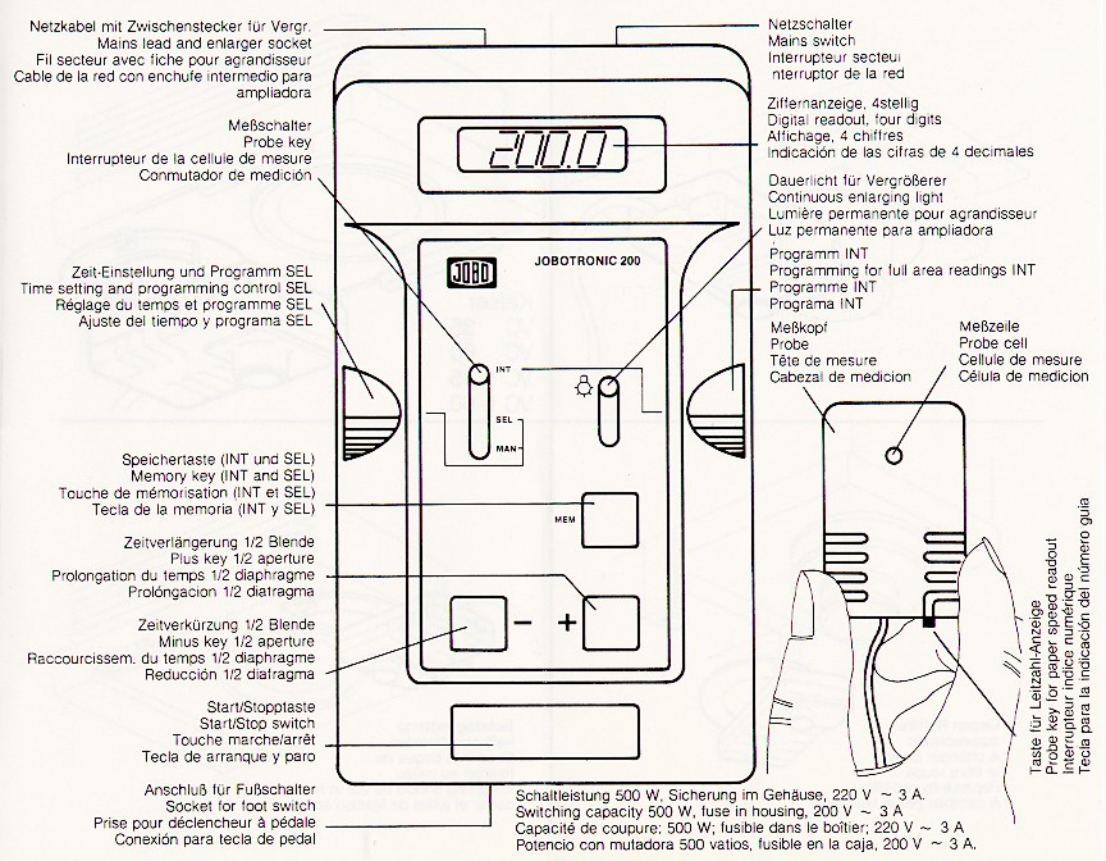
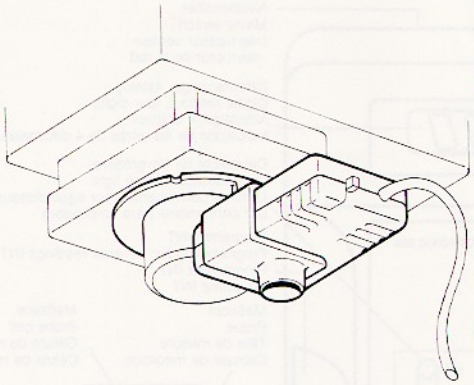
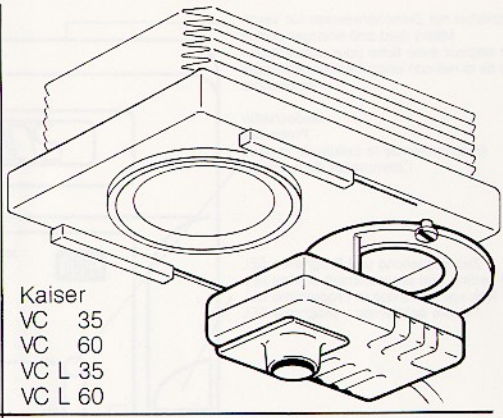
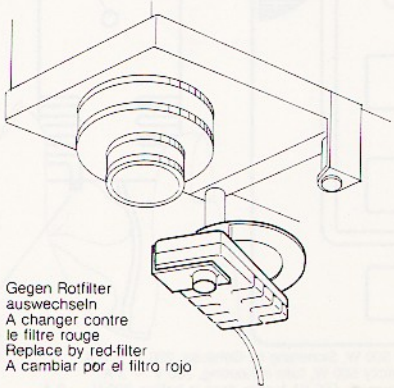

Netzkabel mit Zwischenstecker für Vergr.
Mains lead and enlarger socket
Fil secteur avec fiche pour agrandisseur
Cable de la red con enchufe intermedio para ampliadora
Meßschalter
Probe key
Interrupteur de la cellule de mesure
Conmutador de medición
Zeit-Einstellung und Programm SEL
Time setting and programming control SEL
Réglage du temps et programme SEL
Ajuste del tiempo y programa SEL
Speichertaste (INT und SEL)
Memory key (INT and SEL)
Touche de mémorisation (INT et SEL)
Tecla de la memoria (INT y SEL)
Zeitverlängerung 1/2 Blende
Plus key 1/2 aperture
Prolongation du temps 1/2 diaphragme
Prolóngacion 1/2 diafragma
Zeitverkürzung 1/2 Blende
Minus key 1/2 aperture
Raccourcissem. du temps 1/2 diaphragme
Reducción 1/2 diafragma
Start/Stopptaste
Start/Stop switch
Touche marche/arrêt
Tecla de arranque y paro
Anschluß für Fußschalter
Socket for foot switch
Prise pour déclencheur à pédale
Conexión para tecla de pedal
Netzschalter
Mains switch
Interrupteur secteur
nterruptor de la red
Ziffernanzeige, 4stellig
Digital readout, four digits
Affichage, 4 chiffres
Indicación de las cifras de 4 decimales
Dauerlicht für Vergrößerer
Continuous enlarging light
Lumière permanente pour agrandisseur
Luz permanente para ampliadora
Programm INT
Programming for full area readings INT
Programme INT
Programa INT
Meßkopf
Probe
Tête de mesure
Cabezal de medicion
Meßzeile
Probe cell
Cellule de mesure
Célula de medicion
JOBOTRONIC 200
200.0
INT
SEL
MAN
MEM
Taste für Leitzahl-Anzeige
Probe key for paper speed readout
Interrupteur indice numérique
Tecla para la indicación del número guía
Schaltleistung 500 W, Sicherung im Gehäuse, 220 V ~ 3 A.
Switching capacity 500 W, fuse in housing, 200 V ~ 3 A
Capacité de coupure: 500 W; fusible dans le boîtier; 220 V ~ 3 A
Potencio con mutadora 500 vatios, fusible en la caja, 200 V ~ 3 A.

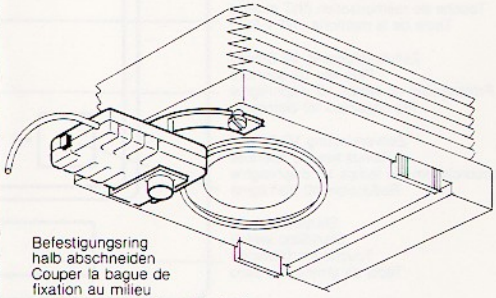




Kaiser
VC 35
VC 60
VC L 35
VC L 60



Gegen Rotfilter
auswechseln
A changer contre
le filtre rouge
Replace by red-filter
A cambiar por el filtro rojo



Befestigungsring
halb abschneiden
Couper la bague de
fixation au milieu
fixing-ring should be cut in half
cortar el anillo de fijacion en el centro

JOBOTRONIC 200

The JOBOTRONIC 200 is a digital automatic timer of up-to-date computer engineering with a highly sensitive silicon meter probe to establish exposure times.

It provides the following functions:

Manual exposure timing (MAN) without metering but with provision for override correction and interrupted exposure.

Exposure timing with metering: Full-area average readings (INT) or spot readings (SEL).

Contrast range measurement to determine required paper grades.

All time settings and stored values are entered via two analogue setting wheels and displayed digitally.

In the continuous-light setting the digital display automatically switches to increased brightness.

The JOBO foot switch can be fitted for easier operation.

For a description of the controls see fold-out back page.

1 Manual exposure timing without measurement

Set the selector switch to MAN.
Set the required exposure time on the digital display with the left-hand control wheel.
Press the main START/STOP key to start the exposure; the time display runs back to zero.
At the end of the exposure the previously selected time reappears in the display and can be called up afresh.

1.1 Interrupted exposure

By pressing the START/STOP key you can interrupt and restart an exposure any number of times.
The display each time shows the remaining time.

1.2 Overide correction and memory keys

The exposure time input may be increased or decreased automatically when required by the equivalent of half a lens stop.
To do this, press the + key or — key and input the newly indicated value into the memory by pressing the MEM key at the same time.
Start the exposure by the main START/STOP key.
To enter new values, clear the memory by once more pressing the MEM key.

2 Measuring methods

The JOBOTRONIC 200 has a measuring probe designed for two measuring modes.

2.1 Full-area average readings (integrated readings)

Push the measuring probe into its holder. Screw this to the enlarger together with the lens (see illustration). This arrangement keeps the baseboard uncluttered while the meter probe covers the correct field being measured. The JOBOTRONIC 200 automatically allows for all magnifications and aperture changes.
Full-area readings are based on the average brightness of the negative or transparency image projected on the masking frame. Hence images with large shadow or highlight areas may give wrong readings.
Note: When changing the negative or slide format (for instance from 35 mm to 6x6

cm) or if the negative area is greatly reduced with negative carrier strips, reprogram the unit.

2.2 Spot readings (Selective readings)

This method precisely reads selected image portions.

Locate the measuring probe on the baseboard so that it reads the lightest projected image area that should still show detail - i. e. shadows in negatives and highlights in transparencies. With images of normal contrast accurate exposure of such detail ensures optimum rendering of all tones or colours in the picture.

Note: With portraits measure the lightest part of the face, not the background, hence special programming is recommended here.

3 Programming the paper speed number

The JOBOTRONIC 200 can establish the exact paper speed number for all black-and-white, colour and reversal papers and allows for it during the exposure. Before programming, establish the correct exposure time (with test exposures) for an original of normal contrast and brightness distribution — for instance a street scene. Then without changing the aperture or magnification, use the same negative for programming as follows.

Important: After programming do not change the control wheel settings.

3.1 For full-area method

Switch off the darkroom lighting and switch the enlarger to continuous light. Set the metering selector to INT (integrated or full-area reading) and fit the measuring probe in its holder.

Use the right-hand control wheel to set the exposure time, as established by the exposure test, on the digital display.

The right-hand (full-area reading) control wheel can be reset quickly for all subsequent enlargements on the same paper.

To set the speed value, irrespective of the prevailing lighting, press the red key on the measuring probe. The value then displayed is the paper speed number for full-area readings.

Note: Mark the paper speed number on the paper packing. You can then set it

directly on any future occasion by pressing the key on the meter probe and turning the righthand control wheel.
Important: With full-area readings and the enlarger head in its top position, the luminous keys and digits of the JOBOTRONIC 200 could affect the reading. In this case keep the JOBOTRONIC 200 well outside the measuring area.

3.2 For spot method

Switch off the darkroom lighting and switch on the enlarger for continuous light.
Set the selector switch to SEL.
Move the probe to the lightest image area.
Turn the lefthand control wheel to set the exposure time, as established by the exposure test, on the digital display.
The left-hand (spot reading) control wheel can be reset quickly for all subsequent enlargements on the same paper. To set the speed value, irrespective of the prevailing lighting, press the red key in the measuring probe. The value then displayed is the paper speed number for spot readings.

4 Exposure readings

After programming check the position of the selector switch and measure the exposure by the appropriate method.

4.1 Full-area readings

Set the selector switch to INT and fit the measuring probe in its holder.
Switch off the darkroom lighting and switch on the enlarger for continuous light.
Select the image area required, focus sharply and set the lens aperture. Store the time indicated on the unit by pressing the MEM key.
Switch off the continuous enlarger light and place the enlarging paper on the baseboard. Start the exposure with the main START/STOP key.
Before every new reading clear the memory by once more pressing the MEM key.

4.2 Spot readings

Switch off the darkroom lamp and switch on the enlarger for continuous light.
Set the selector switch to SEL and measure the required image area with the measuring probe.

Important: If you programmed the unit for the lightest image portion required to show detail, again read the lightest area. Store the time indicated by pressing the MEM key.
Start the exposure sequence with the START/STOP key.

4.3 Reciprocity correction

As reversal papers tend to be subject to pronounced reciprocity failure, increasing the exposure time has less effect than would be expected. Therefore use both measuring methods at a constant exposure time and adjust the image brightness with the lens aperture.

5 Exposure

Pressing the START/STOP key switches on the enlarger lamp; the time display now runs back to zero. At the end of the exposure the previously set time reappears on the display and can be called up again. For a new measuring sequence clear the stored time by pressing the MEM key.
Important: With a large number of equal exposures the time set can shift by fractions of a second. Avoid this by resetting the original time manually.

5.1 Interrupted exposure

See section 1.1

6 Contrast readings

The JOBOTRONIC 200 can simply and rapidly measure the contrast range of a negative or transparency. With the measuring probe take a spot reading of the lightest image area and adjust the lens aperture so that the display shows 10 seconds.
By moving the measuring probe around the projected image you can now read off the corresponding local exposure times for each image tone. By comparison with the 10 seconds for the brightest image area, these times also indicate contrast ranges. For instance, if the unit is set to give a reading of 10 seconds for the brightest area and the darkest portion then reads 500 seconds, you have a 1:50 contrast ratio. This therefore shows immediately whether the contrast of the negative matches the exposure range of the paper. The list below shows typical values of black-and-withe paper exposure ranges.

Gradation	ex. soft (0)	soft (1)	normal (2)	vigor (3)	hard (4)	ex.hard (5)
Exp. range	1:50	1:25	1:16	1:10	1:6	1:3.5

Exposure range of colour papers 1:80

If in certain cases you want to use a paper grade that does not match the full contrast range of the negative, the following equation gives a correct extra exposure time for individual image areas:

$$\text{Exposure factor} = \frac{\text{Negative contrast range}}{\text{paper exposure range}}$$

6.1. Burning in (spot printing)

For burning in or spot printing multiply the measured exposure time by the calculated exposure factor. This gives the total exposure time for the image portion in question.

6.2 Dodging (shading)

For shading divide the measured exposure time by the calculated exposure factor to obtain the effective exposure time for the image area to be held back. In other words, shade that image portion during the exposure period beyond the calculated effective time.

7 Technical data

Power supply:	220 volts, 50 Hz
Current consumption:	2.7 watts
Switching capacity:	500 watts
Manual setting range (MAN):	1 to 100 seconds
Measuring range:	0.1 to 600 seconds
Image brightness measuring range:	0.001 to 15 lux