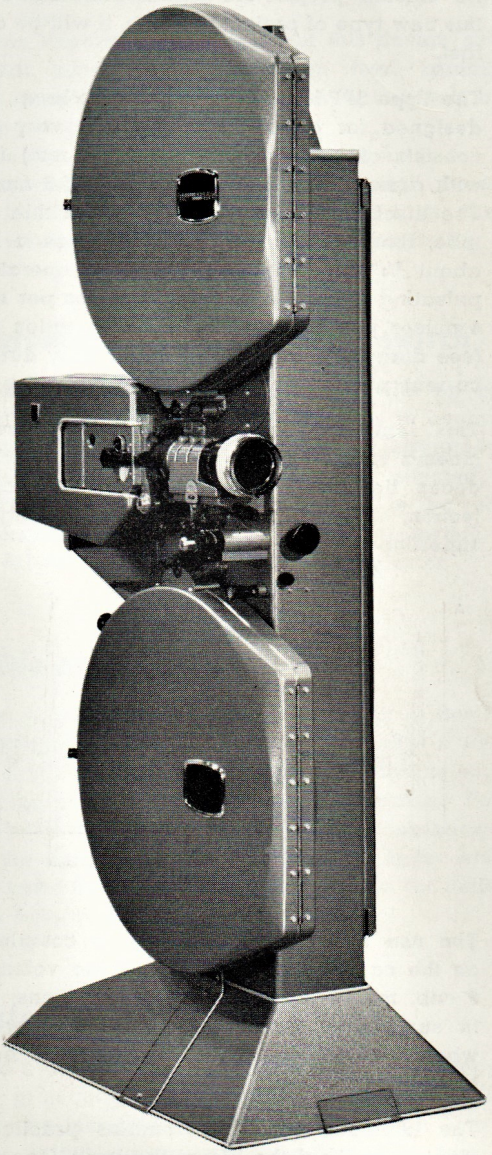
PHILIPS

Projector FP 25 S
with pulsed discharge lamp SPP 1000



This projector is intended for the projection of 25 frames per second. It is equipped with a synchronous motor and operates in conjunction with a simple pulsator. Its principal features are:

- Maximum reliability.
- Suitable for all kinds of 35 mm films.
- Easy operation.
- Simple film threading.
- Faultless running of the film.
- Minimum stress on the film and minimum heating.
- Very little maintenance.
- Automatic change-over to stand-by projection lamp.
- Saving of space in the projection room.
- Facilities for automatic change-over from one projector to the other.
- Facilities for remote focusing control.

Pulsed discharge lamp

- Great economy.
- Flicker-free projection, even at very high screen brilliance.
- Constant light output, irrespective of the number of operating hours.
- Perfectly uniform brightness on the screen.
- No rotary shutter.
- No flue or exhaust system.
- No arc adjustment.

The projector can be supplied with optical soundhead or with both optical and magnetic soundheads.

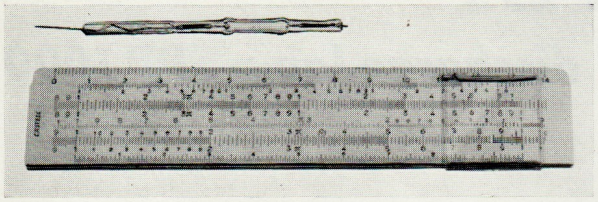
Cinema

Projector FP 25 S

PHILIPS

Cat. A-II-27-E

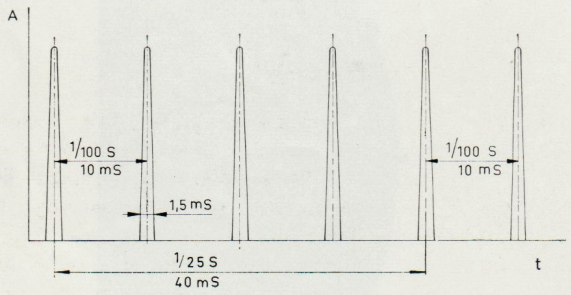
Pulsed discharge lamp SPP 1000



As cinema proprietors will be interested most in this new type of projection lamp, it will be described first.

The Type SPP 1000 pulsed discharge lamp, specially designed for cinema projection, is very small. It consists of a quartz tube 3⅛" (80 mm) in length, with a maximum diameter of 7/32" (5.6 mm).
The discharge takes place inside a thin capillary tube, the luminous part of which has a length of about ⅝" (16 mm). The lamp is operated by a pulsating direct current of 100 pulses per second or 4 pulses per frame, each with a duration of 1.5 ms (see diagram). Light is produced only during these current pulses; in the intervals the lamp is dark.

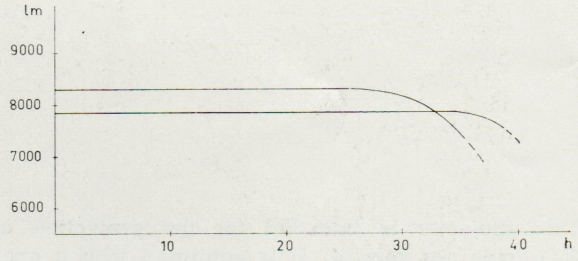
This lamp at last fulfils the old dream of the cinema technicians, viz. a light source which produces light only while required for actual projection, thus making the "light-devouring" shutter superfluous.



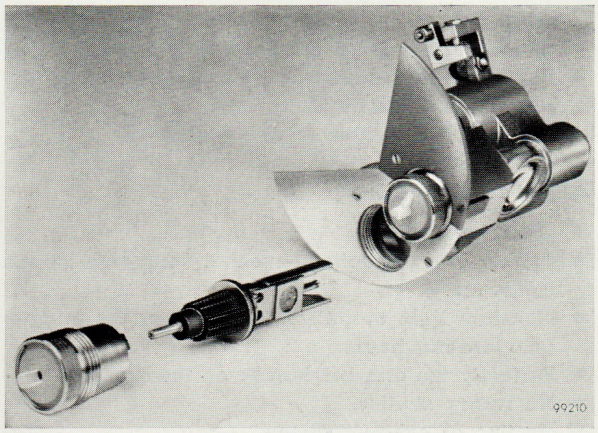
The use of the SPP 1000 lamp is completely safe as the capillary tube has a minute volume (about 3 cub. mm). Under operating conditions, the lamp is surrounded by a flow of cooling water, and when it is not on, the gas pressure is below that of the atmosphere.

The luminous efficiency remains practically constant throughout the life of the lamp (see diagram). In contrast to incandescent lamps or carbon arc lamps, the light output decreases no more than proportionally with the load. The extremely high brilliancy during the pulse peaks—during which values of ten times the mean value are reached—ensures uniform spectral energy distribution and hence excellent rendering of colour films. Moreover, the film is exposed to less heating, ultraviolet radiation being eliminated by an absorption filter contained in the lamp holder while the infrared is absorbed by the cooling water.

The difference in luminous flux between individual lamps is only a few per cent. Consequently, there is no objection against employing an older lamp in one projector and a new lamp in the other projector.



The projector is equipped with a turret fitted with two lamps. Normally, the lower lamp is in operation. If it breaks down, the turret pivots *automatically* and the upper lamp takes the place of the lower one with practically no delay. The defective lamp can be replaced and the turret turned up again *during the performance*, thus re-establishing the automatic stand-by for the lamp in operation.

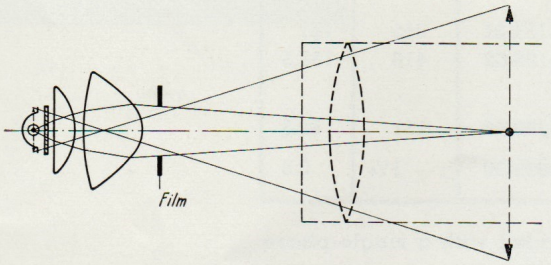


The lamp can operate at any wattage between 850 and 1000 W.

Optical system

Since the lamp is small and may be placed without any risk in the immediate vicinity of the picture gate, the optical system can likewise be small (see sketch).

It consists of a cylindrical reflector of only 7/16" x 3/8" (11 x 9 mm) and two lenses, which form an image of the lamp directly in the projection lens. This explains the exceptional uniformity of the light distribution, the side-to-centre ratio being about 95 %.



Each film frame receives four flashes whilst stationary. During the pull-down period, the lamp is completely dark. The dark periods are sufficiently long to permit of the use of a normal intermittent system with a 90° Maltese cross. No rotary shutter is required. All the light produced is completely utilised for projection instead of about half of it being lost because of the shutter. The lamp, operated at 1000 W, produces the same luminous flux on the screen as a H.I.-arc of 80 A.

Construction of the projector

Rectangular steel housing

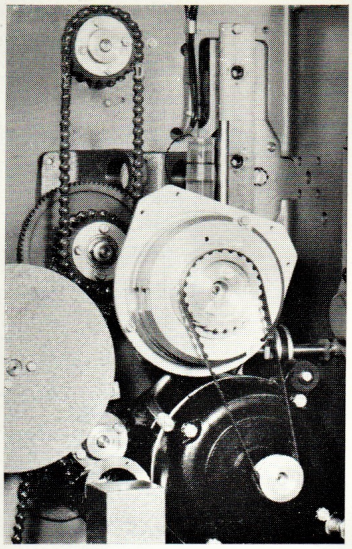
The skeleton of the projector consists of a rectangular sheet-steel housing. Its front panel is completely flat so that components subsequently to be fitted will not require any special alignment to ensure a smooth running of the film. Projection up to 15° upwards or 25° downwards is possible by tilting the whole housing with respect to its base.

Simple driving mechanism

Thanks to the ingenious combination of various transmission systems and a new central framing device, the driving mechanism is extremely simple. The feed and the hold-back sprocket as well as the lower spool are driven by chains. These are slow-running on chain-wheels of a synthetic material that is practically indestructible and ensures absolutely silent operation.

The new framing device requires no phase correction and hence no gear transmission for this purpose.

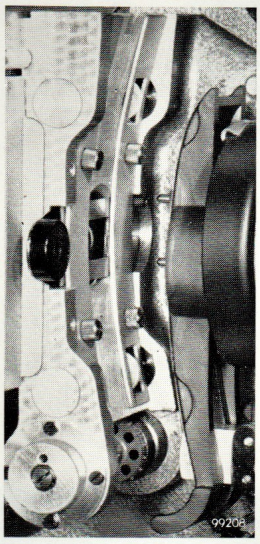
All the spindles and shafts run in sealed ball-bearings, requiring no lubrication, and all the guide rollers are made of self-lubricating material.



The oil bath of the Maltese cross is fully enclosed and easy to replenish. The risk of oil splashes on the film is thus eliminated and the driving mechanism does not need to be housed in a sealed compartment; it is therefore readily accessible at all times.

Film path

The carefully designed film path is simple and logical. As several functions have been combined, the number of parts is surprisingly small. Thus, the feed and the hold-back sprocket serve also as fire-trap rollers, while the pressure skates and the pad shoe of the intermittent sprocket constitute a single unit. The number of manipulations for threading the film is therefore less than ever before.



Film gate

On account of the excellent experience obtained with the Philips projector for 70 mm films, the FP 25 S projector is also equipped with a curved film gate which ensures perfect steadiness of the picture both vertically and horizontally.

The runner strips can easily be replaced, without the use of tools. Novotext, steel or velvet-covered strips can be used; the left-hand and the right-hand strips can be interchanged, which doubles

their life. Moreover, the three kinds of strips can be turned over, the velvet-covered ones then being used as plain steel strips.

The length of the film gate and of the pressure skates is such that splices enter and leave the gate at the lowest possible speed of the film. Consequently there is hardly any risk of their breaking.

The film is guided laterally by four ceramic rollers, two at the top and two at the bottom of the film gate, which can easily be replaced if necessary.

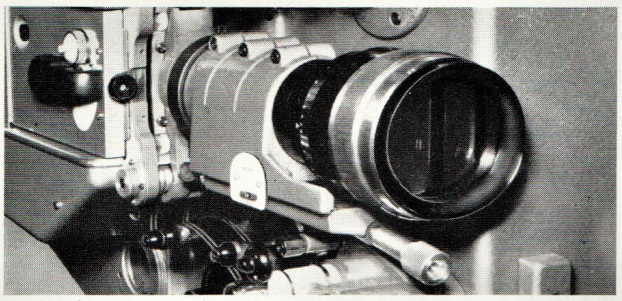
The skate pressure is adjusted with one central knob; a scale facilitates checking and re-adjustment.

The aperture plates for different aspect ratios are inserted into a slit directly behind the gate; they snap automatically into their correct position and can readily be interchanged, even during projection.

Intermittent mechanism

The film is moved by means of a normal 90° Maltese cross, made of the same high-quality material and with the same precision as that of other Philips projectors. Thanks to the light weight of the intermittent sprocket, its wear is reduced to a minimum.

Lens holder



The lens holder is suitable for lenses with a diameter of up to 70.6 mm ($2^{25}/_{32}$"). It slides over a sturdy support fixed to the projector. The fine-focusing screw, in conjunction with a pressure spring, makes it possible to shift the lens without any backlash.

The lens holder with lens can be taken from the support in a single manipulation so that, for change-over to another aspect ratio, it can readily be replaced by a holder fitted with the requisite lens. During installation the lenses are so adjusted in their holders that they can be interchanged without any re-focusing apart from a possible correction imposed by the film itself. A scale has been provided for checking the focusing.

On request, the projector can be equipped with an electric remote-control device for adjusting the focus from any part of the theatre.

Automatic film-rupture switch

This is a safety device in the film path. As soon as the upper film loop becomes too large—for example in the event of film rupture—it operates a micro-switch which at the slightest pressure switches off the motor and the projection lamp.

Centrifugal switch

This switch, located in the lower spool box, is driven by the film; in the event of film rupture or if the film is not fixed correctly to the lower film spool it automatically switches off the motor and the projection lamp.

"Start/Change-over/Stop" switch

Starting, changing-over and stopping of the projector are effected with a single switch, which greatly facilitates operation. As soon as—after starting of the motor—the film has reached sufficient speed, the lamp is switched on automatically. Motor and lamp are switched off together.

Furthermore, this switch can be used for the rapid finding of the starting frame by pushing it quickly up and down; the film is thereby moved forward a short distance.

Synchronisation

The pulse frequency (and hence also the flash frequency of the SPP lamp) is 100 c/s. To ensure perfect synchronism between the flash-frequency and the intermittent movement of the film, the film speed has to be exactly 25 frames/s, each frame then being illuminated four times during its projection. To keep the film speed constant, the projector is equipped with a synchronous motor and a timing-belt transmission. The moment of film movement lies exactly between two consecutive pulses.

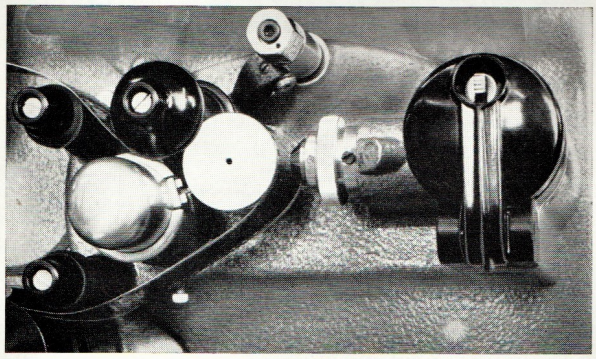
Spool boxes

As change-over to the stand-by projection lamp, in case of breakdown of the lamp in operation, takes place automatically, the projector can be operated continuously for an indefinite period. It is therefore generally equipped with spool boxes for 6000 ft (1800 m) of film, which represent a projection time of about one hour.
The upper spool box has a time scale and an inspection lamp.

Soundheads

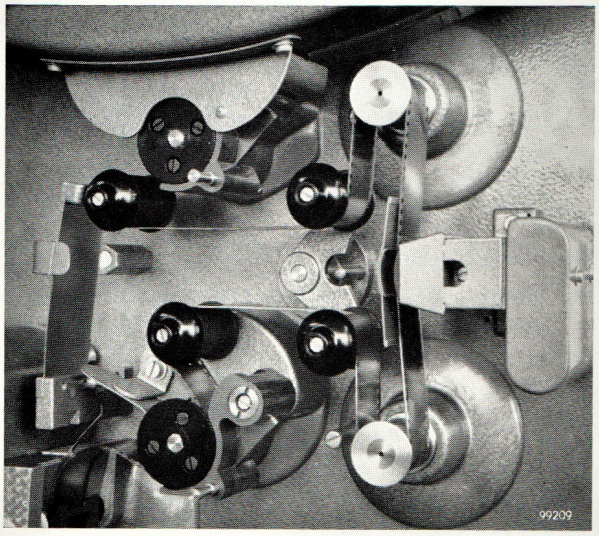
The projector can be equipped with both a magnetic and an optical soundhead. These form separate units which can easily be fitted and removed. The necessary mounting holes for the soundheads are already provided in the projector cabinet. When they are not used, they are covered by an inconspicuous round plate.

Optical soundhead



This soundhead is of the same construction as that of the other well-known Philips projectors. The sound drum is driven by the film. The starting time is only about 3 seconds and a very small pull is sufficient to keep the drum rotating at its rated velocity. The film is therefore not stretched between the sound drum and the take-up sprocket but forms a slack loop which absorbs all the small shocks caused by the teeth engaging in the film perforations, thereby precluding any risk of hoarseness on account of sprocket modulation.

Magnetic soundhead



The magnetic soundhead has two sound drums, running in precision ball-bearings and provided with heavy flywheels, and a head assembly for one-to-four-track reproduction. If a magnetic soundhead is used, the projector is equipped with two feed sprockets, the upper one for pulling the film from the reel and the lower one for pulling it through the soundhead.

The requisite tension in the piece of film between the two feed sprockets is obtained by means of spring-loaded rollers.

Some important advantages of this design over the usual construction—where the feed sprocket is not coupled to the mechanism but driven by the film—are:

- lower stress on the film perforations;
- smoother running of the film through the soundhead, irregularities originating from the unwinding reel being completely excluded.

Automatic system-selector switch

If an FP 25 S projector equipped with an optical and a magnetic soundhead operates in conjunction with a Philips "OMA 4" amplifying equipment the choice "optical/magnetic" can be effected automatically when the film is threaded in the relevant soundhead by means of a selector switch, type EL 4214/00, to be mounted on the projector.

Slide attachment

The projector can be equipped with a device for projecting lantern slides of 3¼" x 4" (83 x 100 mm) or of 3¼" x 3¼" (83 x 83 mm). The light is supplied by the same lamp as for film projection. For this purpose the lamp turret can be pulled backwards in the lamp housing by means of a lever which at the same time inserts the mirror system for deflecting the light on to the slide attachment.

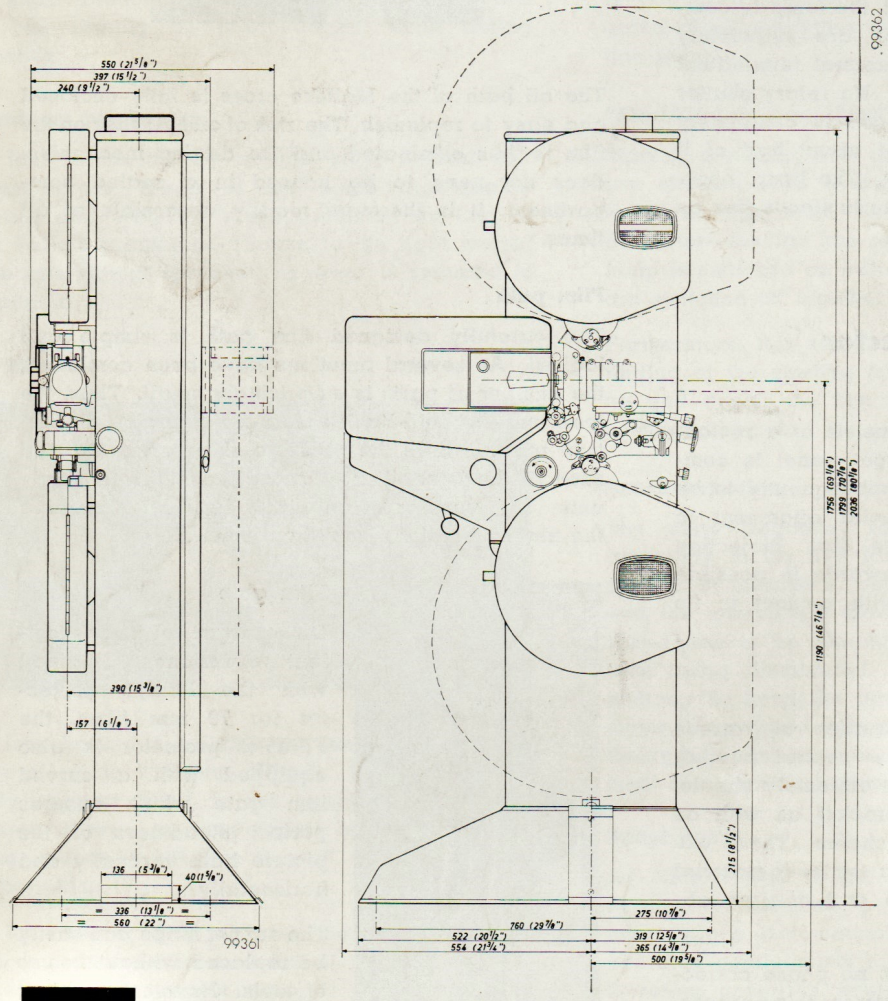
Pulsator

One pulsator per projector is used for the supply of the projection lamp. Like the customary rectifier, it may be installed in an adjoining room.
The output power can be adjusted in four steps between 850 and 1075 W, thus making it possible to obtain the correct load of the lamp in the event of overvoltage or undervoltage of the mains. To avoid overloading of the lamp a warning signal sounds as soon as the power of 1000 W is exceeded.

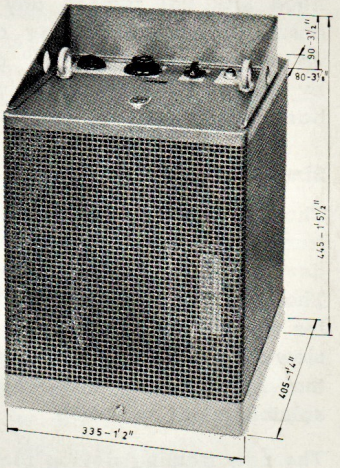
Type numbers and weights

Description	Type	Net weight	
		lb	kg
FP 25 S projector with optical soundhead and			
2000 ft (600 m) spool boxes	EL 4125/00	341	154.5
6000 ft (1800 m) spool boxes	EL 4125/02	401	182
FP 25 S projector with optical and with magnetic soundhead and			
2000 ft (600 m) spool boxes	EL 4125/01	355	161
6000 ft (1800 m) spool boxes	EL 4125/03	416	188.5
Single-phase synchronous pulsator	EL 5209/00	151	68.5
Lens holder	EL 4029/00	1¼	0.6

These projectors are optionally provided with a single-phase or a three-phase motor for 220 V, 50 c/s.



Pulsator



Data subject to change without notice

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