PATEK PHILIPPE
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Patek Philippe Ref. 6002
Sky Moon Tourbillon

The grand creation of a grand complication

During the 174 years since it was founded, Patek Philippe has demonstrated its expertise in the entire spectrum of horological complications. Impressive manifestations of this competence include the Calibre 89 presented in 1989. With 33 complications, it holds the world record as the most complicated portable mechanical watch. The Ref. 5002 Sky Moon Tourbillon is the manufacture's most complicated wristwatch with 12 complications on two dials. Now, with the Ref. 6002, the Sky Moon Tourbillon has a successor that redefines the term grand complication – with a case and dial that require the utmost in craftsmanship and artistry.

As regards the movement, the new Ref. 6002 is largely identical with its predecessor. It possesses a minute repeater with two cathedral gongs and a tourbillon; on the front dial, it indicates standard time and features a perpetual calendar with a retrograde date and a moon-phase display. The rear dial sets the stage for astronomical functions: it shows the northern sky, sidereal time, and the angular progression and phases of the moon. Unlike the Ref. 5002, it indicates the moon phases instead of the moon age and features apertures instead of hands for the day of the week, month, and leap year displays.

The totally new aspect of the Sky Moon Tourbillon Ref. 6002 is its appearance, with lavish decorations that elevate it to the status of a grand creation. To refer to a case or a dial is almost a sacrilege in the context of the Ref. 6002. Sculpture would be the more fitting term for a genuine work of art like the Sky Moon Tourbillon. In particular, it showcases two artisanal skills: the art of the engraver and that of the enameler. Since the advent of Geneva's watchmaking heritage in the late 16th century, both of these crafts have been inseparably allied with watchmaking.

Because the first portable timepieces of the epoch were still very inaccurate and had to be reset several times a day, they were primarily objects of prestige. That made it all the more important to endow them with precious materials and painstaking decorations as testimony to the influence and affluence of their owners. The invention of the balance spring toward the end of the 17th century marked the beginning of the era of precision timepieces that were also suitable for scientific measurements.

The Patek Philippe Sky Moon Tourbillon Ref. 6002 unites these two dimensions with incomparable poise: the precision of a tourbillon timekeeping instrument with the rate accuracy of a chronometer and the immaculate decorations that reflect the finest artisanal traditions of Geneva.

Chemin du Pont-du-Centenaire 141 – CH - 1228 Plan-les-Ouates
Mail address: P.O. Box 2654 – CH - 1211 Geneva 2
Tel. + 41 22 884 20 20 – Fax + 41 22 884 25 47 – www.patek.com

The Sky Moon Tourbillon Ref. 6002: a sculpture for the wrist

The case of the Ref. 6002 is a superb oeuvre carved from the massive white-gold blank entirely by hand. The eloquent ornaments, arabesque garlands, and gently curved elements of the Calatrava cross are produced with chip removal techniques using sharp burins that not only incise the precious metal but actually "lift" the decorations out of the gold surface. An involuntary movement or a brief moment of distraction would ruin the case and it would have to be re-melted. But the engraver not only molds the gold in bas-relief but also applies the chisel to sculpt life into the small surfaces between the three-dimensional structures. Thus, more than one hundred hours of work are invested until the engraving alone meets the approval of the master artisan and Patek Philippe's President Thierry Stern. With the same precision and artistry, the engraver uses relief techniques to decorate the minute-repeater slide in the case flank, the two crowns, and the white-gold clasp that locks the strap. The ornaments of the two crowns are as informative as they are decorative: The dynamometric winding crown at 4 o'clock shows an arrow in relief to indicate the direction of rotation, while the moon and stars in relief on the crown at 2 o'clock reveal that it is intended to adjust sidereal time and the celestial functions on the rear dial.

An expressive face in champlevé and cloisonné enamel

The front dial of the Ref. 6002 is a work of art in its own right. Its small surface unites the skills of many specialists who master milling, applique setting, and – most spectacularly – enameling with the champlevé and cloisonné techniques.

The dial is crafted from a thin disk in gold that is milled out until the crisp railway track scale, the surrounds of the dial center, calendar apertures, and moon-phase display stand out in relief. This is followed by the work of the specialized champlevé enameler who fills the recesses around the relief contours with blue enamel by hand. Even the smallest bounded recesses are carefully filled with enamel, applied with an ultra-fine brush. When all recesses have been uniformly filled, the miniature oeuvre is fired in the oven at 850° Celsius.

Conversely, the center of the dial is decorated with so-called cloisonné enamel. This technique involves shaping the contours of the blossoms and leaves using fine, flattened gold wire that must be affixed to the dial. The result of countless hours of painstaking work is numerous separate cells (cloisons) that are then filled with enamel of different shades of blue. Again, the next step is firing and fusing for eternity in an oven at about 850° Celsius.

While most contours in the form of silvery relief structures are embedded in blue enamel, the Roman hour numerals are gold appliques. Other dial elements such as the numerals and the markers of the retrograde calendar scale, the PATEK PHILIPPE GENEVE and TOURBILLON inscriptions, the movement number and the delicately pointed stars are painted bright gray.

The small lunar disk is another fine example of champlevé: the circumference of the moon is elaborated in relief and enclosed with blue enamel. The cratered landscape of the moon’s surface is emulated with gradations of white, gray, and black enamel. This represents a huge effort for a single dial element, but it certainly ranks among the most poetic complications imaginable. For a watch of the likes of the Sky Moon Tourbillon, no amount of work can be deemed unreasonable when the issue is to pay tribute to the movement that ticks beneath the phenomenal dial.

A highly complex masterpiece

In horological terms, the Ref. 6002 distinguishes itself only marginally from its predecessor. Even though the caliber RTO 27 QR SID LU CL is the Genevan manufacture's most complicated wristwatch movement, its concept is to unite not as many as possible, but the most fascinating complications in the compact case of a wristwatch: a perpetual calendar with a retrograde date display, a minute repeater, a tourbillon, the display of sidereal time and a depiction of the nocturnal sky with the motion of the stars, the angular progression of the moon, and the moon phases. The analog displays for the day of the week, the leap year cycle, and the month have been replaced with aperture displays and the moon-age indication at 6 o'clock with a moon-phase display featuring the typical curved cutout that emphasizes the poetic personality of the watch.

Minute repeater with cathedral gongs

The minute repeater was and still is the pinnacle of horological artistry. During the past 25 years, Patek Philippe has devoted considerable attention to this complication, imbuing the hour, quarter-hour, and minute strikes with a new dimension in sonority. Thanks to a proprietary alloy developed explicitly for the gongs and the decades of experience accrued by Patek Philippe's specialists, the sound of the strikes is pure, clear, and easily audible, even in the small case of a wristwatch. A practically inaudible centrifugal governor is responsible for the perfect rhythm of the strike sequence and suppresses the annoying background chatter that is typical of many minute repeaters. And not least, two extra-long cathedral gongs assure the remarkable richness and clarity of the sounds. They are nearly twice as long as ordinary gongs, so both of them must be coiled around the movement twice – a formidable challenge for the watchmaker. The relief-engraved slide that is used to actuate the minute repeater adds aesthetic charisma to the peerless acoustic experience.

The course of time with tourbillon accuracy

The minute repeater derives its timing information from a precision movement with a tourbillon that guarantees superb rate accuracy. The filigreed mechanism offsets rate deviations in vertical positions, rotates about its own axis once a minute, consists of 69 individual parts, and nonetheless weighs a scant 0.3 grams. The separate rate certificate that accompanies each Ref. 6002 verifies the impressive rate accuracy of the tourbillon-controlled Patek Philippe movement. Completely assembled and cased up, the caliber's rate fluctuates by no more than -2 to +1 seconds per day.

The perpetual calendar with retrograde date

Patek Philippe perpetual calendars are legendary. This also applies to the Sky Moon Tourbillon Ref. 6002 and its perpetual calendar with the automatic retrograde date. Its hand points to the current date on a 240° arc from 8 to 4 o'clock. Every day, the date hand advances by one increment and at the end of the month, on the 28th, 29th, 30th, or 31st day automatically jumps back to the 1st day of the new month. This function is handled by a patented mechanism with a ratchet wheel and a pawl, which, in contrast to conventional solutions with cam disks, guarantees extremely precise hand alignment. The mechanism prevents the date hand from bouncing forward to the second or third day on the scale after it has jumped from the last day of the month to the first. It reliably stops on the first day and is held there.
Contrary to the Ref. 5002, the other indications of the perpetual calendar are displayed in apertures: the day of the week at 9 o'clock, the leap year cycle at 12 o'clock, the month at 3 o'clock, and the moon

phases at 6 o'clock. Aperture displays are more complex to build and require more force than hand displays, but their advantage is faster and more convenient legibility.

Celestial pleasures on the back

The back dial of the Sky Moon Tourbillon Ref. 6002 presents a highly unusual spectacle on its rear dial. The night sky of the northern hemisphere rotates beneath a sapphire-crystal glass, depicting the angular motion of the stars and of the moon, the meridian passages of Sirius and of the moon, and the waxing and waning moon phases. Additionally, two hands from the center indicate sidereal time on a 24-hour scale. An elliptical contour surrounds the portion of the nocturnal sky that is visible from a specific location. These fascinating functions are handled by a highly unique, patented mechanical module. With this Sky-Moon mechanism, Patek Philippe has achieved a nearly incredible degree of precision in the astronomical depiction of the heavenly canopy.

A lunar day is defined by the time that elapses between two consecutive passages of the moon across a given meridian; on average, it lasts 24 hours, 50 minutes, and 28.328 seconds. One lunation (the period of time between two consecutive full moons) has an average duration of 29 days, 12 hours, 44 minutes, and 2.82 seconds. A sidereal day is defined as the time between two consecutive passages of a fixed star (such as Sirius) across a given meridian; its average duration is 23 hours, 56 minutes, and 4.09892 seconds. Sidereal time makes it possible to calculate the geographical longitude of a specific location.

To assure correct displays, these deviations from mean solar time require appropriate step-up and reduction gear ratios in the going train that transmits the force from the spring barrel to the individual astronomical indications. Some of these ratios rely on the accuracy of the moon-phase display versus the sidereal day, others on the accuracy of the sidereal day versus the orbital position of the moon, etc. Overall, more than 25 trillion (25,000,000,000,000) variations were calculated for the transmission ratio pairings of the going train. From this incredible number of ratios, Patek Philippe picked the optimal set that resulted in the smallest possible deviations for all displays. The outcome of the theoretical computations surpassed all expectations:

- The deviation for the lunar day is -0.05 seconds per day, -18.385 seconds per year, or -30 minutes and 38.5 seconds per century.
- For a sidereal day, the deviation is -0.088 seconds per day, -32.139 seconds per year, or -53 minutes and 33.9 seconds per century.
- For the moon phases, it is -6.51 seconds per lunation.

A paragon of perfection

The manually wound movement is a masterpiece of micromechanical engineering composed of a total of 686 parts that are lavishly finished by hand. All edges of the steel parts are beveled and each tooth of every steel wheel is polished with a rotating hardwood disk by hand, one by one. This degree of perfection is not an end in itself; it reduces friction at the points where the wheels mesh, thus contributing significantly to the legendary precision and longevity of Patek Philippe watches. The plate and the module with the perpetual calendar are finished with a perlage pattern on both sides, and the bridges are decorated with Geneva striping. Due to the number and complexity of the elaborate processes and stringent rate tests, it takes many months to complete a single movement. The result is

a flawless caliber that displays the Patek Philippe Seal on its plate – the most prestigious attestation of quality for top-echelon mechanical movements.

The opus is delivered to its owner in a precious box worthy of being called a treasure chest. It is crafted from rare Macassar ebony with hand-engraved white-gold decorations and accents in blue lacquer. In addition to the unique timepiece, the case also accommodates two hand-engraved cufflinks in 18K white gold with blue lacquer fillings.

Patek Philippe's Sky Moon Tourbillon Ref. 6002 is a globally unique timekeeping instrument that expands the notion of a grand complication by the aesthetic accolade of a grand creation. It proudly pays homage to the canton of Geneva which has been the home of haute horlogerie for 500 years and of Patek Philippe for 174 years.

Technical data

Patek Philippe "Sky Moon Tourbillon" Ref. 6002

Movement:	Caliber RTO 27 QR SID LU CL Manually wound mechanical movement. Minute repeater, tourbillon, perpetual calendar with aperture displays and retrograde date, moon phases, sidereal time, angular progression of the moon
Overall diameter:	38 mm
Height:	12.61 mm
Number of parts:	686
Number of jewels:	55
Power reserve:	Min. 38 hours – max. 48 hours
Balance:	Gyromax®
Tourbillon:	1 revolution per minute; number of parts: 69; overall weight: 0.3 g Steel cage; tourbillon, balance wheel, and fourth wheel on one axis
Frequency:	21,600 semi-oscillations per hour (3 Hz)
Balance spring:	Breguet
Balance spring stud:	Adjustable
Hallmarks:	Patek Philippe Seal, rate accuracy certificate for Patek Philippe tourbillon watches
Displays:	Front side, dial: Mean solar time in hours and minutes, perpetual calendar with retrograde date, day of week, month, leap year cycle, and moon phases Back side, sky chart: Sidereal time in hours and minutes, time of meridian passage of Sirius and of the moon, angular progression of the moon, and moon phases.
Minute repeater:	Hour, quarter-hour, and minute strikes on two “cathedral” gongs
Features:	
Case:	18K white gold with reliefed engraving Sapphire-crystal glass front and rear
Dimensions:	Diameter 42.80 mm Height (crystal to back): 16.25 mm Height (crystal to lugs): 17.35 mm
Crowns:	At 4 o'clock to wind the movement and set the hands for mean solar time, hand-engraved At 2 o'clock to adjust the sky chart, sidereal time, angular position of the moon, and the moon phase, hand-engraved
Slide:	In the case flank to actuate the minute repeater

Correction push pieces: (in the case flank)	Date and day between 11 and 12 o'clock Month between 3 and 4 o’clock Moon phase between 5 and 6 o'clock Day of week between 6 and 7 o’clock
Front side:	Gold dial with blue enamel in champlevé and cloisonné Railway-track minute scale integrated in the blue champlevé enamel Applied Roman numerals in white gold Date numerals and markers, signature lettering, and movement number painted bright gray
Hands:	Hours and minutes: leaf-shaped hands in white gold, hand-engraved Date: slender double-leaf flyback hand in rhodiumed steel
Back side: (sky chart)	Four metallized sapphire-crystal disks Hours and minutes of sidereal time: white counterbalanced baton hands
Strap:	Hand-stitched shiny blue alligator with large square scales and hand-engraved fold-over clasp in 18K white gold