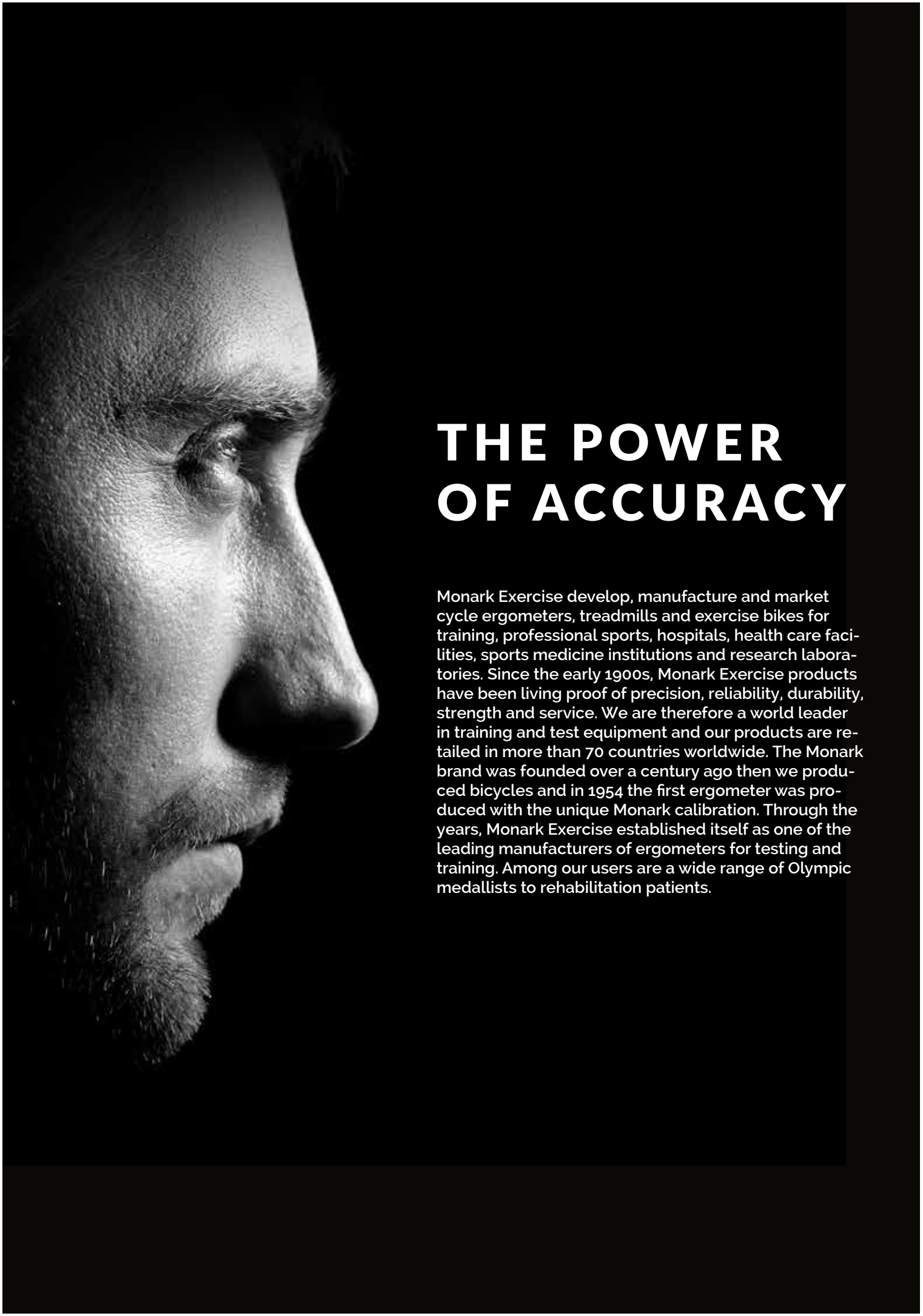
MONARK SPORT & MEDICAL
CYCLE ERGOMETER SUMMARY



THE POWER OF ACCURACY

Monark Exercise develop, manufacture and market cycle ergometers, treadmills and exercise bikes for training, professional sports, hospitals, health care facilities, sports medicine institutions and research laboratories. Since the early 1900s, Monark Exercise products have been living proof of precision, reliability, durability, strength and service. We are therefore a world leader in training and test equipment and our products are retailed in more than 70 countries worldwide. The Monark brand was founded over a century ago then we produced bicycles and in 1954 the first ergometer was produced with the unique Monark calibration. Through the years, Monark Exercise established itself as one of the leading manufacturers of ergometers for testing and training. Among our users are a wide range of Olympic medallists to rehabilitation patients.

Every Monark Exercise product is designed for physical activity but some products are better suited for rehabilitation and medical use whereas other products are designed for elite sports and maximal performance tests. Knowing the customer's intended use for the Monark Exercise product is the most important question to ask. Consequently, you need to know which Monark Exercise product to direct them to as the customer does not know the complete Monark Exercise product range. Hence, to increase sells, you must make the effort to know and understand the main specifications and intended use for each ergometer and treadmill, and where to find more information when needed.

MONARK EXERCISE CYCLE ERGOMETERS (ERGOMETRY)

"The term ergometry from the Greek" ergon (work), and metron (measurement). Work measurement.
Why perform a test?- A decrease in the hearts pumping capacity may not be detectable at rest, with a demand for cardiac output 0f 4-5 litres, but certainly will be so if the load, as a result of work, is a cardiac output of 10-15 litres per min. or more.

The Åstrand and Ekblom-Bak sub maximal fitness tests are simple tests of the heart function and state of physical fitness, with the help of a bicycle ergometer. By using a Monark Exercise bicycle ergometer, the Astrand test, YMCA, Ekblom-Bak or other protocols, can be performed at schools, sports clubs, corporate fitness facilities and gyms.

ABOUT CYCLE TESTING

The demand for oxygen when cycling is relatively alike for all people, young, old, fit or deconditioned. The load on the bicycle ergometer creates a demand on the body to transport oxygen through the body's organs. Ie heart, lungs, veins and arteries.

WORKLOAD DEVICE OF THE MONARK BIKE

Cycling makes the flywheel rotate and store energy. Applying a braking resistance, will make the flywheel lose energy. We change the workload, or energy stored, by changing the pedal speed or increasing or decreasing the load.

SUBMAXIMAL FITNESS TESTS, ÅSTRAND AND EKBLOM-BAK

The Åstrand and Ekblom-Bak tests are simple sub maximal cycle ergometer tests for estimation of cardiorespiratory fitness (VO2max). The tests have low risk, are easily administrated and do not need any advanced laboratory equipment. The tests are suitable in health evaluations when a maximal test is not feasible.

YMCA TEST

YMCA test is an automatic test in three steps, where the second and third levels of workload depend on the heart rate of the previous step. Every third minute the workload increases until the test person has managed 3 levels, which takes 9 minutes.

HOW TO CALCULATE THE BRAKE POWER FOR MONARK ERGOMETERS

Cycling makes the flywheel rotate and store energy. Applying a braking resistance, will make the flywheel lose energy. We change the workload by changing the pedal speed (cadence) or increasing or decreasing the braking resistance. 1 revolution of the crank =6 meters in length on the flywheel.
Metronome = 100 beats per minute, which should equate to 50 RPM's. 50RPM's = 300Meters/minute.

KILOPOND AND NEWTON

The braking load is measured in kilopond (kp), which is the magnitude of the force exerted on one kilogram. Hence, 1 kp = 9.81 N.

Power (P) is defined as the amount of work per time unit. Work on a Monark ergometer is calculated as; **W = Braking load x Distance**
Where one revolution on the crank equals six meters in distance and the breaking load is in kiloponds or Newtons.

If you have 2 kp of resistance and are pedalling with 60 RPM the work equals:
W = 2 x 60 x 6 = 720 kpm/min (kilopond meter per minute).

To calculate the power output, you will have to convert kpm/min to Newtons per minute (N/min)
P = (720 kmp/min x 9.81) / 60 seconds = 118 W.

This can easily be simplified and approximated as:
Power output = Braking load x RPM
P = 2 kp x 60 RPM = 120 W.

WATTS

KP x RPM = WATTS. 1kp x 50rpm=50watts.

WATT	kpm/min	Watt	KPM/Min
50	300=1kp@50rpm	200	1200=4kp@50rpm
100	600=2kp@50rpm	250	1500 =5kp@50rpm
150	900=3kp@50rpm		

100kpmeters/min= 723 foot-ponds/min = 16.35 watts, 300kpmeters/min = 3 x 16.35watts(49.05watts). The difference between kpm and watt is 2% when converted 50W=300kpm/min

DIFFERENT MONARK MODELS FOR DIFFERENT TESTING AND PURPOSES

MEDICAL RANGE

Easy entry frame.
Upright cycling position
Hospitals, Rehabilitation, Physiotherapists.

- 939 Novo
- 928G3
- 927E
- RT2 – Recumbent
- RC4 – Recumbent
- RC6 – Recumbent
- 881-Upper body ergometer (available with table)*.
- 871-Upper Body exercise only (available with table)*.
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*both products come with pedals that can be swapped with the handles and used between the legs for seated clients. And is

SPORT RANGE

Perfect fit frame
Realistic cycling feeling
Sports science
Universities
Institute of sports
Professional sports Clubs

- LC7 TT
- LC6 Novo
- LC4
- LT2
- 894

INDEPENDENT PEDALLING:

When the RPM slows down or speeds up, for the 928E, 939 Novo, RC4, RC6 Novo, LC4, LC6 and LC7 TT, the bike automatically adjusts the load to maintain the correct power output.

BRIEF SUMMARY PF WHAT EACH MODEL DOES

LT2

A training ergometer for the serious athlete. Especially designed for high intensity and interval training (HIT). The unique resistance control with fixed steps and sprint function enables unmatched possibilities for qualitative training with accurate power output data.
The perfect fit frame and the 20 kg flywheel create an optimal cycling sensation. Calibration of the resistance is possible and demands no external electricity source.

LC4

When accuracy, versatility and usability matter. The LC4 is an advanced training and test bike with either constant or cadence dependent power output. Equipped with Monark's pendulum system which enables accurate calibration of the ergometer. The resistance control system can be controlled as a stand-alone system or can be controlled from a computer with the Monark Test Software. The G3 display has five preprogrammed test protocols, Åstrand, YMCA, PWC, Increment, Mets. The perfect fit frame and the 20 kg flywheel create an optimal cycling sensation.

LC6 Novo

The perfect ergometer for physiological tests and is the obvious choice for any research laboratory, where accuracy and repeatability are essential. The LC6 Novo is equipped with the Novo control system which guaranties a very fast and accurate adjustment of the resistance. The resistance can either be RPM dependent or RPM independent. The LC6 Novo can be used as stand-alone ergometer or be controlled by an external system like a metabolic cart or a computer. It has both Bluetooth and ANT+ heart rate sensor. The pendulum system provides you with Monark's unmatched calibrations which guaranties accurate and reliable data.

LC7 TT

The ultimate research and performance analysis tool. The LC7TT is equipped with Shimano Di2 gear shifters which allow the cyclist to individually adjust the resistance and power output, exactly as on a regular bike. Perform time trials or open end protocols to analyse individual pacing strategies and performance indicators. The LC7TT can also be controlled from external systems like metabolic carts, ECG systems and computer software. The resistance can either be RPM dependent or RPM independent. It has both Bluetooth and ANT+ heart rate sensor. The perfect fit frame with mm scales for precise and optimal adjustments and the 20 kg flywheel create an optimal cycling sensation. Equipped with Monark's unique calibration method, which provides incomparable accuracy, reliability and repeatability.

894E

The golden standard for Wingate and anaerobic tests. The unique weight basket enables instant loading and the calibrated weights vouch for unmatched accuracy, repeatability and reliability. The 894e has extra reinforcements and extended floor support to withstand the tremendous strain involved with anaerobic tests. The weight basket can be controlled manually or automatically with the Monark Anaerobic Test Software which also enables multiple different test analysis tools.

The difference between the 894 and the 874E is that the 894 can be connected to a computer and the Monark Anaerobic Test Software. Both models use the same constructed weigh basket which is a great and easy way to add or remove braking resistance (0.1 kg at 50 RPM = 5 Watts). Also, the weight basket is the fastest way to change the resistance on cycle ergometer.

927E

Easy-to-use ergometer for rehabilitation and basic training. The 927 is extremely robust and reliable which makes it perfect for rehabilitation and training. It has low entry and upright cycling position with manual load adjustment. The user-friendly display shows speed, distance, time, heart rate and calories. The well balanced flywheel ensures a nice cycling feeling even at low cadence.

928 G3

The perfect ergometer for submaximal tests, training and rehabilitation. The 928E is RPM-independent ergometer with easy entry and upright cycling position. The resistance control system can be controlled as a stand-alone system or can be controlled from a computer with the Monark Test Software. Several submaximal test protocols, eg. Åstrand and YMCA, are already preprogrammed in the display and in the Monark Test Software, which also enables to create custom test and training protocol. The 928E is equipped with Monark's pendulum system which enables accurate calibration of the ergometer.

939 Novo

Advanced test ergometer for medical use. The 939 Novo is our top of the line medical cycle ergometer, especially designed to facilitate advanced physiological tests where accuracy and repeatability are essential. The easy entry frame and upright cycling position creates a perfect test, rehabilitation and training ergometer for all cyclists.

The 939 Novo is equipped with the Novo control system which guaranties a very fast and accurate adjustment of the resistance. The ergometer can be used as stand-alone unit or be controlled by an external system like a metabolic cart, ECG-system or a computer. Monark's unique pendulum and calibration system guarantee unmatched accuracy, reliability and repeatability.

RT2

A recumbent ergometer for training and rehabilitation. The RT2 is especially developed to enable qualitative training for disabled patients who cannot sit or use an ordinary cycle ergometer. The backrest is adjustable as well as the seat, which has discreet backward lean. This, together with ergonomically positioned handles create a comfortable and stable cycling position with easy entry. The resistance control is easy-to-use and has fixed steps for instant and precise changing of the breaking resistance. The RT2 can be calibrated and needs no external power to operate.

RC4

User-friendly recumbent ergometer with high accuracy. The RC4 is an easy-to-use recumbent ergometer, designed for hospitals and rehabilitation centres. The backrest is adjustable as well as the seat, which has discreet backward lean. This, together with ergonomically positioned handles create a comfortable and stable cycling position with easy access for patients with different disabilities. The display has several preprogrammed tests protocols, e.g. Åstrand and YMCA which allows you to perform submaximal tests without connecting the ergometer to and external system. Still, the ergometer can be connected and controlled via a PC and the Monark Test Software which allows you to create custom made test and training protocols and to save all results. The RC4 is RPM independent (constant power output regardless of pedalling speed) and equipped with the Monark pendulum system which allows you to easily calibrate the resistance and guaranties accurate and reliable data.

RC6 Novo

A recumbent ergometer for maximal accuracy and connectivity. The RC6 Novo is a top of the line recumbent ergometer, especially designed to facilitate advanced physiological tests where maximal accuracy, reliability and repeatability are essential. The adjustable and easy-to-use swivel seat and the easy entry recumbent frame create a perfect test and training device for elderly, mobility impaired and obese patients. The RC6 Novo is equipped with the Novo-control system which enables very fast and accurate adjustment of the resistance. The resistance can either be RPM independent or RPM dependent. The ergometer can be used as a stand-alone unit or be controlled by external systems, e.g. a metabolic charts and computers. The unique pendulum system provides you with Monak's unmatched calibration method which guaranties accurate and reliable data.

Monark Medical Treadmill

The Monark Medical Treadmill is designed for medical and rehabilitation purposes. Low entry speed, easy access and long handrails ensure the best usability.

The Monark Novo display together with the possibility to control the treadmill from a third party device (metabolic cart or ECG), enables easy and precise operating.

WHEN EVERY HUNDRED OF A SECOND COUNTS

MONARK

EXERCISE • PRODUCTS FOR LIFE AND PERFORMANCE

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