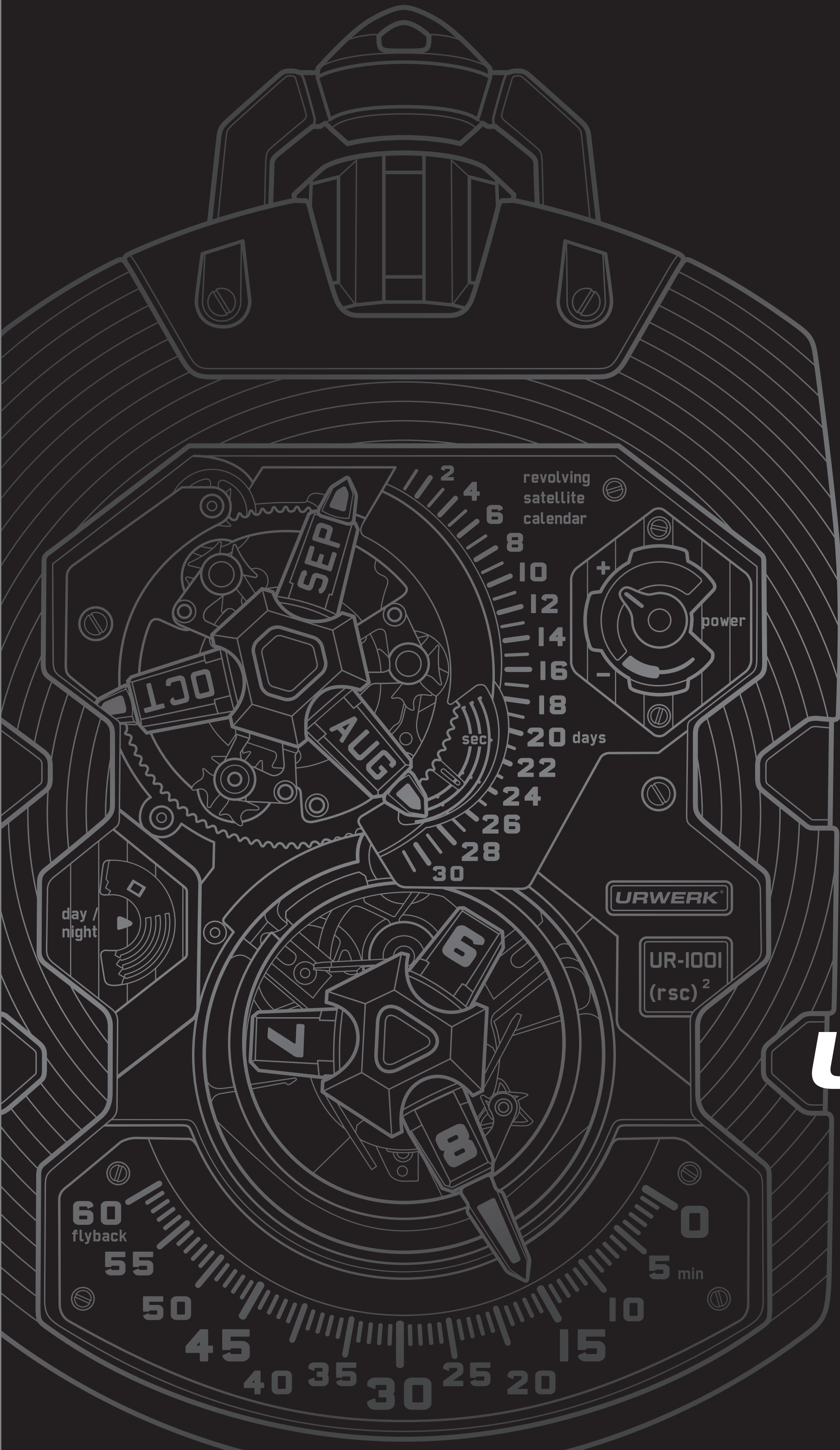


EPISODE 2

URWERK®

BAUMGARTNER & FREI GENEVE

URWERK
THE FUTURE OF FINE WATCHMAKING

URWERK is what translates the hearts and minds of its founding partners into sensational watchmaking. Felix Baumgartner, a watchmaker like his father and grandfather, has time running through his veins.
Felix learned the secret language of minute-repeaters, tourbillons and perpetual calendars at his father's bench.

Martin Frei is the artistic counterweight to his partner's technical expertise. Accepted into the Lucerne's college of art and design in 1987, Martin delved into every form of visual artistic expression from painting and sculpture to video, emerging as a mature artist. The two men met by chance and discovered a common fascination with the measurement of time, spending hours analysing the gap between the watches they saw in the shops and the vision of their future creation.

"Bringing out yet another version of an existing mechanical complication was not our aim," Felix Baumgartner explains. *"Our watches are unique because each has been conceived as an original work. This is what makes them valuable and rare. Above all, we want to explore beyond the traditional horizons of watchmaking."* Martin Frei, responsible for the shape of future time, helps make this possible. *"I come from a world of total creative freedom. I'm not cast in the watchmaking mould, so I can draw my inspiration from my entire cultural heritage"*. That heritage goes back to the roots of time, reflected in the name of their company. URWERK means "original accomplishment", and Ur of the Chaldees, in Mesopotamia, is where the Sumerians first observed the concurrence of the heavenly bodies with the seasons, and so developed the first measurements of time.

URWERK®
BAUMGARTNER & FREI GENEVE

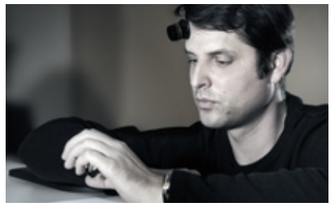
Contemporary watchmaking

by URWERK

Introduction

FELIX BAUMGARTNER

“There was the watchmaking that my father taught me at his bench, watchmaking with history, with its codes and its special vocabulary. It was watchmaking that you wanted to touch, where the wood on pendulum clocks cracked, where wheels tarnished by time squealed for oil. Nostalgic horology, dealing with legendary models from an era when clocks and watches were of vital importance.



Then there was the watchmaking school where knowledge was in books, with equations, long and short, easy and difficult. Where golden rules were engraved on the paper and appeared immutable. The watchmaking school where I made and remade components, until I felt their precision and I began to experience the art.

And then there was URWERK, which I created with Martin Frei in 1997. Our adventure. A story that began in the mists of time, but is still playing out today. Watchmaking in the 21th century.”

MARTIN FREI

Contents

The URWERK models

URWERK specialises in unconventional ways of indicating the time. The complex mechanisms, interactive features and imaginative designs of URWERK's contemporary watchmaking are found nowhere else today.

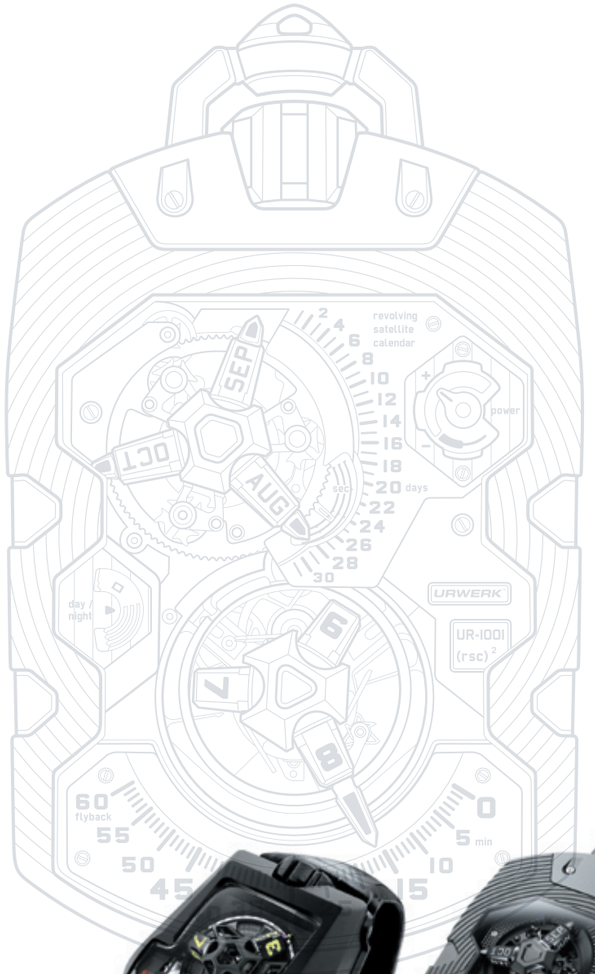
UR-103 Manually wound, hour satellite watch with wandering hours; power-reserve indicator, fine tuning screw, 15-minute and seconds dials for precise time setting.

UR-110 Self-winding, patented revolving satellite complication watch with wandering hours on planetary gears; day/night indicator, running seconds and "oil change" indicator. Winding rotor dampened by turbines.

UR-201 Manually wound, patented revolving satellite complication watch with wandering hours; telescopic minutes hands, day/night indicator, power-reserve indicator, fine tuning screw, "oil change" and running-time indicators.

UR-202 Self-winding, patented revolving satellite complication watch with wandering hours; telescopic minutes hands, day/night indicator, moonphases and adjustable pneumatic control of the winding rate using turbines.

UR-103 UR-110 UR-201 UR-202



UR-203 Self-winding, patented revolving satellite complication watch with wandering hours; telescopic minutes hand, "oil change" and running-time indicators, adjustable pneumatic control of the winding rate using turbines.

UR-1001 Patented revolving satellite complication device with wandering hours, retrograde minutes, revolving satellite calendar, running seconds, day/night and power-reserve indicators, "oil change" and running-time indicators.

UR-CC1 Self-winding watch with linear indications of the jumping hours and retrograde minutes, triple indications of the seconds (both lineally and digitally). Winding rotor dampened by an air vane.

UR-203 UR-1001 UR-CC1

A NEW TAKE ON TIME

Research into different ways of indicating the time is an ancient branch of watchmaking, although few watchmakers have made it their speciality. Today, URWERK exploits inventive techniques to take forward horological ideas that had been abandoned for technical or economic reasons. The results not only give you a fresh look at time, but also a captivating demonstration of the latest watchmaking engineering.

Campani Brothers Tabernacle Night Clock. Late 17th Century. Night clocks had a candle or lamp burning inside to illuminate the wandering hour. Many caught fire.

It started with the wandering hour …

The wandering hour is the intuitive way of reading the time. By combining the hours and minutes in a single indicator, it is also a most efficient way of communicating time. In this ingenious combination of digital and analogue, the numerical hour, traditionally on a disc, travels along an arc of 60 minutes. As the old hour reaches the end of the arc, the next hour appears at the beginning.

CLOCKS FOR THE POPE

The Campani brothers in mid-17th century Italy are credited with the idea in their wandering-hour clocks made for the Pope. Major European clockmakers then adopted the system, but it was not until around 1800 that wandering hours appeared in pocket-watches. In its simplest form, the 12 hours are divided into two groups of six — odd numbers and even numbers. Each group appears in succession displaying the correct hour numeral along an arc opened in the dial and graduated in minutes.

UR- 103

In URWERK's modern interpretation of the wandering hours, the UR-103, the 12 hours are arranged in groups of three on each of the four satellites carried on four arms of a revolving carousel. As the carousel revolves, the four satellites successively pass over four Maltese crosses that rotate each satellite so that the hours follow one another across the 60-minute sector.

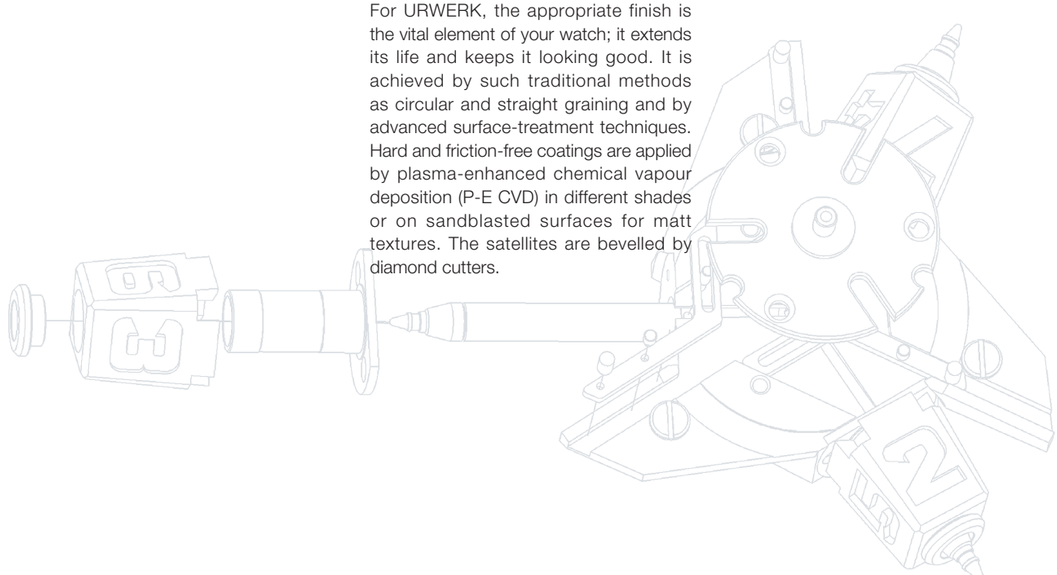
… And evolved into the revolving satellite complication

URWERK's patented revolving satellite complication is based on the same principle. The hours are in groups of four presented on the rotating arms (satellites) of a revolving three-pointed carousel. The satellites are truncated pyramids with each side presenting an hour numeral at an angle of 85° so that the hour can be seen without turning the wrist.

Revolving satellite complication

THE BEAUTY OF A FUNCTIONAL FINISH

For URWERK, the appropriate finish is the vital element of your watch; it extends its life and keeps it looking good. It is achieved by such traditional methods as circular and straight graining and by advanced surface-treatment techniques. Hard and friction-free coatings are applied by plasma-enhanced chemical vapour deposition (P-E CVD) in different shades or on sandblasted surfaces for matt textures. The satellites are bevelled by diamond cutters.



Revolving satellite complication with telescopic hands

As the satellite reaches the minutes sector, a coaxial pointer (hand) extends and retracts, its length precisely following the minutes scale along its three vectors. When it leaves the minutes sector, the hand withdraws into the satellite to its minimum length of 1.8mm. This allows a smaller case to give more prominence and clarity to the time display.

Oval watch with extending hands, made in England circa 1800.

HANDS THAT STRETCH AND SHRINK

Watches with hands that retract and extend to follow the minutes on a non-circular track are extremely rare. The best-known examples are watches with oval dials made at the end of the 18th century by London watchmakers, notably William Anthony. At 6 o'clock the hands are at their longest and at 09:15, at their shortest.

Three transporters push the telescoping hands in and out to follow the vectors of the minutes scale. The groove that the transporters follow can be seen cut into the base of the case on the left.

In the URWERK models UR-201 and UR-202, each hand is extended and retracted by an angled pivoting arm called a transporter that goes around with each arm of the carousel. One end of the transporter has a stud, which follows in a grooved track cut into a plate. The contours of the track determine how far the hand must extend and retract to follow the vectors of the minutes scale. The other end of the transporter pushes the hand in and out telescopically according to the shape of the track.

In an earlier version of the telescopic hand in the UR-201 watch, the transporter follows the edge of a cam cut into the plate. The hand is returned by an extremely fine spring (70 microns) within the satellite.

The groove or cam edge, which the transporter follows, is calculated using 380 points of reference from the three vectors of minutes scale. It is cut at an optimum distance from the centre so as to widen the angles, thus minimising friction.

The minutes sector has been designed for a quick and easy appreciation of the time. The 33.2mm scale is divided into a triptych of three straight-line segments, the first and the last 15 minutes of the hour flanking the middle 30-minute segment.

ZERO TOLERANCE OF IMPRECISION

Tolerances are extremely finely calculated. The transporter arm, for example, is machined to a precise thickness of 0.895mm. A hard lubricating coating adds another 0.005mm, bringing the thickness to 0.9mm. This has to work within a space of 0.905mm, leaving a clearance of only 0.005mm.

Revolving satellite complication with retrograde minutes

In this ingenious variation of the revolving satellite complication, the minutes hand detaches from the wandering hour at the end of its journey and flies back to the beginning of the scale to join the next hour.

URWERK made the first watch combining revolving satellite complication and retrograde minutes for Harry Winston in 2005.

A LOGICAL COMBINATION

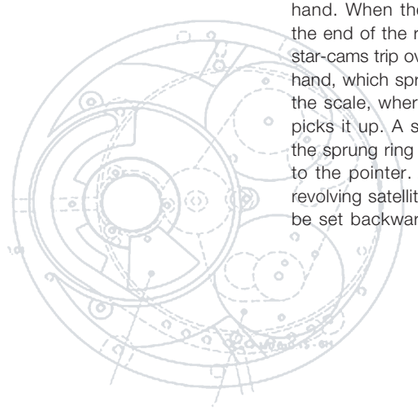
Mechanisms for retrograde indications were known from the early 20th century, but it was not until the 1990s that they became popular in complicated wristwatches. The hand indicating a unit of time (months, dates, hours, minutes or seconds) travels in an arc instead of a circle, flying back to the beginning when it reaches the end of its scale.

Since the revolving satellite complication already show the hours along an arc, adding a retrograde minutes indication seemed logical. The three arms of the carousel share a single pointer — an example of URWERK's design.

The first watch to combine revolving satellite complication and a retrograde indication of the minutes was the Opus V watch, produced by URWERK in 2005 for Harry Winston.

In the UR-1001 time device, the minutes pointer leaves its satellite hour at the end of the hour and slides back to join the next hour at the start of the minutes scale.

In the UR-1001, the minutes hand, on a sprung ring, is pushed along a guide rail by the wandering-hour satellite. A swan's neck spring on each arm of the carousel engages two coaxial star-cams that slide along the guide rail, carrying the minutes hand. When the minutes hand gets to the end of the rail after 60 minutes, the star-cams trip over to release the minutes hand, which springs back to the start of the scale, where the next satellite hour picks it up. A small bar of platinum on the sprung ring acts as a counterweight to the pointer. As in URWERK's other revolving satellite watches, the time can be set backwards as well as forwards.



Revolving satellite complication on planetary gears

The three hours satellites and minutes hands are mounted on planetary wheels that keep them aimed in the same direction as they go round on the carousel.

ALIGNED ON TARGET

Planetary systems are well known to watchmakers and are applied notably in tourbillons and power-reserve indicators.

URWERK uses a planetary train to give an added dimension to the revolving satellite complication. The hour modules and their pointers are counter-rotated as they orbit the centre, keeping them perpetually aligned towards the arc of minutes.

The inner planetary wheel on each arm runs around the stationary centre wheel. It counter-rotates the outer planetary wheel to keep the satellite hours and minutes hands pointing constantly towards the scale.
At a point opposite the scale, the satellite hour trips over a peg, which rotates the satellite to the next hour.

DEMONSTRATING MECHANICAL ELEGANCE

URWERK's constructors strive for the simplest mechanical solutions to the most intricate concepts. Mechanical constructions that involve the minimum of components for the maximum of effect are the essence of good engineering — an efficient machine is always pleasing to the eye.

The revolving satellite complication on planetary gears are featured in URWERK's self-winding UR-110. The minutes scale is on the extreme right, revealing the time on the wrist with the minimum of disclosure. Drawing back your sleeve unveils the day/night indicator and an "oil change" indicator showing when a service is due.

Planetary gear system

Revolving satellite calendar

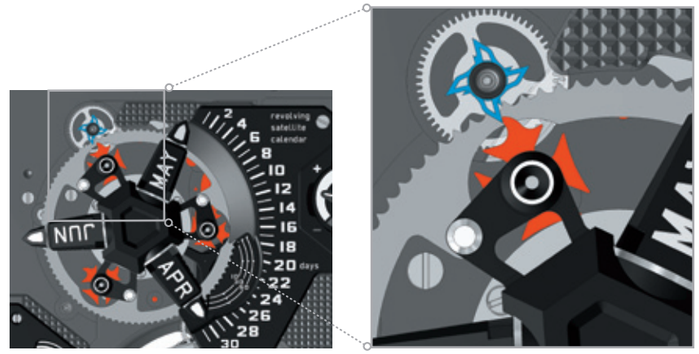
The three-armed carousel with rotating satellites is equally suitable for the 12 months of the year and the 31 days of the month as it is for the 12 hours and 60 minutes.

The revolving satellite calendar in the UR-1001 device shows the months, in three groups of four, successively moving across a scale of 31 days on a carousel that advances every 24 hours. The dates are self-adjusting for months of 30 and 31 days but need to be set manually to March 1 on the last day of February.

INGENIOUS DATES...

URWERK has invented a beautiful way of advancing the date twice at the end of the short months — April, June, September and November — to the start of the following month. The dates wheel has 93 teeth and goes around in three months carrying the three-armed carousel. Mounted on the carousel are three Maltese crosses, each corresponding to a satellite of four months at the opposite end of the dates wheel.

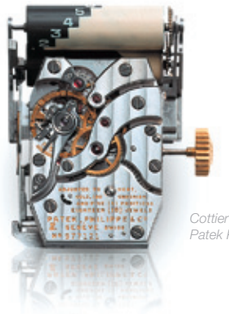
At the end of short months, a Maltese cross on the dates wheel opposite the month, rotates to present a finger which engages with the star of the transmission wheel to advance the dates two steps.



Maltese cross detail

Linear indications

In URWERK's UR-CC1, the hours and minutes are shown by lines extending on rotating cylinders. The seconds are indicated in three different ways: digitally, linearly and by successive hands crossing a 20-second arc.



Cottier Cobra watch. Patek Philippe Museum

BRINGING THE COBRA TO LIFE

One of the most creative watchmakers of the 20th century was Louis Cottier of Carouge, near Geneva. In 1958, no doubt inspired by the horizontal dashboard speedometers and radio dials of the time, he made a watch with similar linear indications of the hours and minutes. The unusual case was conceived by the jewellery designer, Gilbert Albert. A prototype was made for Geneva watch manufacturers, Patek Philippe, but it never went into production.

In the UR-CC1, as in the Cottier watch, the minutes are shown by a helix on a cylinder. As the cylinder rotates in its horizontal aperture, the helix progresses as a dashed line along the minutes scale. When the line reaches 60 minutes, the helix winds back in 0.1 seconds to the start of the scale.

The hours are similarly shown on a long cylinder, but in 12 lines, each an hour longer than the last against the linear scale of hours. This cylinder jumps to the next line at the end of each hour.

The minutes cylinder is rotated by a rack at the end of a sprung rocker arm that engages the pinion of the cylinder. The rocker arm is lifted and dropped by a rotating vertical cam with three columns shaped like right-angled triangles. A peg on the rocker arm rides up the slope of the triangle, lifting the rack and turning the minutes cylinder.

On the UR-CC1, there are two horizontal indications displayed by two cylinders: one for the retrograde minutes, the other one for the (jumping) hours

When the peg falls off the top of the triangle after 60 minutes, the rack drops, turning the minutes cylinder in the opposite direction and diminishing the minutes line to zero.

Simultaneously, the hours cylinder jumps forward to the next line.

The pink cam lifts and drops the honeycomb arm. The rack at its far end rotates the cylinders for the linear minutes and hours.

The dial of the UR-CC1 is animated by a rotating disk displaying the seconds both digitally and linearly – a world first!

The seconds are indicated by a single-coil flat spiral, trisected by three arms and having 30 numerals for every other second around its circumference. The spiral, revolving once a minute, progresses along a linear scale; the seconds numerals appear at two-second intervals in an aperture, while the three arms successively traverse a 20-second arc.

BALANCING ACT

Despite its irregular shape, the seconds spiral with its hands and numerals is finely balanced on its physical centre within microns of its centre of gravity. The lightweight nickel structure (0.09 grams) and its numerals are formed using LIGA (ultra-violet lithography, electroplating and moulding) technology that produces complex shapes to micrometric exactness.

Odometers and "oil change" indicators

Two indications on URWERK watches can show for how long the movement of the watch has been in operation. The first shows the running time on the "oil change" indicator; when the pointer reaches the figures in red, it's time to have your watch serviced and its oil changed. The "oil change" indicator is reset to zero when the watch is serviced.

A second indication which can be linear or on a dial shows the accumulated running time of your watch. Equivalent to the odometer showing the total mileage of a car, it advances in several increments with every revolution of the oil change indicator.

On the UR-201, the running time and "oil change" indicators are coupled to the manual winding system and are advanced by winding the watch. They therefore take no energy from the mainspring and have no effect on the rate of the watch.

WITHOUT PRECEDENT

The indication of the accumulated running time in the URWERK models is believed to be the first such device in a watch.

Both the UR-201 and the UR-203 feature "oil change" and running-time indicators. In the UR-203 (top), the service intervals and the circular odometer are displayed on the dial whereas in the UR-201 (bottom), the control board is on the back of the case.

In the UR-1001, the running time is shown on three scales under the hinged back cover: the five-year cycle of the "oil change" indicator, an accumulated time of a century and a scale that will tell you when your watch has run for 1,000 years.

Adjusting the rate

The performance of each watch is subject to the habits and activities of its wearer. URWERK adds controls that allow the owner to adjust the rate of the watch in the UR-103 and UR-201, and the winding rate in the self-winding UR-202 and UR-203 models.

Turning the screw on the back of the UR-103 and UR-201 makes the watch go faster or slower. The screw acts on the index that changes the rate of the balance by altering the effective length of the balance-spring.
The owner can thus adjust the rate of the watch to gain or lose up to 30 seconds a day.

Fine tuning screws on the back of the UR-201 (top) and the UR-103.

RESTORING OWNER CONTROL

Pocket-watches were seldom sealed so the owner could easily open the watch and set the index fast or slow. However some makers, including Abraham-Louis Breguet, provided for adjustment without opening the case. Such a device is extremely rare in modern wristwatches.

Air brakes

URWERK uses air pressure to absorb any violent movements of the winding rotor in the UR-202, UR-203, UR-110 and UR-CC1 self-winding watches. A control lever in the UR-202 and UR-203 enables the winding rate to be slowed or stopped when increased activity by the wearer might cause overwinding or strong shocks.

These pneumatic devices are designed primarily to reduce wear by absorbing the shocks to the winding system and by preventing the mainspring from being overwound by the rotor and slipping in its barrel.

In the UR-110, two turbines are geared to the rotor, which engages the winding system in only one direction of spin. These turbines are not adjustable, but their curved blades offer increased air resistance to the rotor's free direction of spin, and less resistance to its winding rotation, thereby encouraging the rotor to do its duty.

A NEW APPLICATION FOR AN OLD DEVICE

Air friction has long been applied in horology. Spinning vanes are employed in clocks to steady the striking rate, and were also used in early repeating watches for the same purpose. However the use of turbines to create air pressure in the winding system of a wristwatch is a new sophistication.

The self-winding UR-202 and UR-203 models feature an adjustable pneumatic control of the winding rate. The winding rotor is coupled to a pair of air turbines, geared to spin six times faster than the rotor. The turbines force air through a pattern of small holes. By progressively shutting off the holes the air pressure is increased, causing the turbines and the rotor to slow.

The air holes are closed by moving the lever. When they are fully open the turbines and the rotor spin freely. When the lever is in the halfway position, the increased air pressure on the turbines slows the winding rate by about 35%. When the airflow is blocked with the lever in the stop position, the winding rotor ceases to function.

UR-202
3-position of the selector level

URWERK®

Technical specifications

UR-103

Movement

Calibre:	UR 3.03 manually wound
Jewels:	21
Escapement:	Swiss lever
Balance:	Monometallic
Frequency:	21,600v/h, 3Hz
Balance spring:	Flat
Power source:	Single mainspring barrel
Power reserve:	36 hours
Materials:	Orbital cross in titanium Triple baseplate in ARCAP Hour satellites in aluminium
Surface finishes:	Circular-grained and rhodium-plated baseplate Chamfered and polished screw heads

Indications

Hour satellite with wandering hours on a four-armed carousel

On the back:	Control board in titanium with: Power-reserve indicator 15-minute and 60-second dials for precise time setting
Surface finishes:	Sandblasted and satin-finished carousel Circular graining P-E CVD Super-LumiNova® treatment on hours and minutes markers

Controls

Two-position winding crown

On the back:	Fine tuning screw (fast/slow)

Case

Material:	White gold, red gold, TiAlN, or black platinum; caseback in titanium
Dimensions:	50mm x 36mm x 13.5mm
Glasses:	Sapphire crystal with anti-reflective coating
Water resistance:	Pressure tested to 3ATM
Surface finishes:	Polished cases P-E CVD and micro-sandblasted caseback

URWERK®

Technical specifications

UR-110

UR-110

Movement

Calibre:	UR 9.01 self-winding
Jewels:	46
Escapement:	Swiss lever
Balance:	Monometallic
Frequency:	28,800v/h, 4Hz
Balance spring:	Flat
Power source:	Single mainspring barrel
Power reserve:	39 hours
Winding system:	Unidirectional winding rotor coupled to twin turbines
Materials:	Baseplate and satellite in brass Central satellite tower in ARCAP
Surface finishes:	Circular graining and diamond polishing Chamfered and polished screw heads

Indications

Revolving satellite complication with wandering hours on planetary gears
Day/night indicator
“Oil change” indicator
Running seconds

Surface finishes:	Sandblasted and satin-finished carousel Satin-finished and diamond-polished satellites Super-LumiNova® treatment on markers

Controls

Two-position winding crown with cover

Case

Material:	Case in titanium with bezel in 316L stainless steel or AlTiN; caseback in titanium
Dimensions:	47mm x 51mm x 16mm
Glasses:	Sapphire crystal with anti-reflective coating
Water resistance:	Pressure tested to 3ATM
Surface finishes:	Brushed and polished, or micro-sandblasted cases P-E CVD and micro-sandblasted caseback

Technical specifications

UR-201

UR-201

Movement

Calibre:	UR 7.01 manually wound
Jewels:	20
Escapement:	Swiss lever
Balance:	Monometallic
Frequency:	21,600v/h, 3Hz
Balance spring:	Flat
Power source:	Single mainspring barrel
Power reserve:	50 hours
Materials:	Baseplate and satellites in ARCAP Transporters in bronze beryllium treated with MOVIC Telescopic hands in titanium
Surface finishes:	Circular-grained and rhodium-plated baseplate Chamfered and polished screw heads

Indications

Revolving satellite complication with wandering hours and telescopic minutes hands
Day/night indicator
Power-reserve indicator

On the back:	“Oil change” indicator (5 years) Linear indication of total running time (118 years)
Surface finishes:	Sandblasted and satin-finished carousel P-E CVD Satin-finished and diamond-polished satellites Super-LumiNova® treatment on hours and minutes markers

Controls

Two-position winding crown

On the back:	Fine tuning screw (fast/slow)

Case

Material:	White gold, red gold or black platinum; caseback in titanium
Dimensions:	45.6mm x 43.5mm x 15mm
Glasses:	Sapphire crystal with anti-reflective coating
Water resistance:	Pressure tested to 3ATM
Surface finishes:	Brushed and polished, or micro-sandblasted cases P-E CVD and micro-sandblasted caseback

URWERK®

Technical specifications UR-202

UR-202

Movement

Calibre:	UR 7.02 self-winding
Jewels:	34
Escapement:	Swiss lever
Balance:	Monometallic
Frequency:	28,800v/h, 4Hz
Balance spring:	Flat
Power source:	Single mainspring barrel
Power reserve:	39 hours
Winding system:	Unidirectional winding rotor coupled to twin air-compression turbines
Materials:	Baseplate and satellites in ARCAP Transporters in bronze beryllium treated with MOVIC Telescopic hands in titanium
Surface finishes:	Circular-grained and rhodium-plated baseplate Chamfered and polished screw heads

Indications

Revolving satellite complication with wandering hours and telescopic minutes hands
Day/night indicator
Moonphases

Surface finishes:	Sandblasted and satin-finished carousel P-E CVD Satin-finished and diamond-polished satellites Super-LumiNova® treatment on hours and minutes markers

Controls

Two-position winding crown

On the back:	Winding-rate control lever

Case

Material:	White gold, red gold or black patinum; caseback in titanium
Dimensions:	46.6mm x 43.5mm x 15mm
Glasses:	Sapphire crystal with anti-reflective coating
Water resistance:	Pressure tested to 3ATM
Surface finishes:	Brushed and polished, or micro-sandblasted cases P-E CVD and micro-sandblasted caseback

Technical specifications

UR-203

Movement

Calibre:	UR 7.03 self-winding
Jewels:	39
Escapement:	Swiss lever
Balance:	Monometallic
Frequency:	28,800v/h, 4Hz
Balance spring:	Flat
Power source:	Single mainspring barrel
Power reserve:	39 hours
Winding system:	Unidirectional winding rotor coupled to twin air-compression turbines
Materials:	Baseplate and satellites in ARCAP Transporters in bronze beryllium treated with MOVIC Telescopic hands in titanium
Surface finishes:	Circular-grained, rhodium-plated and skeletonised baseplate Chamfered and polished screw heads

Indications

Revolving satellite complication with wandering hours and telescopic minutes hands
“Oil change” indicator (3 years)
Total running-time indicator (150 years)

Surface finishes:	Sandblasted and satin-finished carousel P-E CVD Satin-finished and diamond-polished satellites Super-LumiNova® treatment on hours and minutes markers

Controls

Two-position winding crown

On the back:	Winding-rate control lever

Case

Material:	Black coated platinum; caseback in titanium
Dimensions:	45.7mm x 43.5mm x 15mm
Glasses:	Sapphire crystal with anti-reflective coating
Water resistance:	Pressure tested to 3ATM
Surface finishes:	Micro-sandblasted case P-E CVD and micro-sandblasted caseback

URWERK®

Technical specifications

UR-1001

Movement

Calibre:	UR-10.01
Jewels:	51
Escapement:	Swiss lever
Balance:	Monometallic
Frequency:	28,800v/h, 4Hz
Balance spring:	Flat
Power source:	Single mainspring barrel
Power reserve:	39 hours
Winding system:	Unidirectional winding rotor
Materials:	Baseplate in ARCAP
Surface finishes:	Circular-grained, Côtes de Genève and rhodium-plated baseplate Chamfered and polished screw heads

Indications

Revolving satellite complication with wandering hours
Retrograde minutes
Revolving satellite calendar with months and dates
Day/night indicator
Power-reserve indicator
Running seconds

On the back:	“Oil change” indicator (5 years) Running-time indicator for 100 years Linear running-time indicator for 1,000 years
Surface finishes:	Sandblasted carousel PVD WC/C coating Satin-finished and diamond-polished satellites Super-LumiNova® treatment on markers

Controls

Three-position winding crown

Case

Material:	AlTiN
Dimensions:	106mm x 62mm x 23mm
Glasses:	Sapphire crystal with anti-reflective coating
Water resistance:	Pressure tested to 3ATM
Surface finishes:	Micro-sandblasted

URWERK®

URWERK®

Technical specifications

UR-CC1

R-CC1

Movement

Calibre:	UR-8.02 self-winding
Jewels:	37
Escapement:	Swiss lever
Balance:	Monometallic
Frequency:	28,800v/4Hz
Balance spring:	Flat
Power source:	Single mainspring barrel
Power reserve:	39 hours
Winding system:	Unidirectional winding rotor coupled to an air vane
Materials:	Minutes and hours cylinders in Elox Cylinder brackets in titanium Honeycombed rack and seconds disk in nickel (LIGA process) Baseplate in ARCAP, black PVD coating Vertical cam in beryllium bronze
Surface finishes:	Circular-grained bridges, P-E CVD Circular-grained movement components Micro-blasted complication components, diamond-cut and mirror polished

Indications

Linear jumping hours
Linear retrograde minutes
Digital and linear seconds (world first)

Controls

Two-position winding crown

Case

Material:	White gold or gold treated with AlTiN, caseback in titanium
Dimensions:	42.6mm x 53mm x 16mm
Glasses:	Sapphire crystal with anti-reflective coating
Water resistance:	Pressure tested to 3ATM
Surface finishes:	Brushed and polished, or micro-sandblasted cases P-E CVD and micro-sandblasted caseback

Glossary

AlTiN	Aluminium Titanium Nitride
ARCAP	Non-Corrosive Copper-Nickel Alloy
DLC	Diamond-Like Carbon
Elox	Anodicaly inactivated aluminium
LIGA	Ultra-violet lithography, electroplating and moulding
MOVIC®	Lubricating coating
P-E CVD	Plasma-Enhanced Chemical Vapour Deposition
PVD	Physical Vapour Deposition
WC/C	Tungsten (or Wolfram) Carbide and Carbon

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IMPRESSUM

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