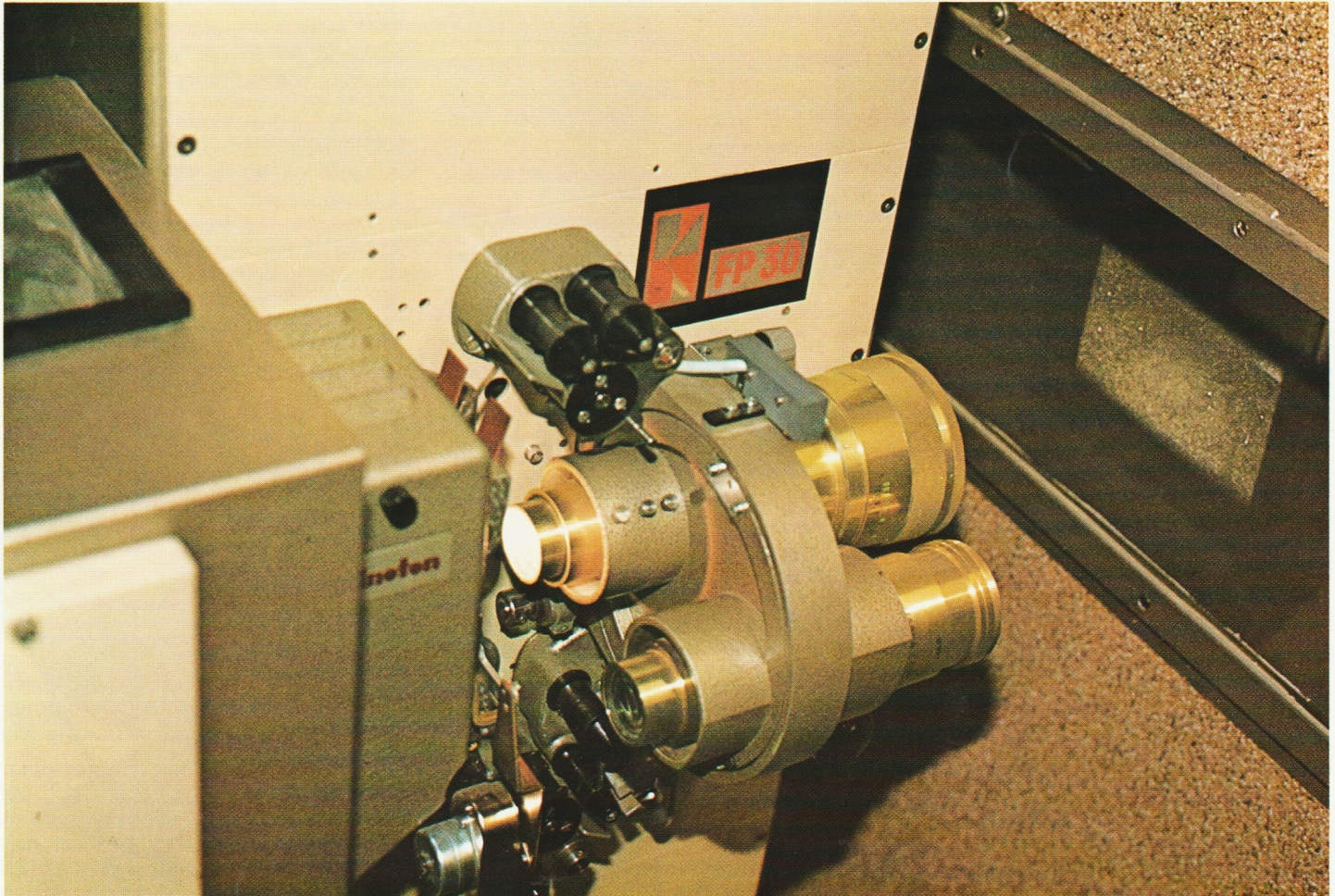




Light sources

The answer to the question which light sources should be used for the projection, depends from case on the picture dimensions, on the reflection factor of the screen and on economical arguments. Appropriate light sources are available for all purposes. Originally our lamp houses were designed for our own extensive programme of projectors, but nowadays they are frequently being used with excellent results also as light sources for projectors of other types of projector.

- the adequate light source for any picture size
- optimal luminous efficiency
- ozon-free xenon lamps
- the use of a "cold" mirror prevents the film from being exposed to excessive temperatures, even at a large light output
- the operation is controlled fully automatically by the projector
- many possibilities of adaption to a great diversity of projectors



700/1600 W attachable xenon lamp house

The xenon 700/1600 W lamp house for 35 mm and for 16 mm projectors is characterized by its compact construction, its possibilities of being optimally adjusted and its perfect illumination optics. The lamp house can supply an adequate luminous flux for the screen of auditoriums with up to 700 seats.

In a lamp house with a length of only 22" (56 cm), a width of 13,4" (34 cm) and a height of 17,3" (44 cm), which can be bolted directly to the housing of the projector, the xenon block for 700 W, 1000 W or 1600 W lamps has been accommodated.

duction of the central adjustment permits the mirror to be mounted in a fixed position, coinciding exactly with the optical axis. For the alignment the horizontally mounted xenon lamp can be adjusted in three planes (horizontally, vertically and axially) with respect to the mirror. The latter remains exactly in the optical axis, the greatest part of the reflected light reaches the screen via the aperture plate, and the luminous efficiency is optimal.

Cooling

A powerful blower ensures the required cooling of the xenon lamp. The blower is so positioned that the air flow coaxially sur-

At the rear of the lamp house a counter that indicates the number of hours during which the lamp has been operating, and an easily readable ammeter have been provided. Precautions have been taken to prevent the lamp from being operated unless the air cooling is working and the doors are secured.

The xenon building block can also be supplied with its mirror and ignition circuit, but without its housing, to be built into available lamp houses. The latter must satisfy the following requirements. The free width must be at least 11,8" (30 cm), the free height at least 15 $\frac{3}{4}$ " (40 cm) and the length should be such that the distance between the aperture plate and the vertex of the mirror of the built-in lamp lies between 21 $\frac{1}{4}$ " (540 mm) and 23,6" (600 mm).

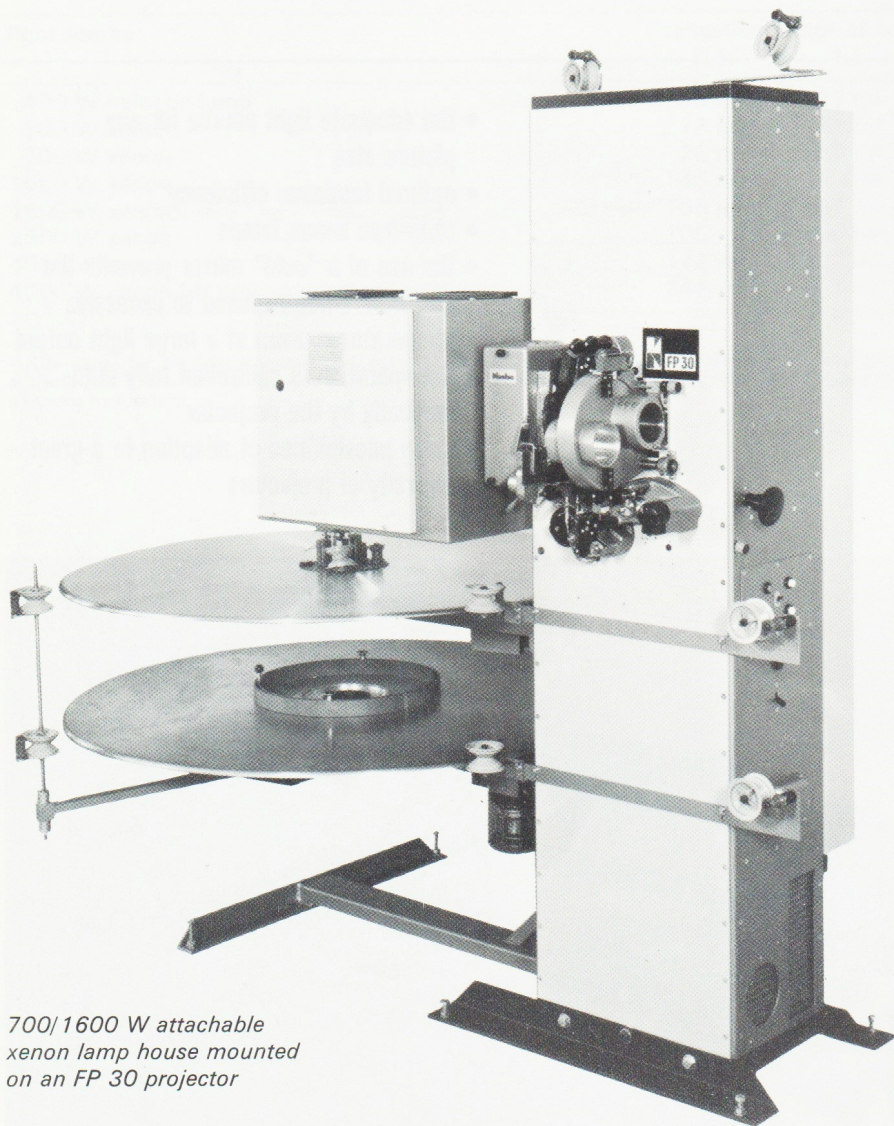
Occasionally projectors of former construction do not permit the lamp house to be mounted close to its housing because of the location of the upper spool box. In those cases use can be made of an intermediate frame designed for this purpose.

The voltage for feeding the xenon lamp is supplied by a rectifier. For the 700 W lamp the maximum current amounts to 37 A, for the 1000 W lamp it is 50 A, and for the 1600 W lamp the maximum current is 65 A. The lamps produce no ozon during operation. Rectifiers for a power of up to 1000 W can be mounted directly into the column of the FP 30 projector.

Like all our light sources, the lamp house can be supplied for connection to the 220 V, 50 Hz mains or to the 110 V, 60 Hz mains.

700/1600 W xenon lamp house for mounting on a lamp-house bracket

The xenon block of the lamp house for mounting on a bracket is identical to that of the attachable lamp house described above.



700/1600 W attachable xenon lamp house mounted on an FP 30 projector

Optical system

The arc of the xenon lamp is accurately stabilized by a magnet which has been adjusted before delivery. The optical system consists of an elliptical mirror with a diameter of 11" (280 mm) it can be supplied as a "cold" or as a "warm" mirror.

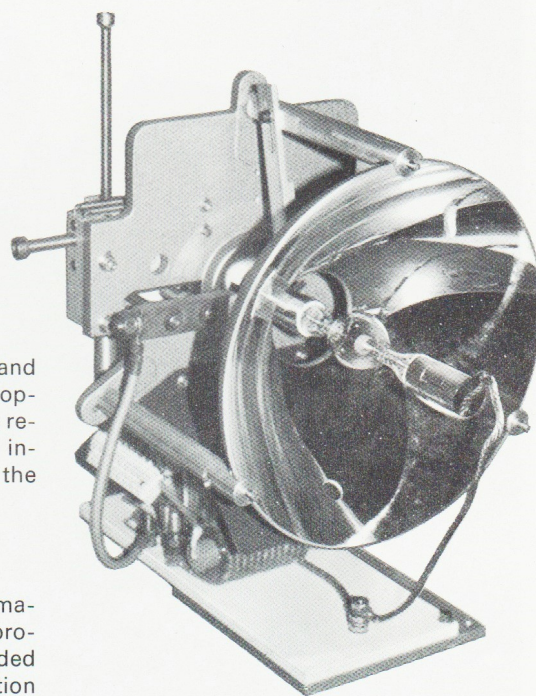
Central adjustment

A significant advantage with respect to conventional xenon lamps has been achieved by the central adjustment. Whereas in the past the mirror had to be adjusted for aligning the light source (which unavoidably often led to luminous losses), the intro-

rounds the horizontally mounted lamp and cools it uniformly. Two fans rotating in opposite directions ensure that the heat is removed from the lamp house. The one injects fresh air, the other removes the heated air.

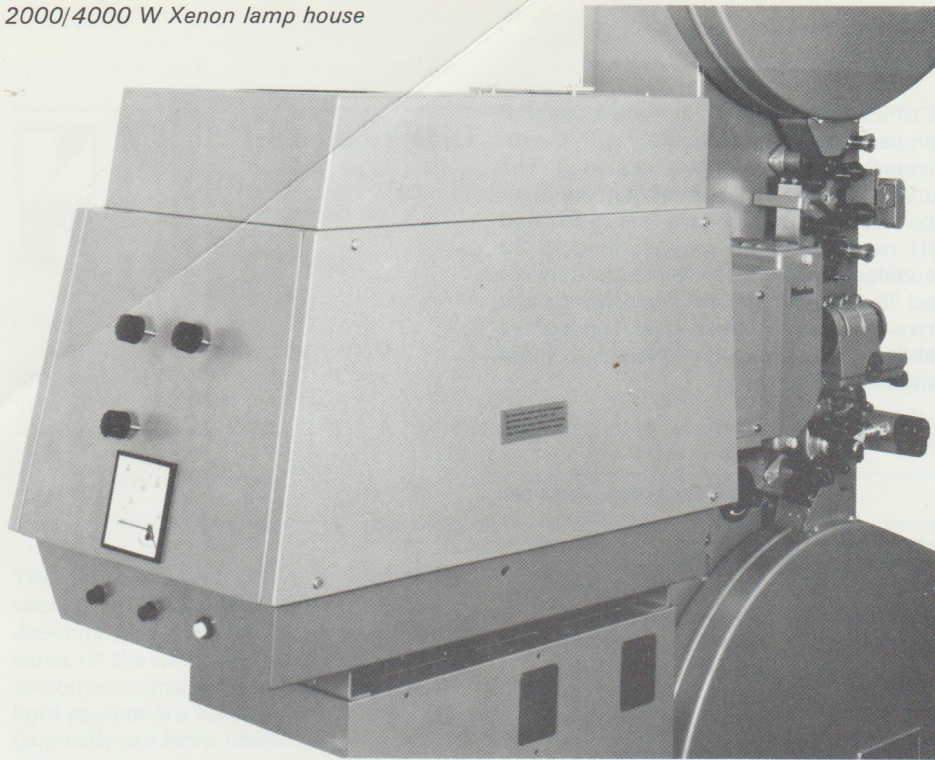
Ignition

Although the lamp can be ignited automatically, as is the case with all Kinoton projectors, a press button has been provided for igniting the lamp manually. The ignition device is mounted on the support of the xenon building block and protected against heat radiation.



Xenon building block with mirror and ignition circuit

2000/4000 W Xenon lamp house



Recourse must be had to mounting the lamp house on a bracket if it is used in combination with a projector to which the lamp house cannot be fixed. The optical axis is situated 8,9" (226 mm) above the bottom plate of the lamp house. For projectors the bracket of which cannot be raised to the required height, auxiliary spacers can be interposed.

In this lamp house a mirror is used which has a longer focal length than employed in the previously described version. The distance between the aperture plate and the vertex of the mirror has been increased to 28 $\frac{3}{4}$ " (730 mm). As a result the dimensions of the housing had to be modified; the length is 35" (89 cm), the width 17,7" (45 cm) and the height 22" (56 cm). The optical and technical properties of both types, including the method of wiring the installation, are identical.

The 700/1600 W bracket type lamp house is of particular interest to be used as the light source of 35/16 mm dual-purpose projectors, such as the FP 38. A light change-over device, specially designed for this purpose, permits full illumination of the 35 mm aperture plate, or – by revolving a converting optical system so as to enter the light beam – projection of the 16 mm film.

2000/4000 W xenon lamp house

The 2000/4000 W lamp house was developed for satisfying the most stringent demands as regards luminous flux, as required by the largest auditoriums, including drive-in cinemas.

In this lamp house, too, the optical axis is 8,8" (226 mm) above the bottom plate, but the housing and the xenon block are larger than those of the previously mentioned 700/1600 W types and allow the use of horizontal xenon lamps with a power of 2000, 2500, 3000 or 4000 W. For the latter type of lamp it is imperative to use a "cold" mir-

ror, additional cooling and heat filters to cope with the greater amount of heat produced.

It should be recognized that with the horizontal 4000 W lamp the same luminous flux is obtained as with the former vertically mounted 6500 W xenon lamp.

For projecting 70 mm films, a cylindrical lens adapts the light beam to the wider aperture plate, thus ensuring optimal luminous efficiency.

The xenon lamp, which may be considered ozon-free, is fed by a rectifier. The maximum current is 95 A for 2500 W lamps and 140 A for 4000 W lamps.

500 W xenon lamp house

For small cinema theatres and pre-view rooms the 500 W lamp house is the ideal, compact light source.

Its housing with a length of only 8 $\frac{1}{4}$ " (21 cm), a width of 10,6" (27 cm) and a height of 13,4" (34 cm) accommodates in addition to the optical system the ignition equipment and the blower. This lamp house is fixed directly to the projector and can be used for the FP 30 projector as well as for the FP 18 projector.

The optical system consists of an elliptical "cold" mirror mounted in a holder with the mounting support for a 500 W xenon lamp, the arc of which is stabilized by means of a permanent magnet.

The supply voltage for the lamp is obtained from a rectifier that can be accommodated in the column of the projector. The maximum current amounts to 28 A. The xenon lamp may be considered to produce no ozon.

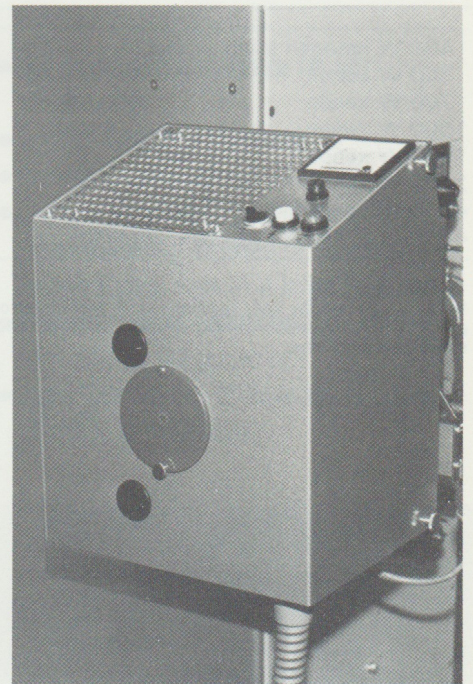
Halogen lamp

The halogen lamp is the most compact light source; it is used in those cases where particularly little space is available. It requires no lamp house, and the complete unit is ac-

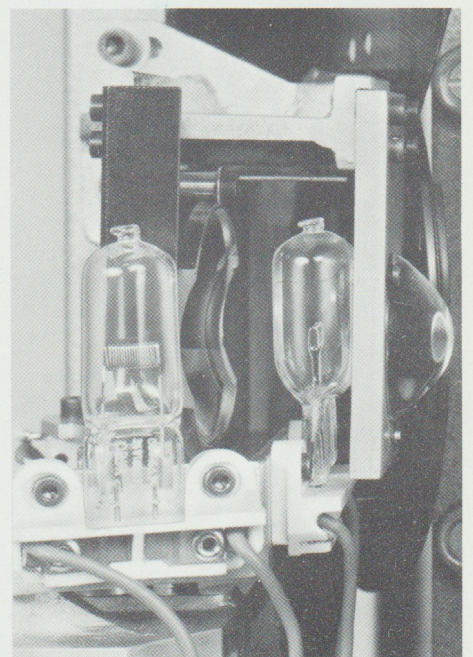
comodated in the shutter housing of the projector.

Two halogen lamps can be inserted in a turret. Upon failure of one of the lamps, an electronically controlled device energizes a solenoid which rotates the turret so that the other lamp is put into operation.

For the 35 mm projectors FP 30, FP 20, FP 23 etc., 36 V/400 W halogen lamps are used; the 16 mm film projectors FP 18 and the 16 mm projection part of the dual-purpose projector FP 28 are equipped with 24 W/250 V halogen lamps. The optical system consists of a "cold light" mirror, an aspherical condensor and an aperture lens adapted to the focal length of the projection lens employed.



500 W Xenon lamp house



Lamp turret for 2 halogen lamps
36 V/400 W built-in in FP 30

The required cooling is obtained by means of the shutter, which has been given the form of a fan.

The supply of the halogen lamps is provided by a transformer built into the projectors.

Picture size

The choice of the appropriate lamp house is facilitated by consulting the survey below

in which the maximum surface areas that can be illuminated adequately with the individual light sources are tabulated. The survey is based on the minimum illumination laid down in standard DIN 15 571 and ISO recommendations, amounting to 30 candelas per m² for enclosed auditoriums and 15 candelas per m² for open-air and drive-in cinemas; the values quoted are valid for the luminous efficiency of our range of projectors¹⁾:

light source	reflection factor of screen	
	0,8	1,5
400 W halogen lamp	15 m ²	27 m ²
500 W xenon	17 m ²	31 m ²
700 W xenon	26 m ²	47 m ²
1000 W xenon	45 m ²	80 m ²
1600 W xenon	65 m ²	117 m ²
2500 W xenon	105 m ²	190 m ²
4000 W xenon	172 m ²	310 m ²
4000 W xenon for drive-in cinemas	344 m ²	—

¹⁾ The values for the light sources alone, without account being taken of the inherent losses occurring in the projector, or the values for screens defined according to other standards must first be converted to allow a reliable comparison.