A TEST OF THE LANGE ZEITWERK,
FROM THE PAGES OF WATCHTIME MAGAZINE

A. LANGE & SÖHNE
We test A. Lange & Söhne’s mechanical digital watch, the Zeitwerk, which combines a groundbreaking design concept with classic Lange features.

Pros
- Ingenious design
- Innovative movement technology
- Value for the price

Cons
- Visible difference in height between first and second minute digits
- Minute disk moves slightly before jumping to the next minute
motions are sure to run high among fans of A. Lange & Sohne watches when the new Lange Zeitwerk appears in jewelers’ display windows this year. Some will love the offbeat design concept, while others may dismiss it as straying too far from the “classic” features they expect. Many will compare it to the Lange 1, a watch that became the German manufacturer’s most recognizable and successful model thanks to its unconventional, offset display. The Zeitwerk is expected to achieve similar notoriety, with its new design concept that may very well influence the style of Lange models in the future.

The watch cuts a striking figure. Its most dramatic feature is the winged German silver time bridge that extends over the dial to frame the digital hour and minutes displays as well as the small seconds subdial, effectively unifying all these elements. Besides its aesthetic appeal, this bridge is also a functional part of the movement: it holds the arbor for the two minute disks with an unusual colorless jewel and is secured visibly to the mainplate by a screw. In conjunction with the two digital displays this creates a harmoniously balanced image. The Zeitwerk is immediately recognizable as a Lange product, with its “auf” (up) and “ab” (down) indications on the power display and unique shape of the hands. The shape of the case reflects typical Lange styling, and even the digital displays have a familiar look: they use the same type of numerals as do the large date indications on many other Lange watches. Lange dispensed with the usual bar between the first and second digits of the display (shown with two disks), which is an appealing aesthetic touch.

HISTORICALLY SPEAKING, the Zeitwerk is preceded by the Dresden Semperoper five-minute watch, built by J.C. Friedrich Gutkaes (Ferdinand A. Lange’s teacher and later father-in-law) in 1841. In that watch, the hours appear as Roman numerals in the first window while the second window, showing the minutes, advances only every five minutes (i.e., the numerals 00 are followed by 05, then 10, and so on).

The minute indication on the Zeitwerk is much more precise and involves a shift every minute. This “jumping” minute indication has presented a massive challenge for other watch companies that have attempted it. Harry Winston, for example, did not get its Opus 3 to work until six years after its introduction, and the Porsche Design Indicator, with digital display of chronograph hours and minutes, had to be redesigned after its debut.

The caliber developed for the Zeitwerk, with its skeletonized bridge for the constant-force escapement and numerous decorative finishes, is a feast for the eye.
A CONSTANT-FORCE ESCAPEMENT ENSURES CONSISTENT RATES AND ADVANCES THE MINUTE DISK. LANGE PRODUCES ITS OWN ESCAPEMENT SPRING AND HAIRSPRING.

The problem is the enormous force required to move the disks. While the date disk advances only once per day, the three disks required for displaying the hour and the two digits for the minutes require a total of 1,608 advances per day. The strong spring that is needed for this is the reason for a significant difference in power between the watch’s fully wound and nearly unwound state. In fact, an even stronger spring would be needed in order to utilize only the relatively constant mid-range torque. And while A. Lange & Sohne has experience with strong springs, as in the Lange 31 with its entire month of power reserve, the spring in the Zeitwerk had to be even stronger than that.

LANGE CREATED AND PATENTED an innovative barrel with the goal of keeping the watch’s dimensions relatively small. This design reverses the conventional principle of winding up and winding down. The high-friction bearing for the spring barrel is used for winding the movement; this ensures that the barrel wheel can turn in a minimized friction bearing as the watch winds down, leaving more energy in the mainspring for power-bearing as the watch winds down, leaving the barrel wheel independent of the state of the mainspring. Lange produces its own hair-springs in addition to the spring for the constant-force escapement, bringing the number of components in the Zeitwerk to an impressive 388.

Close examination of the constant-force escapement reveals that its pallet must hold back the entire torque of the powerful barrel alone, so it is essential that the pallet stone be fastened securely. There were no problems with the company’s own test watches (which were set to run at 12 times normal speed, the equivalent of 10 years of operation, while also being subjected to extreme impact tests). However, our test watch contained one of the first production movements and stopped advancing correctly after only a short time because a pallet stone had shifted out of place. Afterward, Lange replaced the shellac it had been using with a strong adhesive in all completed watches. In addition, the company redesigned the column wheel to be sturdier and more reliable. After this repair, our test watch ran perfectly for the entire duration of the three-week test.

THE SAPPHIRE CRYSTAL caseback provides an excellent view of the large movement, which is truly a work of art: Every part exhibits hand-executed finishing and brilliant gold-finished engraving; details like the screwed gold chatons and hand-engraved balance and pallet bridges radiate the highest level of craftsmanship. The three-quarter plate for the escape wheel is decorated with a Glashütte stripe finish, the mainplate with perlage, and visible gears with a Glashütte sunburst finish. The end plate of the escape wheel is high-polished, and the screws are polished and partially blued. The delicate bridge for the constant-force escapement shines with a line finish and two screwed gold chatons. Some (but not all) of the mainplate’s edges are bevelled and polished. As in the Richard Lange watch, the
large balance wheel has eccentric regulating weights instead of regulating screws.

The movement was adjusted as carefully as it was decorated. Measurements on the timing machine showed a minimal positional error of only four seconds. The Zeitwerk ran slightly ahead in all positions, and the average deviation was quite low, at only +1.5 seconds per day. Moreover, even after the watch had been worn under real conditions for three weeks, the watch showed exactly the same results.

It takes some time to become accustomed to reading the disks within the windows; a standard digital display reads much differently. However, while it is much easier to read the approximate time on a standard analog watch dial, reading the exact time is actually easier on this watch thanks to the large numerals in the windows. And if only the right third of the watch is peeking out from under your sleeve, you can still easily read the minutes — a practical feature, since most of us usually know the hour.

The barely audible click that occurs when the minute disks advance sounds like a tiny lock snapping into place, and is only slightly louder than the ticking of the Lange movement. Less pleasing is the warning sound we all know from mechanical clocks, which is caused by the minute disk being slightly offset downward about six seconds before it jumps. The case, with its satin-finish center section and narrowing lugs, is the picture of reserved elegance. The slightly raised caseback has a concave edge that makes the watch appear flatter than it actually is. Every surface boasts excellent polishing and finishing.

The movement innovation bridge features partially blued screws, scintillated gold chatons and a line finish.

The numeral disks have a multi-layered design. The movement's remontoir bridge features partially blued screws, scintillated gold chatons and a line finish.