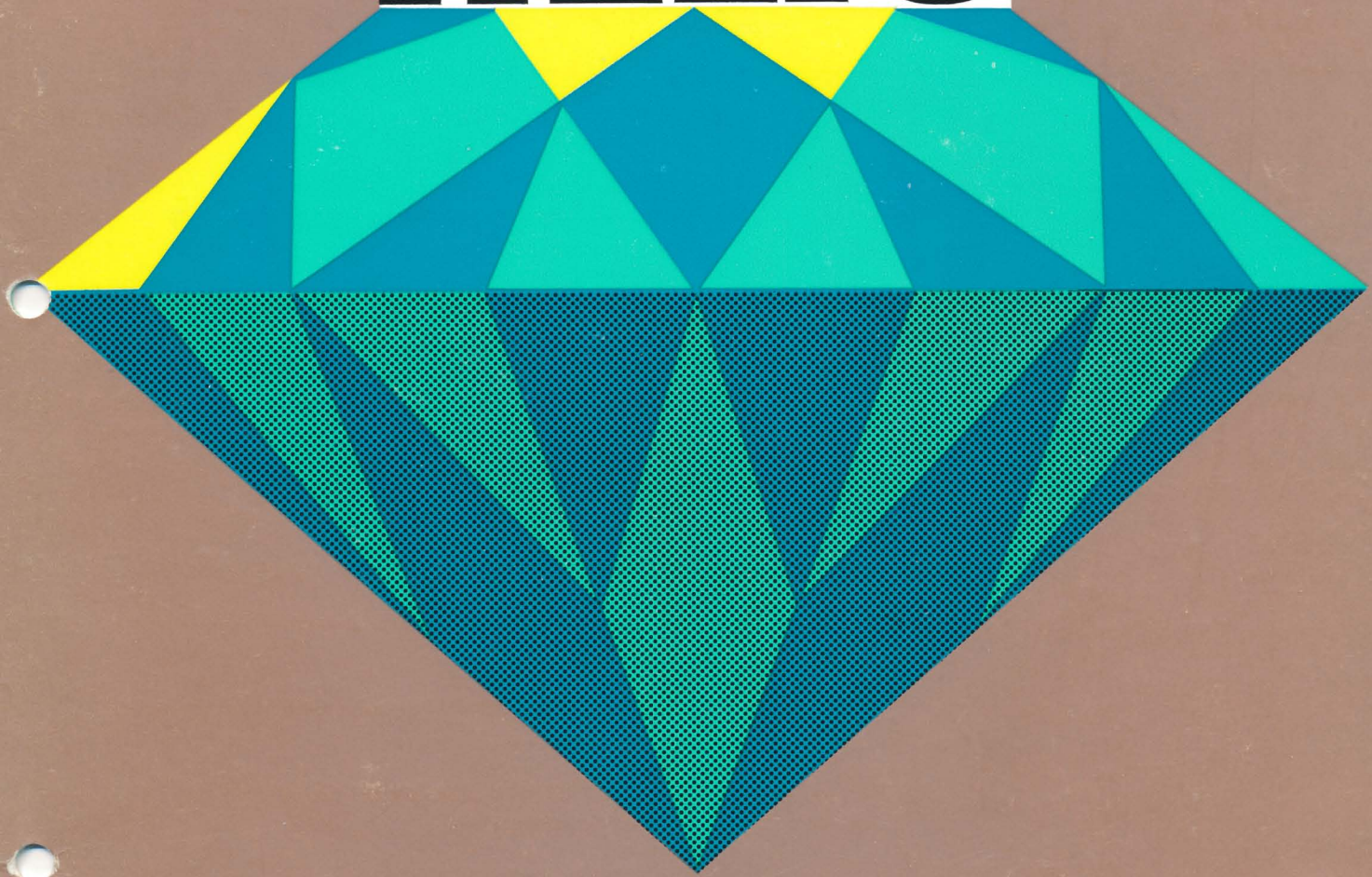
HELIO



KLISCHOGRAPH

DR.-ING. RUDOLF HELL · KIEL

HELIO-KLISCHOGRAPH

FOR ENGRAVING OF PHOTOGRAVURE CYLINDERS

K 190 consisting of two separate machines for the copy scanning cylinder and the forme cylinder respectively; each of maximum length
or
for the scanning of one copy cylinder of maximum length and simultaneous engraving of two forme cylinders of shorter length

K 192 Scanning and engraving machine forming one unit (tandem machine). It will engrave one forme cylinder of maximum overall length of 8 ft 3"

A simple, fast and therefore economical process

For black-and-white and multi-colour reproductions

Continuous engraving process, automatically switched off at the end of the copy

Control over the ink cells by means of a microscope located above the cylinder

Increase of image sharpness and detail contrast by optical/electronic means

Individually adjustable gradation

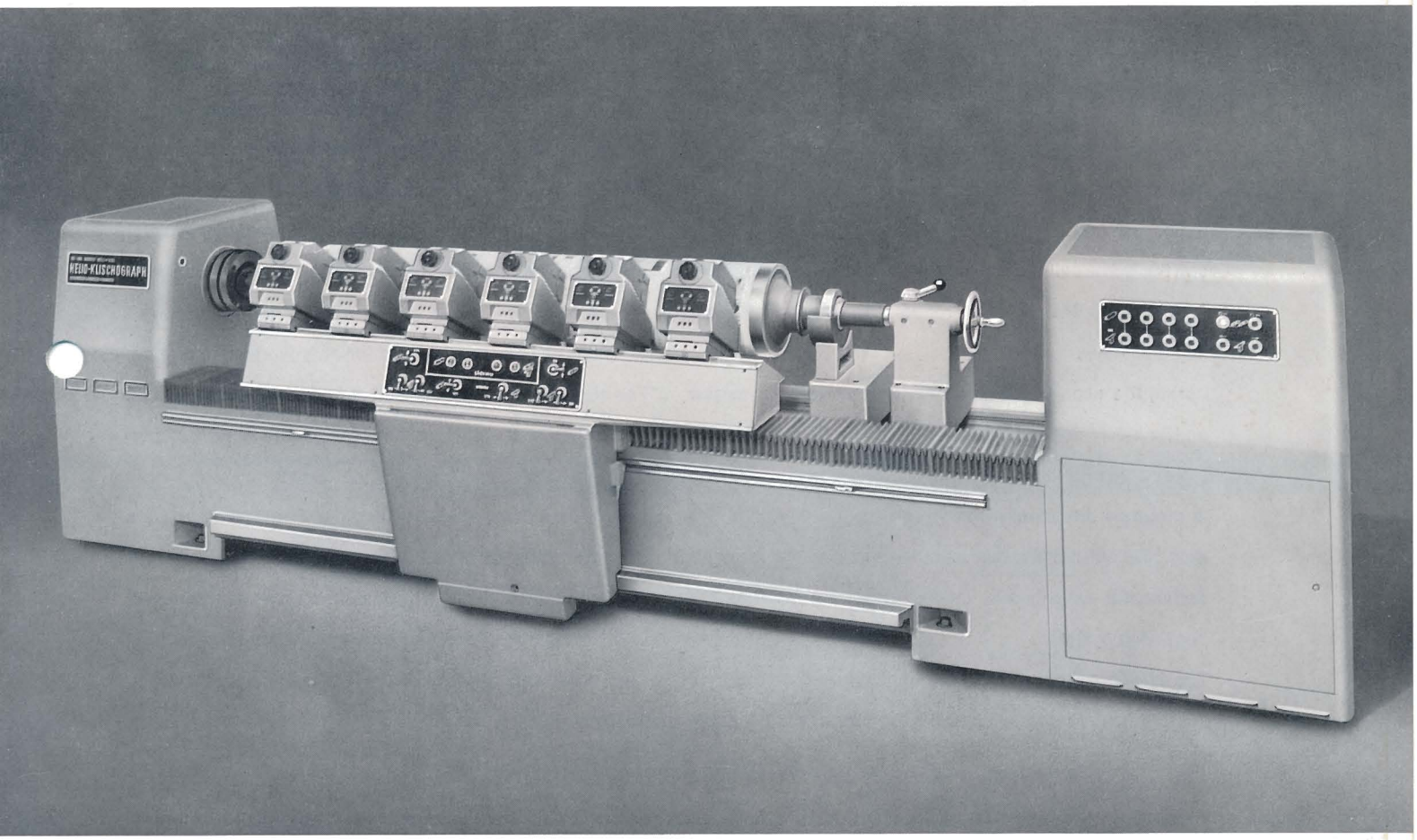
Exceptional life of diamond engraving stylus

Removal of burr caused by engraving by means of scraping diamond

Engraving speed: 0,3 m^2 per hour with 70 lin/cm screen

HELIO-KLISCHOGRAPH
FOR GRAVURE ENGRAVING
SCANNING MACHINE

HELIO-KLISCHOGRAPH



Electronic engraving of photogravure cylinders

"The demonstration print showed a surprisingly high quality. One can say that some parts were even better than the originals because details and image sharpness have been increased by optical/electronic means". The cylinders which brought this comment in 1962 from an expert in the photographic field well known for his critical appreciation were engraved by a Helio-Klischograph. Three years have now elapsed and the trend towards further time- and material-saving improvements which simplify working procedure is unmistakable. Already electronics are playing a leading part in the development of printing machines to ensure the prompt appearance of millions of copies of illustrated periodicals, catalogues, and advertising publications. But however that may be, everything is still dependent upon the timely availability of the forme cylinders. The Helio-Klischograph is the only machine for electronic engraving of ready-to-print photogravure cylinders which overcome this bottle-neck in the production line.

Construction of the Helio-Klischograph

The Helio-Klischograph consists of two seperate machines: one, the scanning machine, is for the optical-electronic scanning of the original on the copy cylinder, and the other, the engraving machine, for the electro-mechanical engraving of the photogravure cylinder. The complete unit also includes a main switch cabinet for the electric motor drives, and a control cabinet for the electronic systems. The heavy machine bed has a towerlike addition to the structure on both sides. One houses a powerful electric motor with precision drive for the copy scanning cylinder and the forme cylinder, and the other holds the computers. A switch enables the operator to work from positive or negative copy.

During the scanning and engraving processes a carrier on the machine bed is moved parallel to the cylinders by a precision spindle. The carrier holds a support on which is mounted the panel with controls for the drive of cylinders and carrier. On the scanning machine this support carries the optic heads, on the engraving machine the engraving system.

The length of the support depends upon the length of the cylinders and also upon the number of the scanning and engraving systems. Considerable time can be saved if multiple systems are mounted on one cylinder (max. 6 systems) for simultaneous scanning and engravings.

There are two special features on the Helio-Klischograph: the repetition drive and the fitting - in device. The repetition drive is an additional drive which doubles the speed of the copy cylinder so that an image can be engraved twice on the forme cylinder in the circumferencial direction. By additional insertion of a special system the engraving of a copy can also be repeated in axial direction. The fitting-in device allows subsequent engraving in perfect register of an already partly engraved cylinder, as may be required for an advertisement page.

For shorter cylinders up to 8 ft 3" length, model K 192, also called a tandem machine, is available. On this model both the scanning and the forme cylinders are mounted in one bed. This model is equipped with two separate supports each of which can be moved backwards and forwards thus allowing operation from normal and reversed copies. This model is equipped with four scanning and engraving systems, otherwise it correpsonds to model K 190.

Safety of operation

One of the conditions for a smooth flow in the production line in photogravure plants is safety when preparing the cylinder. On the Helio - Klischograph models this is achieved by

- Simple sequence of operations
- High precision
- Over-dimensioning of all parts
- Strict supervision of production
- Exceptional steadiness of diamond engraving stylus

Copies

The Helio - Klischograph works on the scale 1 : 1. It will scan either positive or negative reflection copies which must be supplied without a margin. The same scale applies for multicolour jobs, but the individual separation negatives will be handled as black and white images.

Engraving speed

The engraving system is equipped with a diamond engraving stylus for engraving copper cylinders. The normal output is approximately 4000 cells per second with a 70 lin/cm screen, and 3600 cells per second with a 60 lin/cm screen, corresponding to 0,3 m^2 per hour with the 70 lin/cm screen, and 0,36 m^2 per hour with the 60 lin/cm screen. The burr is removed by a diamond scraper.

Ink cells

The cells are shaped like quadrilateral pyramids which open upwards. They vary in size and depth according to the tone values. At their maximum depth sufficiently broad walls remain for bearing the doctor blades. This shape also guarantees smooth inking.

Adjustments for contrast and gradation

By optical-electronic means details and image sharpness are adjustable according to individual judgment; this corresponds to "unsharp masking" in photography. Thus sharpness of type and full detail in reproduction are obtained. Small deviations in the gradation of the prints may occur due to variations from one make of printing machine to another, different arrangements of the doctor blade, speed of printing, and different kind of paper. These deviations can be compensated for electronically.

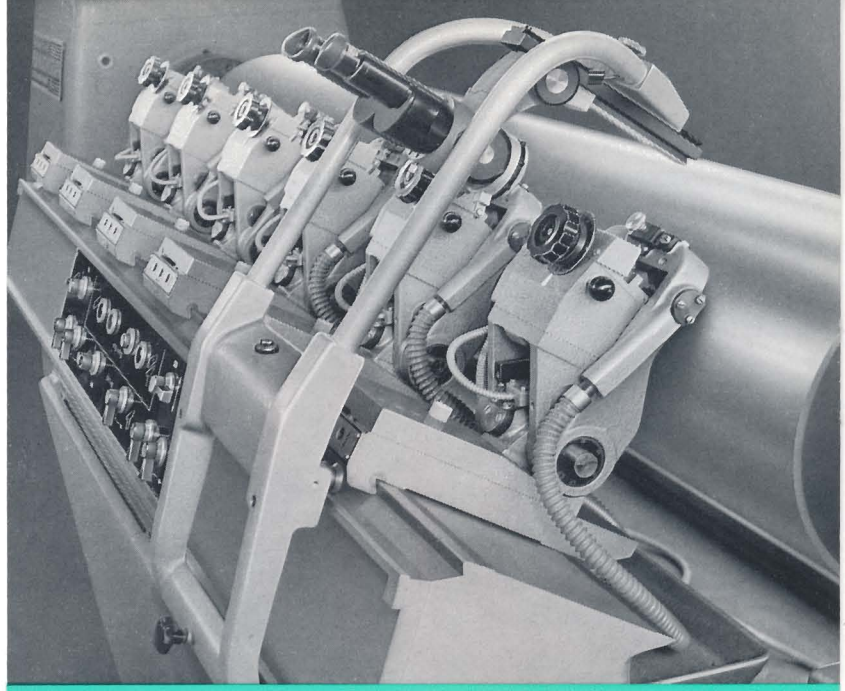
The influence of printing ink

The influence of printing ink is very great because its chemical components influence depth of tone. The greater the amount of pigment in the ink, the less saturation of the depth will be obtained and the flatter the reproduction of the dark tones. This corresponds fully to the conventional methods used in photogravure printing.
The regulator for regulating the gradation curve has been factoryadjusted in such a way that it will counteract flatness in depth if turned to the right. If inks of the same concentration are always used the regulator need not be turned.

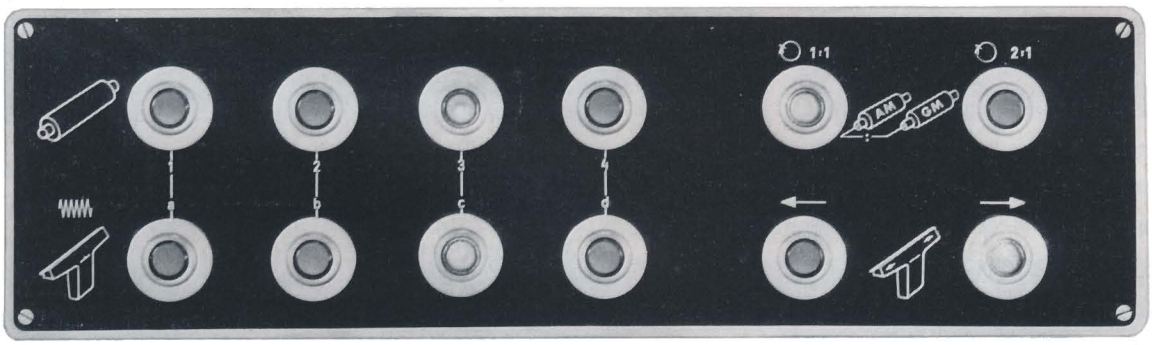
Rulings and angle of screens

All Helio-Klischograph models can be equipped with either a 60 lin/cm screen or a 70 lin/cm screen. Other rulings can be supplied upon request. The screen is placed in an angle of 45^0 to the cylinder.

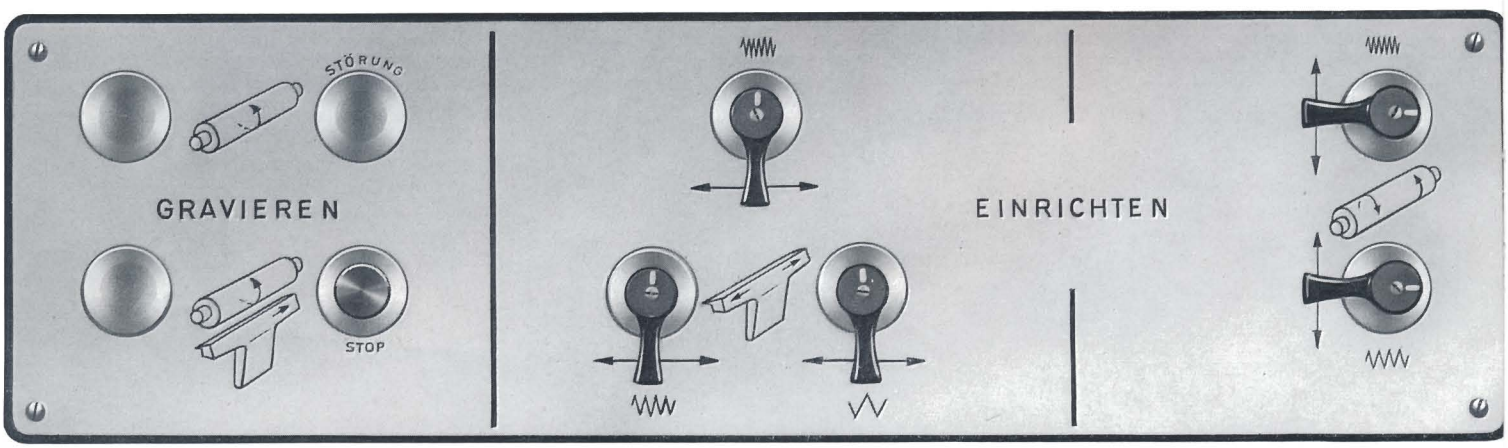
The form of the cavities can be judged at any part of the cylinder by means of this microscope



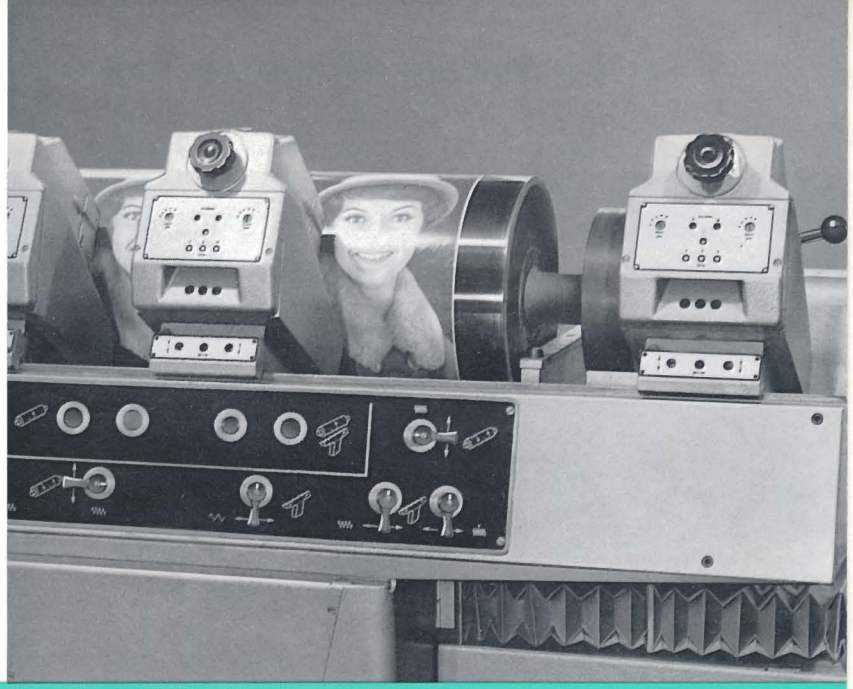
Pre-Selection Panel



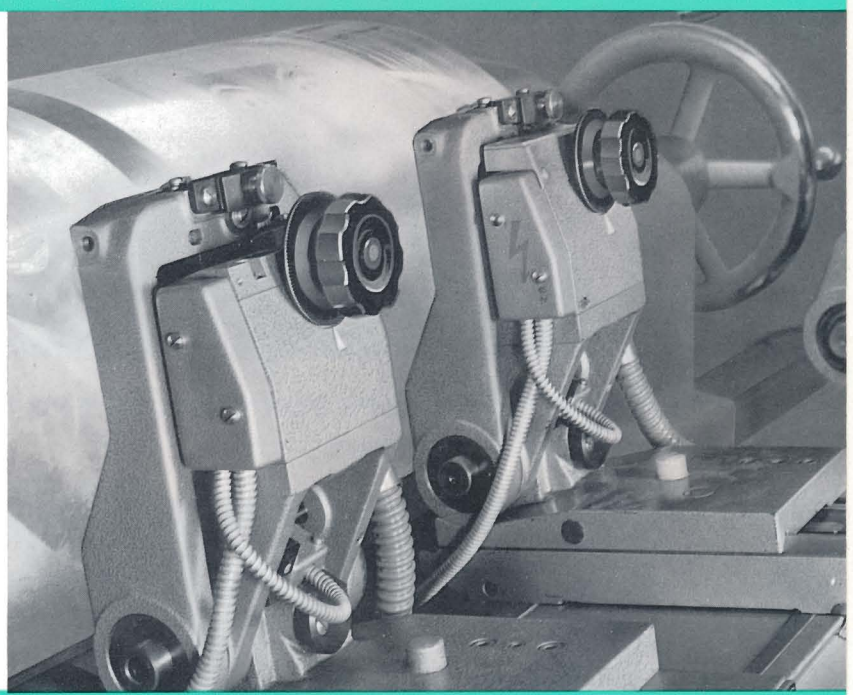
Operating Panel



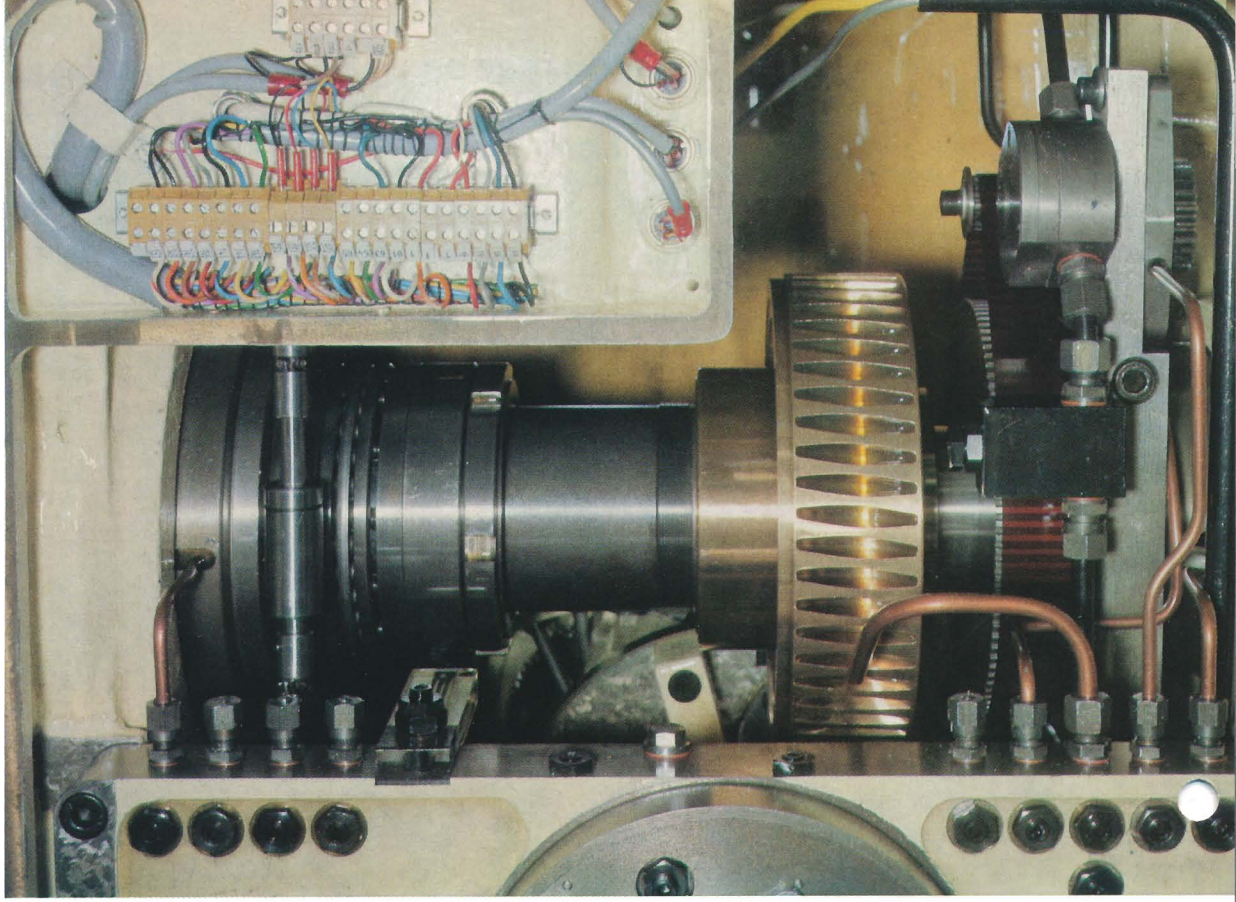
Partial view of the scanning cylinder with two mounted positive reflection copies; negative reflection copies can be processed, too



Partial view of an engraved printing cylinder. By means of a small wheel, the engraving depth for the first printing tone is adjusted at the engraving system

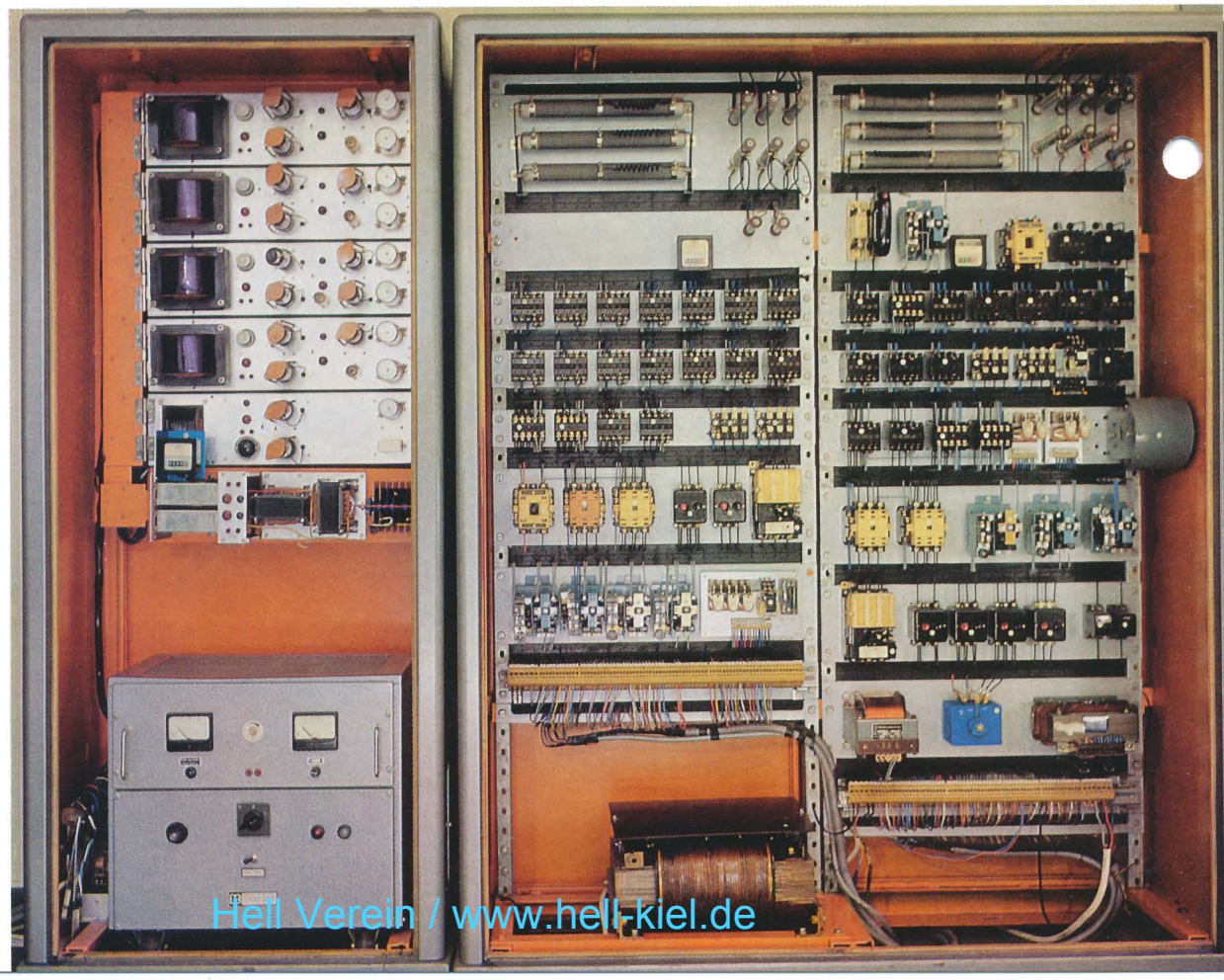


Part of a microphotograph of an engraved gravure cylinder. The reproduction shows a tone corresponding approximately to a printing density of 1.3



GEAR DRIVE

CONTROL CABINET



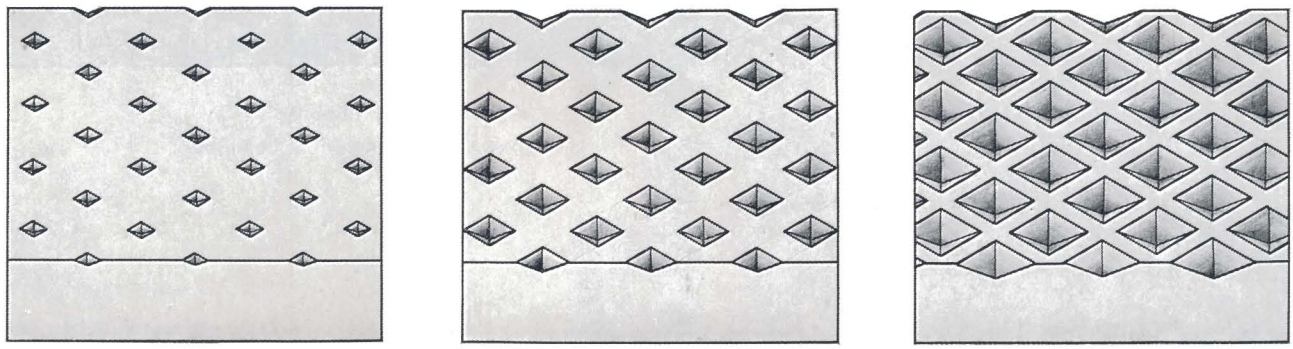
DIFFERENT VIBRATION ADJUSTMENT (EXAMPLES)

50 sca. div.

– 20 % | – 10 % | 0 | + 10 % | + 20 %

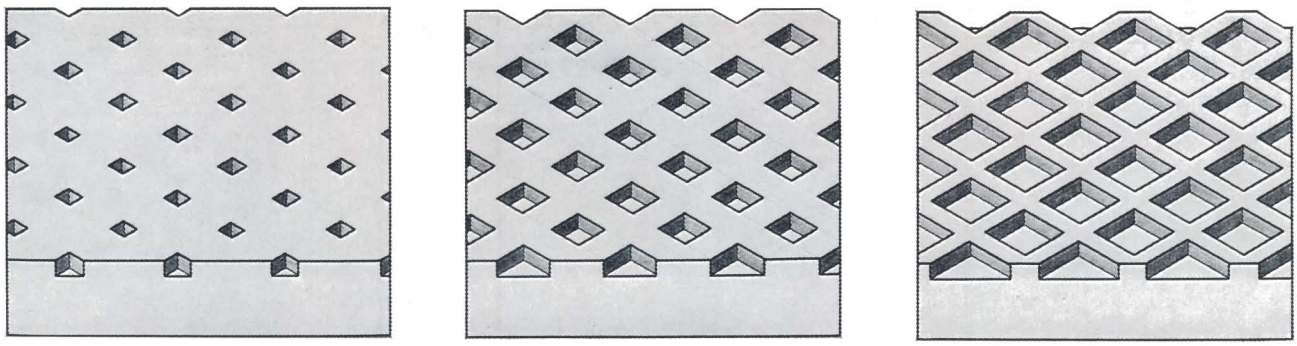
80 sca. div.

ENGRAVED GRAVURE SCREEN



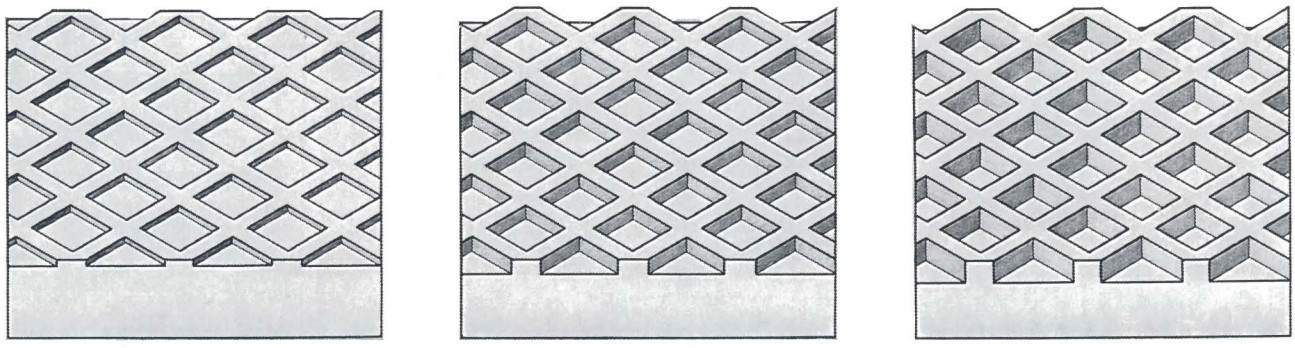
HIGHLIGHT | MIDDLE TONE | SHADOW

HALFTONE GRAVURE SCREEN



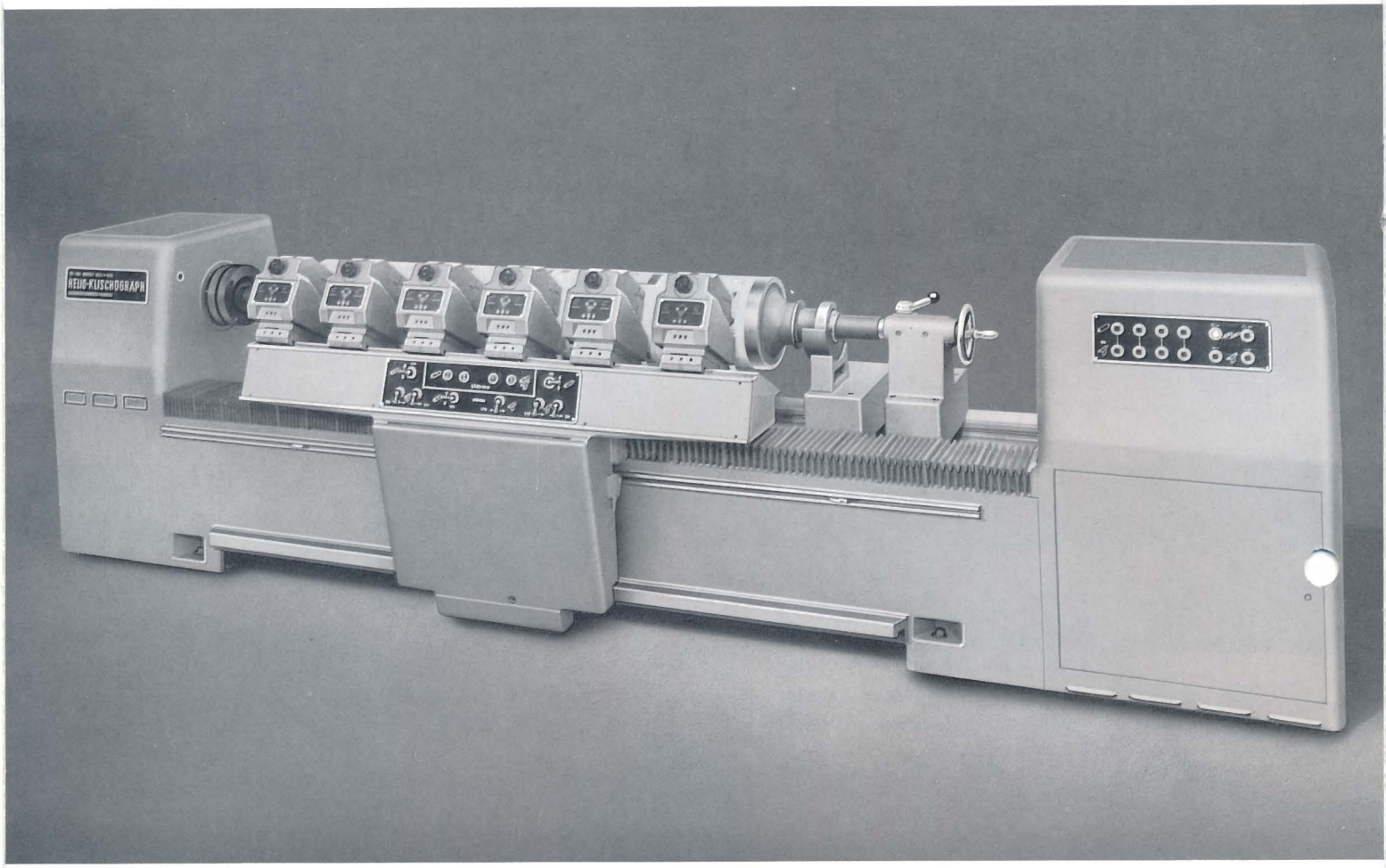
HIGHLIGHT | MIDDLE TONE | SHADOW

CONVENTIONAL GRAVURE SCREEN

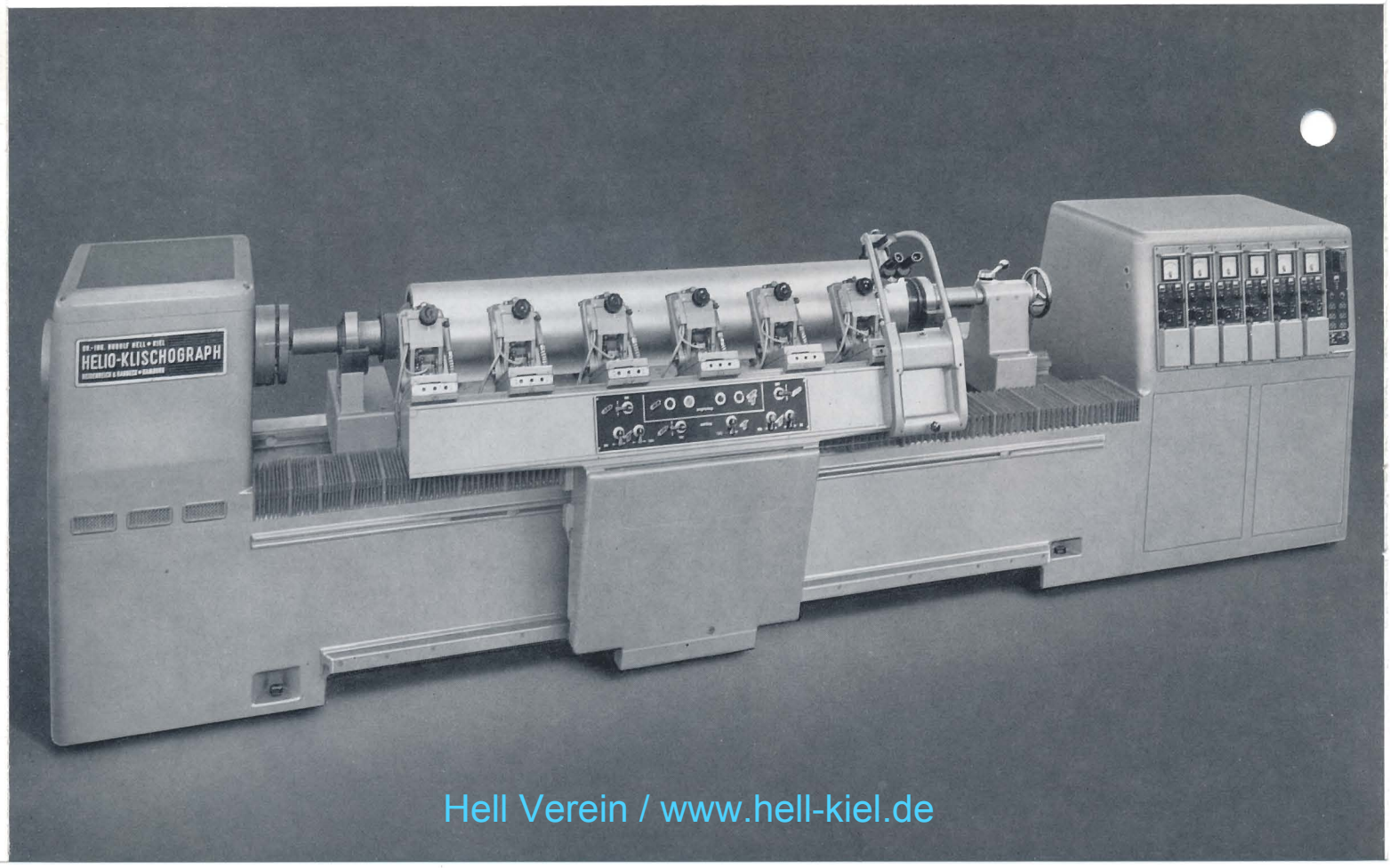


HIGHLIGHT | MIDDLE TONE | SHADOW

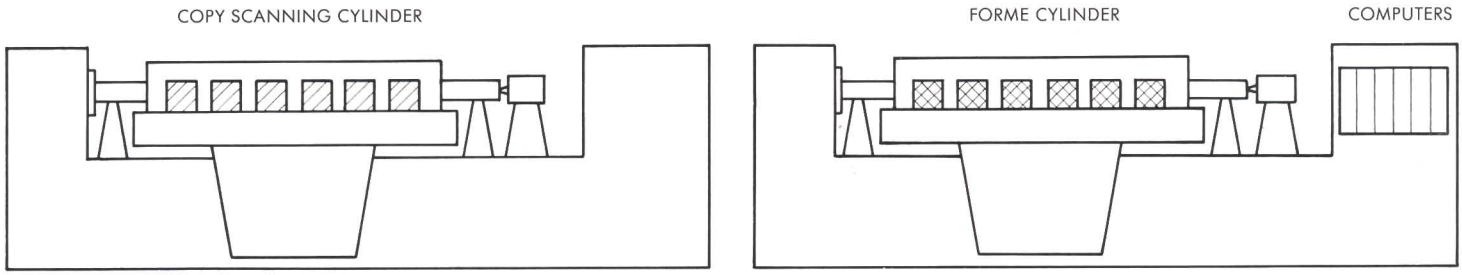
HELIO-KLISCHOGRAPH FOR GRAVURE ENGRAVING
SCANNING MACHINE



HELIO-KLISCHOGRAPH FOR GRAVURE ENGRAVING
ENGRAVING MACHINE



Model K 190



SCANNING MACHINE

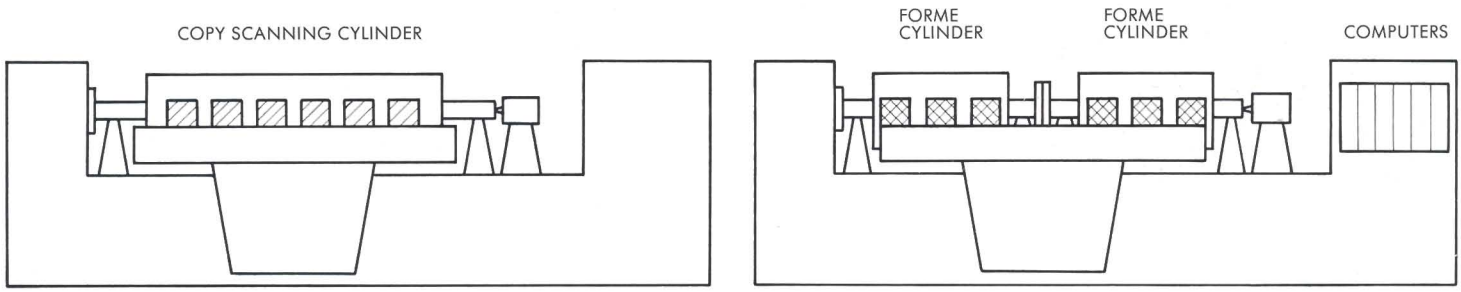
= Scanning Systems (max. 6)

ENGRAVING MACHINE

= Engraving Machine (max.6)

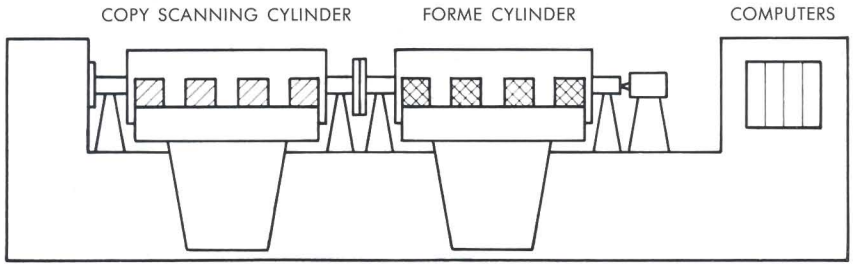
max. length (incl. axle journals) of copy- and forme cylinders: 9 ft;
minimum circumference: 1 ft 10" (192 ⌀) max. circumference: 4 ft 7" (1 ft 5" ⌀)

Model K 190 Special



max. length (incl. axle journals) of copy cylinder: 9 ft
max. length (incl. axle journals) of forme cylinder: 9 ft or 2 x 4 ft 3"

Model K 192



max. length (incl. axle journals) of copy cylinder: 7 ft 7"
max. length (incl. axle journals) of forme cylinders: 8 ft 3"

HELIO-KLISCHOGRAPH TECHNICAL DATA

Helio Klischograph K 190

Max. length of cylinder (total overall length)	9 ft (longer cylinders upon special request)
Circumference of cylinder	min. 21" – max. 4 ft 4"
Number of engraving systems	up to max. 6
Width of engraving systems	min. 7 1/4"
Dead zone between engraving systems	min. 0,08" wide
Shielded seam parallel to the axis of the cylinder	min. 0,2" wide
Number of seams	1, 2 and 4 or seamless
Screens	60 lin cm or 70 lin/cm, others upon request
Width of walls between cells	varying according to tone values; depth of picture adjustable to almost zero
Depth of cells	varying according to tone values; depth of picture 0,00118 – 0,00158"
Engraving speed with screen 70 lin/cm with screen 60 lin/cm	 0.3 m^2 per hour 0,36 m^2 per hour
Electrical load	Three-phase 220/380 volts 50 cycles, abt. 7 kVA other voltages upon request

Dimensions of engraving machine and scanning machine:

Length	14'10"
Width	4'1"
Height	4'7"
Weight	4,5 tons

Control cabinet

Length	4 ft 9"
Width	1 ft 8"
Height	5 ft 11"
Weight	approx. 350 kg

Main switch cabinet

Length	2 ft 7"
Width	1 ft 8"
Height	5 ft 11"
Weight	approx. 220 kg

Helio Klischograph K 192

Max. length of cylinder (total overall length)	7 ft 7" copy cylinder 8 ft 3" forme cylinder
Circumference of cylinder	min. 21" – max. 4 ft 4"
Number of engraving systems	up to max. 6
Width of engraving systems	min. $7\,^{1}/_{4}$"
Dead zone between engraving systems	min. 0,08" wide
Shielded seam parallel to the axis of the cylinder	min. 0,2" wide
Number of seams	1, 2 and 4 or seamless
Screens	60 lin/cm or 70 lin/cm, others upon request
Width of walls between cells	varying according to tone values; depth of picture adjustable to almost zero
Depth of cells	varying according to tone values; depth of picture 0,00118 – 0,00158"
Engraving speed with screen 70 lin/cm with screen 60 lin/cm	 0,3 m^2 per hour 0,36 cm^2 per hour
Electrical load	Three-phase 220/380 volts 50 cycles, abt. 4 kVA other voltages upon request

Dimensions of engraving machine and scanning machine:

Length with 5 ft 9" cylinder	23 ft 8"
Width	4' 1"
Height	4' 7"
Weight	4 - 5 tons

Control cabinet

Length	4 ft 9"
Width	1 ft 8"
Height	5 ft 11"
Weight	approx. 350 kg

Main switch cabinet

Length	2 ft 7"
Width	1 ft 8"
Height	5 ft 11"
Weight	approx. 220 kg

1000 — 5 — 65 — Printed in Germany

HELL

DR.-ING. RUDOLF HELL · 23 KIEL · GERMANY · TELEX 0292858