

ILFORD

**ILFOSPEED
MULTIGRADE
400**

OPERATING MANUAL

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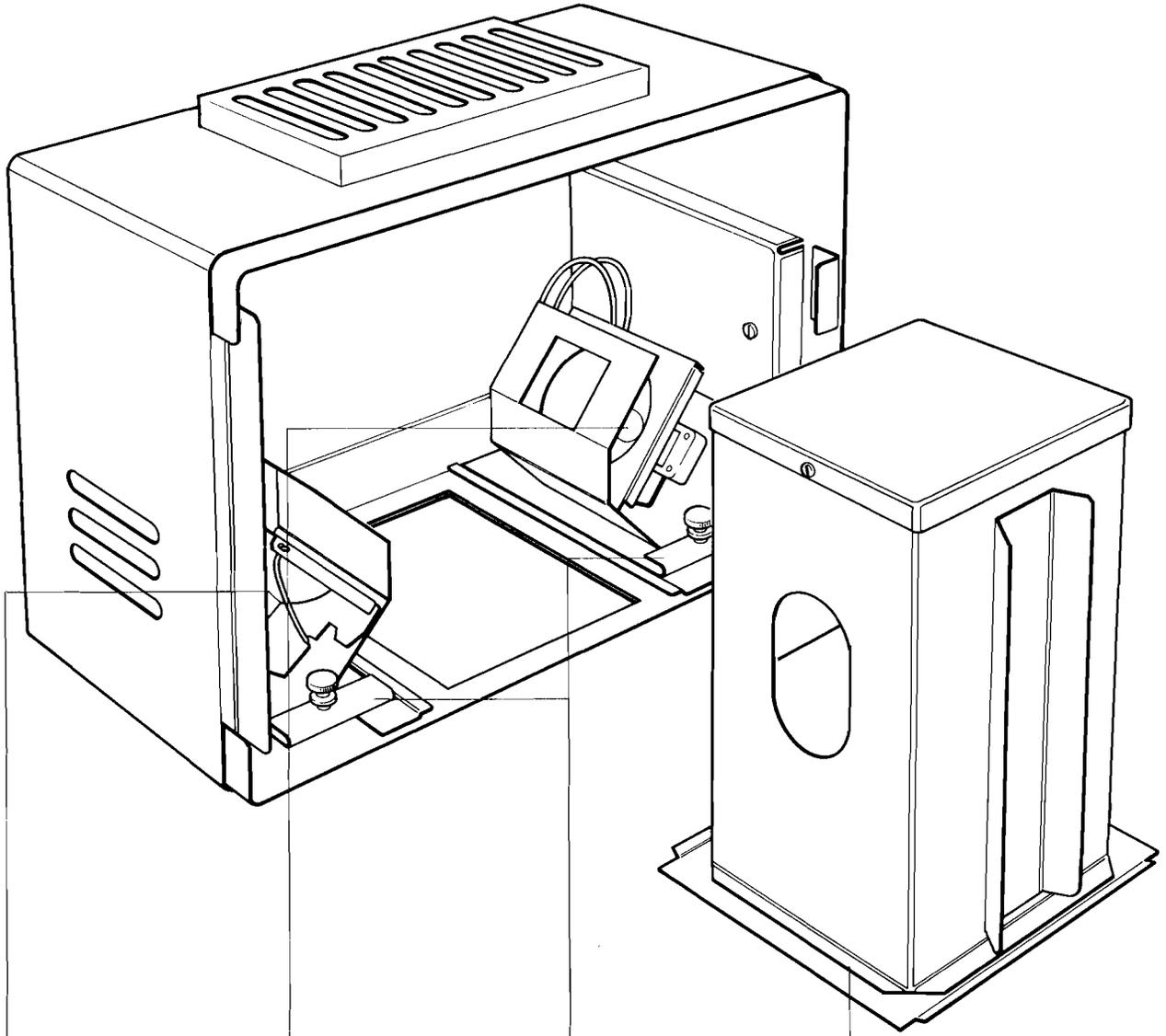
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INTRODUCTION

ILFORD ILFOSPEED MULTIGRADE 400 equipment offers the black and white printer the unique opportunity of contrast control at the push of a button, and with just one pack of paper – ILFOSPEED MULTIGRADE.

The equipment comprises the totally novel ILFOSPEED MULTIGRADE 400 enlarger head and ILFOSPEED MULTIGRADE 400C control unit and gives the printer a choice of nine half-grade contrast steps and equal exposure from grade to grade. With ILFOSPEED MULTIGRADE paper, the contrast range covers grades 0-4 of ILFOBROM and ILFOSPEED paper.

ILFOSPEED MULTIGRADE 400 is easy to install. It is also simple and straightforward to use. By following the operating instructions in this booklet, quality ILFOSPEED MULTIGRADE prints from almost any negative, together with continuous and reliable operation, are assured.



1 Light source and yellow dichroic filter

2 Light source and magenta dichroic filter

3 Lamp tracks

4 Light mixing box

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ILFOSPEED MULTIGRADE 400 ENLARGER HEAD

The ILFOSPEED MULTIGRADE 400 enlarger head replaces the standard condenser or cold cathode lamphouse used with most professional enlargers, and fits into place with the aid of specially designed adaptors.

The ILFOSPEED MULTIGRADE 400 enlarger head works in the following way. Two dichroic filters – one yellow and the other magenta – are installed within the enlarger head. By controlling the amount of light which passes through each filter, and this is controlled electronically, the colour of the light produced may be varied to give a large contrast range on ILFOSPEED MULTIGRADE paper. The light is produced by two quartz halogen lamps and, after passing through the filters, is diffused in a light mixing box to give even illumination.

The ILFOSPEED MULTIGRADE 400 enlarger head is available in two sizes.

2.1 ILFOSPEED MULTIGRADE 400HL

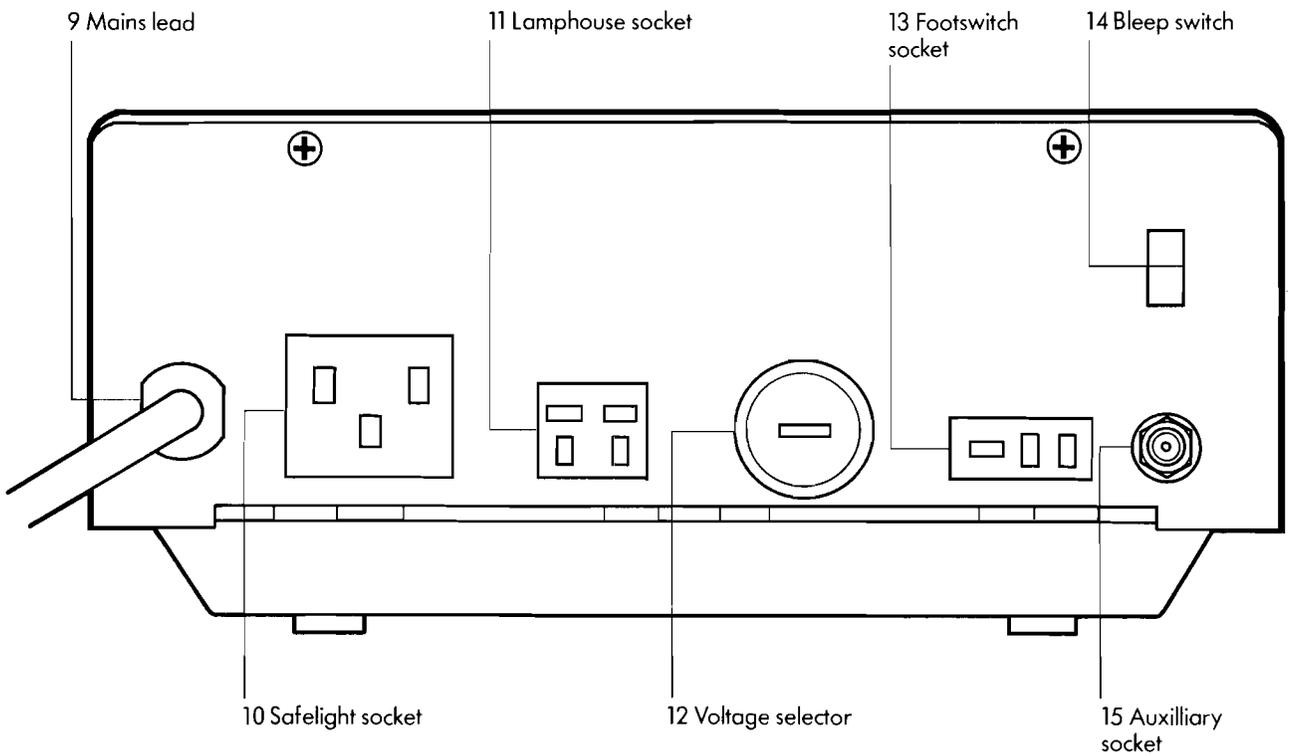
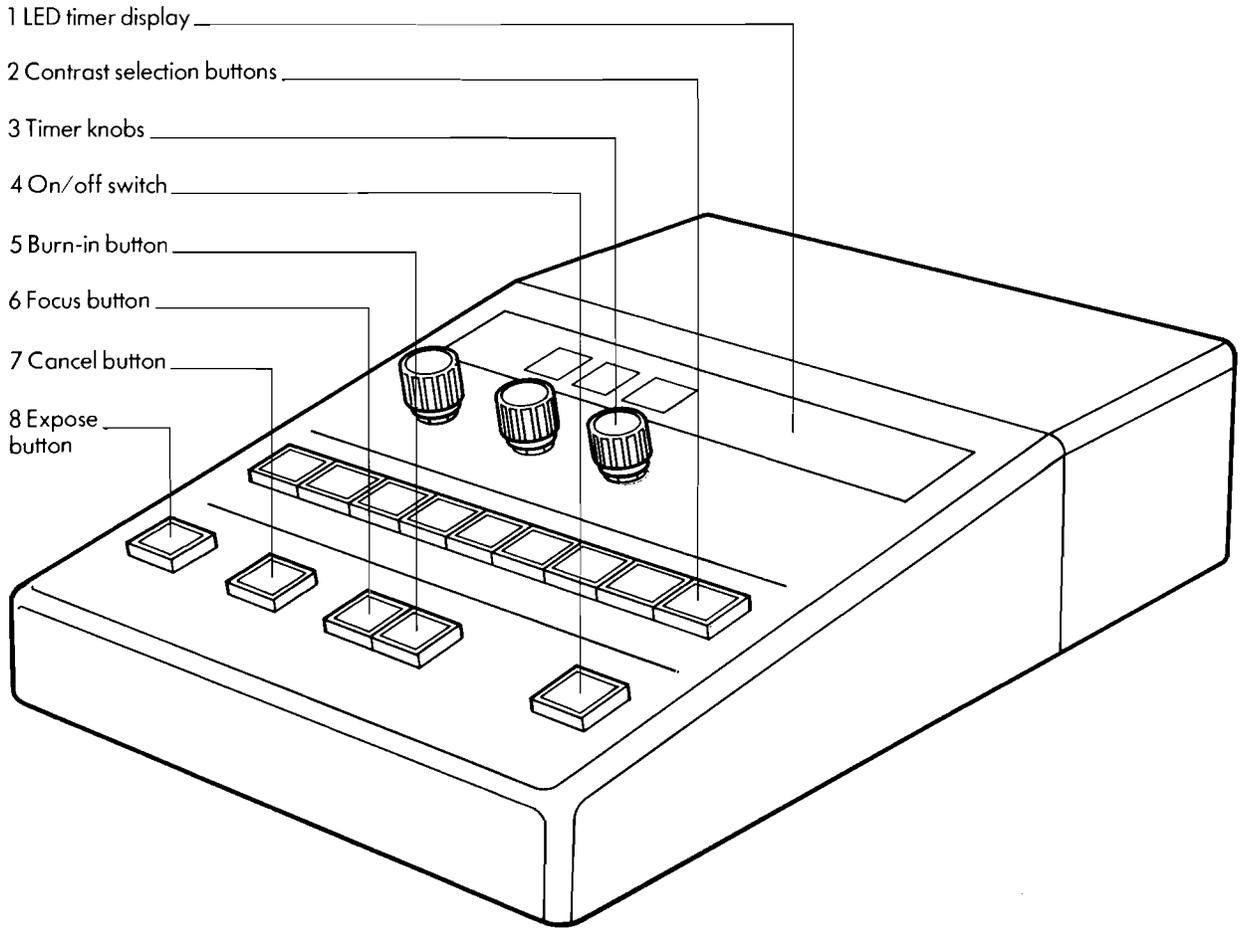
This enlarger head is designed for the larger format enlarger. This is supplied together with an adaptor kit and three light mixing boxes to optimise the light output for all negative sizes up to and including 4x5 inches. The following table gives the recommended light mixing box for each negative format.

Negative format	ILFOSPEED MULTIGRADE recommended mixing box
up to 35mm	400HL-M1 series
up to 6x7cm, greater than 35mm	400HL-M2 series
up to 4x5inch, greater than 6x7cm	400HL-M3 series

2.2 ILFOSPEED MULTIGRADE 400HS

This enlarger head is designed for the smaller format enlarger. This is supplied together with an adaptor kit and two light mixing boxes to optimise the light output for all negative sizes up to and including 6x7cm. The recommended light mixing box for each negative format is given below.

Negative format	ILFOSPEED MULTIGRADE recommended mixing box
up to 35mm	400HS-M1 series
up to 6x7cm, greater than 35mm	400HS-M2 series



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ILFOSPEED MULTIGRADE 400C CONTROL UNIT

The ILFOSPEED MULTIGRADE 400C control unit not only provides push-button contrast control, it also compensates for exposure differences when changing contrast. That is, provided the correct exposure has been given and it is only a change in contrast that is required, the ILFOSPEED MULTIGRADE 400C control unit automatically adjusts the intensity of the exposure to ensure exposure times remain the same right across the contrast range.

The control unit has nine contrast selection buttons, an extremely accurate timer, 'focus', 'expose', 'burn in' and 'cancel' modes, an optional once-a-second bleeper, safelight synchronisation and an input socket for operation by footswitch. It is suitable for use alongside the enlarger on the bench or wall mounted.

3.1 Contrast selection buttons

The nine contrast buttons are numbered 0-4 in half unit steps. The integral numbers correspond closely to the contrast grades of conventional paper. The half-grade selection buttons are for use with negatives that need a contrast grade between the usual grades.

Yellow light giving low contrast is produced by pressing button 0. Magenta light giving high contrast is produced by pressing button 4. The remaining contrast selection buttons give a contrast range between these extremes by mixing different amounts of the yellow and magenta light.

The control buttons on the ILFOSPEED MULTIGRADE 400C control unit are back illuminated for ease of use in the darkroom. When one of the contrast selection buttons is depressed, the intensity of the illumination for that button is increased, so it is possible to see, at a glance, which contrast has been selected.

3.2 Electronic timer

The electronic timer is extremely accurate and measures in tenth second intervals from 0.1 to 99.9 seconds. During exposure a three-digit LED display counts down in seconds until the last second, when tenths of seconds are displayed.

3.3 Bleeper

An audible signal is also fitted in the control unit which is set to operate in one second bleeps as the timer counts down to zero. The bleeper can also be used independently of the timer, and can be switched off when not required by pressing the switch down on the back of the control unit.

3.4 Safelight synchronisation

The control unit is designed to switch off the safe-lighting during focus, expose and burn in operations. For this purpose a safelight socket is provided at the rear of the control unit. A plug is supplied with the ILFOSPEED MULTIGRADE 400C control unit.

3.5 Voltage selection switch

Control units with a 220/240 V selection switch must be set to the appropriate voltage before use. This can be done by turning the slot on the voltage selection switch to the correct voltage by the use of a coin. Units without this switch have already been set to the correct voltage.

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ILFOSPEED MULTIGRADE 400F FOOTSWITCH

To leave both hands free for better print control, the ILFOSPEED MULTIGRADE 400F footswitch, available as an optional extra, can be connected to the back of the ILFOSPEED MULTIGRADE 400C control unit. The footswitch can be used in two ways.

1 To activate the electronic timer:
depress and release the footswitch immediately.
Electronically timed exposures can be stopped by depressing the footswitch a second time.

2 To time the exposure manually:
press the footswitch and keep it depressed for the required length of the exposure time. To stop the exposure, release the footswitch and press it a second time.

The bleeper may be used in conjunction with the footswitch and will enable consistent exposure times to be given during both the main exposure and also with subsequent burn in exposures.

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INSTALLATION

Fit the ILFOSPEED MULTIGRADE 400 enlarger head by following the instructions supplied with each adaptor kit. These instructions should be kept for future reference.

In countries where a plug is not supplied, connect a plug of at least two amp rating to the electrical lead from the control unit as follows:

Brown wire to the live pin (marked L)
Blue wire to the neutral pin (marked N)
Green/yellow wire to the earth pin (marked E or \perp)

If a fused plug is used it needs a three amp fuse.

If in doubt about making the electrical connections, consult a competent electrician. The electrical lead from the enlarger head should be plugged into the appropriate socket at the back of the control unit.

5.1 Installation checks

- 1 Connect the control unit to the electrical supply and switch on.
- 2 Press the 'On/off' switch on the control unit to the 'On' position.
- 3 Check that the control unit LED display lights up. The lens position does not display a zero. If the LED fails to light up, see section 10.
- 4 Open the front cover of the enlarger lamphouse.
- 5 Press the 'Focus' button.
- 6 Check that both lamps light up. Replace a faulty lamp as detailed in section 9.
- 7 Switch off the lamps by depressing the 'Cancel' button and close the front cover.

5.2 Safelight connection

The plug provided with the control unit should be attached to the safelight lead as follows:

Brown or red wire to the live pin (marked L)
Blue or black wire to the neutral pin (marked N)
Green/yellow or green wire to the earth pin (marked \perp)

If in doubt about making the electrical connections, consult a competent electrician.

5.3 Wall-mounting the control unit

Position two screws securely on the wall and hook the control unit onto them.

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CHANGING A LIGHT MIXING BOX

The ILFOSPEED MULTIGRADE 400 light mixing boxes are easy to change.

- 1 Press the cancel switch on the control unit.
- 2 Open the front cover of the enlarger lamphouse.
- 3 Release the locking nuts and slide the lampholders sideways for clearance.
- 4 Two types of light mixing box are supplied depending on the enlarger model: the 'slide in' type and the 'drop in' type.
'Slide in' type: slide the light mixing box towards the front of the enlarger head and out.
'Drop in' type: lift the light mixing box up and out of the recess in the enlarger head. For 35mm negatives a mask and the smaller drop in light mixing box should be used – see the adaptor kit instructions.

To fit a different light mixing box simply reverse these instructions taking care to ensure that the light mixing box is fully seated in the enlarger head, and the lamps are touching the side of the light mixing box.

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MAKING ILFOSPEED MULTIGRADE PRINTS

- 1 Ensure the appropriate light mixing box is fitted.
- 2 Press the 'On/off' switch on the control unit to the 'On' position.
- 3 Place the negative in the negative carrier of the enlarger.
- 4 Press the 'Focus' button.
Light suitable for focusing, composition and assessment of exposure and contrast is now produced by the enlarger head. Single exposures of more than 15 minutes should not be given.

WARNING

If the focusing light is left on for more than 15 minutes a thermal cut-out will switch off the enlarger illumination. This prevents overheating and damage to the polystyrene in the light mixing box. The lamps will remain off for about 30 minutes and then reset automatically.

- 5 Press the 'Cancel' button.
This cancels the 'Focus' mode and switches off the enlarger illumination.
- 6 Select the contrast required.
The integral numbers on the contrast selection buttons of the control unit correspond closely to ILFOBROM and ILFOSPEED contrast grades. For example, to make prints from negatives normally requiring grade 2 ILFOBROM and ILFOSPEED paper, contrast button 2 should be depressed.
For negatives that need a contrast grade between the usual grades, the half grade contrast selection buttons can be used.
- 7 Set the timer for the estimated exposure.
The exposure time selected will be displayed on the control panel.
- 8 Place a sheet of ILFOSPEED MULTIGRADE paper on the enlarger easel, and expose it by pressing the 'Expose' button.

The light now projected from the ILFOSPEED MULTIGRADE 400 enlarger head will be a mixture of yellow and magenta light depending on the contrast selection button depressed. As the exposure progresses, the illuminated display will be seen to count down in seconds with tenths of seconds displayed for the final second, until the exposure is complete, when the enlarger lamps are automatically switched off.

- 9 Give additional exposure to local areas of the print as required. This can be done by (i) depressing the 'Burn in' button and timing the exposure manually with the aid of the bleeper, (to stop the exposure, press the 'Cancel' button), (ii) using the electronic timer in the normal way, (iii) using the footswitch (see section 4).

Any contrast selection button may be used when giving additional exposure.

- 10 Process the exposed ILFOSPEED MULTIGRADE paper.

This may be dish processed using ILFOSPEED MULTIGRADE developer and ILFOSPEED fixer, and dried through the ILFOSPEED 5250 dryer, or machine processed in the ILFOSPEED 2000 series processors with ILFOSPEED 2000 chemistry.

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11 Check print contrast. If the contrast of the print is judged to be too hard or too soft, but the density is correct, then a new print may be made as before but with an alternative contrast selection button depressed – the exposure time need not be changed. This is because the light intensity is adjusted electronically for each contrast setting.

Prints from graded paper, such as ILFOSPEED, can be made using the ILFOSPEED MULTIGRADE 400 enlarger head and ILFOSPEED MULTIGRADE 400C control unit. Simply depress the 1½ contrast selection button and expose the paper using the electronic timer in the normal way.

CLEANING

It may be necessary to occasionally dust out the light mixing boxes.

- 1 Undo the two small screws securing the top of the light mixing box, remove the cover and polystyrene reflector.
- 2 Invert the box and dust out the interior with a small, soft brush, allowing dust particles to drop out.
- 3 Replace the polystyrene reflector, top cover and two screws.

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ENLARGER LAMP REPLACEMENT

Before carrying out the following operation, disconnect the lamphouse electrical supply plug from the back of the control unit.

WARNING Allow the lamp to cool for a few minutes before replacing.

- 1 Open the front cover on the enlarger lamphouse.
- 2 Release the locking nut and slide the lamp-holder sideways.
- 3 Slide the lamp upwards and out of the holder where it is retained by spring tension.
- 4 Pull off the electrical connector from the two pins at the base of the lamp.
- 5 Fit replacement lamp, taking care not to handle the inner reflective surface and especially the bulb. The lamp may be fitted into the electrical connector either way round. Reassemble enlarger head.

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FAULT FINDER

A microprocessor is used in the ILFOSPEED MULTIGRADE 400C control unit in order to improve reliability, simplify maintenance and reduce cost. Should any fault occur other than those detailed below, the whole unit should be returned to ILFORD Limited.

Symptom	Possible fault	Remedy
Whole system inoperative.	Electrical supply to unit not connected.	Check the mains supply is switched on. Check the On/off switch on the 400C control unit is in the 'On' position.
	Fuse in electrical supply plug defective (if fitted).	Fit a new 3 amp fuse in the plug.
	Fuse in 400C control unit defective.	Before carrying out the following operation, disconnect the mains plug from the electrical supply. Remove the back top cover. The fuse is mounted inside the control unit on the right side. Replace the fuse.
Control buttons on 400C control unit will not light up when switched on (with exception of On/off switch).	Microprocessor or associated electronics malfunctioning.	Consult ILFORD Limited.
	Back illumination lamp defective.	With the buttons in the up position, remove the cap by pulling it away from the control unit. They are retained in position by plastic spring clips. Remove the faulty bulb and replace.
LED display will not light up.	Fuses defective.	Check fuses as described in 'Whole system inoperative.'
	LED display defective.	Consult ILFORD Limited.
Failure of On/off switch to light up. Partial cut-off on the print, Uneven illumination. Uneven contrast balance.	Neon illumination failure.	Consult ILFORD Limited.
	Enlarger head incorrectly fitted.	Check adaptor kit fitting instructions.
Contrast spacing inconsistent. Uneven illumination. Reduced illumination.	Light mixing box incorrectly fitted.	Check fit of light mixing box following instructions in section 6.
	Enlarger lamp defective.	Replace lamp as detailed in section 9.
Enlarger lamps will not light.	Power not connected to lamphouse.	Check the lamphouse electrical supply plug is connected to the back of the control unit.
	Enlarger lamps defective.	Replace as detailed in section 6.
Enlarger lamps both suddenly fail.	The lamphouse may have become excessively hot and the thermal cut-out has operated.	The enlarger will remain off for about 30 minutes and then reset automatically.

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SPECIFICATION

Two sizes are available:

ILFOSPEED MULTIGRADE 400HS – to fit small format enlargers up to 6x7cm.

ILFOSPEED MULTIGRADE 400HL – to fit large format enlargers up to 4x5 inches.

Adaptor kits are available to enable the ILFOSPEED MULTIGRADE 400 enlarger head to fit most popular professional enlargers.

Dimensions

	400HS	400HL	400C
Length	264mm	340mm	233mm
Width	141mm	179mm	204mm
Depth	178mm	199mm	94mm

Weight

	400HS	400HL	400C
	3.50kg	4.75kg	5.25kg

Electrical details

Both heads are fitted with two quartz halogen lamps, which are held in place by spring clips and are easily removed for replacement if necessary. Each lamp is rated at 30V, 80W.

400C control unit

Model	Frequency
220Vac	50Hz
240Vac	50Hz
110Vac	60Hz

Replacement lamps are available from ILFORD Limited. Alternatively, a General Electric type ELB bulb, available only in some countries, may be used. All models take the same lamp type.

Light mixing boxes

Three sizes of light mixing box are supplied for use with the 400HL enlarger head:

400HL-M3 series for negative formats greater than 6x7cm and up to 4x5 inches.

400HL-M2 series for negative formats greater than 35mm and up to 6x7cm.

400HL-M1 series for negative formats up to 35mm.

Two sizes of light mixing box are supplied for use with the 400HS enlarger head:

400HS-M2 series for negative formats greater than 35mm and up to 6x7cm.

400HS-M1 series for negative formats up to 35mm.

With certain enlargers fitted with the 400HS enlarger head it may be advantageous to use the 400HS-M2 series light mixing box for 35mm negative format.

Filters

Two dichroic filters are employed: magenta and yellow. These are fade resistant and cut down heat transmission.

Ventilation

Ventilation is by convection – two light secure vents are provided, one in each end of the cover.