

Zeiss, Winkel and Standard

An overview of the microscopes from Carl Zeiss Oberkochen between 1948 to 1990

Compiled by Klaus Henkel

(Auto-translated from German by Chris Dreher, see appendix)

If advertise nowadays pharmaceutical or cosmetic companies, food manufacturers and test houses to the confidence of customers, they make use of the microscope with fondness as a symbol of the science-based background. Especially often we find - whether in advertisements, brochures, on stamps, or wherever - a microscope type, which is characterized by arc, circle or even ball elements. (After FK Möllring: A man who made history microscope: Dr. Kurt Michel, 70 years old in: Microcosm 69 (1980) 10-16.)

The microscope Zeiss Standard has become a symbol around the world for science and research.

In micro fibula, I particularly recommend ZEISS STANDARD to used buyers. But again and again we read on eBay or in other offer descriptions "Zeiss Standard," while accompanying photos often show a Zeiss Standard Junior that I have not recommended. To the proportions of the stand and the equipment which is easily recognizable. Below I will explain the individual model ranges and types in more detail, as the sole name "Standard" is about as revealing as "Opel" in a motor vehicle. But first: how, when and where is the most successful microscope in the world originated and where it was built?

RUDOLF WINKEL 4th * September 1827, † 29 January 1905

The son of a teacher is forced by the early death of his father to cancel the visit of the Göttingen school early.

~1841 engineering apprentice at Lippert Mechanical Engineering, Hamburg.

~1841 in the Eggestorffschen machine factory in Hanover.

~1845 when FW Breithaupt & Sons in Kassel, precision mechanical instruments.

In 1855, after several years of wandering through Thuringia, Bohemia and Austria return to the birthplace of Göttingen. Building mechanical instruments for the Göttingen University at Gebrüder Meyerstein. Marriage.

1857 independently, renting rooms in the Goethe-Allee and building mechanical instruments for Breithaupt and the University.

1866 First Trichinella microscope Winkel from workshop; occasion was the trichinosis epidemic in South Hanover.

In 1870 the first large Winkel microscopes by Prof. LISTING be examined and compared with the then famous English microscopes. He certifies the Winkel's better quality. This is remarkable, as the self-taught Winkel even his machines for the manufacture of microscopes themselves are constructed.

Rudolf Winkel is said to have checked every instrument himself and his workshop. A microscope with the slightest unevenness he smashed with a hammer without taking the opportunity to correct the error into consideration. (Whether he then miscarried the relevant piece of journeyman wage withdrew, as did Carl Zeiss in Jena, is beyond my knowledge.)



R. Winkel

1874 Winkelsche workshop first time in their own rooms:

Göttingen
Gloomy Eichenweg 9
Corner Baurat Gerber Road



1872/77/80 Winkel three sons, Carl, Hermann, and Albert enter as apprentices in the company.



1890 About 30 workers, exports to the UK, Austria, Russia, America.

In 1893 the first Winkel fluorspar in the construction of microscope objectives.

1894 Abbes first visit to Winkel workshop.

1895 Development of micro-photographic apparatus.

In 1898, construction of the first micro-Luminare for motion pictures on the microscope and the bellows camera.

1900 Winkel at the World Exhibition in Paris.

1905 Winkel lead three sons continued the business after his father's death.



1907 Under the new partner and commercial director GEORGE HAUSSMANN new factory in Königsallee, the introduction of mass production, production program significantly expanded.

1911 conversion of the company into a limited entry of Carl Zeiss, as that of a sole proprietorship, Carl-Zeiss-Stiftung main shareholder. Expansion of the factory. The first operation of Göttingen Winkel leads to the example of the Carl Zeiss Foundation, enter the eight-hour day. 130 people



1916 DR ARTUR EHRING HOUSE occurs as a research assistant for polarization microscopy and polarimetry.

1923 Significant enhancements to the production with new buildings.

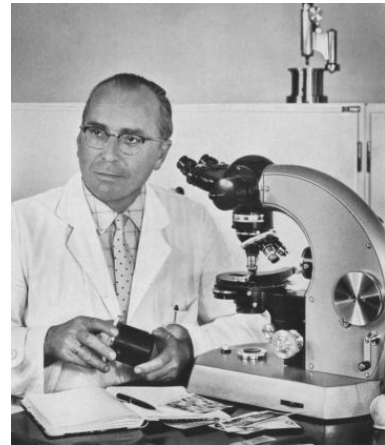
1935 360 employees.

In 1945, the tradition of manufacturing microscope from Carl Zeiss Jena in Göttingen resumes, 120 employees.

1948 The biologist KURT MICHEL, previously assistant to Prof. August KOHLER at Zeiss in Jena, takes over on 1 April, succeeding HOUSE EHRING the scientific management.

In collaboration with the designer Jena OTTO HERITAGE, Michel finds in Göttingen, he developed separately from the previous traditions in microscope, a whole program microscope in a new form. Early May, the first wooden model is on the table and in July three functional models of the new microscope, which in a short time on earth is the epitome of "the microscope" to simply be:

STANDARD GFL



KURT MICHEL

The Zeiss Standard Photomicroscope, in hand the round of the camera body Phomi.

1949 appears the first of MICHEL and his team designed microscope STANDARD. 850 employees.



1952/53 Plant II (optics manufacturing) in the Carl-Zeiss-Straße Göttingen arises.

October 1952 The first Standard JUNIOR comes. 1130 employees

1953 The 10,000 th STANDARD comes

The series Zeiss STANDARD takes their unprecedented, global conquest, the STANDARD is the best selling in the world and secures microscope Carl Zeiss for many decades an overwhelming market share.

1955 The scientific management (MICHEL), the design office and the distributors of Göttingen moved to Oberkochen and integrated into the Zeiss Works. The hallmark of Carl Zeiss is now available on the microscopes from Göttingen.



1957 May: 20,000th STANDARD delivered.

1957 Aug: 20,000th Standard JUNIOR delivered.



Standard GFL



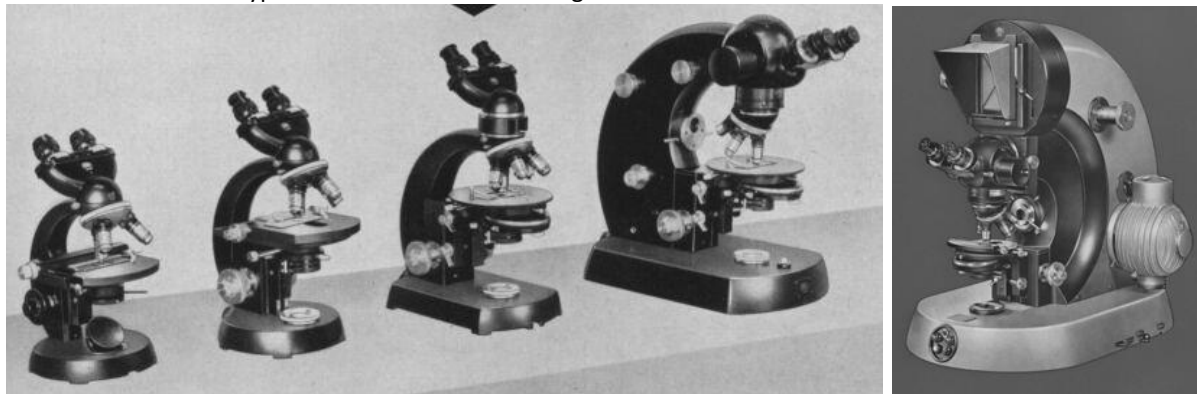
Standard Junior

1957 October 1st:

The company goes on in R. WINKEL GMBH Foundation operating CARL ZEISS the Carl Zeiss Foundation. The 1180 Göttingen employees receive the extensive rights that the foundation statute granted to all employees of the foundation companies Carl Zeiss and Schott & co. The Foundation is based in West Germany since the new beginning in the Württemberg Heidenheim. Since unification and merger of Carl Zeiss Oberkochen and VEB Carl Zeiss Jena in Heidenheim and Jena.

The types of Standard microscope series

Now for the different types of the model and its designations.



Standard Junior

Standard GFL

Standard WL

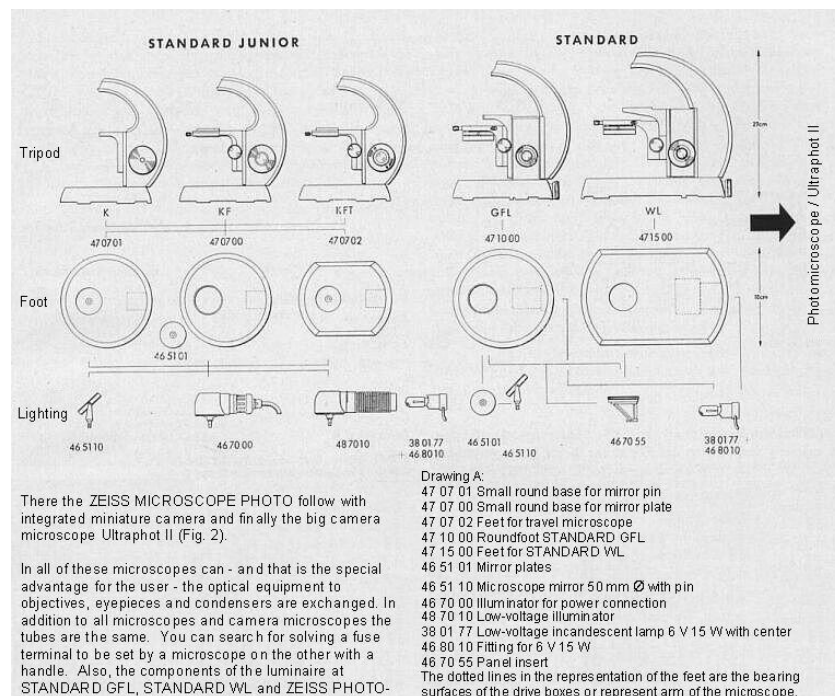
Photomicroscope

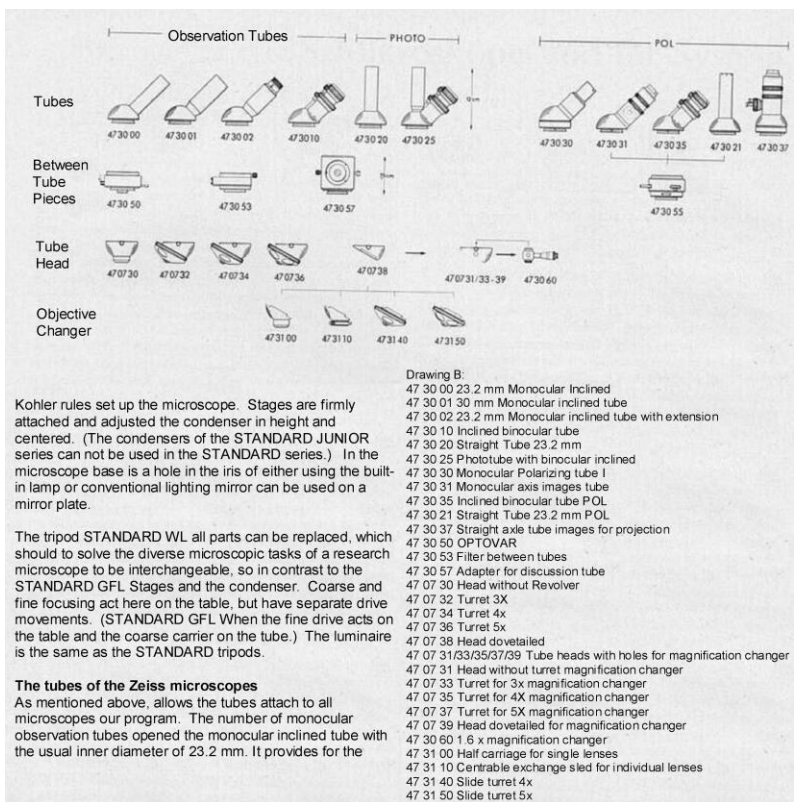
Ultraphot II

The quotations in this section come from - unless otherwise noted - the paper by W. Porzig: ZEISS microscopes and their system, ZEISS factory magazine 6, 27: v. 15, Jan. 1958, pp. 20-24.

"The gradation of Zeiss microscopes starts with the Microscope STANDARD JUNIOR K. It follows that with coarse and fine adjustment provided STANDARD JUNIOR KF, then the original form of our Standard series, the STANDARD GFL, a working microscope is very versatile and expandable large, and finally the research microscope STANDARD WL. There the ZEISS PHOTO MICROSCOPE follow with integrated miniature camera and finally the big camera microscope Ultraphot II. In all these microscopes - and this is a particular advantage for the user - optical equipment on objectives, eyepieces and condensers can be exchanged. Also on all microscopes and camera microscopes are the same tubes. ... The components of the luminaire at STANDARD GFL, STANDARD WL and ZEISS PHOTO MICROSCOPE are the same." And also the ULTRA MICROSCOPE!

In the following sketch the proportions of the "Standards" of 1958 are clearly visible. The subsequent Standard, the gray painted, had an elongated feet, about how the WL, the condensers because of the heavy phase and interference contrast and heavy prisms and intermediate tubes had a shifted forward focus and no longer with the circular foot got along.



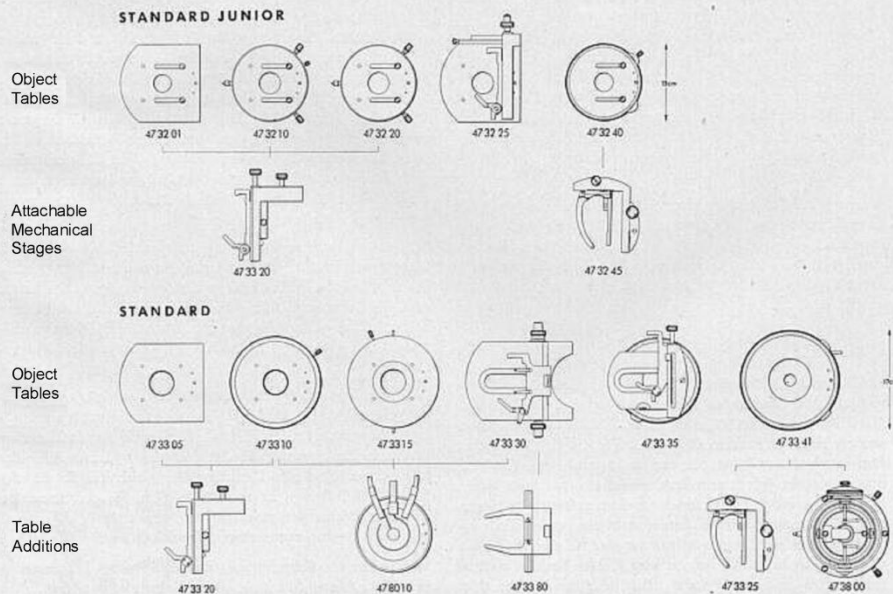


- Drawing C:**
- 47 32 01 Solid square table
 - 47 32 10 Round centerable turntable
 - 47 32 20 Simplified circular XY table
 - 47 32 25 Simple XY table 24 mm x 75
 - 47 32 40 Turntable with polarization division
 - 47 33 20 Attachable XY table 24 x 75 mm
 - 47 32 45 Attachable XY table 20 x 25 mm for STANDARD JUNIOR POL
 - 47 33 05 Solid square table
 - 47 33 10 Round centerable turntable
 - 47 33 15 Round rotation and centering slide table
 - 47 33 30 Large square XY table
 - 47 33 35 Round rotation and centering XY table
 - 47 33 41 Polarization turntable with ball bearing
 - 47 80 10 Heating stage 35 ° to 43 ° (or 47 80 11 heating stage 30 ° to 60 °)
 - 47 33 80 Support for trays/bowls/shells
 - 47 33 25 Attachable mechanical stage for polarization turntables
 - 47 38 00 Universal turntable 4achsig.

the tube length effect.

Tube Heads

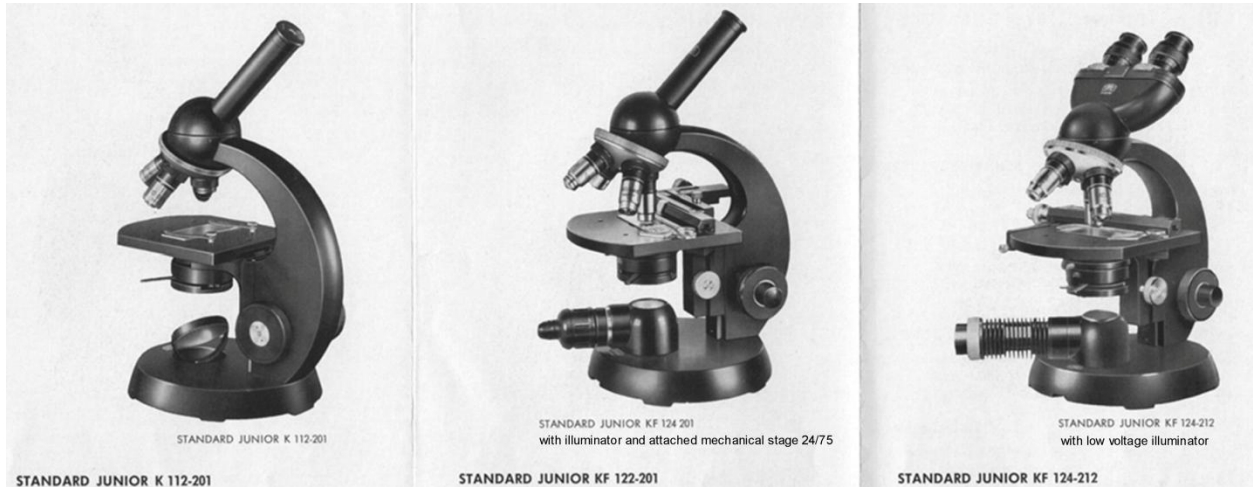
Also the tube heads are shown here at all microscope stand same. However, they can not replace the microscope. The simplest form is the head tube with a lens thread for screwing. He is primarily required in microscopes for industrial controls, working with an ever-same level of magnification. The course-work and contrast microscopes are generally supplied with a permanently attached turret. There are for this turret with three, four or five holes to screw the lens



ZEISS

The STANDARD JUNIOR (1955)

"... is built as well as the large Standard microscope of modern principles, ... has a number of advantages, which allow the microscopist to devote his full attention to the preparations."



That is, it is in the equipment less extensive and therefore easy to use. For example, it has no Köhler illumination, in contrast to all Standard models. It was intended for

- Biological and medical studies in daily practice and lab operation
- Microscopy courses in scientific institutes and colleges
- Routine work in industrial laboratories.

The quality of execution was the same as in the Standard series, but the Junior had easier gear focusing, a different, simpler condenser version for light condensers, no built-in lighting in the foot, and it was smaller in form. See the schematics.

The Standard Junior KF later bought virtually new, it is now the Standard KF with built-in foot Nelson lighting. See opposite.

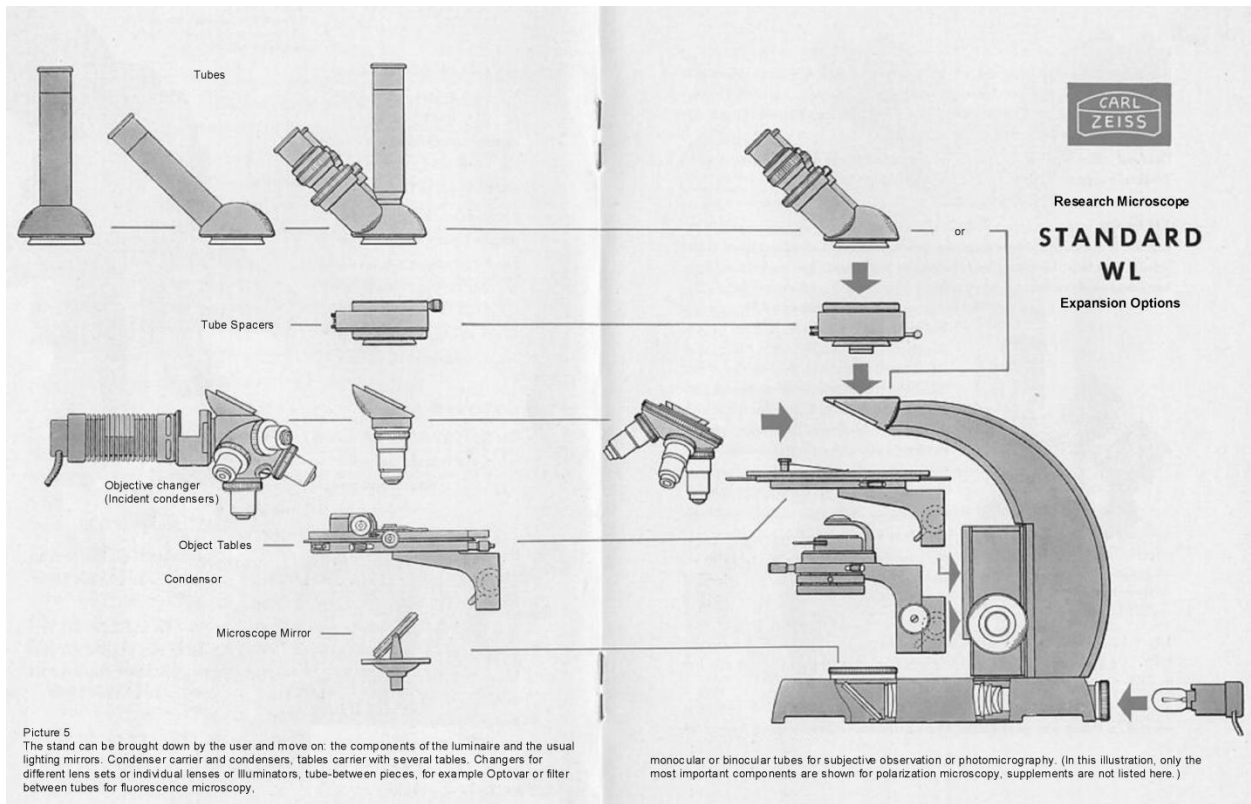


The Standard WL

Characterized particularly by the fact that virtually all parts, you can touch, interchangeable: optics, tubes, tube heads, intermediate tubes, tables, table support, specimen holders, lighting, turret. Again, it is significantly larger than the Standard (GFL) and built more sturdy and solid, not only because it has to absorb heavy accessories such as phase contrast and fluorescence illumination and polarization devices, but because it will endure as a research tool, and frequent changeovers, without the may occur interfaces mechanical wear and tear.

Standard WL with OPTOVAR Intermediate



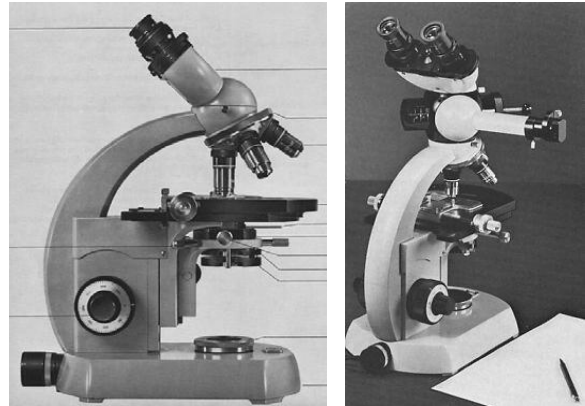


The Standard GFL

Was in the 60s on the model Standard RA.

It is slightly smaller than the later, more modern Standard. For example, the arm is a little narrower and Standard models of the seventies.

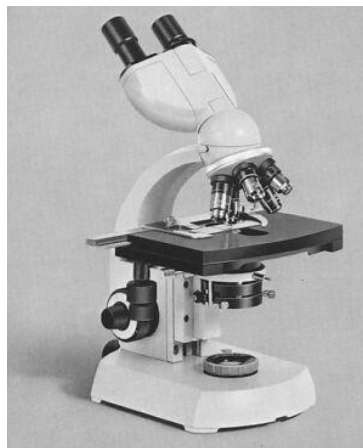
The paint is no longer black but gray.



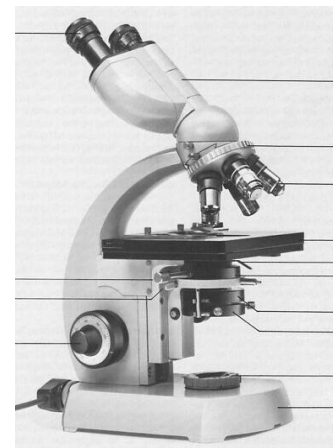
Standard

Followed by a Standard model number 14, 15, 16, 18, 20 was the name in the seventies and eighties. (The "pyramids" models include Standard 20 and 25 from the AXIOZeit from 1989 out of the old Standard series.)

Here are some more pictures orientation.



Standard 16



Standard 18

Standard 14: 10 watt halogen lamp, 3200, which was built in the foot of the field diaphragm. A knob on the foot control the brightness with a thyristor. Quadruple nosepiece.

Standard 16: Low Voltage 6V 15W bulb, from 2750 to 2800 Kelvin, inserted in the rear foot regulated, with a transformer. Quintuple turret, condenser lens and helpful thicker swing filter support ring.

Standard 18: In addition, exchangeable turret Dovetail.

Standard 20: Equipped Integrated, non-exchangeable pancratic condenser ("Zoom")

Standard UNIVERSAL

For up-and-light, with built-in filters.

With built-in camera and accordingly modified beam is called this Model Photomicroscope.

The MICHEL together with electronics H. Wedeking 1953/54 realized built-in camera was the world's first automatic electronic exposure control. Only two years later AGFA introduced at Photokina 1956 with the Automatic 66 be the first automatically exposed amateur camera - with a pneumatic shutter controller (!).



Ultraphot II

This microscope called photomicrograph probably better machine. Their enormous dimensions are only in comparison with a "natural living person" recognizable.

Built small and large format camera (9x12 cm), multiple lighting options, photographic opportunities from the weakest to the strongest magnifications.

This model is no longer in the proper sense of the Standard series, but the round, curved style elements clearly show the origin.



With the Standard model following changes were introduced:

- Binocular without additional magnification
- Koehler illumination in the microscope
- Condensers with a hinged front lens
- Coaxial transmission
- Color coding of objective magnifications
- Resilient lens mount, "physical protection"
- Uniform color magnification error of the lenses (no longer necessary diverse eyepieces)
- Balance at length lenses at 45 and eyepieces 10 mm (acquired in 1980 as the Standard DIN 58887)
- Magnification changer Optovar
- Antireflection compensation
- Phase contrast (ZERNIKE 1936, Nobel Prize)

Why I recommend the oldest models Standard and Standard Junior from the 50's not as good Buying used

According to the tradition in Winkel in Göttingen and the first production Standard and Standard Junior had the ocular alignment length of 5 (!) mm, from 1948 to 1955. Then 10 mm. The optical length was thus to 1955 200 mm, 195 mm thereafter.

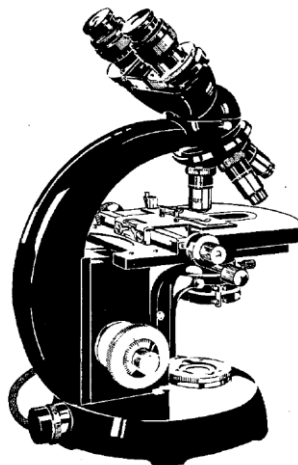
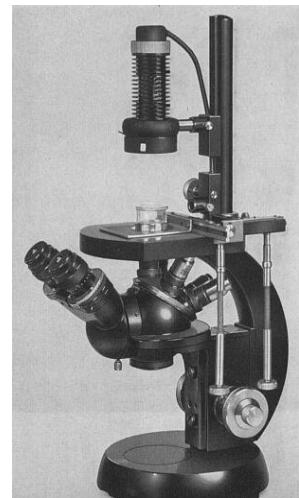
Despite the robustness of the design and manufacturing of precision Zeiss is no guarantee that all Standard Junior, have been offered in recent years on the used market and are well cared for and are obtained. They were often decades in hospitals or academic institutions in lumber rooms or course rooms and are now out of service permanently. Well conserved with lenses without "blind" lenses and used focus drives from the first Standard series are not too common.

The circular components

The one thought that the design would have met the then taste generally, the other, MICHEL have basic geometric shapes, line, line, arc and ball "copied from nature." These are myths that arise whenever the reasons for the shape are unknown. Michel chose the circular shapes in the foot, prism-tube head, neck stand, condenser carrier and binocular, because significant parts were then almost turned "on unlimited". Molds also could be manufactured more easily than round shape. Since Round shapes are technically efficient production. That's the whole secret of the decision for the round shape elements.

To its clever combination of a practical application, and feels exactly like instrument in a very aesthetic form, but should have a good sense of style. The designers of the Standard had no doubt.

Also later in the photomicroscope, when Ultraphot II and particularly consistent again with the Great micro cinema camera MICHEL always comes back to circular shapes, and even in the inverted microscope of the construction according to Le Chatelier (above right) and after Utermöhl (bottom right). MICHEL continued in later retrospect, the first Standard model STANDARD GFL. Always to be the purest and most beautiful style microscope but lovers and owners of the GFL are more inclined to believe that it is absolutely the best that has ever been built.



February 17, 2004

Appendix

This document was auto-translation by Chris Dreher to English from the original German version (located at <http://www.klaus-henkel.de/standard.pdf> as of October 12th, 2012). The goal was to translate quickly to allow a crude understand of the original material for English speakers. Tools such as Google Translate and online OCR sites were used. Only minimal effort was made to further manually improve the translation.

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