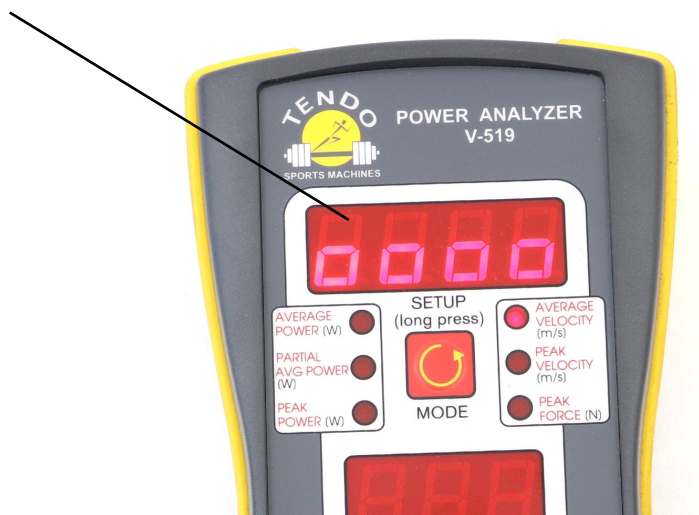
***"nnn" in upper display, indicates data in memory.***

If there are data in microcomputer's memory and you do not delete them, it is possible to continue exercising without deleting previous repetitions. However, the microcomputer will compare the previous Power and Speed data against your new workout.

***! If data are downloaded to the Tendo Power Analyzer computer software from the microcomputer's memory, it is not possible to display graphs.***

## 10.2 FULL MEMORY

The microcomputer has a memory for 500 repetitions. Once the memory is full the upper display shows "○○○○".



***! It is not possible to measure more repetitions once the memory is full. To continue with a measurement you will need to free the memory.***

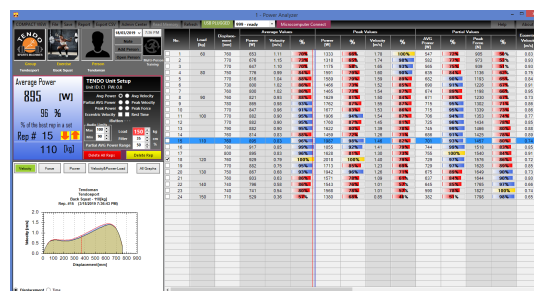
To free microcomputer's memory, delete all data or selected repetitions.

- **Press Reset to recall delete process for all data.** Upper display shows "rSt" and middle display shows "ALL". To delete all data, press Reset button again.
- **Press ON/OFF button to recall delete process for the last repetition.** Upper display shows "dEL.". To delete the last repetition, press Reset button, again.
- **To exit from deleting process** after the Reset or ON/OFF button is pressed, just press Up or Down button.

## 11. CONNECTION TO COMPUTER

Each Tendo Unit can also be interfaced with a computer via wireless Tendo Bluetooth set.

- It is not needed to pair the bluetooth devices.
- The Tendo software recognises the bluetooth the same way as a cable.



*Computer software and Tendo Bluetooth is not included in the package and is an additional option for this model.*

## 12. MAINTENANCE AND TROUBLE-SHOOTING

TENDO unit can be cleaned with a soft, damp cloth. Avoid spilling liquid on the microcomputer and sensor unit.

Keep the microcomputer out of direct sunlight.

Remove the batteries when storing the Tendo unit.

**If the microcomputer does not function properly** - the batteries should be charged.

In addition, make sure that the data cable is connecting both microcomputer unit and the sensor unit.

**!!! Check the Filter. The value of Filter has to be set less than the amplitude of the motion !!!**

For indoor use, only.

**Attention:** This product contains magnet.

### **Magnet Safety:**

1. *Proper Magnet Handling:* Assure that no two magnets come in close proximity to one another when handling.
  2. *Transportation and Storage:* Wood, plastic or other non-ferrous containers can be used to create barriers around the magnet for safe transportation or storage.
  3. *Medical Devices:* Some medical devices (such as pacemakers and heart defibrillators) can be adversely affected by strong magnetic fields.
  4. *Credit Cards and Electronic Devices:* Credit cards, computer disks, and other magnetic storage devices away from magnets. Exposure to the magnetic field may result in malfunction or permanent damage to such items.
  5. *Keep away from mechanical watches, compass and hearing aid*
- CDs and DVDs sticks are not magnetic data carriers and will therefore not be damaged by static magnetic fields.
  - Cameras, cell phones and smart phones contain non-magnetic storage media. Therefore, static magnetic fields near those devices cannot delete data.
  - USB sticks and memory cards are not magnetic data carriers and will therefore not be damaged by static magnetic fields.
  - A static magnetic field does not damage a vehicle key or the embedded transponder for the anti-theft device. Therefore, you can hang up your vehicle key on a magnetic board.



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