

[E] ELIO - KLISCHOGRAPH

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English edition

HELIO-KLISCHOGRAPH

A gravure printing plant considering whether to replace the conventional method of reproducing gravure cylinders for monochrome and multi-colour printing with electronic engraving on the

HELIO-KLISCHOGRAPH

will benefit from gravure printers who have experience in this field. The same applies to newly established gravure printing plants faced with the problem of whether to introduce the conventional method, which does not always produce satisfactory results.

The user of such a machine is able to judge the advantages of modern cylinder engraving better than the manufacturer himself.

Engraved cylinders give extremely sharp results in the printing. Sharpness is perfectly reproduced.

Engraved cylinders enable very fine detail to be reproduced. Even the finest detail in the highlights, middle tones and shadows are reproduced without any loss.

Engraved cylinders ensure perfect reproduction of lettering. This applies to both advertisements and text/picture combinations, irrespective of whether the lettering is in negative or positive form.

Engraved cylinders allow exceptionally even printing of individual screen elements. Large areas with the same tone value are smoother and more uniform than in conventional gravure.

Engraved cylinders ensure reliability. Precisely controlled procedures have superseded the difficult-to-control chemical methods. Expense arising from faulty cylinders and manual retouching are considerably reduced.

HELIO-KLISCHOGRAPH

Helio-Klischograph installation, consisting of 2 scanning units and 4 engraving units for combined operation, as installed in the publishing house of Axel Springer + Sohn, Ahrensburg/Germany.



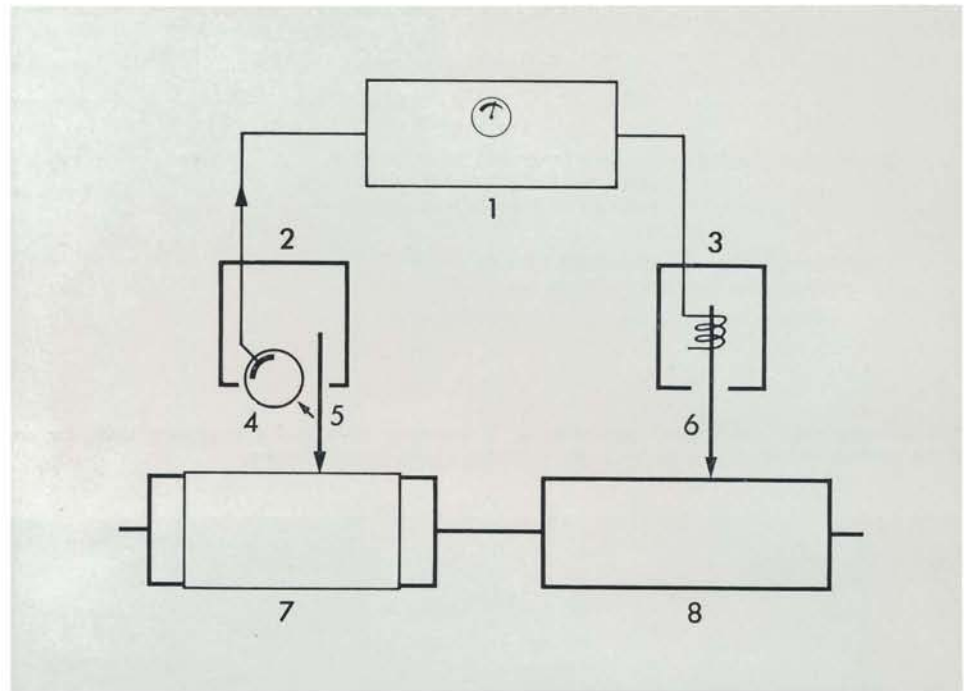
Operation

Two cylinders of the same size which are rigidly coupled to each other (Type K 493) or which are positioned in separate machines (Type K 193) and driven synchronously, rotate at a constant speed. The copy cylinder carries the originals, which normally consist of a combination of halftones and lettering. The printing cylinder, which is copperized conventionally, is engraved by an electro-magnetically controlled diamond stylus.

The drawing shows the basic principle of electronic gravure engraving.

Basic Principle of Electronic Cylinder Engraving.

- 1 Computer unit
- 2 Scanning head
- 3 Engraving head
- 4 Photo-multiplier
- 5 Light beam
- 6 Engraving stylus
- 7 Copy cylinder
- 8 Printing cylinder



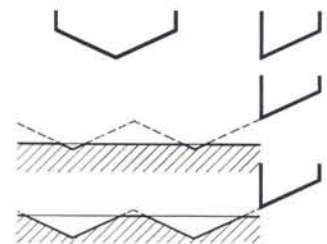
Scanning

A light source and photo-multipliers serve as scanning elements. They are housed in an optic head with a condensing optical system and its corresponding electronic equipment.

The cylinders rotate at a constant speed and the photo-multipliers, which receive the light reflected by the original, transmit the density values of the original as successive electrical signals. The optic head moves at a specific cross-feed along the picture cylinder so that the original is scanned in the form of a helix.

Engraving

At the same time the printing cylinder is engraved by a diamond stylus which is driven electro-magnetically and makes a continuous vibrating movement. The cylinder surface moves uniformly under the stylus. Every time the stylus pierces the surface (4,000 times per second), it produces a chip. The resulting cells become larger the deeper the stylus penetrates the cylinder skin. Its depth of penetration is controlled by the signals coming from the photo-multiplier via a computer.



As described above, the signals depend on the reflection densities.

Cutting Principle of the Engraving Stylus

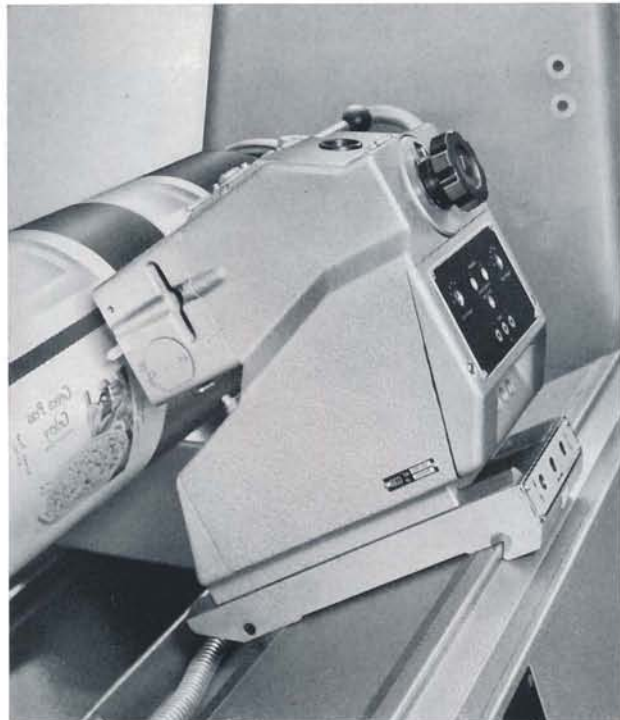
Optics – Electronics – Mechanics

As with electronic picture reproduction in general, the electronic engraving of gravure cylinders require a combination of optical, electronic, and mechanical systems.

Scanning System

The originals, which are normally produced photographically, are scanned by opto-electronic means. The optic head incorporates a light source of constant brightness which is focused by a lens system so that a relatively large area of the original is uniformly illuminated. From this area the scanning optical system, by means of the scanning aperture, selects a very small picture spot. Depending upon the tone value of this picture spot more or less light is reflected into the scanning optical head from where the reflected light passes to the cathode of a photo-multiplier. The signal voltages from the photo-multiplier are pre-amplified in the optic head and then applied to the input of one or more computers of the engraving machine. The light reflected from a larger scanning area surrounding the above small picture spot reaches a second photo-multiplier, via deflection prisms. The main signal, in conjunction with the unsharp-masking signal, enhances the picture contours and increases the contrast.

During setting-up to scan, a magnified ground-glass image of the illuminated picture spot can be seen when looking through the viewing window. At the same time, this allows focus checking of the scanning optical system. The focus can be adjusted with a lever.



Scanning head in front of a copy cylinder. Up to six heads (Type K 193) and up to four heads (Type K 493) can operate simultaneously.

Engraving System

The movable engraving system with sliding foot rests with its own weight on the cylinder surface to be engraved. This makes the depth of penetration of the stylus independent of a possibly unsteady cylinder rotation. The stylus is brought to the basic level by adjusting a rotary knob. With this knob the engraving head can be raised or lowered, via a spindle.

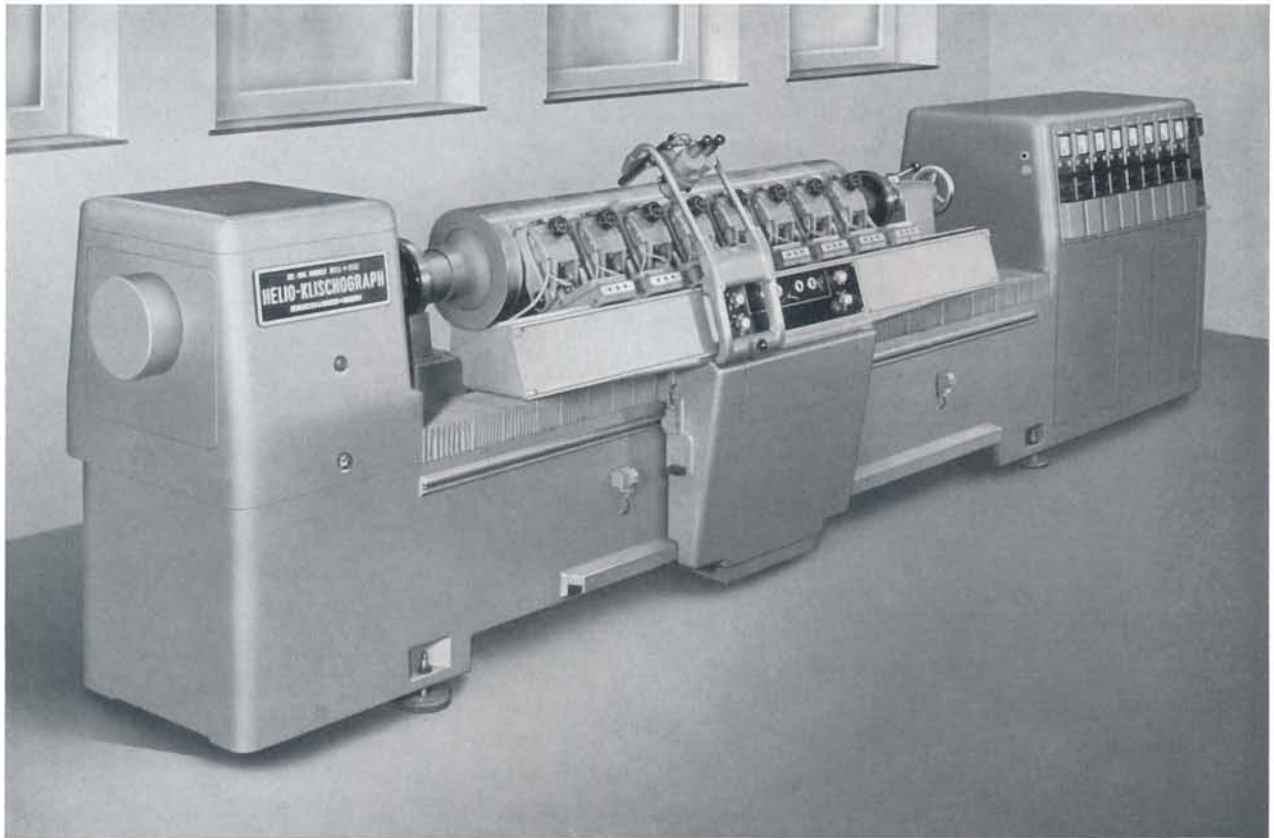
The depth of penetration of the stylus is controlled by the signals from the appropriate computer. A spirit level in the point of rotation of the engraving head facilitates precise adaptation to the respective cylinder diameter.

To remove the burr from the engraved cylinder, the engraving system is provided with a bracket holding a burr cutter which rests with its own weight on the cylinder surface. The fine copper chips produced during engraving are sucked off through a duct in the bracket. From a nozzle near the burr cutter and stylus, this duct leads to a collecting duct in the equipment carrier.



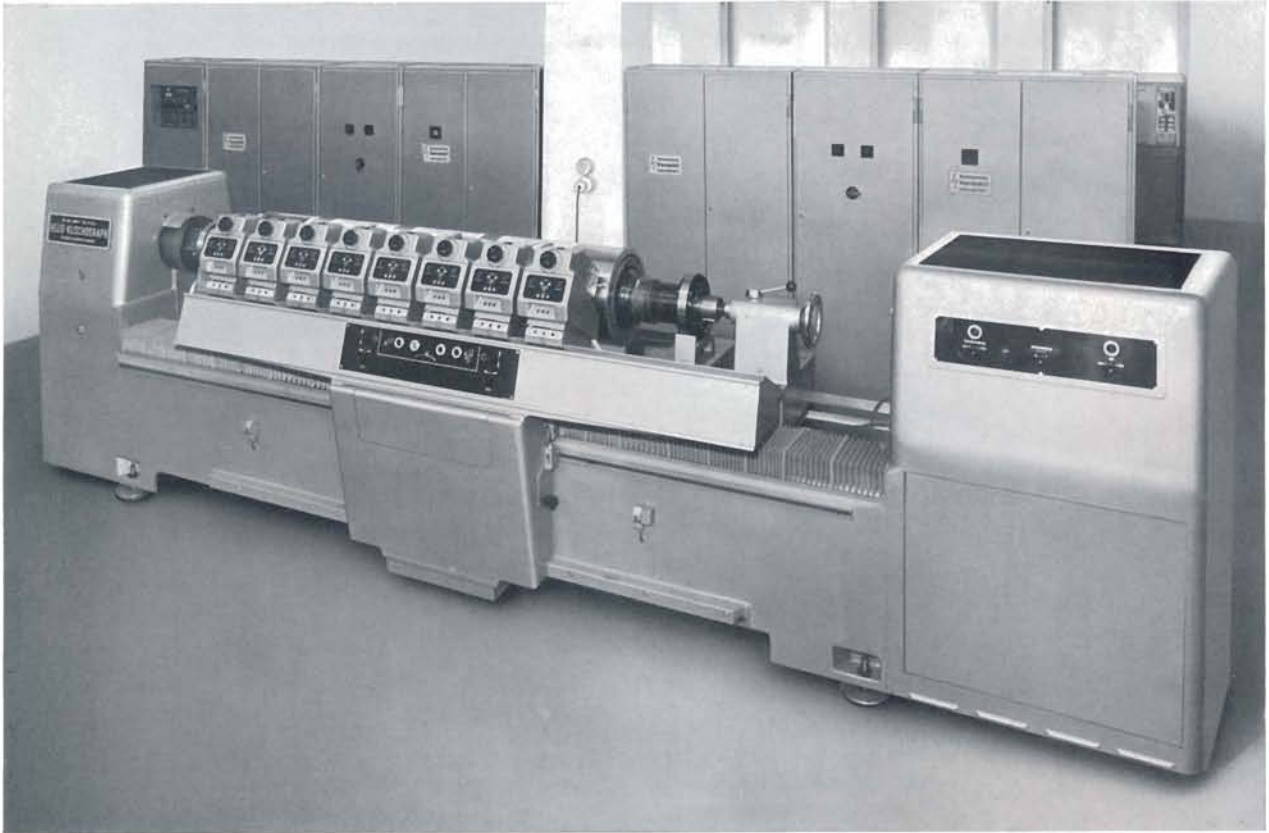
Engraving head resting on the printing cylinder surface. Normally each scanning head controls one engraving head by means of a computer unit.

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Helio-Klischograph Type K 193 — Engraving unit with eight engraving heads. The Helio-Klischograph Type K 493 consists of one combined scanning and engraving machine.

HELIO-KLISCHOGRAPH



Helio-Klischograph Type K 193 — Scanning unit with eight scanning heads; electronic cabinets with central control system (on the left) for multi-machine operation.

Construction

The scanning and engraving units are designed to take extremely large and heavy gravure cylinders. The necessary precision is ensured by the box-type, rigid cast-iron bed, which rests on shock-absorbing feet and protects the sensitive parts against all mechanical vibrations.

Scanning Unit

The copy cylinder rests on the machine bed in two bearing blocks and is fixed in the axial direction by a tailstock. A slide, with the optic heads for scanning the originals mounted on its equipment carrier, runs in guideways in front of the cylinder. The control panel at the front of the equipment carrier contains the switches for controlling the machine.

The machine bed is flanked by two compartments: the left-hand one, the driving compartment, contains the driving motor for the copy cylinder, a high precision gear, and, on the outside behind a cover, the optical seam drop-out system for fixing the number of longitudinal seams and width of the seams to be dropped out. The lower half of the right-hand compartment contains the cross-feed drive; the upper half contains a control panel and electronic equipment for switching facilities such as right-reading or wrong-reading scanning, day/night switching, etc.

Engraving Unit

The basic construction of the engraving unit is identical to that of the scanning unit. It carries the printing cylinder instead of the copy cylinder and engraving heads instead of the optic heads. The control panel and the left-hand driving compartment are the same as on the scanning unit, with the only exception that a seam drop-out system is not provided. The lower half of the right-hand compartment houses the cross-feed drive and a vacuum pump from which a duct runs to each engraving head for sucking off the engraving chips. The most striking difference, however, is in the upper half of the compartment where the computers are arranged next to each other as plug-in units. Next to the computers there is a switching plug-in unit and on the far right the so-called monitor unit.

Computers

The illustration on page 15 shows the division of the cylinder into several fields (ribbons). Each field (ribbon) is engraved by an engraving head which receives its commands from the optic head over the appropriate computer. The signal path from the optic head via the computer to the engraving head is termed "channel". These computer units are of same construction and are interchangeable. The basic electronic adjustments are made with their controls before engraving, due consideration being given to the original and the subsequent printing process.

Monitor Unit

The monitor unit with one programme plug each for the picture and seam programme is arranged on the right of the switching plug-in unit. The copy programme effects the linking of the signal paths pre-programmed with interchangeable plugs. For example, an optic head can be connected to two or more engraving heads for multiple engraving. The seam programme is pre-programmed in the optical seam drop-out system and distributed to the engraving fields (ribbons) by an interchangeable programme plug.



Flower-Bed in Spring

Calendar picture — four-colour rotary gravure.

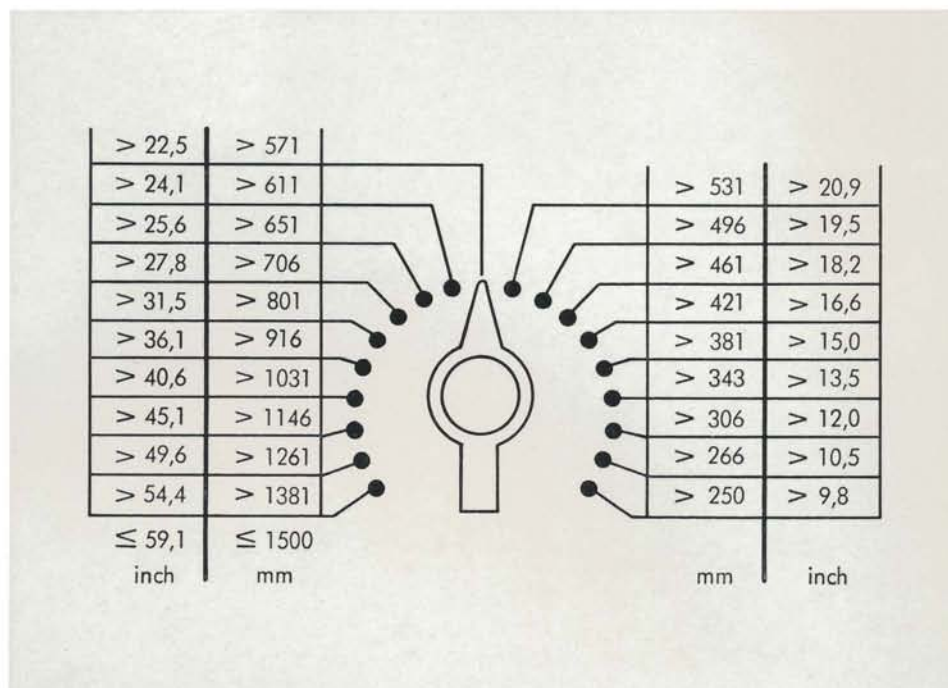
Printed from electronically engraved gravure cylinders by Graphische Betriebe W. Girardet, Essen, Germany.

Scanning and Engraving machines

Switching Plug-in

The switching plug-in is located next to the computer units. The driving frequency for cylinder speed and cross-feed are selected by a step switch for a specific cylinder circumference. The required screen angling for multi-colour printing can be adjusted by a further switch.

Step switch for switching on the driving frequencies which differ according to the cylinder circumference



Drive

The cross-feed and cylinder driving speeds are selected by a frequency generator which controls the driving motors. Electronic divider stages derive the different driving frequencies from a fixed basic frequency. The selected ratio is set by a step switch on the control panel of the switching plug-in. With this switch up to 19 different speeds can be pre-selected for the copy and printing cylinders. Only the cylinder circumference determines speed selection because its speed must always remain constant. This driving principle allows extremely fine adjustment of the range of cylinder circumferences.

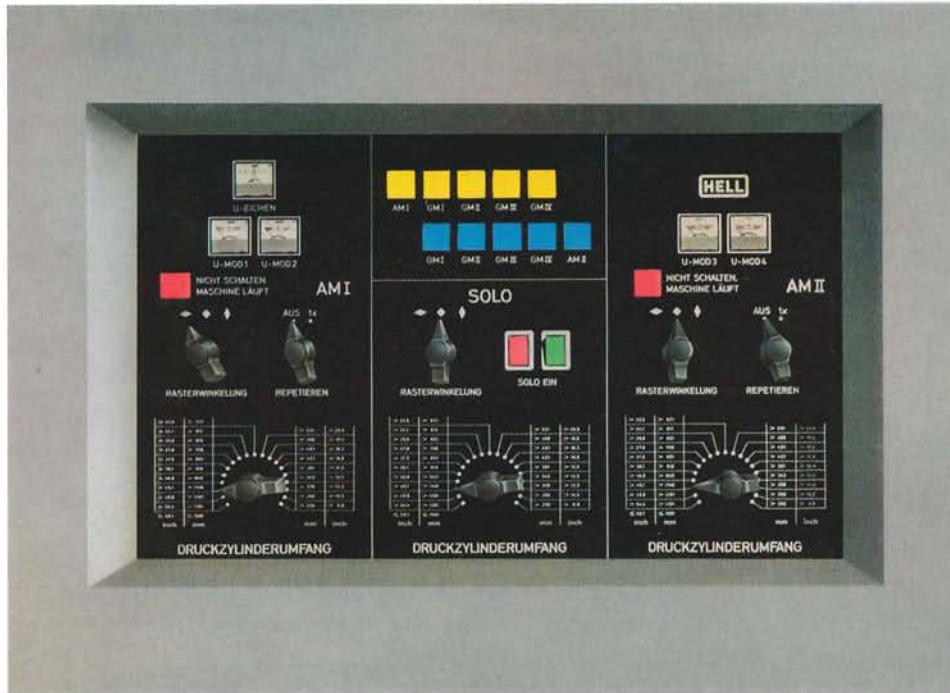
Optical Seam Drop-out

To prevent the edges of the different originals becoming visible in the print, the depth of penetration of the stylus must be re-set to zero at these seams. This is done opto-electronically. A drum with its peripheral area divided into six equal tracks is mounted on the cylinder driving shaft extension. Guide grooves, into which small reflectors can be inserted as required, have been milled across these tracks. When the cylinder revolves these reflectors throw the light from an illuminating lamp in short pulses to a photo-cell, which transmits corresponding electrical signals. These signals cause the stylus to be lifted momentarily from the cylinder surface. The width of the reflectors determines the length of the signal and thus the width of seam drop-out.

Since the peripheral area is divided into six tracks, six different programmes can be set before engraving takes place. Up to eight seams can be dropped out for each track depending on the number of transverse grooves. The programme selection, i. e. combination of programme tracks with engraving heads, is just as versatile as the already mentioned picture programme. The required programme is selected by the appropriate plugs provided for this purpose.

Electronic Cabinets

The entire power supply for the installation, including the electronic assemblies for generating an internal frequency-variable network, is housed in separate cabinets of the same height and depth. The total number of cabinets depends on the make-up of the installation.



Control panel of the central control system for combined operation of 2 scanning and 4 engraving units

The 'Solo'-panel allows independent tests of single engraving units to be made.

If the installation consists of one scanning and one engraving unit, only one power supply cabinet is required. It contains the electronically stabilized power supplies for all supply voltages for the electronic system. A magnetic regulator pre-stabilizes the input voltage of the power supplies, thus making the installation independent of voltage fluctuations in internal mains. For multi-machine operation with more than six channels, one cabinet of this type is allocated to each scanning and engraving unit.

Power Supply Cabinets

Each machine also has a 'machine control' cabinet which contains the contactors for controlling the different movements and a 'machine drive' cabinet with the plug-ins for generating the control frequencies required for the drive.

Control Cabinets

For multi-machine operation, i. e. when a certain combination of several engraving and scanning units is required, the switching plug-ins and monitor units are removed from the engraving units and placed in a separate cabinet which serves as a central control system. In this case, the engraving units are provided with a simplified switching plug-in. The scanning machine that is to control the engraving unit is determined by a switch on the panel of the switching plug-in. For test cuts the switch is set to "solo", in which case the engraving unit operates without the scanning unit. The driving frequencies etc. for a related machine group are adjusted at the control panel on this cabinet. The selected interconnection is indicated visually on an illuminated board.

Central Control Cabinet

Cell Shape

The cells resemble four-sided inverted pyramids. In the shadows their edges almost meet and leave only a narrow bridge. In the light areas the bridge becomes increasingly wider and finally in the highlights the surface of the cylinder is only interrupted by very small cells.

On conventionally etched cylinders with cells of variable depth but equal area, the lightest tones disappear first during the printing as a result of wear on the cylinder surface. However, the electronically engraved cylinder has a maximum cell depth of approx. 7μ in the light areas. Hence wear on the surface by the doctor blade is negligible.

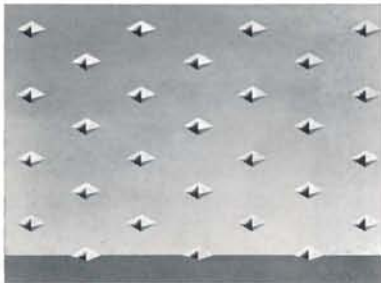
Originals

The Helio-Klischograph engraves with a scale of 1:1. The originals can be reflection copy, or right- or wrong-reading positives or negatives, (only wrong-reading with type K 493). Accordingly the photographic department can prepare the originals for scanning by many simple and quick methods. Lettering can be copied in or superimposed as a transparent overlay.

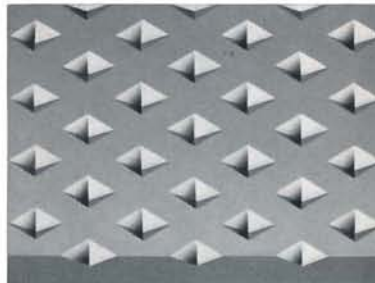
The only condition is that the initial density, density range and gradation of the originals are identical. All screening is dispensed with, because the engraving unit makes the screen itself.

Engraved Gravure Screen

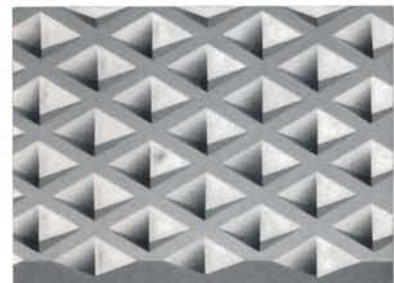
highlight



middle tone



shadow



highlight



middle tone



shadow

Microphotographs of an Engraved Gravure Cylinder

Screen Angling

The optic heads and engraving heads are moved along the scanning and printing cylinders in an axial direction and cover a specific distance after each cylinder revolution. The screen cells are engraved so that every second row of cells is staggered in relation to the first. Consequently the screen is positioned at 45° to the axis, as is usual for monochrome printing.

For multi-colour printing, the screen must be at a different angle in order to suppress hue shift and moiré. This is achieved by changing the relation between the cross-feed and rotation speed which can also be adjusted by a switch on the panel located in the central control system.

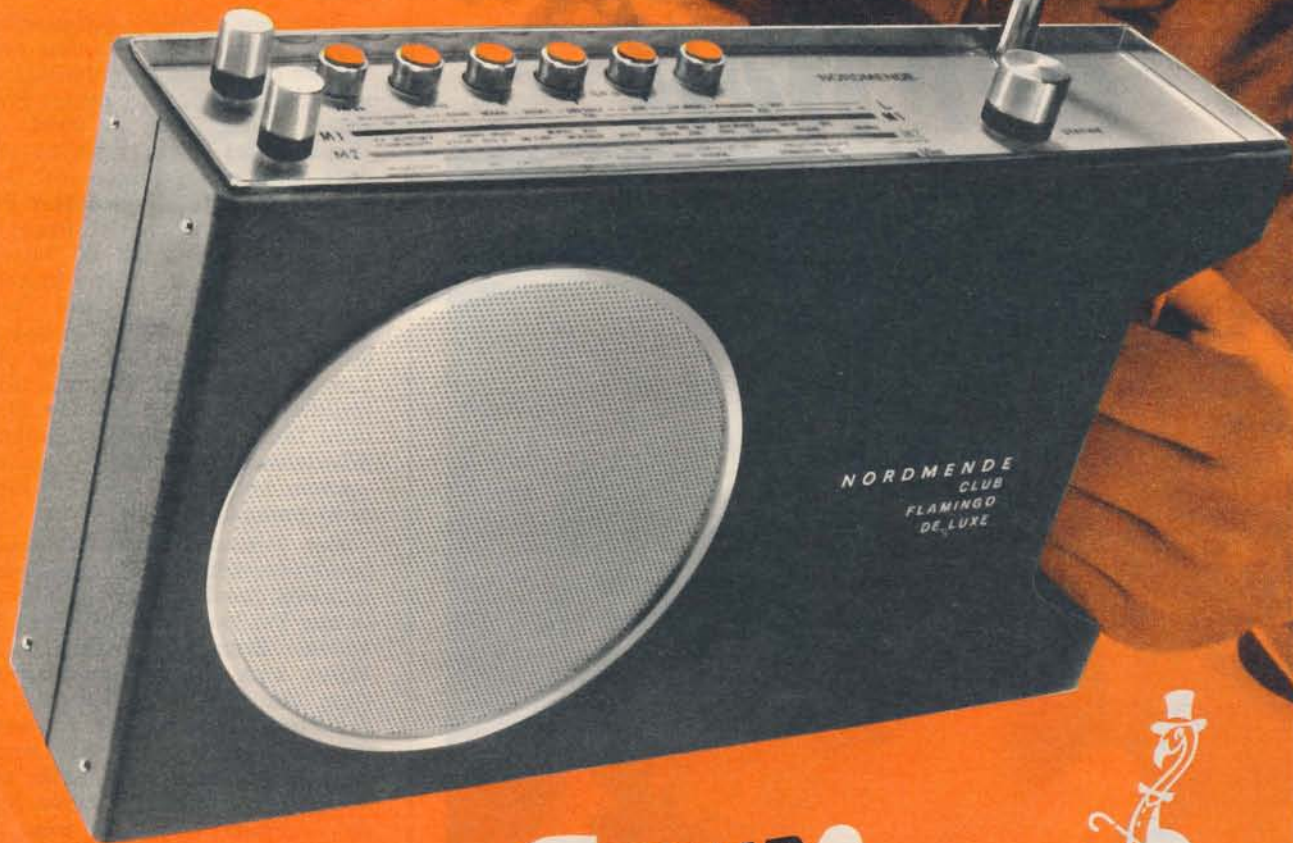
Screen Rulings

As in letterpress and offset printing, the reproduction quality of detail in illustrations is influenced by the resolution, i. e. the screen ruling used. With gravure also lettering must be screened. Very fine lettering and line drawings require a finer resolution. For such originals a screen ruling of 70/cm (175/inch) is preferred whereas for packaging printing and magazines without characters below eight typographical points 60/cm (150/inch) is sufficient.

The Helio-Klischograph can be supplied with a screen ruling of 60/cm (150/inch) or 70/cm (175/inch).

Any other screen ruling can be provided on request.

präsentiert



Vier schicke Farben haben Sie zur Wahl
beim Club Flamingo-Trage-Transistor:
Schwarz, Rot, Grün und Weiß.

CLUB
flamingo

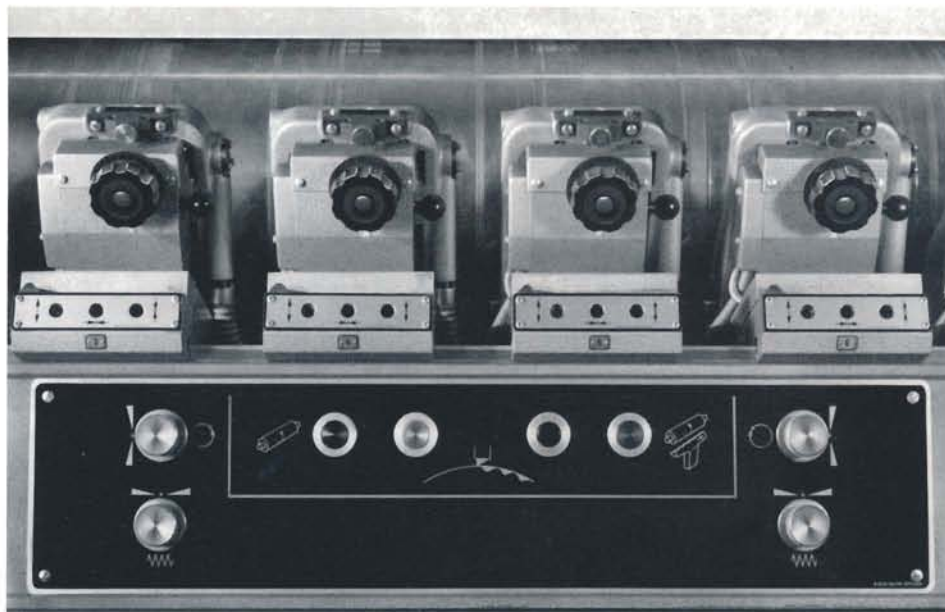


**...viel mehr als ein gewöhnlicher
Transistor-Koffer!**

Two-colour advertisement — line and halftone combination.

Printed from electronically engraved gravure cylinders by Verlagsanstalt Gruner + Jahr, Itzehoe, Germany.

Control panel
on the equipment carrier.
The control panels of
scanning and the engraving
units are identical.



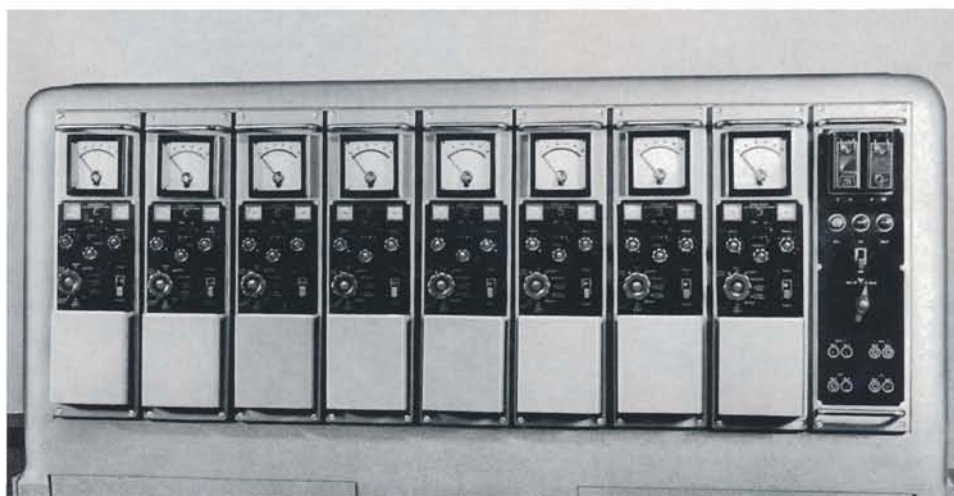
Adjustable Gradation

Small deviations in printing gradation due to different ink properties, paper, printing speeds, etc., can be compensated for by a control on the front panel of each computer. 'Overall gradation' can be adjusted by internal controls when the equipment is installed and can be adapted within wide limits to customer requirements. In the electronic computers of the Helio-Klischograph the dependence of the engraving depth on the visual signal is regulated so that all non-linearities, including those of photographic preliminary work, are linearised. An electronic gradation regulator ensures that the printed density corresponds to the original density in all tones.

Increase in Picture Sharpness and Detail Definition

The good reproduction sharpness and fine detail definition, as is anticipated and usual in conventional gravure, can be increased still further by electronic engraving. This is achieved by an opto-electronic unsharp-masking system, which has intentionally been made controllable in order to cover the entire range from 'soft gravure character' to brilliant, sharply defined detail.

Computer units
of an engraving machine
with 8 engraving heads.
The monitor unit
can be seen on the
extreme right.



Cylinder Division

Left:
Each engraving head
is controlled by one
scanning head.

Right:
2 engraving heads each
are controlled by one
scanning head.

1. Copy Cylinder
2. Scanning Heads
3. Computer Units
4. Engraving Heads
5. Printing Cylinder

Copy and printing cylinders are divided into individual fields (ribbons), the width of which correspond to one dimension of a magazine page, in order to enable a magazine cylinder to be engraved within a reasonable time. Normally one scanning head and one engraving head are provided for one field (ribbon).

Linking of engraving and scanning heads is performed with the interchangeable programme plug of the monitor unit.

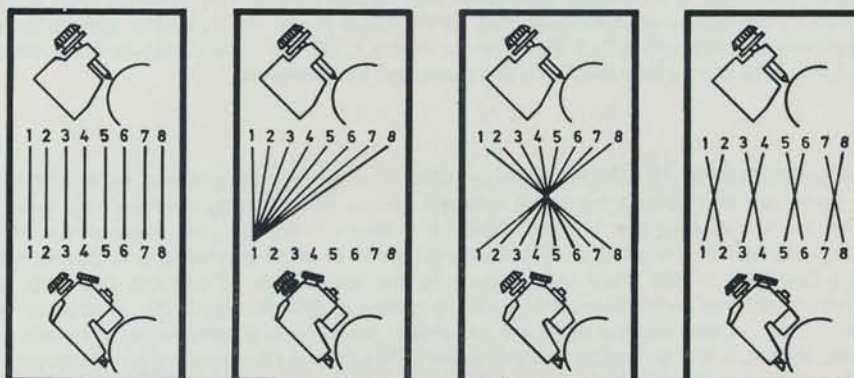
Scanning and engraving of all cylinder fields (ribbons) take place simultaneously.

Cylinder Division

The interchangeable copy selection plugs enable each scanning head to control one or more engraving heads. For example, up to six copies can be engraved simultaneously on a cylinder from one original, up to three from two originals, and up to two from three originals. Other combinations are also possible.

Simultaneous Stepping in Longitudinal Direction

Four examples of copy
selection for an
eight-channel installation.



The function
of all programme
plugs is clearly symbolized
on their front panel.

Modified Models

Extension to 8 Channels

With this model 8 fields can be scanned and engraved instead of 6. The scanning machine is enlarged by adding two scanning heads, the engraving machine by two engraving heads and two computer units. A power supply cabinet is added to the entire installation.

Circumferential Repetition 1:2 to 1:6

If the circumference of the copy cylinder is half that of the printing cylinder and its speed is twice as high, this means that the original is engraved twice on the circumference of the printing cylinder. An original can be repeated up to six times using the same principle. For this purpose the control panel on the switching plug-in or the central control system is extended by a repeater switch with which the desired driving frequency for the scanning machine, corresponding to the repetition speed, can be adjusted.

Seamless Engraving for Decorative Printing

Up to eight seams can be dropped out with the drop-out system of the basic model. However, continuous engraving over the entire printing cylinder, which is an indispensable pre-requisite for decorative printing, can only be achieved with a different method. Two identical originals are mounted next to each other over half of the cylinder circumference with a stagger of 180° and scanned by two optic heads, which transmit their signals alternatively to the same engraving head after each half cylinder revolution. Since an optic head is always located above one of the two originals, the printing cylinder is also engraved continuously over its entire circumference, i. e. without seams.

Seamless engraving requires the special version of the seam drop-out system, computer unit, switching plug-in and two scanning heads.

Subsequent Engraving of a Field (Ribbon)

This method enables late copy to be engraved with accurate register on a cylinder which has already been partly engraved. If required, an automatic phase-in device can be delivered which, if the copy and printing cylinders have been only partly engraved, allows them to be replaced in the exact previous position for subsequent engraving.

Elongation of Machine Bed and Equipment Carrier

The basic model allows the engraving of printing cylinders with a maximum overall length up to 2,750 mm (9 ft.). Elongation of both machine beds by 500 mm (20 ins.) or by 1,000 mm (39 ins.) enables scanning and engraving of cylinders of a total length up to 3,250 mm (10 ft. 8 ins.) or 3,750 mm (12 ft. 3 ins.).

The equipment carrier can also be elongated in order to increase, for example, the number of scanning heads or engraving heads. Considerations in this direction are dependent on the face width and the engraving programme. Apart from the basic type 1,750 mm (5 ft. 9 ins.), elongated equipment carriers of 2,000 mm (6 ft. 6 ins.); 2,250 mm (7 ft. 4 ins.) and 2,500 mm (8 ft. 2 ins.) are also available.

Simultaneous Engraving of Two Small Cylinders

Instead of one large cylinder, two small ones can be engraved if their abutting shaft ends are supported by an additional central bearing. In the basic model the maximum overall length of each cylinder is 1,300 mm (4 ft. 3 ins.). Two cylinders 1,550 mm (5 ft. 2 ins.) or 1,800 mm (5 ft. 11 ins.) in length can be engraved with the elongated machine beds.

Linking of Several Machines

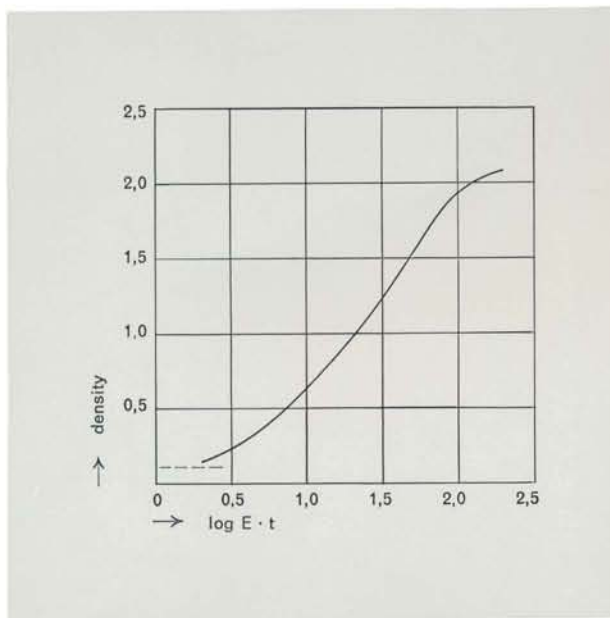
The basic HELIO-KLISCHOGRAPH machine consists of a scanning unit and an engraving unit. In the same way that several engraving systems can be controlled by a single optic head, two or more engraving units can be controlled by a single scanning unit. Alternatively, several scanning units can be installed, each one operating one or more engraving unit. Apart from the extreme flexibility of the plant with regard to the production of printing cylinders, these combination facilities mean an enormous saving of time in cylinder engraving. In such cases the switching plug-ins and monitor units are withdrawn from the engraving units and placed in a separate cabinet, i. e. the 'central control system'. The driving frequencies etc. referred to each scanning unit are adjusted for a related machine group on the control panel of this cabinet. Assignment of the engraving units to the scanning units or "solo" operation is effected by a switch position on the modified switching plug-in of each engraving unit.



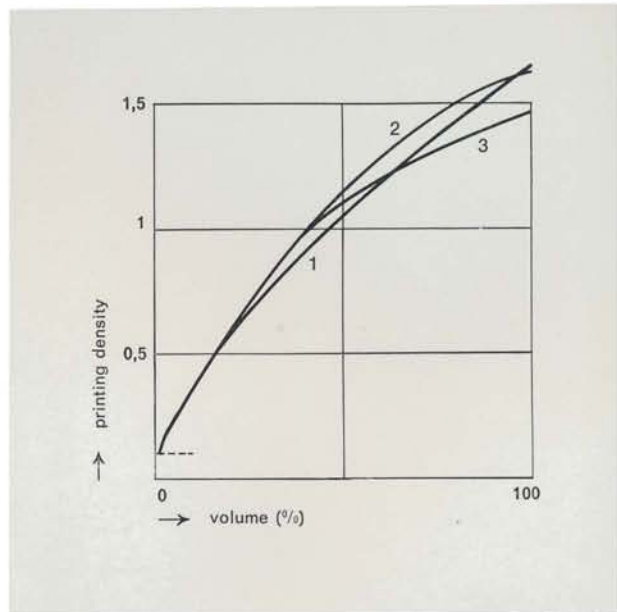
Four-colour advertisement in a weekly magazine.
 Printed from electronically engraved gravure cylinders by Verlagsanstalt Gruner + Jahr, Itzehoe, Germany.

HELIO-KLISCHOGRAPH

Special Helio-Paper Type HK 111
Characteristic curve of the flat emulsion proportion



Printing Gradations Dependent on Ink
1. Transparent ink; 2. Normal ink; 3. Ink rich in pigment



Photographic Materials

Commercial photographic paper cannot be used for colour work because it is not dimensionally stable. Hence a special material with an aluminium foil insert has been developed for the Helio-Klischograph. Besides special surface treatment, this material also has a mixed emulsion, viz. a steeper one for line originals and a flatter one for halftones. The steeper emulsion proportion is sensitized so that it responds to yellow light. Consequently, halftones and line work can be exposed separately. The above diagram shows the characteristic curve for the flat emulsion proportion. It runs linearly with good approximation between the densities 0.3 and 1.8. The usable density range is thus 1.4 to 1.5 with a gamma of 1.0. Hence the material is well suited to the processing of standard gravure negatives or transparencies, which normally have a density of 1.4.

Ink Effect

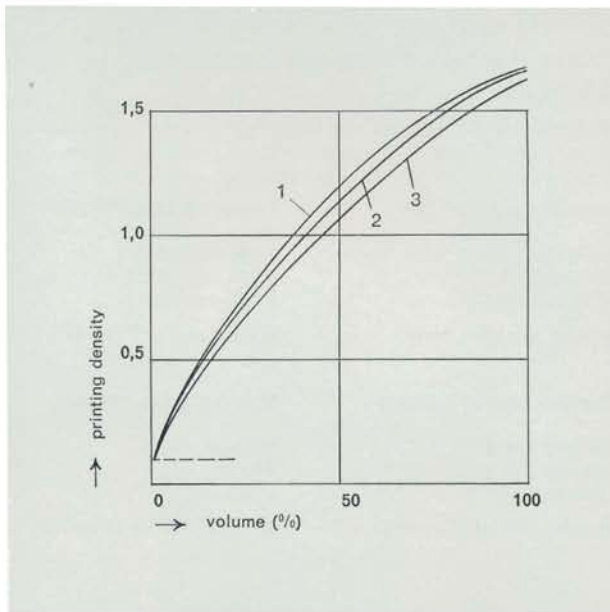
Differences in printing gradation, i. e. dependence of the printed depth on the cell volume, are caused primarily by the physico-chemical properties of the ink. Transparent inks give a good, straight gradation curve, ink rich in pigment reveals a certain flattening in the shadows. Blending mainly takes effect in the medium tones.

It will be noted that none of these curves starts at volume "zero". If the cells become smaller and smaller during the engraving of a cylinder, a limit will finally be reached where cells are still engraved but no ink is transferred to the paper. The first printing tone begins at a cell depth of approximately 7μ and a printing density of about 0.04. This limit cannot be altered either by dilution or blending and thus ensures that the light picture tones are printed out with greater reliability. Even a printing density of 0.05 can be reproduced accurately.

HELIO-KLISCHOGRAPH

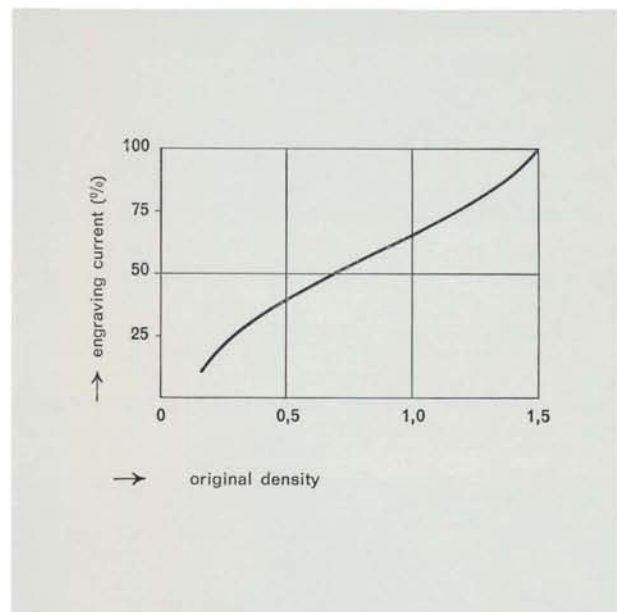
Effect of Blending on Printing Gradation

1. Transparent ink; 2. Normal ink; 3. Ink rich in pigment



Example of Electronic Overall Gradation

first printing tone value .05



Originals for Packaging Printing

Packagings for tubes, tins, bottles, etc. are arranged so that a minimal amount of paper is wasted in the final cut. In conventional printing as many identical originals as required are assembled on a cylinder. In electronic engraving, however, only one field (ribbon) of the picture cylinder has to be covered by originals.

The originals can be engraved 2- to 8-up in axial direction depending on the number of computer units and engraving heads.

An additional repetition device allows 2- to 6-up engraving of an original in circumferential direction.

As is also the case with the example shown on page 18, the above curve does not start at volume "zero".

Originals for Decorative Printing

Among the printing products generally designated as "decorative printing", the printing of wood patterns becomes more and more important. Moreover, an increasingly high number of large-size decorations are produced from gravure cylinders.

Most of the originals used for this purpose are multi-colour line or halftone prints. These originals are mounted on the copy cylinder and electronically engraved.

By means of optical seam drop-out and suitable preparation of the originals it is possible to eliminate the seams between the originals in circumferential direction and, under certain conditions, also in axial direction of the field (ribbon).

For detailed description of this procedure see "Optical Seam Drop-out".

Technical Data

HELIO-KLISCHOGRAPH, Type K 193

Cylinder length
Standard Model A
Special Model B
Special Model C

Cylinder circumference

Cylinder diameter

Number of engraving fields (ribbons)
Width of engraving fields (ribbons)

Number of seams that can be dropped out
Width of seams

Screens
Bridge width
Cell depth

Engraving speed
60 (150) screen
70 (175) screen

Power supply

Mains frequency

Power consumption

Separate Scanning and Engraving Units

up to 2,750 mm (108") overall
up to 3,250 mm (128") overall
up to 3,750 mm (148") overall

250—1,500 mm (10—60")

80—480 mm (3—19")

up to 6 (on special request up to 8)
min. 185 mm (7")

up to 8
up to 8 mm ($\frac{5}{16}$ ")

60 or 70/cm (150 or 175/in.) (other screens on request)
varies according to tonal value
varies according to tonal value

0,36 m² (.43 sq.yds.) per hour and engraving system
0,3 m² (.36 sq.yds.) per hour and engraving system

3-phase, 220/380 V, other mains data on request

50 or 60 c/s

approx. 15 kVA

Dimensions (Standard Model A)

Width
Depth
Height
Weight

Scanning unit AM 193

4,940 mm (194")
1,040 mm (41")
1,335 mm (53")
approx. 4,2 t (84 cwts.)

Engraving unit GM 193

5,540 mm (218")
1,040 mm (41")
1,335 mm (53")
approx. 4,2 t (84 cwts.)

Power supply cabinet NV 6

Width 900 mm (35")
Depth 400 mm (16")
Height 1,800 mm (71")
Weight approx. 100 kg (2 cwts.)

Machine control cabinets

600 mm (24")
400 mm (16")
1,800 mm (71")
approx. 100 kg (2 cwts.)

Machine drive cabinets

900 mm (35")
400 mm (16")
1,800 mm (71")
approx. 250 kg (5 cwts.)

Special Equipment

Device for seamless engraving (jointless pattern)
Repetition device
Automatic phase-in device
Central bearing
Series transformer
Central control cabinet

Lengthening the machine bed (Model B)
(Model C)

Lengthening the equipment carrier

Accessories

for decorative printing
for 2- to 6-up engraving in circumferential direction
for subsequent engraving of a field
for simultaneous engraving of two small-cylinders
for mains voltages differing from 220/380 volts
for optional linking of machines or for operation with
7 or 8 channels

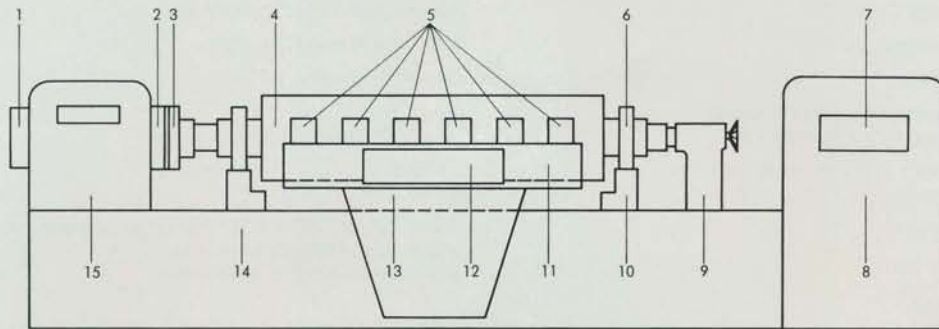
by 500 mm (20") for cylinder lengths up to 3,250 mm (128")
by 1,000 mm (39") for cylinder lengths up to 3,750 mm (148")

to 2,000 mm (79")
to 2,250 mm (89")
to 2,500 mm (98")

Copy cylinder
including 2 bearings and 1 coupling flange
Register punch
Engraving test equipment DURIMET

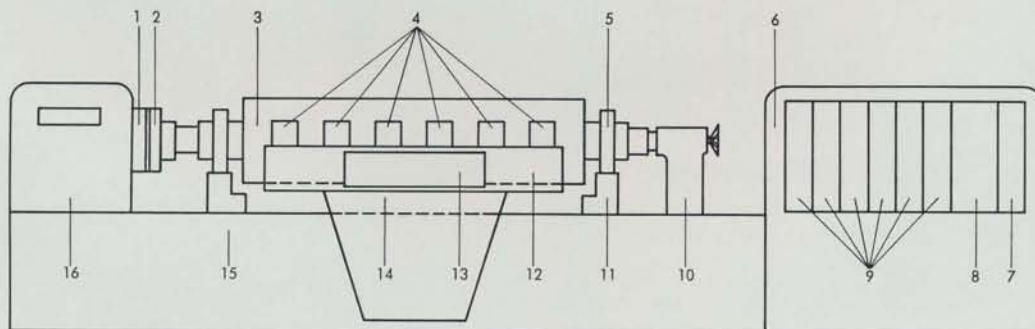
Helio-Klischograph K 193

Scanning Unit AM 193



- | | | | |
|-------------------|---------------------------|----------------------|------------------------|
| 1 Seam drop-out | 5 Scanning heads | 9 Tailstock | 13 Base carrier |
| 2 Drive coupling | 6 Cylinder bearing | 10 Bearing support | 14 Machine bed |
| 3 Coupling flange | 7 Switchboard | 11 Equipment carrier | 15 Driving compartment |
| 4 Copy cylinder | 8 Switchboard compartment | 12 Operating panel | |

Engraving Unit GM 193



- | | | | |
|---------------------|------------------------|----------------------|------------------------|
| 1 Drive coupling | 5 Cylinder bearing | 9 Computer inserts | 13 Operating panel |
| 2 Coupling flange | 6 Computer compartment | 10 Tailstock | 14 Base carrier |
| 3 Printing cylinder | 7 Monitor unit | 11 Bearing support | 15 Machine bed |
| 4 Engraving heads | 8 Switching plug-in | 12 Equipment carrier | 16 Driving compartment |

Technical Data

HELIO-KLISCHOGRAPH, Type K 493

Cylinder length
 Standard Model A
 Special Model B
 Special Model C
 Cylinder circumference
 Cylinder diameter
 Number of engraving fields (ribbons)
 Width of engraving fields (ribbons)
 Number of seams that can be dropped out
 Width of seams
 Screens
 Bridge width
 Cell depth
 Engraving speed
 60 (150) screen
 70 (175) screen
 Power supply
 Mains frequency
 Power consumption

Dimensions (Standard Model A)

Width
 Depth
 Height
 Weight

Control cabinets

Width
 Depth
 Height
 Weight

Power supply cabinet NV 4

Width
 Depth
 Height
 Weight

Special Equipment

Device for seamless engraving (jointless pattern)
 Series transformer
 Special shaft

Lengthening the machine bed (Model B)
 (Model C)

Lengthening the equipment carrier

Accessories

Combined Scanning and Engraving Unit

up to 1,300 mm (51") overall
 up to 1,550 mm (61") overall
 up to 1,800 mm (71") overall
 250—1,500 mm (10—60")
 80—480 mm (3—19")
 up to 4
 min. 185 mm (7¹/₄")
 up to 8
 up to 8 mm (5¹/₁₆")
 60 or 70/cm (150 or 175/in.) (other screens on request)
 varies according to tonal value
 varies according to tonal value
 0,36 m² (.43 sq.yds.) per hour and engraving system
 0,3 m² (.36 sq.yds.) per hour and engraving system
 3-phase, 220/380 V, other mains data on request
 50 or 60 c/s
 approx. 10 kVA

Scanning/Engraving unit AGM 493

5,240 mm (206")
 1,040 mm (41")
 1,335 mm (53")
 approx. 4,2 t (84 cwts.)

Machine control cabinet

600 mm (24")
 400 mm (16")
 1,800 mm (71")
 approx. 100 kg (2 cwts.)

Machine drive cabinet

900 mm (35")
 400 mm (16")
 1,800 mm (71")
 approx. 250 kg (5 cwts.)

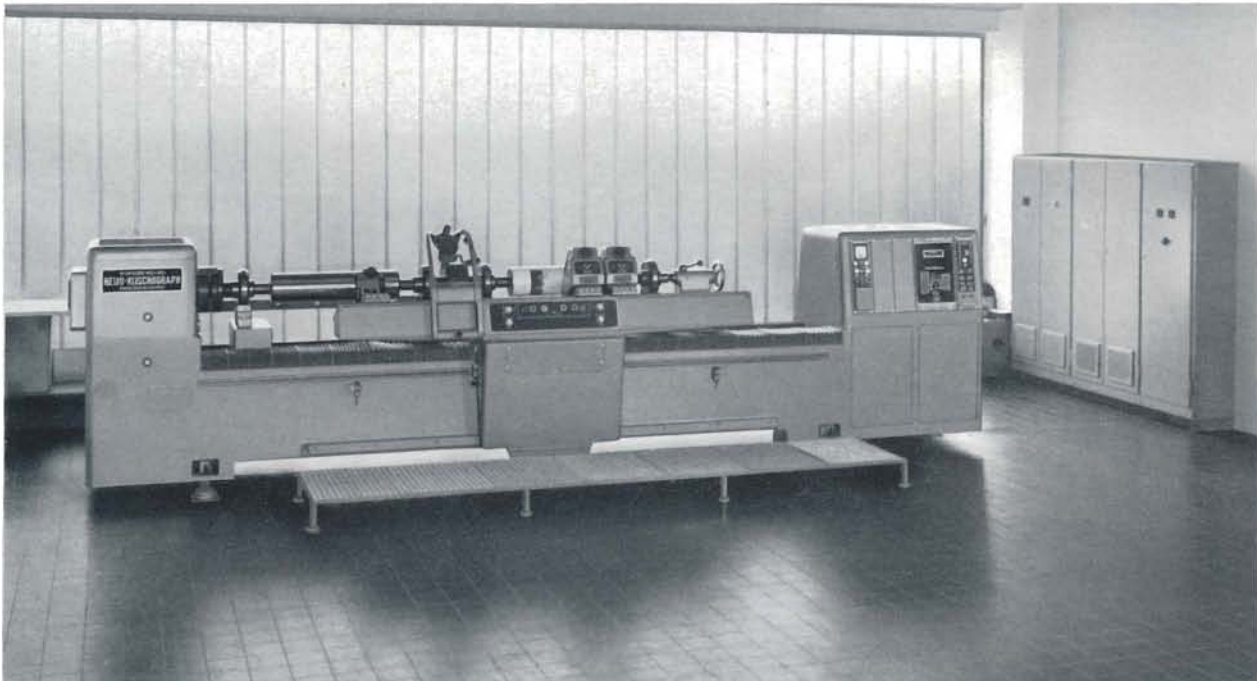
900 mm (35")
 400 mm (16")
 1,800 mm (71")
 approx. 100 kg (2 cwts.)

for decorative printing
 for mains voltages differing from 220/380 volts
 for two tube cylinders
 by 500 mm (20") for cylinder lengths up to 1550 mm (61")
 by 1,000 mm (39") for cylinder lengths up to 1800 mm (71")

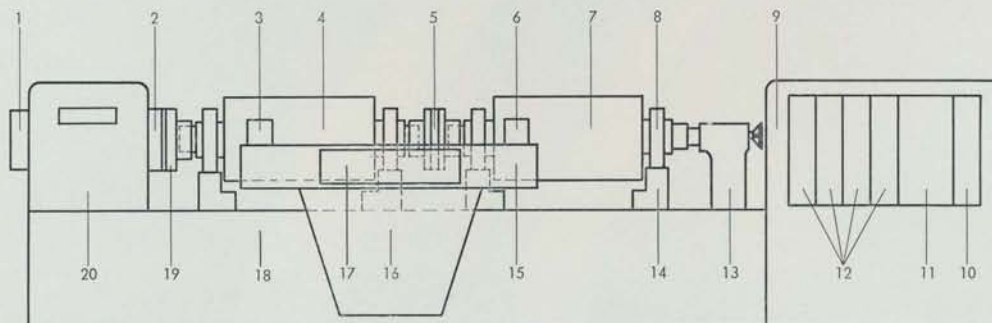
to 2,000 mm (79")
 to 2,250 mm (89")
 to 2,500 mm (98")

Copy cylinder
 including 2 bearings and 1 coupling flange
 Register punch
 Engraving test equipment DURIMET

Helio-Klischograph K 493



Combined Scanning and Engraving Machine Type K 493 (Tandem Machine). The machine shown is designed for seamless decorative printing of veneers and used by Messrs. Hueck & Cie Pirkühle, 848 Weiden/Oberpfalz, Postfach 106, Germany.



- | | | | |
|-------------------|---------------------------|----------------------|------------------------|
| 1 Seam drop-out | 6 Engraving heads | 11 Switching plug-in | 16 Base carrier |
| 2 Drive coupling | 7 Printing cylinder | 12 Computer inserts | 17 Operating panel |
| 3 Scanning heads | 8 Cylinder bearing | 13 Tailstock | 18 Machine bed |
| 4 Copy cylinder | 9 Switchboard compartment | 14 Bearing support | 19 Coupling flange |
| 5 Central bearing | 10 Monitor unit | 15 Equipment carrier | 20 Driving compartment |

HELL

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