

Maximal Metrics

Power	VO2max	Heart Rate
327 W	51.4 mL/kg/min	185 bpm
Ventilation	Tidal Volume	Respiratory Frequency
131 L/min	2.9 L	46 bpm

Maximal metrics values are provided at the time of VO2Max.

Ventilatory Thresholds

	VT1	VT2	
Heart Rate	139	160	bpm
Power	165	201	W
Calories	6931	1000	kcal/hr

Ventilatory thresholds are transitions in breathing patterns.
 VT1 marks ventilation increasing faster than VO2.
 VT2 is the point of sustainable output.

How Your VO2max Compares to Others



This scale shows how your VO2max compares to statistical norms for you to track changes over time.

Training Zones

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
	Warm Up	Fat Burning	Endurance	Vigorous	Maximal
Heart Rate [bpm]	125	146	152	168	
Calories [kcal/hr]	620	730	950	1050	
Power [W]	150	175	190	210	

Training Zones are calculated using your ventilatory thresholds to accurately determine your optimal training intensities, based on your unique physiology. If your thresholds cannot be found, Training Zones are calculated based on the relationship between your VO2, heart rate, and mechanical output.

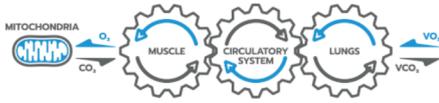
Workout Name		GXT - Sample		Athlete Name		User 1 - Male		Weight		81.5 kg		
Test Date				Date of Birth		Sex		Male		Height		172 cm
Elapsed		00:20:06	Data Average	30s	PDF Version	1.8.9.0	Notes					
User Piece Size		Medium		Mask Size		Small						



Learn the Fundamentals

Maximal Oxygen Consumption

Maximal oxygen consumption (VO2max) describes the bodies' capacity to maximally uptake oxygen from the environment and use it in skeletal muscle during intense full-body exercise and is considered the gold-standard measurement for cardiorespiratory fitness.



What determines VO2max?

When oxygen enters the body it enters through the lungs, and is loaded onto red blood cells, which are then pumped by the heart to muscles where oxygen is ultimately converted to water to synthesize energy for continued muscle contraction. Therefore, VO2max is determined by the integration of all the parts necessary for transport, delivery and utilization. There are four main determinants of VO2max:



1) Pulmonary Diffusion Capacity

The ability of the lungs to uptake large volumes of air and exchange oxygen and carbon dioxide through the alveoli.

2) Cardiac Output

The ability of the heart to pump large volumes of oxygenated blood.

3) Oxygen Carrying Capacity of the Blood

The amount of oxygen that can be transported to the muscle.

4) Skeletal Muscle Oxygen Extraction

The muscle's ability to uptake and utilize oxygen.



While a VO2max test does not determine which system is limiting performance, gaining an understanding of the physiology behind VO2max can help you make informed decisions for exercise prescription.

Interpret Your Workout

How Your VO2 Compares to Others

Your measured VO2max is a gold-standard. Here we compare it across the population based on age, gender, and weight. Lower VO2max is associated with an increased risk of cardiovascular disease, while higher VO2max is associated with decreases in all-cause mortality.

Good VO2max

A score of 99% means you're in the top 1% of your peers in terms of VO2max. A good VO2max correlates strongly with fitness capability and a reduction in all-cause mortality.



Poor VO2max

A score of 10% is low but it means you have plenty of room for improvement. Today is the best day to begin a new lifestyle.



Use Your Training Zones

Use these training zones to set the intensity of your regular workouts. Determining training zones from a VO2max test is much more accurate than doing so by estimation or with a fitness tracker.



Technical Details

VO2max is the maximum value of the VO2 trend after applying a 60-second moving average. The same logic applies to the displayed heart rate and intensity values.

When your ventilatory thresholds are detected, your Training Zones are optimized for you by using the thresholds to accurately identify the workloads which demarcate each zone. If your thresholds cannot be detected, Training Zones are calculated by the %VO2max method, which can be found in the ACSM Guidelines. This uses the linear relationship between your VO2, load, and heart rate.

Train Your VO2

Improve VO2max

Wherever your VO2max falls in comparison to others, the good news is that it is highly trainable. Through concerted training, VO2max can be increased by 10 - 25%. Gradual introduction to the following workouts will lead to the most maintainable and consistent progress towards increasing your fitness.

There are a few different exercise modalities that have been shown to most effectively increase VO2max; these range from relatively short (30s) intense intervals, to longer (30min) less intense intervals.

Sprint Interval Training (SIT)

Exercise in Zone 5 for 30s then rest for 2-4 minutes. Repeat this 4-6 times.

High Intensity Interval Training (HIIT)

Exercise in Zone 3 or 4 for 3-5 minutes then rest for 3-5 minutes. Repeat this 3-5 times.

Medium Intensity Continuous Training (MICT)

Exercise steadily in Zone 2-3 for 20-45min.

Practical Recommendations

Of the above training modalities start with the one you have done the LEAST. Slowly introduce 1-2 VO2max workouts into your weekly routine. Days before and after VO2max workouts should be VERY EASY recovery (i.e. Zone 1-2 ONLY). Follow this training plan for 4-6 weeks, then switch out the style of VO2max workout for another every 4-6 weeks. After each 4 to 6 week phase reassess VO2max to track your progress.

A proper training plan should also include strength training, proper warm-ups, and mobility.



Workout Guidelines

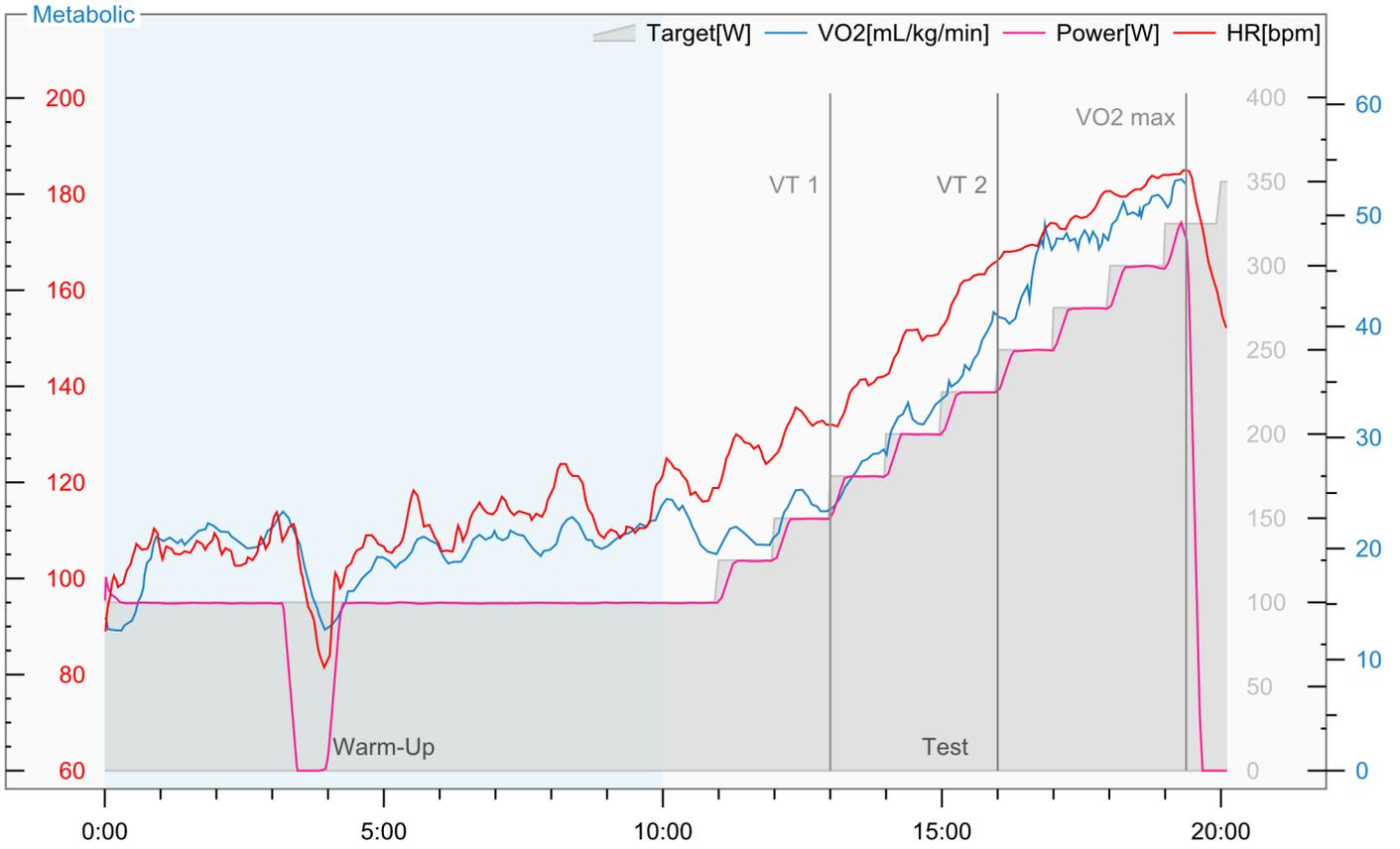
Type	Frequency	Repetitions	Duration	Intensity	Rest	Ratio
SIT	3x per week	4 - 6	30s	All-out	4min	1:8
HIIT		3 - 5	3 - 5min	As hard as possible	3 - 5min	1:1 or 5:2
MICT		1	20 - 45min	Just over threshold	N/A	N/A



VO2 Min: 12.6 Max: 53.3 Avg: 30.1

HR Min: 81 Max: 185 Avg: 131

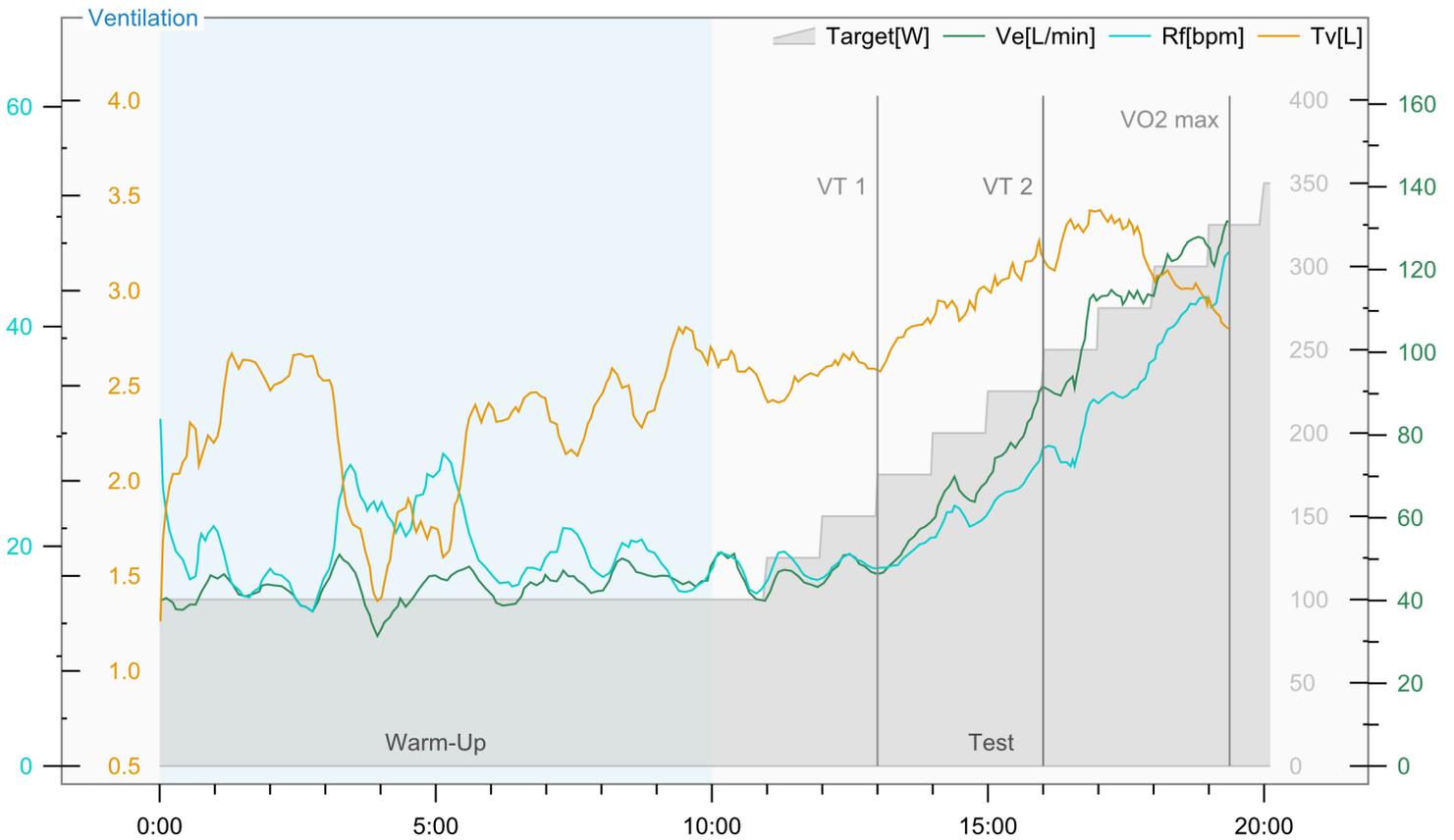
Power Min: 0 Max: 327 Avg: 142



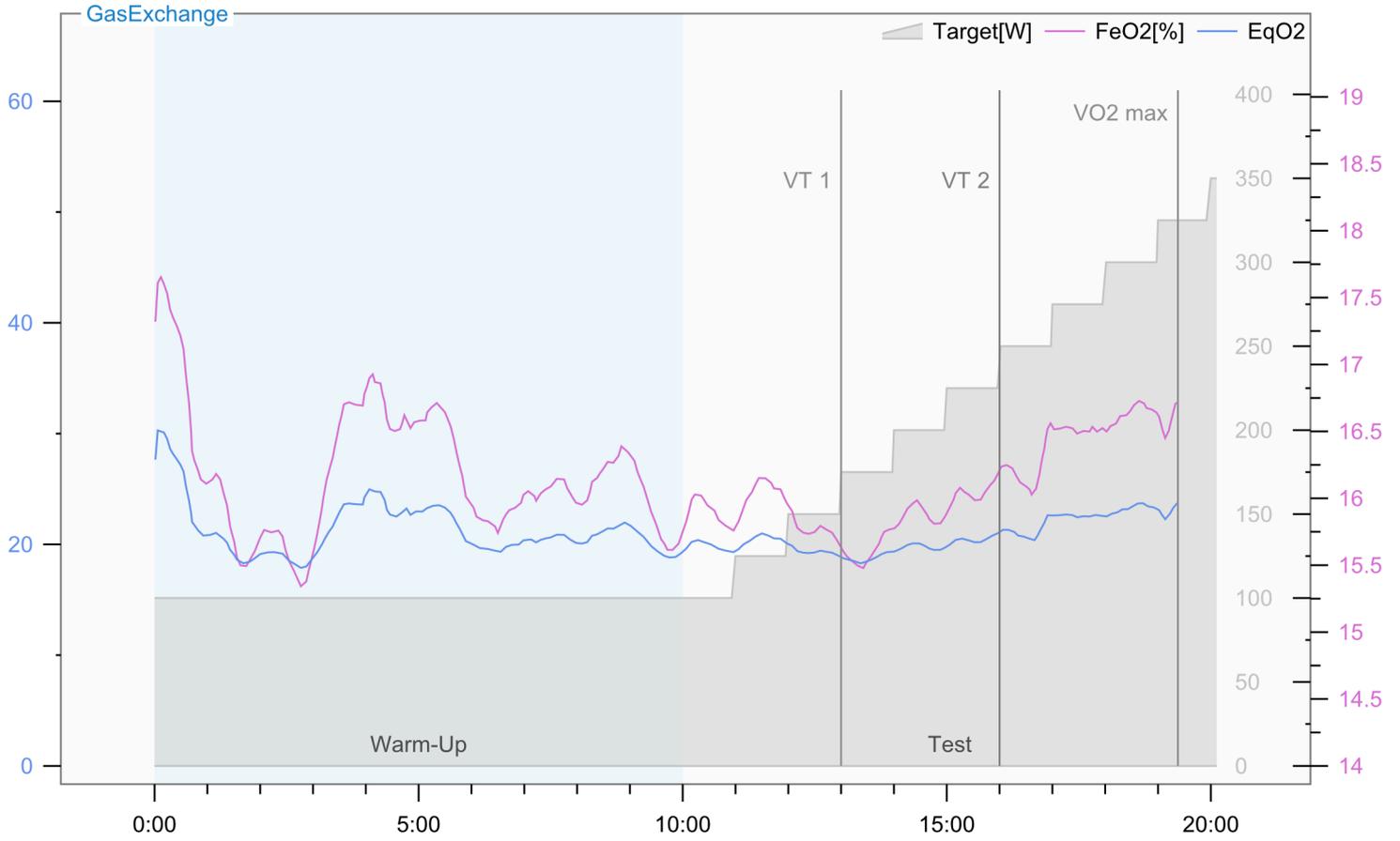
Tv Min: 1.3 Max: 3.4 Avg: 2.6

Rf Min: 14.1 Max: 46.9 Avg: 25.0

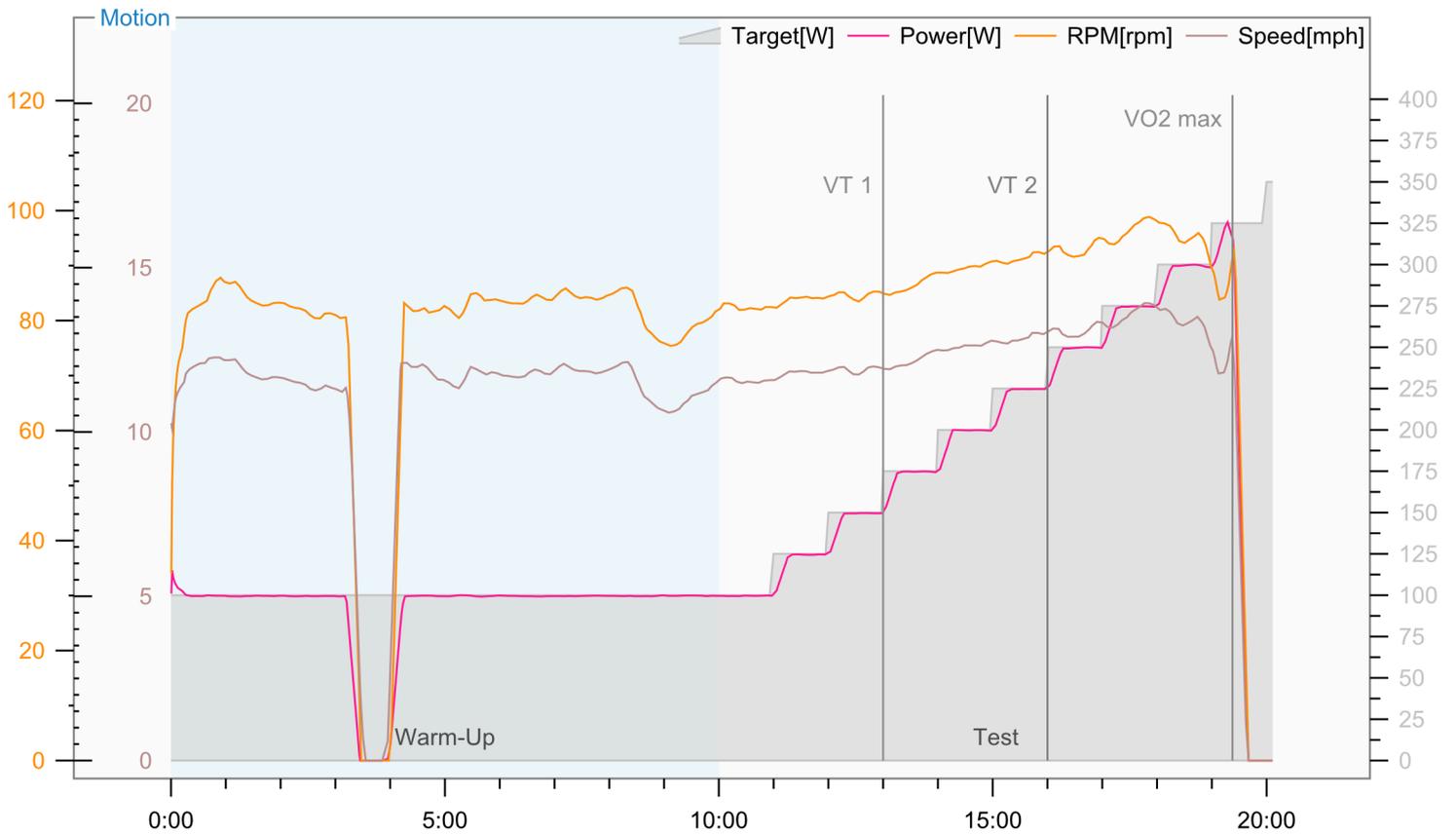
Ve Min: 31.4 Max: 132.0 Avg: 67.7

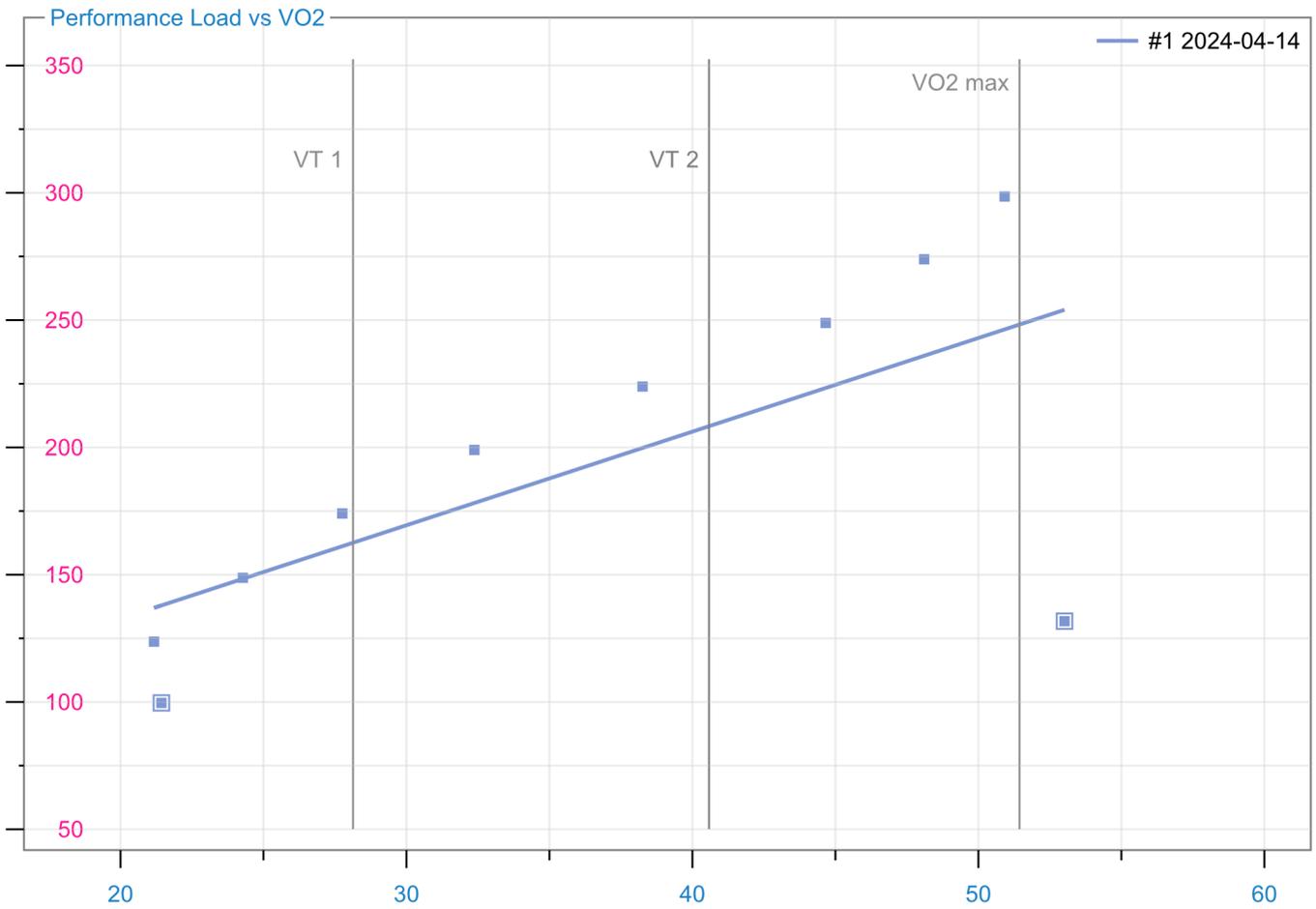
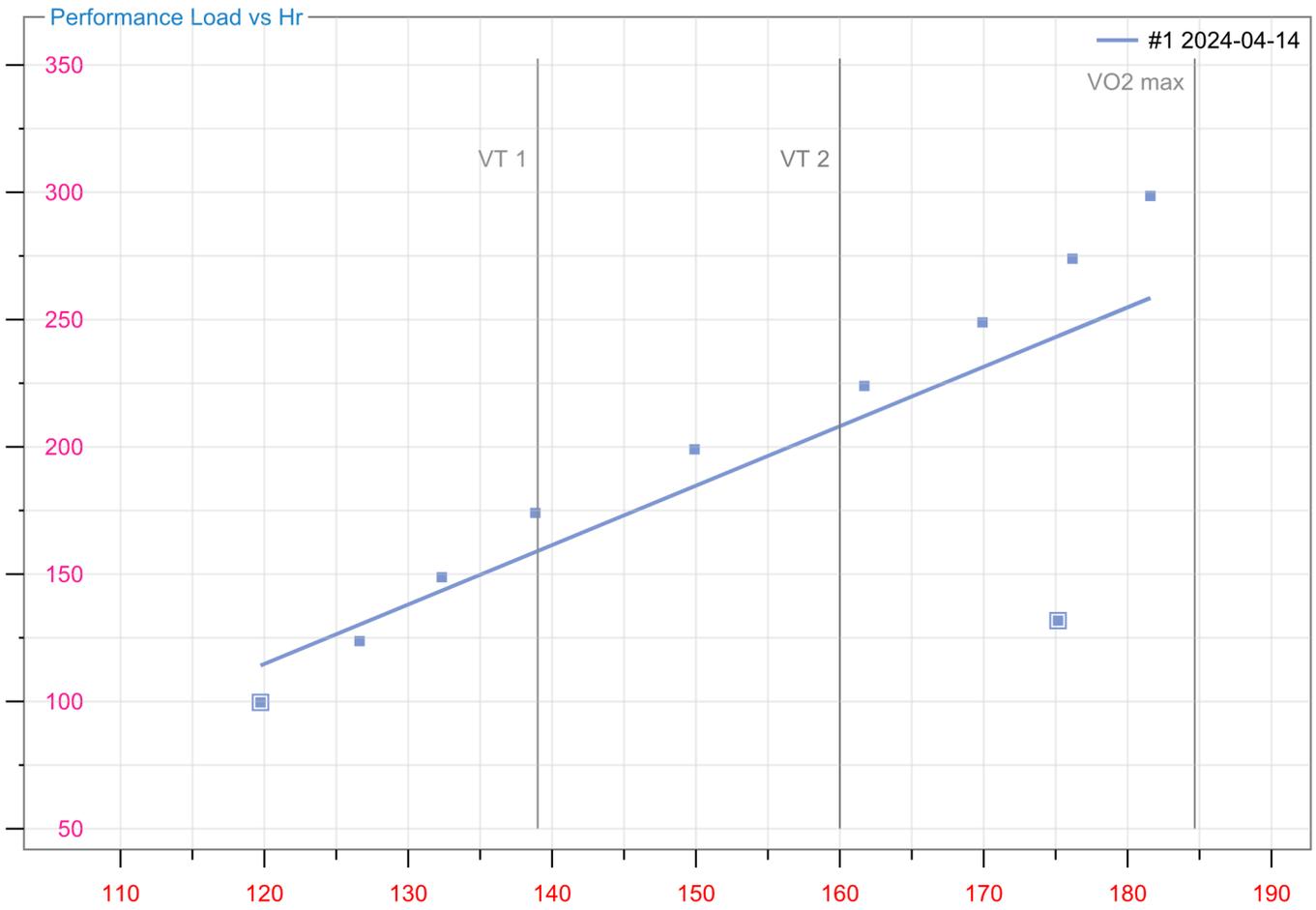


FeO2 Min: 15.3 Max: 17.7 Avg: 16.2 EqO2 Min: 17.88 Max: 30.61 Avg: 21.30



Speed Min: 0.0 Max: 13.9 Avg: 11.3 RPM Min: 0 Max: 99 Avg: 80
 Power Min: 0 Max: 327 Avg: 142





Device Information

Name	Measurement Types	Description
KICKR CORE 7FD0 (FW:1.1.1 SW: HW:1 Wahoo Fitness)	Power, RPM, Speed	
VO2 Master 3581 (1.6.1 FD0D000000043EEE FW:14 SW:35 HW:15 VO2 Master Health Sensors Inc.)	Rf, Tv, VO2, Ve, FeO2, VO2, Pressure, Temp, HUM, EqO2, Calories	
TICKR 5563 (FW:1.14.0 SW: HW:21 Wahoo Fitness)	HR, RR, HRV	

Resting Energy Expenditure

1705
kcal/day

This is an objective measure of your daily energy expenditure at rest. You can master a healthy weight by monitoring your caloric intake.

Your Metabolism [%]



This is how your metabolism compares to the average given your age, weight, height, and sex.

Resting Heart Rate [bpm]



Those who achieve a resting heart rate under 50 live the longest.

Heart Rate Variability



A higher HRV is associated with better health and fitness.

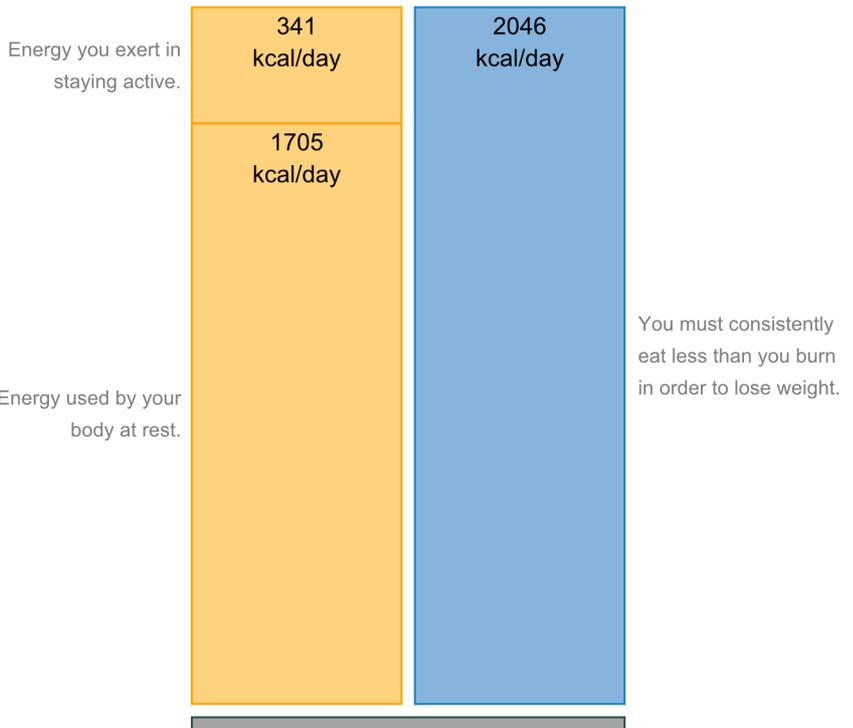
Caloric Balance

You need to eat on average 2046 calories to maintain your current weight.

Current weight: 83 kg
 Goal weight: 0 kg
 Weeks to attain: 0
 Weekly loss goal: 0 kg
 Activity level: Sedentary:

You Burn 2046 Calories
 Total Daily Energy Expenditure

Goal Ingestion 2046 Calories
 Daily Caloric Intake



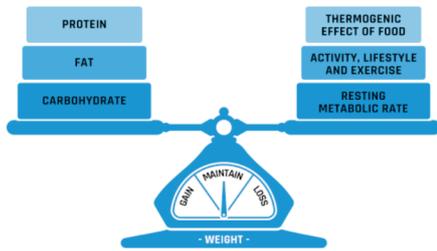
VO2/kg	2.9	Ve[L/min]	8.4	Tv[L]	0.8	Rf[bpm]	10.6	FeO2	17.4	HR[bpm]	60
Workout Name							Athlete Name			Weight	
RMR - Sample							User 1 - Male			83 kg	
Test Date							Date of Birth		Sex	Height	
									Male	172 cm	
Elapsed		Data Average		PDF Version		Notes					
00:09:52		30s		1.8.7.0							
User Piece Size			Mask Size								
Resting			Small								

Learn the Fundamentals

Energy Balance

The primary determinant of weight management is energy balance. Energy balance describes the difference between energy consumed and energy burned, measured in calories.

Measuring metabolic rate is the first step in managing energy balance.



How is Energy Burned?

$$\text{Expenditure[kcal]} = \text{RMR} + \text{Activity} + \text{Exercise} + \text{Thermogenesis from food}$$

Resting Metabolic Rate (RMR)

Resting metabolic rate is the amount of energy your body would burn if you laid around all day. This measure is unique to each individual and is largely determined by lean muscle mass and organ function. Your unique RMR was measured today.

Activity and Lifestyle

Anything you do requires energy. How much you move on average throughout the day has the greatest effect on your caloric expenditure - even more than exercise.

Exercise

While exercise does not typically make up a large proportion of the total calories burned, it does help to increase lean muscle mass which can increase your RMR over time.

Thermogenic Effect of Food

Your body burns a small amount of energy to digest the food you eat. This is the reason you must fast before measuring RMR.

How is Energy Consumed?

$$\text{Consumption[kcal]} = \text{Food Eaten}$$

The food you consume throughout the day constitutes your energy consumption and can be categorized as fats, carbohydrates, and proteins.

Interpret Your Metabolic Report

How to Use the Caloric Balance

Weight Loss

To lose weight, you must consume fewer calories than you burn. Depending on your weight loss goals it is generally safe to consume 250-750 fewer calories daily.



Weight Gain

To gain weight, you must consume more calories than you burn. If your goals are to gain lean mass through proper exercise, then consuming 250-750 more calories than you burn will help you to effectively gain weight.



Weight Maintenance

Eating at caloric maintenance causes no change in weight.



How Your Metabolism Compares

Your measured metabolism is a "gold standard". Here we compare it to the general population given your weight, height, age and sex.

Fast Metabolism

A score of +10 means your metabolism is 10% faster than people similar to you.



Slow Metabolism

A score of -10 means your metabolism is 10% slower than people similar to you.



Resting Heart Rate

A resting heart rate under 50 beats per minute (BPM) is associated with the lowest risk of all-cause mortality. Risk of all-cause mortality increases two-fold at 80bpm.

< 50	50 - 80	> 80
Ideal	Normal	Fast

Heart Rate Variability (HRV)

Heart Rate Variability describes the variation of time between heart beats. HRV depends on age, fitness, and mental state. As your fitness improves your HRV should increase.

Achieve Your Nutritional Goals

Where to Start

Weight management can be challenging and most often requires us to change the way we perceive food and exercise. Make slow changes and remember, whether you are gaining, losing or maintaining weight, it all comes back to energy balance; manage the calories consumed with the calories burned.

Proper weight management comes from adjusting both sides of the energy balance equation.

Scientists call the activity you do all day that aren't deliberate exercise non-exercise activity thermogenesis (NEAT). This activity includes walking from room to room, gardening and even fidgeting. NEAT typically accounts for 100 to 800 calories burned daily. The easiest way to change the number of calories you burn is to move more. Take the stairs instead of the elevator. Park your car further from work.

Change seated meetings to walking meetings. If you are trying to increase caloric burn through exercise, the duration is just as important as the intensity.

If you are reducing calories to help with weight loss, make sure you are not sacrificing your protein. Follow nutritional guidelines to ensure you are supplying your body with the nutrients needed to keep your muscles healthy. Having muscle mass, also known as lean mass, is one of the keys to maintaining a higher metabolism. Following proper exercise guidelines, and the recommendations of your health professional will help you to increase and maintain muscle mass while safely pursuing your weight goals.



Technical Details

RMR is calculated using the Weir equation, assuming an RQ of 0.85.

Predicted RMR used in the metabolic comparison uses the Mifflin St. Joer equation.

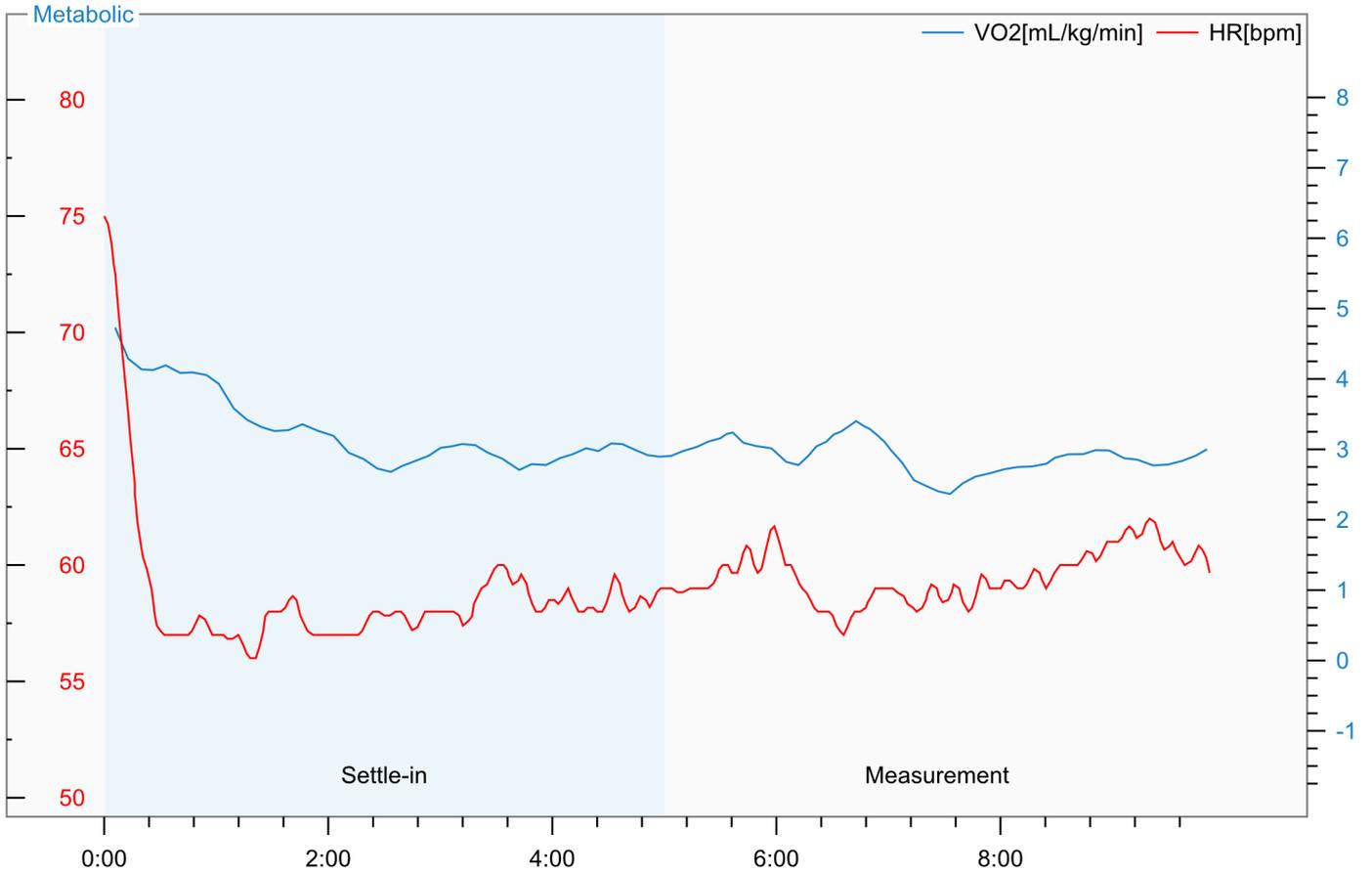
Activity level is calculated as a percent of your RMR. Each option makes an assumption of your average daily MET value:

<i>Sedentary:</i>	20.0%	<i>Light:</i>	37.5%
<i>Moderate:</i>	55.0%	<i>Very:</i>	75.0%
<i>Extra:</i>	90.0%		

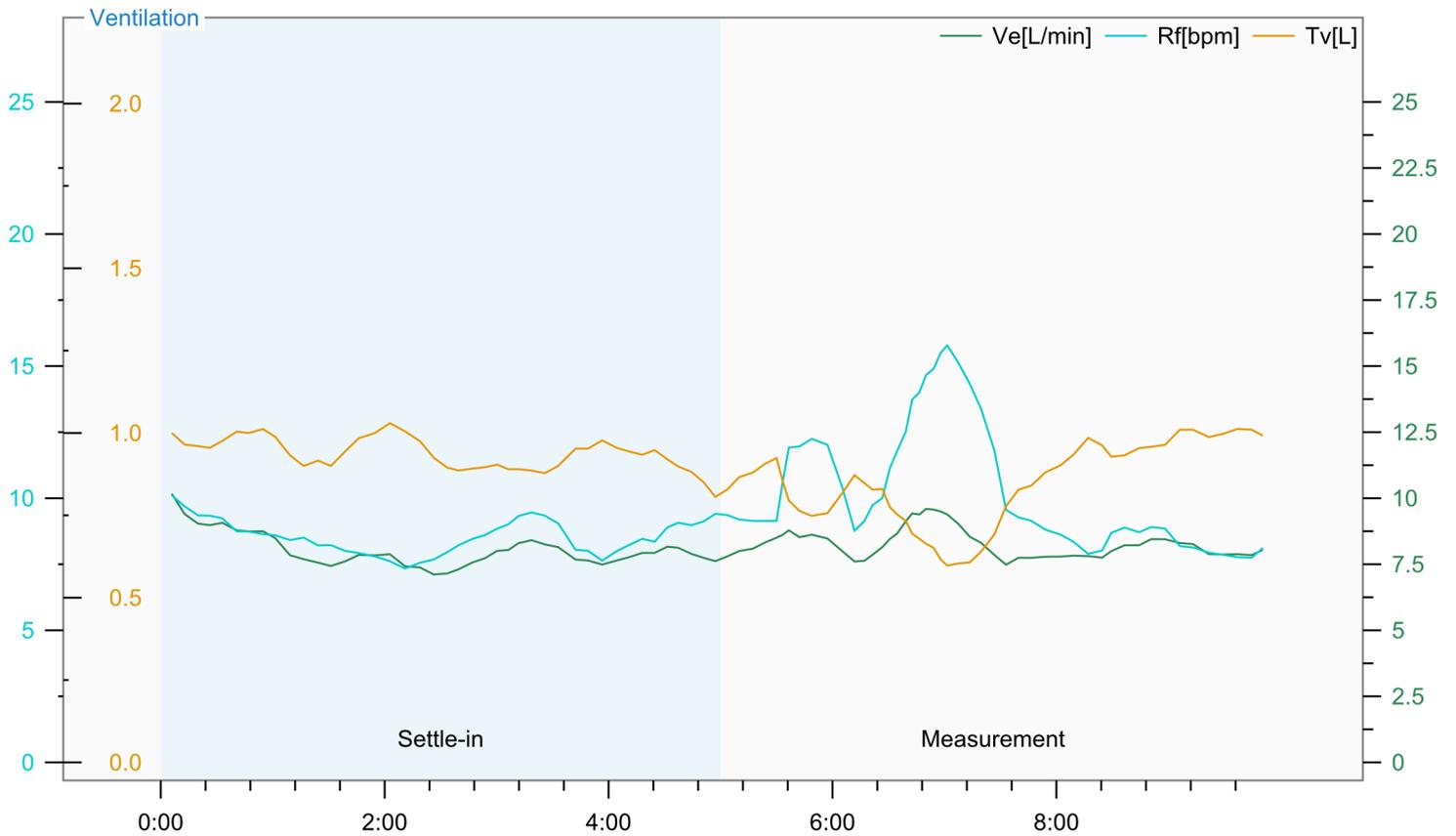
Resting heart rate scale: "Elevated resting heart rate, physical fitness and all-cause mortality" by Magnus Thorsten Jensen et al.



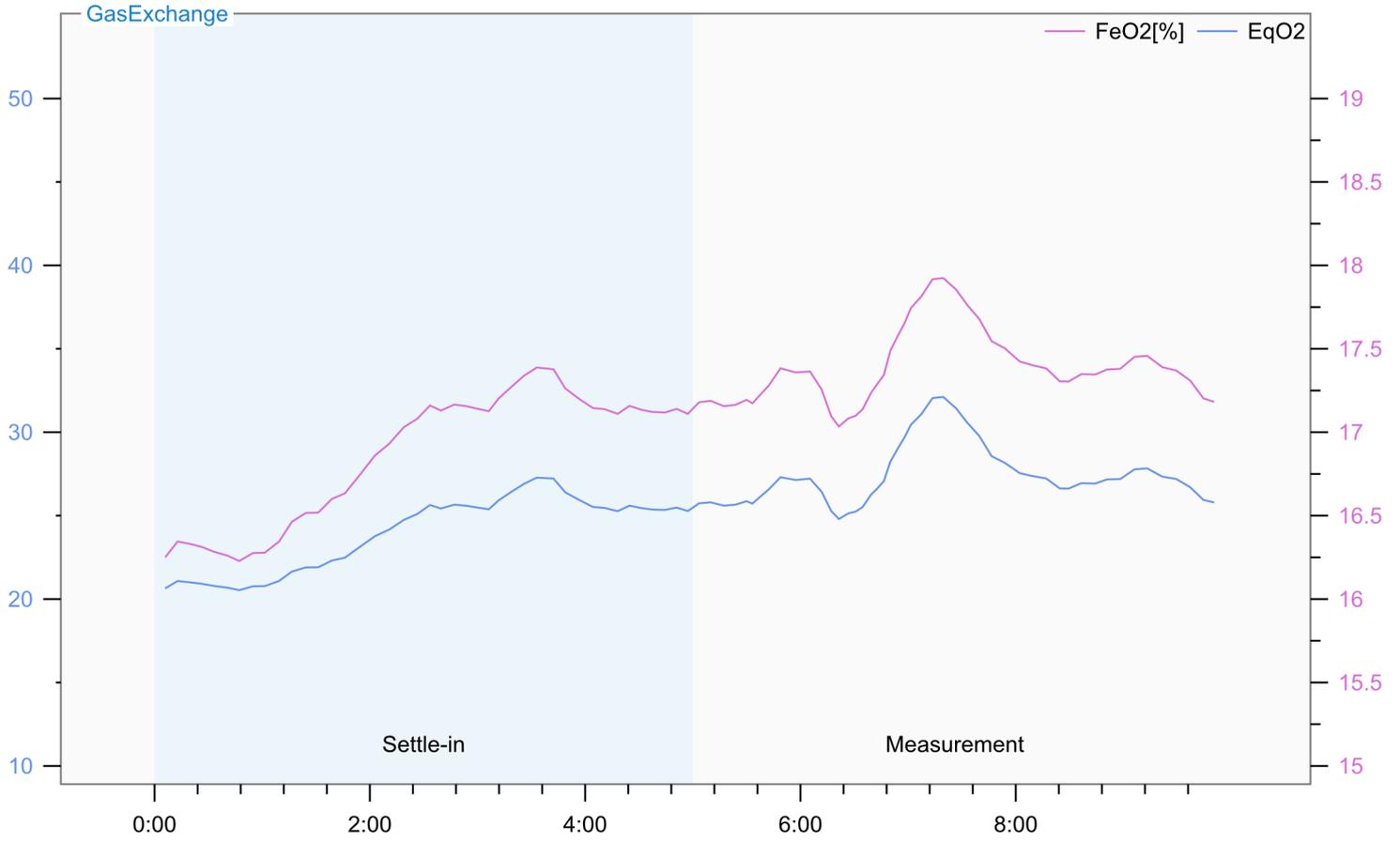
VO2 Min: 2.4 Max: 4.7 Average: 3.1 HR Min: 56 Max: 75 Average: 59



Tv Min: 0.6 Max: 1.0 Average: 0.9 Rf Min: 7.3 Max: 15.8 Average: 9.6
 Ve Min: 7.1 Max: 10.2 Average: 8.2



FeO2 Min: 16.2 Max: 17.9 Average: 17.1 EqO2 Min: 20.53 Max: 32.12 Average: 25.80



Device Information

Name	Measurement Types	Description
Polar H10 B7026123 (H10 6102B7FEFF1A9EA0 FW:5.0.0 SW:3.1.1 HW:00760690.03 Polar Electro Oy)	HR, RR, HRV	
VO2 Master 10429 (1.6.2 BD2800000043EEE FW:14 SW:36 HW:15 VO2 Master Health Sensors Inc.)	Rf, Tv, VO2, VO2, FeO2, Ve, Pressure, Temp, HUM, EqO2, Calories	