PROTEC®
medizintechnik

English

COMPACT 2™
SX 2

Film Processor

Operation Manual

Depending on model type the Compact 2 has either an open stand or like shown here a closed cabinet.

Machine No.:	
Type:	
Date of installation:	
Issued:	05-2006/2.9

Subject to technical alterations

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EU-Declaration of Conformity

PROTEC® Medizintechnik declares, that the product

Description:	COMPACT 2™
Machine type:	X-Ray-Film Processor
Model no.	117x-y-0000 x is a number between 0 and 9, y is a number between 1 and 9

conforms to the following harmonized standards:

Safety:	IEC 61010-1:2001 + A1:92 + A2:95; DIN 1988 T4:12/1988; UL 3101-1; CSA 22.2-1010-1
EMC:	EN 50081 Part 1, 03/1993; EN 50082 Part 1, 03/1993

according to the regulations of:

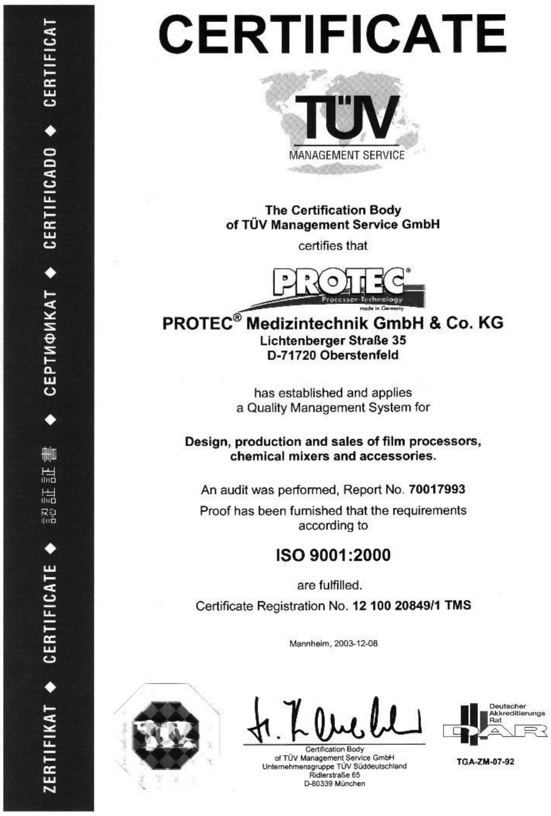
- the Medical Device Directive 93/42/EEC “class 1”,
- the Low Voltage Directive 73/23/EEC and the
- EMC Directive 89/336/EG

PROTEC® Medizintechnik GmbH & Co. KG, Lichtenberger Straße 35, D-71720 Oberstenfeld, Germany

Supplementary Guidelines:

- DIMDI: DE / 0000042967
- WEEE: DE 55471807

Place and date of issue:
Oberstenfeld, 23. May 2006, Jochen Krupp (Technical Manager Analogue Systems)



ZERTIFIKAT ◆ CERTIFICATE ◆ 認証書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

CERTIFICATE

TÜV
MANAGEMENT SERVICE

The Certification Body
of TÜV Management Service GmbH
certifies that

PROTEC® Processor-Technology made in Germany

PROTEC® Medizintechnik GmbH & Co. KG
Lichtenberger Straße 35
D-71720 Oberstenfeld

has established and applies
a Quality Management System for

Design, production and sales of film processors, chemical mixers and accessories.

An audit was performed, Report No. **70017993**
Proof has been furnished that the requirements according to

ISO 9001:2000

are fulfilled.
Certificate Registration No. **12 100 20849/1 TMS**

Mannheim, 2003-12-08

Certification Body
of TÜV Management Service GmbH
Unternehmensgruppe TÜV Süddeutschland
Ridlerstraße 65
D-80339 München

Deutscher Akkreditierungs Rat
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TGA-ZM-07-92

Information on Liability

This manual has been checked for correctness. The instructions and specifications were correct at the time it was published. Future models may have modifications without prior notice. PROTEC® Medizintechnik does not take responsibility for damage caused direct or indirect by error, omission or non-conformity of the manual.

Introduction

You are the proud owner of a modern, automatic processor. Due to the precision roller transport system, both sheet and roll films can be processed. The automatic film registration is activated immediately when a film is fed in. The film materials are developed, fixed, rinsed and dried. With the easy to operate micro-processor, the processing conditions can be adjusted to suit the various film and chemical types. The developing solutions are temperature-regulated, circulated and automatically replenished.

This Operation Manual contains the most important instructions for installation, operation and servicing of this machine. Please read the provided information carefully to ensure reliable and satisfactory operation of your film processor.

Technical Specifications

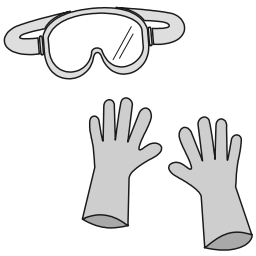
Film transport:	Continuous roller transport system
Film formats:	Sheet and roll films up to 45.1 cm (17.7) width; Roll films with leader from 70 mm (2.8") width; smallest film format 10x10 cm (4x4"). In processor type 1191 roll films in cassettes can also be processed. Cassette box (LxWxH): 53x19x16 cm (20.6x7.5x6.3").
Processing capactiy:	232 films 24x30 cm (10x12“) per hour (standard model, film fed in crosswise, at 90 s)
Process time:	1-5 min.; in 0.1-min. steps adjustable.
Linear speed:	30-151 cm/min., depending on selected process time.
Developing time:	14-71 s, depending on selected process time.
Tank capacities:	12.5 l developer, 12 l fixer,13 l water.
Circulation system:	Developer and fixer are continiuously circulated by a circulation pump.
Replenishment:	Automatic by film surface measurement in relation to processed film; quantity adjustable; time replenishment can be activated.
Developer temperature:	Adjustable 28-40 °C (82.4-104 °F).
Fixer temperature:	Adjusted to developer temperature by heat exchanger.
Dryer temperature:	Adjustable 35-70 °C (95-158°F), achievable temperature depends on mains voltage..
Water connection:	Permissible water pressure 2 - 10 bar (29 - 145 psi), permissible water temperature 5 - 30 °C (41 - 86 °F).
Water consumption:	1.9 litre per minute when processing.
Drain capacity:	11 litres per minute
Noise level:	Less than 59 dB(A).
Heat emission:	During processing approx. 1.5 kJ/s.
Environmental conditions:	1 Temperature 18- 40 °C (51,6 - 104 °F), ventilated room, room temperature should be lower than set bath temperature. 2 Relative humidity lower than 80 % up to 31 °C (88 °F), linearly decreasing to 50 % at 40 °C (104 °F) 3 Height above sea level less than 2000 m (6666 ft.) 4 Indoor use

Pollution degree:	2
System protection:	IP 20
Electrical connections: Type 119x-1-y000: Type 119x-2-y000: Type 119x-7-y000:	 220 - 240 V~, 10 A, 50 Hz 220 - 240 V~, 14 A, 60 Hz 208 - 240 V~, 14 A, 60 Hz Unit tested to IEC 61010 (EN 61010, UL 3101, CSA 22.2-1010) overvoltage category II 2.5 kW
Power consumption:	Stand-by: 0.23 kWh Processing: 2.4 kWh
Weight (processor):	Empty 77 [91] kg (170 [200] lbs) Filled 115 [129] kg (254 [284] lbs) Values with open working table, [in brackets: values with closed base cabinet]
Dimensions (LxWxH):	97 x 68 x 127 cm (38.2x26.8x50")
Floor space required:	0.67 m^2 (7.2 sqft)

Safety Instructions

To ensure the safe operation of this processor, installation and use should always conform to the instructions contained in this manual.

DThe developer and fixer chemicals used in the processor should be handled according to the manufacturers instructions. In general: Non-diluted chemicals are caustic. For this reason, chemicals should be handled very carefully. Avoid contact with skin, always wear protective clothing, gloves and glasses when handling the chemicals - for example, when mixing and refilling. Also when taking the racks out for cleaning or servicing. In case of chemicals getting into the eyes, rinse eyes immediately with cold, running water for approximately 15 minutes, and contact a doctor afterwards. Inhalation of chemicals can be dangerous to your health and should be avoided. For this reason, always ensure that the room in which the processor is installed is adequately ventilated.



Environmental regulations regarding the storage and disposal of waste chemicals should be obtained from the local water authorities and complied with.

Before opening the processor switch off the unit and unplug it from the electrical socket. Service and repairs must be performed by trained service technicians only. Use only manufacturers replacement parts.

Installation

1. Requirements for installation

a. **Fresh water connection:** Stop cock with 3/4" outer-thread diameter (washing machine connection), Water pressure 2 - 10 bar (29 - 145 psi).

b. **Drainage connection:** Plastic tube - inner diameter 50 mm ”or larger. A ventilated syphon which serves as odour preventor should be included in the planning. The drainage tubes should be installed with a fall of minimum 5 %. *Local Water Authorities regulations should be complied with.*

c. **Electrical connection:** Fused wall socket with earth connection according to electrical data (see technical specifications, page 5). It is also required to install an earth-leakage switch (with 25 A / 30 mA nominal error current).

Electrical connections should be carried out according to regulations by an electrician.

2. Installation of processor

a. Unpack and assemble base table/ base cabinet respectively according enclosed manual.

b. Unpack Processor and mount onto base table/ base cabinet respectively according to manual. Remove the transport securing bars of the roller-racks. Fit the gear and dryer plates to the water/dryer-rack.

1 Machine cover

2 Light protection cover on film infeed

3 Control panel

4 Power switch and main fuses

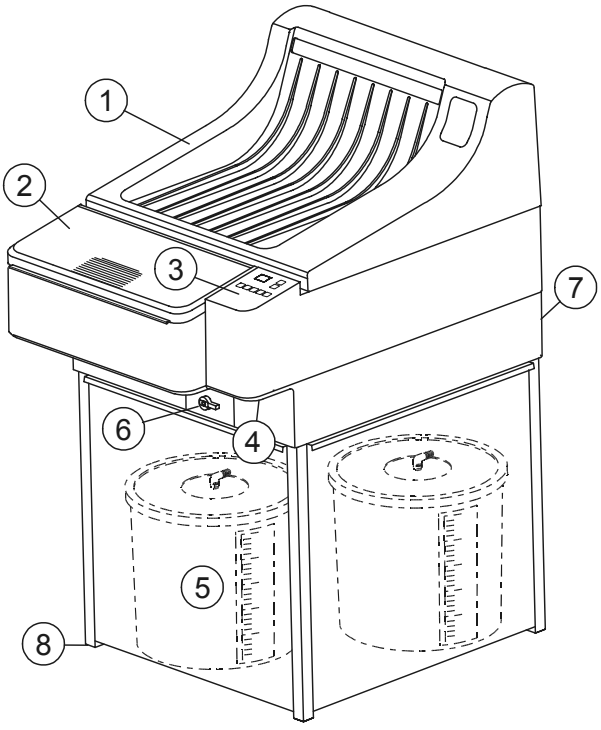
5 Replenishment tanks

6 Stop cock of water

7 Connections for freshwater, replenishment and drainage respective overflow

8 Levelling feet

Depending on model type the Compact 2 has either an open stand or like shown here a closed cabinet.



3. Connecting the processor

Water connection: Fit water-inlet hose (grey) at the rear of the machine and connect to the prepared fresh water supply.

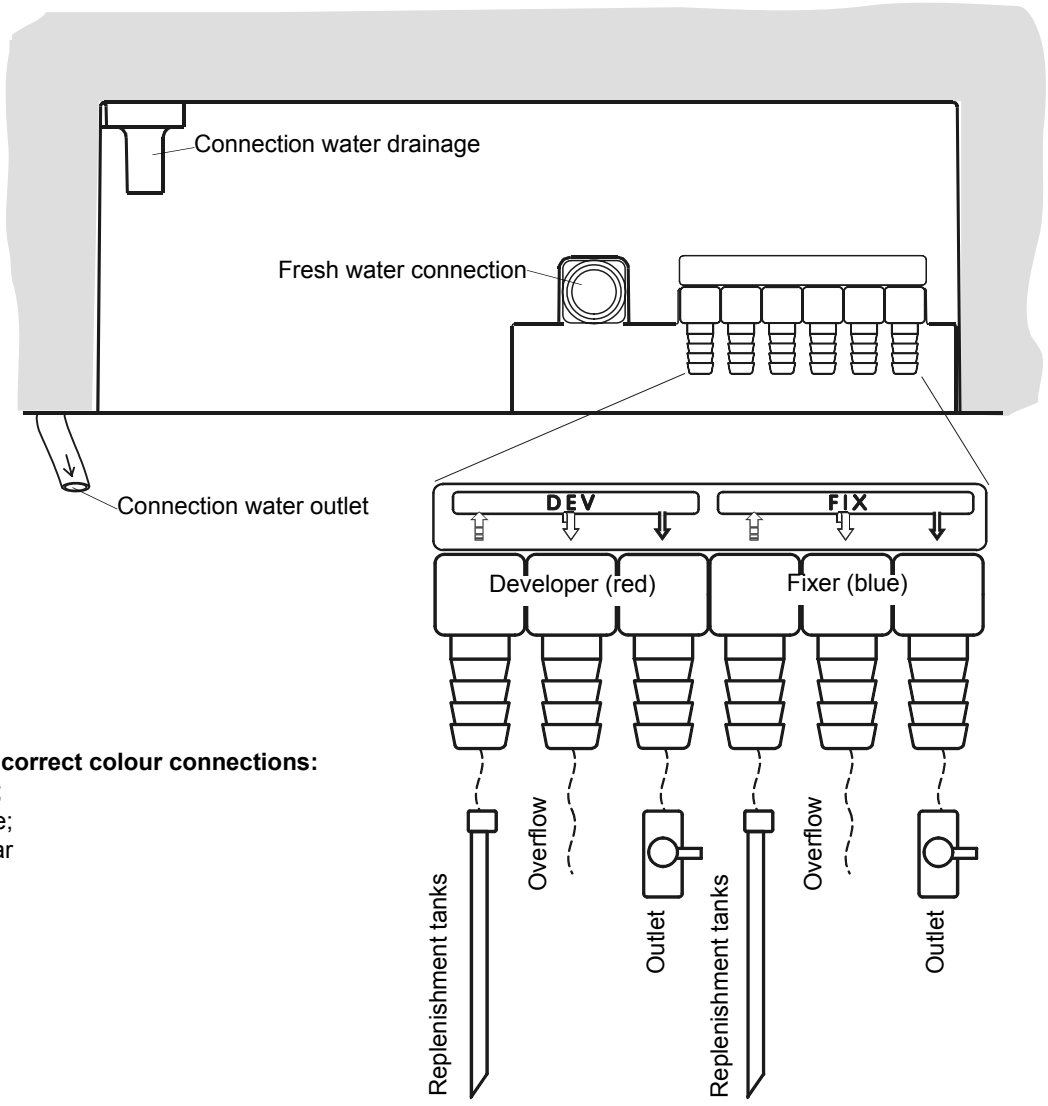
All other hoses (see diagram): Connect the enclosed hoses according to colour system to backside of machine. Put hose clip (enclosed in accessory bag) over hose end, before attaching to connection. Warm up hose end (with hot water or lighter) and push onto the respective connection. Finally push clip over hose and connection.

Cut hoses to required length. Integrate the stop cocks into the drainage hoses in such a position, that they are easy to reach.

Connect the suction pipes to the hose ends for the replenishment tanks using hose clips. Put suction pipes through cover opening into respective replenishment tanks and snap them in.

The overflow and drainage hoses from the developer and fixer should be guided into their respective collecting containers.

The overflow and the drainage of the water can either be guided into the drainage syphon or into respective collection containers.



Pay attention to the correct colour connections:

Developer:	red;
Fixer:	blue;
Water:	clear

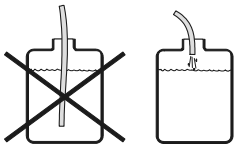
⇧ Replenishment

⇩ Overflow

⇓ Outlet

Danger of Overflow!

Use the included cable binders (accessory bag) to secure the hoses. Fix all hose ends which guide into syphon or collecting container, so that they do not drop into the liquid.



Very important:

The hose piping should be straight (without the hoses going up and down) with a constant fall. The hoses should be as short as possible and without bends and kinks. This is very important for the water overflow hose. Bad piping work will cause the machine to overflow!

Inform yourself of the local water board regulations regarding drainage. These regulations may differ from information in this manual, but they should be complied with.

Initial Operation

Levelling of machine: Place machine in working position and level with spirit level. To do this, take off machine cover and place spirit level across the two intermediary rinsing channels. Level machine by adjusting the feet on the table legs. Accurate levelling is essential to avoid possible overflows at a later point in time.

Connect power cord: Lay power cord so that it will not be tripped over and not be bent or frayed. If an extension cord is required use only cords that have been approved for usage with respective current.

1. Test run

Important!
Processor should not be run dry!

a. Close the three drainage stop cocks (front and rear). Fill the developer- and fixertank and also the replenishment containers with water. Open water inflow tap. Switch the machine on at the main switch. Water now flows into water tank.

b. The circulation pump runs after switching on the machine and ventilates itself. If this does not occur, switch the machine off again. Open the stop cock of the respective chemical for five seconds and close it afterwards again. Switch the machine on again. Repeat this procedure until the pump is ventilated.

c. Before filling with chemicals, check all hose connections again for leakage. Switch machine off and drain water out.

2. Fill processor with chemicals

Prepare chemicals inside the replenishment containers according to manufacturers instructions. By using a suitable container, pour chemicals into the respective tanks.

When filling, be sure that chemicals do no splash from one bath into another. Fixer chemicals destroy developer chemicals! Depending on the chemical type add starter solution. Place the floating cover into developer replenishment container. Close container cover firmly and insert the suction tubes. Pay attention to the colours:
Red = Developer, Blue = Fixer.

Mode of Operation

The processor develops, fixes, rinses and dries your films. The temperatures, speed and replenishment rates required for processing various types of film-materials can be individually selected and stored in the microprocessor control unit.

Automatic filling and heating

When the machine is switched on, the water tank fills and chemical baths heat up automatically. During this procedure the display shows two serifs "--" and the developer temperature button blinks until the set temperature has been reached. The two serifs show the operator, that the machine is not yet ready for processing. Once the set temperature is reached, the machine is ready for processing. The developer button no longer blinks.

Stand-by mode

After a film has been processed, the machine automatically switches to the stand-by mode during which the bath temperatures are maintained. The bath temperature is maintained. The built-in circulation pumps ensure that the bath liquids are circulated and the temperature is evenly maintained and constant. Every 20 minutes an anti-crystallisation programme starts to rotate the rollers, which avoids the building up of aggressive crystals on the rollers within the machine. During very long stand-by periods, and after a set time, the control unit activates a replenishment cycle to avoid oxidation of the chemicals in the machine (time replenishment).

Film registration

The special impulse-reflex-lightbarrier for film registration has been constructed in such a manner that even infrared sensitive films are not exposed. When a film is fed in, the lightbarrier starts the machine.

Automatic replenishment

The quality of the developer and fixer chemicals is reduced when films run through the baths and for this reason a regular replenishment of the chemicals is necessary. By means of the lightbarrier, the film surface of processed films is measured. After approx. 0.25 m^2 of film has passed through, a replenishment cycle is activated. During this cycle, chemicals are pumped up from the replenishment containers into the machine. The replenishment quantity can be adjusted by setting the replenishment rate.

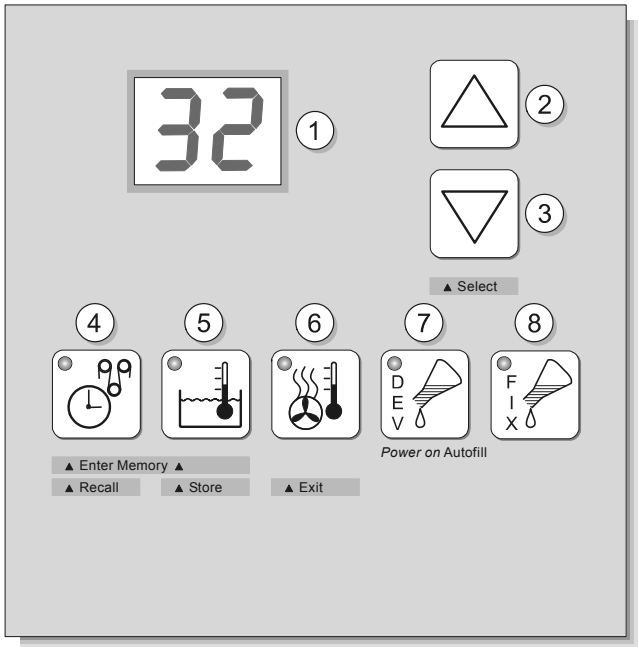
Operation

Short Overview and Control Panel

① Display working parameters
② Arrow button “Up” = increase parameter
③ Arrow button “down” = decrease parameter

Mode Buttons

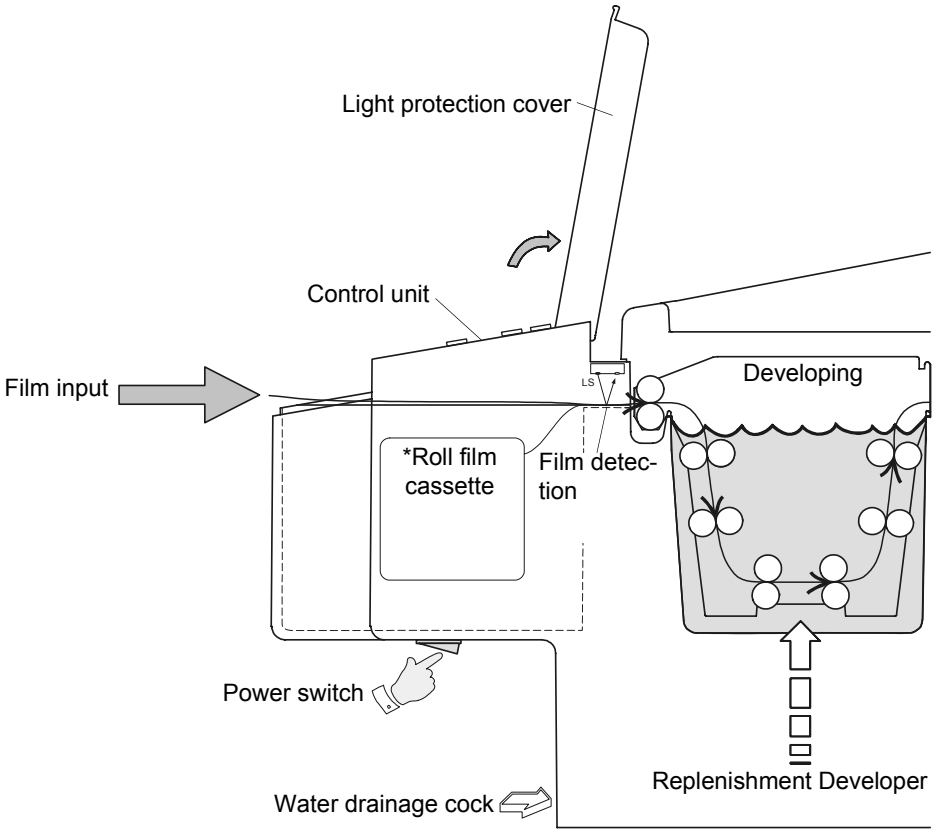
④ Processing time in minutes
⑤ Developer temperature in °C
⑥ Dryer temperature in °C
⑦ Replenishment developer time in seconds
⑧ Replenishment fixer time in seconds



Important!

Safety function stops film transportation when cover is removed. Therefore keep cover placed on the machine when processing films.

*When processing roll films in cassettes, pull approx. 15 cm of film out of the cassette and fold the corners (see page 18). Place cassette into cassette box and feed film into the infeed. Only machines with cassette box.



Attention:

Upon first operation and each refilling of a developer check the function of the circulation pump and vent the pump if required (see page 8).

Before use...

1. Close water-drainage stop cock.
2. Open water tap.
3. Switch processor on.
4. Check liquid level in replenishment and drainage collecting containers.
5. Wait until the start-cycle has been completed or until Developer temperature is reached.
6. Run cleaning films through processor.

Working procedure

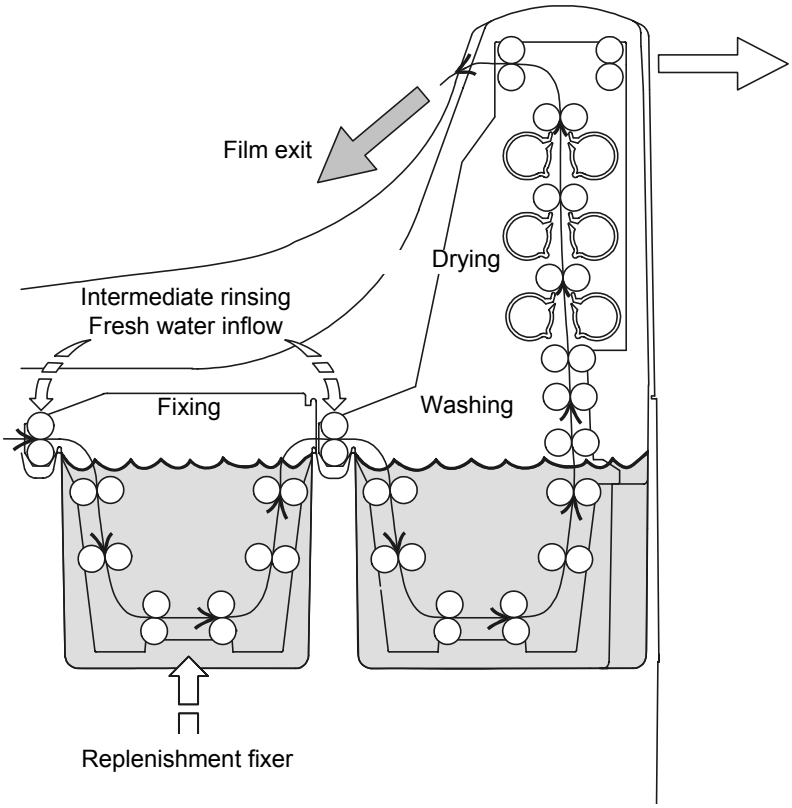
7. Processing films:Open light protection cover, insert film on side of infeed tray and feed in, during infeed please watch the Infeeding-film-display "– –".

After work...

8. Switch processor off.
9. Close water tap.
10. Open water drainage stop cock

Stand-by mode:

When no film is being processed, the machine switches to Stand-by. The chemicals remain at a constant temperature. The film transport and water inflow activate at intervals to avoid crystalisation of the chemicals on the transport rollers. Entry of the next film is possible at any time.



Film exit at rear of machine optional with "Through the wall mounting film output" kit.

Do not place any object on the processor.

Switching the Machine On

Before switching the machine on, open the fresh water tap and close the water drainage tap (under control panel). Then switch the machine on (main switch is situated under the control panel). Once the machine is switched on, a “Start-cycle” of eight minutes duration is activated: A replenishment cycle is carried out, the water tank fills automatically and the chemical baths heat up. During this “Start-cycle” no films can be fed into the machine. The display shows two bars “– –” when the processor is not ready and no films can be fed in. This is the case during the “start-cycle” and also when the baths have not reached the temperature. Until the developer temperature is not reached, the developer temperature button (5) is flashing. It is possible that the chemical bath has not reached the required temperature even after the “Start-cycle” has been completed. You need to wait until the developer temperature is reached, before inserting films. Wait until the bars “– –” disappear from the display.

Automatic Mode

After completion of the “Start-cycle” and after a film-processing, the machine automatically goes into the stand-by mode. In the stand-by mode the processor can be started at any time by placing a film into infeed tray. Note that films can only be processed when the developer temperature is reached. When the display shows two bars “– –” no films can be fed into the machine. The temperature in the bath is too high or too low. However, when a film was fed into the machine, two bars with decimal points “–. –.“. To avoid a jamming of films wait before feeding the next film in until this display disappears (which is also signaled by an acoustic sound).

A film in the infeed-tray is registered by the light barrier and the machine starts up. The film is pulled into the machine and transported through the developer, fixer and water baths. The remaining time of processing i.e. until the film finally leaves the machine is displayed, when no more film is in the infeed-tray and the processing time button was pressed. Each working-parameter can be called up on the display by pressing the respective mode-button, however, during processing, parameters cannot be altered. The temperatures of the developer and dryer are automatically regulated. The replenishment rate of developer and fixer chemicals is activated according to the processed film-surface (film-surface measurement). Before a film is passed on from the developer bath into the fixer bath, it is rinsed with clean water which minimises pollution of the fixer chemicals with developer chemicals. The film is then dried in the dryer before passing out of the machine and falling into the catch tray. The machine then goes into the stand-by mode. To keep the machine in working condition during the stand-by mode, the electronics have been furnished with two specialities: The Anticrystalisation Function and the Time Replenishment.

Anticrystalisation Function

During the stand-by mode, the film transport, the dryer ventilation and the water inflow are activated every 20 minutes for a period of 15 seconds. This prevents the build-up of crystals on the rollers. This function cannot be switched off.

Time Replenishment (Antioxidation function, Flood replishment)

Also during the stand-by, the developer chemicals are subject to change which causes their deterioration. By means of the time replenishment, a replenishment cycle is activated after a set time. With this function, the quality of the developer chemicals are maintained even when standing idle for long periods. The setting-range for the time-replenishment is from 5 up to 99 minutes. When *"0"* is set, the time-replenishment is de-activated.

Setting of time-replenishment:

1. Switch processor off.
2. Press the buttons processing speed (4) and replenishment time developer (7) simultaniously and keep pressed.
3. Switch the machine on again and release the pressed buttons.
4. Select the replenishment interval time (min.) by pressing the arrow buttons (2 and 3). The arrow up button (2) increases and the arrow down button (3) decreases the value.
5. Switch machine off again.

Example: At the setting "*45"* a replenishment cycle is activated every 45 minutes.

Working Parameters

The processing machine develops, fixes, rinses and dries the film materials automatically. The film and chemical requirements can be adjusted accordingly and stored in the control unit.

Display of working parameters:

1. Switch processor on.
2. Press the respective mode button (4-8) and keep pressed to display the required working parameter *or* Press the respective mode button (4-8) and release to display the momentary value.

Setting the working parameters:

1. Switch processor on.
2. Machine must be in the stand-by mode and no film must be in the processor.
3. Press the respective mode button (4-8) and keep pressed: The display shows the set working parameter.
4. Change value by means of the arrow buttons (2 and 3) until required value appears on the display. The upward arrow button (2) increases and the downward arrow button (3) decreases the value.
5. Release the mode button.

Processing time

The processing time, is the time, it takes the front end of a film from the infeed of the processor until it reaches the film exit. The processing time is set by the speed with which the film is transported through the machine. Depending on the requirements, this time can be varied from 1 to 5 minutes adjusted in 0.1-minute-steps (Adjusting the processing time: see page 13 “Setting the working parameters”).

Processing and developer time relation		
Processing time (min)	Developer time (s)	Infeed speed (cm/min)
1,0	14	151
1,5	21	101
2,0	28	76
2,5	35	60
3,0	43	50
3,5	50	43
4,0	57	38
4,5	64	34
5,0	71	30

Developer temperature

The developer temperature of the different film-materials depends on the developing time. The faster a film has to be developed, the higher the temperature must be. The developer temperature can be set between 28-40 °C according to the individual requirements (Setting the developer temperature: see page 13 “Setting the working parameters”). If the temperature is lower or higher than the set value, then the bath temperature button (5) is flashing and the display shows two bars “– –”. Before feeding a film into the machine, wait until the temperature has been reached and the displayed bars “– –” disappear.

The following chart demonstrates guide value relations between developer temperatures and processing times. Variations are possible depending on the various films and chemicals.

Processing time and developer temperature relation	
Processing time “Dry to Dry” (min s)	Developer temperature(°C)
1,0	34 - 36
2,0	32 - 34
3,0	30 - 32
4,0	29 - 30
5,0	28 - 29

Dryer temperature

The dryer temperature can be adjusted within a range of 35-70 °C according to the different film-materials. To avoid dryer spots on the film, the dryer temperature may not be set too high. Adjust the temperature so that the film just gets dry (Setting the dryer temperature: see page 13 “Setting the working parameters”).

Remark: Depending on mains voltage dryer temperatures above 65°C may under certain circumstances not be reached.

Replenishment time

The replenishment of the developer and fixer chemicals is automatic. By means of the light barrier electronic at the film-infeed, the surface of the processed films are calculated and after 0.25 m^2 a replenishment cycle is automatically activated. The replenishment quantity can be adjusted varying for developer and fixer by adjusting the replenishment time. The time can be varied from 3-60 seconds.

The chart below shows the replenishment time to be set for the requested replenisher rate per m^2-film surface. The standard setting is 10 sec. with 500 ml replenisher rate per m^2 film surface. The replenisher rate has to be adjusted depending on film material, chemicals and film throughput.

Replenishment time and replenishment rate relation

Replenisher rate (ml/m^2)	Replenisher time (s)	Replenisher rate (ml per cycle)
200	4(4)	50
300	6(5)	75
400	8(7)	100
500	10(9)	125
600	13(11)	150
700	15(12)	175
800	17(14)	200
900	19(16)	225
1000	21(18)	250

Values in brackets for 60 Hz power connection.
Values when pump is set at 100% pump capacity.

Dimmer Function of Display

With the dimmer function the intensity of the control panel display can be changed. The intensity can be reduced to avoid possible exposure of high-sensitive films. Normal-sensitive films are not affected by the display.

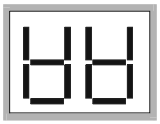
Setting the intensity of the display:

1. Switch processor on.
2. Press “arrow down” button (3) for about 5 seconds. The intensity changes. Two intensity-levels are available: bright and dark. During film-throughput this function is not available.

Machine Cover Safety Disconnection

The machine cover may only be removed for service and maintenance purposes. The processor cannot be started without the cover. In the event that the machine cover is removed during film-throughput, the film transport will be stopped. On the display the error message *“E1”* will be displayed. The error will be reset when the machine cover has been replaced.

Autofill Function



In case new chemicals have to be filled into the processor (after installation, tank cleaning), the tanks can be filled automatically by means of the autofill function. Herewith, the tank is filled for a fixed period of 17 minutes, e.g. chemicals are pumped up from the replenisher tanks into the machine. Also the water bath will be filled (8 min. period). The display will show two symbolized tanks (see right). When the autofill function has been completed, the machine enters the stand-by mode. In the event of the respective baths being full before the time is up, the autofill function can be manually stopped.

Starting up the autofill function:

1. Switch processor off.
2. Filling developer *and* fixer tank: Keep both replenishment buttons for developer (7) and fixer (8) pressed down and switch the machine on. *or filling* developer *or* fixer tank: Keep respective replenishment button (7 or 8) pressed down and switch the machine on.

Manual cancellation of the Autofill function:

- Stop developer tank filling:
- Keep developer replenishment button (7) pressed down and press “arrow down” button (3).
- Stop fixer tank filling:
- Keep fixer replenishment button (8) pressed down and press “arrow down” button (3).

The filling of the water bath will be stopped once the automatic filling of both chemical baths has been stopped.

Manual Mode

In the manual mode, the processor works without the lightbarrier. The film transport has to be started and stopped manually. All the set values in the manual mode are also valid in the automatic mode. Please note that the Infeeding-film-display (“– –”) is deactivated. In the Manual Mode the replenishment function does not use film surface measurement, instead it uses a standard value. In the manual mode, a replenishment cycle can also be activated manually.

Switching to manual mode:

Switch machine on. During stand-by press arrow-buttons “up” and “down” (2 and 3) simultaneously. When in manual mode the display is flashing.

Switch back to automatic mode:

In manual mode when in stand-by press arrow-buttons “up” (2) and “down” (3) simultaneously.

Manual starting and stopping the film transport:

1. Switch to manual mode.
2. Press Processing time button (4) - button illuminates.
3. Start film transport by pressing arrow-button “up” (2) and stop film transport by pressing arrow-button “down” (3).

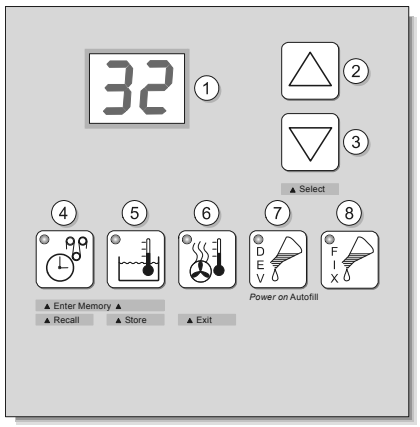
Manual replenishment:

1. Switch to manual mode.
2. Press required replenishment button for developer (7) or fixer (8) - respective button illuminates.
3. Start replenishment cycle by pressing arrow-button “up” (2) or cancel replenishment cycle by pressing arrow-button “down” (3).

In the memory five sets of parameters can be stored and be recalled into working memory.

Use of Memory Function

In the memory five sets of parameters can be stored and be recalled into working memory.



Store processing parameters

1. Set machine to preferable parameters e.g. bath tem-perature, processing time etc. (see manual).
2. Press buttons 4 and 5 “Enter Memory” simultaneously to enter the memory mode.
3. Use buttons 2 and 3 “Select” to select the parameter memory (P1 to P5). Inside this the parameters will be stored, old values will be overwritten.
4. Press button 5 “Store” to store parameters and to leave the memory mode.

Recall processing parameters

1. Press buttons 4 and 5 “Enter Memory” simultaneously to enter memory mode.
2. Use buttons 2 and 3 “Select” to select the parameter memory (P1 to P5) from which the parameters shall be recalled.
3. Press button 4 “Recall” to recall parameters (copy into working memory) and to leave the memory mode.

To leave memory mode without change

Press button 6 “Exit”.

Important: Please note, if input is locked (via lock function), then processing parameters cannot be stored - when trying to do this, an error message “LO” will be displayed. Despite locked input, the processing parameters can be recalled. Choose the same bath temperature for all stored programmes. Of course different bath temperatures can be stored too, but when changing the programme you always have to wait until the changed bath temperature is reached.

Lock Function

To prevent unintentional change of operation parameters the input can be locked. If the input is locked any attempt to change the parameters will display an error “LO” (locked).

Activating and de-activating of the input lock:

1. Press buttons 4 and 5 “Enter Memory” simultaneously to enter the memory mode (see diagram on page 17).
2. Press several times the button 3 “Select” until the display will show “L.0”(Lock off input unlocked) or “L.1” (Lock on: input locked).
3. Now by pressing one of the buttons 4 or 5 change the display: “L.0” if you want to unlock the input or “L.1” if you want to lock the input.
4. To finalize the changes press button 6 “Exit”.

Please note:
Even when the input lock is activated it is possible to recall (previously stored) procesing parameters of the memory-function.

Important: Please note, if input is locked via lock function, then processing parameters cannot be stored - when trying to do this, an error message “LO” will be displayed.

Stop Film Transport

In a case of a film-jam inside the machine, the film transportation can be manually interrupted. To stop the film transport press both arrow-buttons (2 and 3) simultaneously.

Related topics:

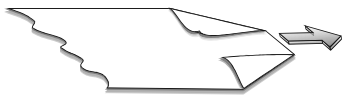
“Manual starting and stopping the film transport” page 16

“Film is caught up in the racks” page 27

Infrared Sensitive Materials

Infra-red sensitive film material can be processed without danger of exposure by the light-barrier.

Rollfilms and Paper Films



Roll films with a polyester lead of at least 10 cm length can be transported. The adhesion must be chemical resistant.
Roll films without lead and paper-films must be folded on the corners, as shown in the diagram, before being fed into the machine.

Automatic Cooling Function

If the developer temperature exceeds the set value, the automatic cooling function will be activated. The fan runs for a fast cooling of the bath. The same happens when the temperature is decreased by pressing the arrow button.

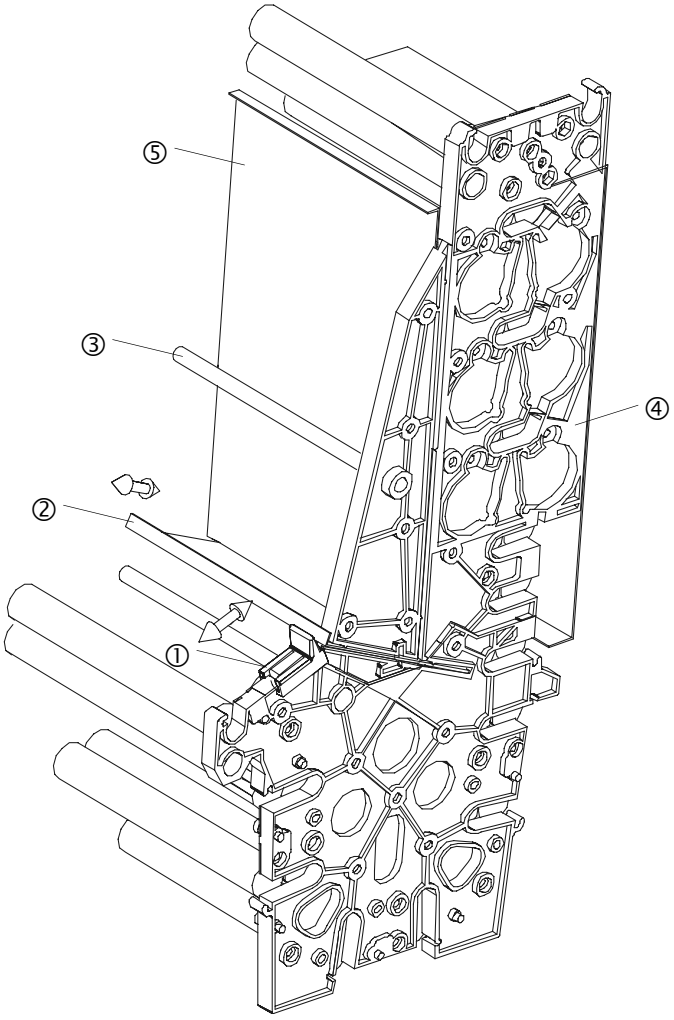
Removal and Installation of Dryer Rack (two-parts)

Removal:

1. Push small, black slide (1) downwards.
2. Pull dryer plate small (2) out of the dryer.
3. The upper part of the dryer can now be removed. Hold the dryer at the front distance bar (3) and the whole of the metal plate in the back (4).
4. Take out lower part of the dryer.

Installation:

1. Insert lower dryer part. Make sure that both slides at the lower part are assembled and pushed down.
2. Put in the upper dryer part. Insert the lower edge of the upper part carefully into the middle guidance of the lower part.
3. Check if sideplates and gears of upper and lower part fit together correctly.
4. The dryer plate small (2) can now be assembled into the guidance. For this lift dryer plate large (5) a bit, so that the small plate can be pushed in, completely.
5. Now push both black slides (1) up until the clips click into place.



Care

Daily Care

Before use...

1. Remove dirt and dust from film-infeed with soft cloth.
2. Run 2 - 3 cleaner films through processor to remove all accumulated dirt and dust from the rollers.
3. Check the liquid level in the replenishment containers and if necessary refill.

After use...

- When working has been completed at the end of the day, the water must be drained out of the machine. This reduces the growth of algae in the water bath. For that purpose open the water drainage stop cock (see page 7 bottom).

Attention:Do not let any liquid drop inside the processor or run over the control.Liquids may cause damage to the processor.

Weekly Care

The developer chemicals cause residue build-up in the machine. This residue has a negative effect on the developing process of the film material. For this reason the processor has to be regularly cleaned of this residue.

Do a weekly clean of the roller racks, which only takes a few minutes.

1. Switch machine off and remove cover.
2. Loosen the securing latches (red, blue and beige) of the drive shafts of each roller rack at the right side.
3. Rinse all racks thoroughly under warm running water and then leave to drain off. Use a soft sponge (do not use scouring-pad, as this would scratch the rollers!) and remove the pollution from the rollers. During this procedure, the rollers can be turned by turning the drive shaft.
4. Wipe the infeed-roller-pair (first roller-pair of developer rack) dry.
5. Replace the racks: Red = Developer, Blue = Fixer. Beige = Washing/Drying. Ensure that the racks are firmly installed and do not forget to close the securing latches on the drive shafts.
6. Replace machine cover and ensure it is securely closed.
7. Clean processor outer casing with damp cloth. Do not use aggressive cleaners or solvents.

Please note:
When removing the Rinsing / Drying roller-rack, ensure that no water gets into the film dryer air channel.

Thorough Cleaning

Depending on the quantity of films processed, a thorough cleaning is necessary every 3 - 6 months. Tank cleaners are available for developer and water baths. The fixer bath is cleaned with water. When preparing chemical tank cleaners, follow manufacturers instructions explicitly.

How to proceed:

1. Switch the machine off and empty all tanks by opening the stop cocks. Attention! Machine will not drain off, if it is swichted on.
2. Remove machine cover. When all tanks are emptied, close stop cocks again. Now fill the fixer-tank with water. Prepare cleaner solutions for developer and water baths and fill into respective tanks.
3. Remove suction pipes from the replenishment containers and place them in a water filled bucket. Attention! Do not add chemical cleaners here!
4. Close machine cover and switch machine on.
5. Start film transport (see “Manual starting and stopping the film transport:” on page 16) and keep running for 10 to 20 minutes. During this the installed roller racks will be cleaned.
6. Important: After completion of tank cleaning, the tank should be rinsed thoroughly with clean water. To do this, fill the machine with fresh water twice and each time, let the machine run for a 10 minute period. Empty the tanks and re-close the stop cocks.
7. Take out the roller-racks and rinse them thoroughly with running water. Remove remaining dirt from the rollers by using a sponge and clean thoroughly. Doing this, the rollers can be turned by turning the drive shaft. Wipe the infeed-roller-pair (first roller-pair of developer rack) dry. Replace the racks.
8. Refill the tanks with respective chemicals. This can be done by hand or automatically (see “Autofill Function” on page 16). Replace the suction pipes into the replenisher containers. In certain circumstances the circulation system must be ventilated: see “1. Test run” on page 8 item b).
9. For quality check, process test films.

Before you go on holiday...

or in the event that your processor will not be in use for longer than two weeks, all the chemicals have to be emptied out of the tanks. In case you don't want to do a complete tank cleaning at once, then fill the tanks after emptying, with water.

Attention: Do not use alcohol containing solvents to clean the machine!

Colour changes in the containers are caused by the properties of the chemicals and no cause for concern!

Maintenance / Disposal

Maintenance Protocol

Installation

Name:	Machine type:	Serial number:
Technician:	Training:	by:
Telephone:	Date:	Guarantee until:

Parameters Set

Developer temp.:	Dryer temp.:	Cycle time:
Dev. reg. time:	Fix. reg. time:	Anti-oxidation:
Developer:	Fixer:	Film type:
Changed by:	Date:	

Developer temp.:	Dryer temp.:	Cycle time:
Dev. reg. time:	Fix. reg. time:	Anti-oxidation:
Developer:	Fixer:	Film type:
Changed by:	Date:	

Developer temp.:	Dryer temp.:	Cycle time:
Dev. reg. time:	Fix. reg. time:	Anti-oxidation:
Developer:	Fixer:	Film type:
Changed by:	Date:	

Maintenance Performed (see page 23)

Maintenance work performed	Maintenance work performed	Maintenance work performed	Maintenance work performed	Maintenance work performed
Date:	Date:	Date:	Date:	Date:
Name:	Name:	Name:	Name:	Name:
next maintenance:	next maintenance:	next maintenance:	next maintenance:	next maintenance:

Maintenance work performed	Maintenance work performed	Maintenance work performed	Maintenance work performed	Maintenance work performed
Date:	Date:	Date:	Date:	Date:
Name:	Name:	Name:	Name:	Name:
next maintenance:	next maintenance:	next maintenance:	next maintenance:	next maintenance:

Maintenance work performed	Maintenance work performed	Maintenance work performed	Maintenance work performed	Maintenance work performed
Date:	Date:	Date:	Date:	Date:
Name:	Name:	Name:	Name:	Name:
next maintenance:	next maintenance:	next maintenance:	next maintenance:	next maintenance:

Attention:

Never start the machine up unless it is filled with liquid!

Recommended Maintenance Work:

1. Functional check
   film intake / film transport / replenishment / bath heating / dryer heating / water supply
2. Cleaning
   - 2.1. Switch off machine, remove cover
   - 2.2. Empty all three tanks
   - 2.3. Close drain cocks and fill tanks with water
   - 2.4. Install cover, switch machine on
   - 2.5. Fill two additional vessels with water, put suction pipes into these vessels and activate replenishment for at least two minutes (to remove residues of chemicals from replenishing hoses)
   - 2.6. Switch machine on for a few minutes
   - 2.7. Switch machine off
   - 2.8. Empty all tanks
   - 2.9. Prepare tank cleaning agent for developer and water tank according to manufacturer´s instructions

Attention:

Do not use chlorine containing cleaning agents!

   - 2.10. Fill developer and water tank with tank cleaning agent **(<u>do not</u> use the replenishment pumps to do so)**
   - 2.11. Fill fixer tank with water
   - 2.12. Place suction pipes into empty tanks
   - 2.13. Install cover, switch machine on
   - 2.14. Wait until the operating temperature is reached, approx. 30 °C (observe information concerning temperature, time, cleaning procedure contained in the datasheet of the tank cleaning agent)
   - 2.15. Activate manual programme and transport
   - 2.16. After approx. 15 minutes (observe information concerning temperature, time, cleaning procedure contained in the datasheet of the tank cleaning agent) switch film transport off
   - 2.17. Remove cover, neutralise developer tank (observe information concerning temperature, time, cleaning procedure contained in the datasheet of the tank cleaning agent)
   - 2.18. Switch machine off
   - 2.19. Empty all three tanks
   - 2.20. Fill machine with water and switch it on
   - 2.21. Put suction pipes into vessels with water
   - 2.22. Activate replenishment pumps for at least three minutes
   - 2.23. Check all pumps for tightness
   - 2.24. Switch machine off
   - 2.25. Drain tanks
   - 2.26. Fill tanks with water until half full
   - 2.27. Switch machine on
   - 2.28. Activate replenishment pumps manually until tanks overflow
   - 2.29. Activate film transport for a few minutes
   - 2.30. Switch machine off and drain all three tanks

2.31. If required repeat items 2.20 to 2.30 (observe information concerning temperature, time, cleaning procedure contained in the
2.32. datasheet of the tank cleaning agent)
2.33. Remove roller racks from the machine and remove dirt under flowing water using a soft rag or sponge
2.34. Remove residual dirt particles in tanks and rinsing gutters.
2.35. Clean all toothed gear wheels, axles, bearings and rollers, check them for damage (replace if required)
2.36. Remove light barrier and clean it with a soft rag
2.37. Clean inlet plate using a soft rag
2.38. Reinstall light barrier
2.39. Align roller racks and re-insert them in machine
2.40. Fill machine with chemicals
2.41. Switch machine on
2.42. Adjust bath temperature to previously adjusted value
2.43. Feed cleaning film (approx. 4 pieces)
2.44. Check function as described under item 1.
2.45. Approx. 15 minutes after reaching of the set bath temperature, measure it for confirmation and re-calibrate if required (see operating manual page 39)
2.46. Perform sensitometric test

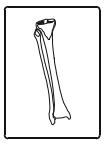
Please dispose of all old devices in an environmentally friendly manner.
Old devices contain materials which need to be recycled. Please have them collected separately and recycle appropriately.

Problems and Solutions

Advise on Film Defects

Your processor has been constructed for long term use. If however irregularities might occur, you will find help to locate the problem below. Please check the listed points, before calling your service-technician.

Films do not have enough density

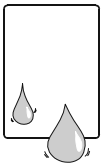


- Bath temperature is too low.
- Developing time too short.
- Exposure time is too short.
- Replenishment rate of developer too low.
- Developer chemicals are exhausted: Renew.
- Fixer solution has been mixed into developer: Renew. Clean and rinse bath well before refilling.
- Circulation is broken down.

Too high a density

- Bath temperature too high.
- Developing time too long.
- Exposure time is too long.
- Replenishment rate of developer too high.
- Developer chemicals are too high diluted: Renew.
- After renewing chemicals: Starter is missing.
- Circulation is broken down.

Films will not dry



- If warm air comes out of air channel in the dryer, chemicals and film type should be checked.
- Fixer solution is exhausted or diluted.

Film has a yellow-green surface

- Not fixed correctly. Check the film type and fixer chemistry.
- Fixer solution is exhausted or diluted. Replenishment rate of fixer is too low.

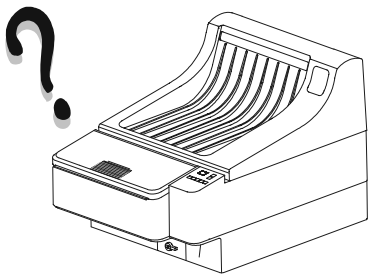
Scratches, pressure marks, dirt on film

- Prior to processing films, run cleaner films through the processor.
- Pressure marks caused by careless handling, finger nails etc.
- Rollers are polluted. Clean tanks and roller racks.

Cloudy film

- Level in developer is too low.
- First guide bar of fixer rack is dirty (condensate or crystals). Clean roller-racks.
- Developer is old or circulation not working.
- Try processing films by infeeding them with emulsion side up.

Advice on Machine Errors



Machine does not switch on

- Ensure that electrical plug is firmly inserted into socket. Ensure that electrical socket has power supply by testing with an appliance e.g. tablelight.

Rinsing water does not flow

- Open water inflow tap.
- Water pressure in the water system is too low: Pressure in the plumping system too low: Minimum pressure has to be 2 bar (29 psi).

Replenishment rate too high

- Check the programmed times of replenishment cycle and replenishment time.

Replenishment rate too low

- Check the programmed times of replenishment cycle and replenishment time.
- Check whether the machine can be started by each of the light barriers (4 pieces). In the case of a light sensor being faulty, call your service technician. In the meantime, double the programmed replenishment time.

Replenishment pump does not pump

- Check whether the replenishment containers are full and that the end of the suction pipe is positioned under the liquid level.
- Check whether there is air in the replenishment pipes. If this is the case, then check the pipe connections.

Water tank overflows

- Water drainage hose (overflow) is bent. The hose end should be positioned above the drainage level in the syphon.›‹›‹
- Check water drainage in the tank and hose for blockage and pollution. The drainage hoses should have a constant fall.

The film does not transport correctly

- Film is fed in and gets caught in the machine: Check the positioning of the racks in the machine and make sure that the latches are closed.

Film cannot be fed, the display shows “E1”

- Close machine cover securely, paying special attention that the switch on the rear of the control panel is actuated.

Film is in the infeed and nothing happens

- Display is flashing: Control is in the manual mode. Switch back to Automatic Mode (see page 16).
- Developer-temperature button is flashing: The temperature of the developer has not yet been reached. Wait until temperature has been reached and the button stops flashing.
- Push the film deep into the infeed and move this from side to side. If the processor still does not start then call your service technician. In the meantime, with limitations the processor can be worked with in the Manual Mode (see page 16).

Film is caught up in the racks

- Switch machine off and remove cover.
- Check in which rack the film is caught up in and remove the respective rack.
- If possible, catch hold of the film end by hand and by manually turning the drive-shaft, pull the film out of the rack.
- Replace the rack and secure with fastener. Replace machine cover and switch the machine on again.
- If a film is caught up in the machine due to a power cut, it can be transported out of the machine by activating the transport with a film in the infeed (machine can also be started up in the manual mode, see “Manual starting and stopping the film transport:” on page 16).

Important notes:

Ensure correct seating of roller racks; keep the lock closed at all times.

Don’t operate processor with empty replenishment tanks.

After a long machine shut down check bath level and refill if necessary.

Error messages

Machine errors are shown on the display as abbreviations. The cause of error is explained below. For service technician: problem solution see “Trouble shooting” in service manual.

Display	Cause and possible correction
E1	Cover switch is not actuated. Place cover correctly on the machine and ensure that the cover switch behind the control panel is actuated. If the error cannot be corrected, then the cover switch may be broken.
E2	Motor servo-control defective, call service technician. In the meantime work can be continued with the last set processing speed. The processing speed cannot be altered. (Service see “Display shows error message “E2”” on page 39).
E3	Drive-overload, take off machine cover and remove all roller-racks. Check each rack for easy rotation of the drive shaft. If necessary clean roller-racks and machine. Error can be reset by switching the machine off. If the need arises let a service technician check the machine. If the above measures do not improve the situation, the motor may be defective.
E4	Error: Overtemperature in dryer section. Call your service technician. Dryer components could be broken. Machine can only be used in manual mode, and the dryer fan runs continously (error will always be displayed). The machine may only be operated under constant supervision. Check if air is coming out from the opening in the cover. If no air comes out, the fan is defective and the machine may not be used. Switch the machine off. Error can only be reset by switching the processor off (Service see “Display shows error message “E4”” on page 41).
LO	Input locked. To change operation parameters the lock function must be deactivated (see “Lock Function” on page 18).

Tips and Tricks

Removal of Control PCB

To reach the screws of the control PCB remove the film over the keyboard in the front area about 20 mm (lift up).

Stop start-cycle

The start-cycle (after switching the machine on) can be manually interrupted. To stop start-cycle, press both arrow-buttons (2+3) simultaneously. The start-cycle may only be interrupted for service purposes.

Display of machine information

When during the start-up cycle one of the arrow-buttons is pressed then various machine information will be displayed.

Arrow button “Up”: At the beginning for three seconds the machine type (C2) and then for five seconds the software version will be displayed.

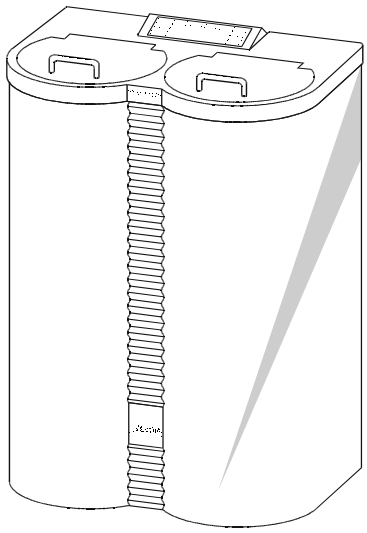
PROMIX® A40

The PROMIX® A40 is a fully automatic chemical mixing machine for preparing developer and fixer bath chemicals of either powder form or liquid concentrates. All stages are guided and controlled by means of a microprocessor. Thanks to a large reserve tank, up to 3 machines can be connected and continue to operate, without having to interrupt the working process.

Due to its patented construction, the PROMIX® A40 is easy to operate, reliable, fast and virtually service free.

The PROMIX® A40 replaces the usual replenishment tanks in the darkroom.

Ask your local dealer for more information.



Technical Specifications

Tank capacities:	each 20, 25, 30 or 40 litres
Reserve tank:	each 13 litres
Water connection:	3/4", 2 - 10 bar (29 - 145 psi)
Pump capacity:	38 l/min
Mixing times:	variable, 2, 3, 5, 10, 15, 20, 25, 30 minutes
Power source:	220-240 VAC, 200 W, 50/60 Hz Fuse: sb 2 A / 250 V
Weight:	28 kg empty, 108 kg full
Dimensions:	(WxHxD) 65 x 93 x 44 cm

AIRCLEAN® 200

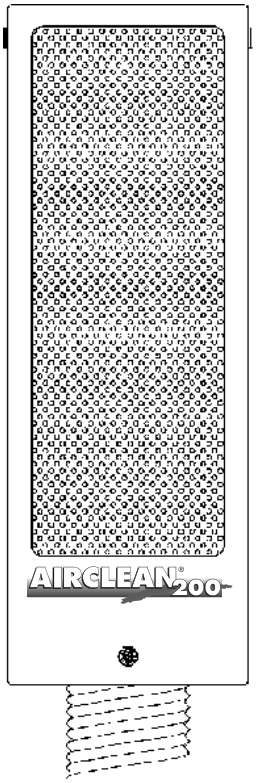
At last you can breathe again

AIRCLEAN® 200 cleans the air from your processor. Unpleasant chemical odours are absorbed through the large active charcoal filter. Allergies are prevented and you can breathe again freely.

Simple installation directly on to the processor (no breaking through the wall).

Filter exchange cheap and fast approx. every 3 months.

Ask your local dealer for more information.



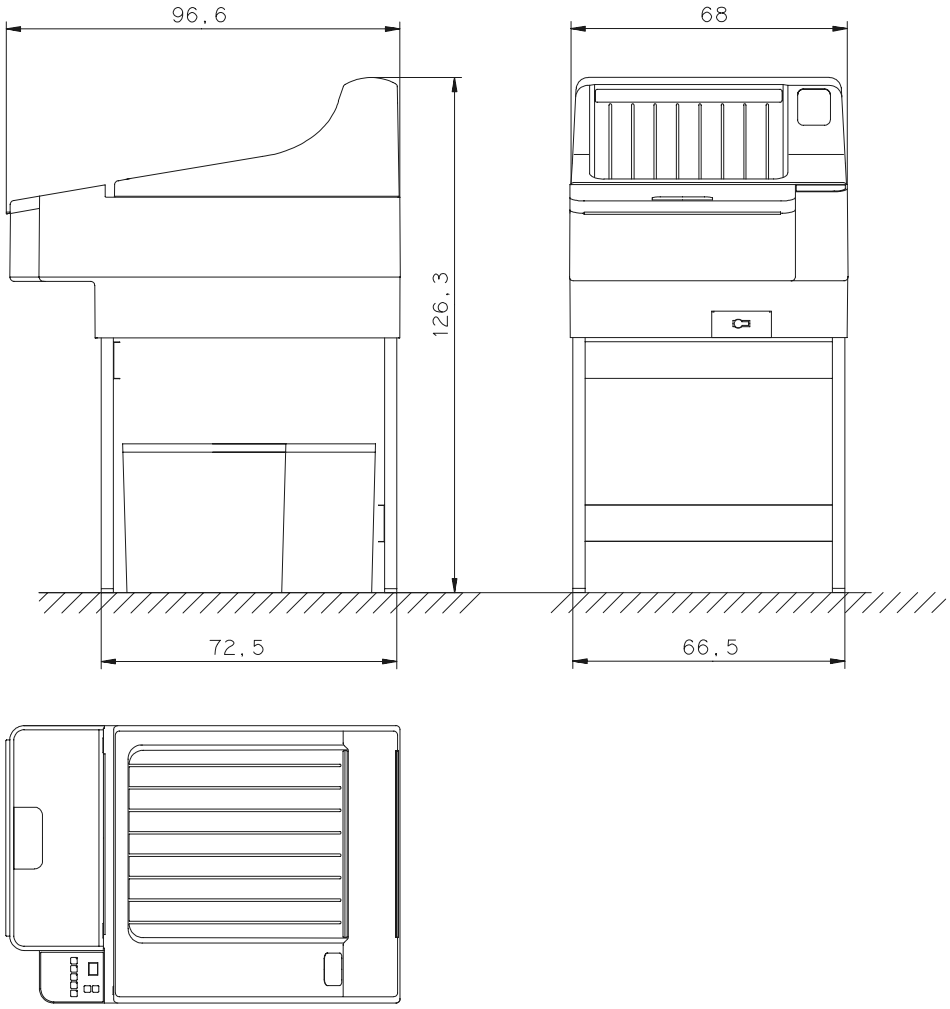
Technical Specifications

Cleaning capacity:	approx. 200 m^3/hour
Filter:	Active charcoal
Power consumption:	43 W
Power source:	220-240 V, 50/60 Hz
Weight:	7 kg
Casing:	Stainless steel, plastic coated
Casing dimensions:	(WxHxD) 21 x 63 x 17 cm

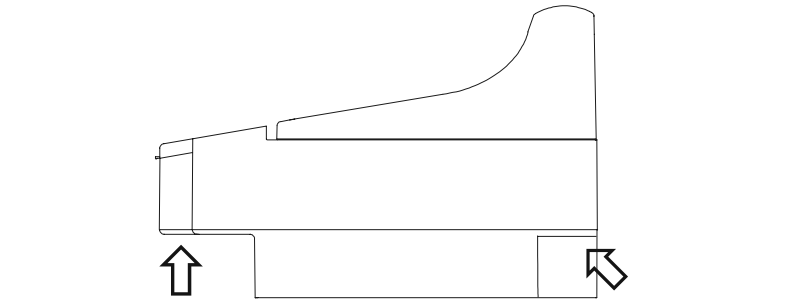
Service Manual

Table of Contents

Dimensions



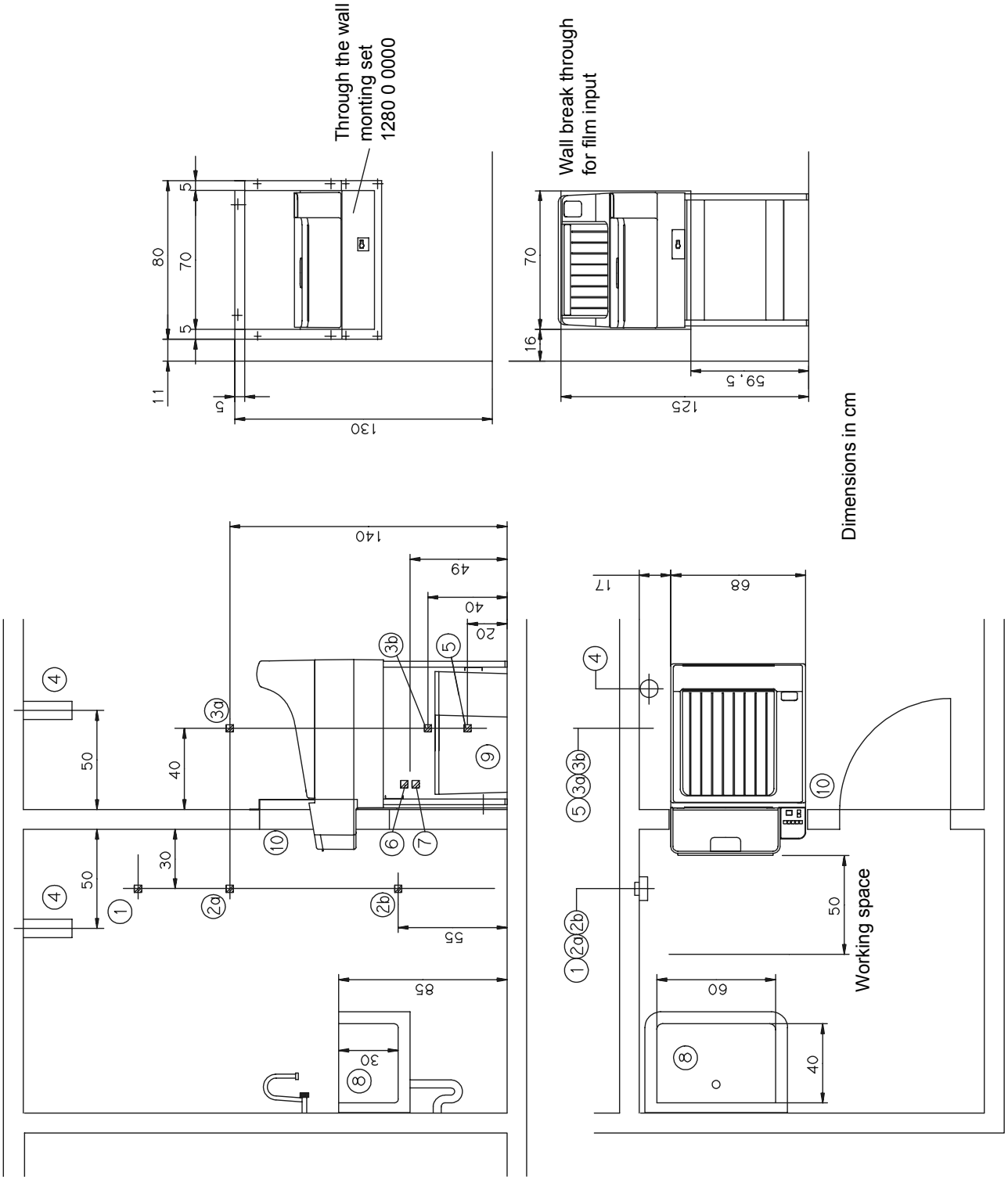
Transport



English

Installation Data

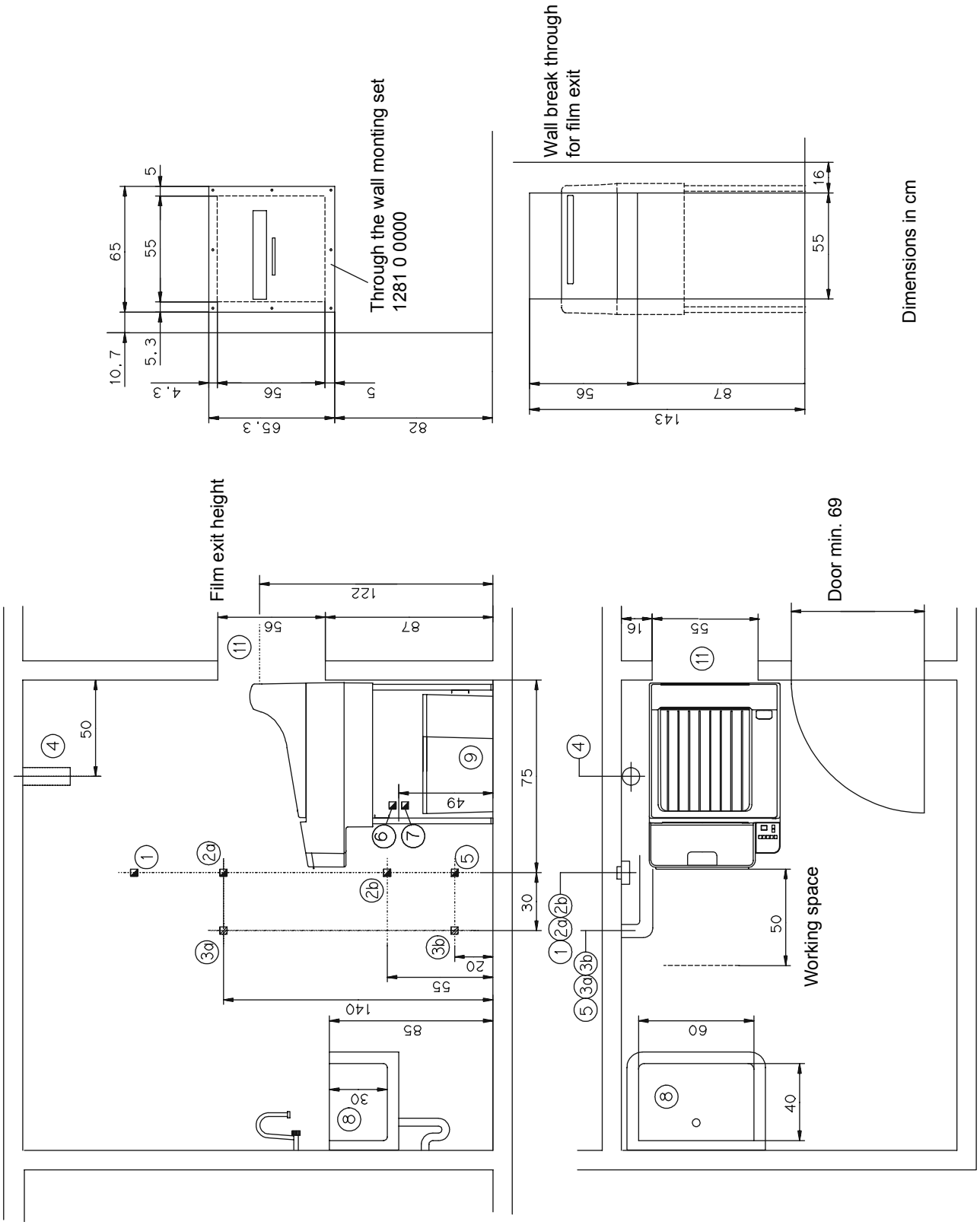
Through the wall mounting film infeed
- Machine in light room



Existing wall break through

If the machine is to be mounted to an existing wall break through of a PROTEC COMPACT 45 machine, then the wall plate order-no. 0280-0-0101 will be required. For “Through the wall mounting film output” the COMPACT 2 can be directly mounted to an existing wall break through of a PROTEC COMPACT 45.

Through the wall mounting film output
- Film output to the light room



1 Mains (208) 220 - 240 V, 16 A; Cu wire-Kabel 3 x 1.5 mm^2; Ground-Leakage-Switch 25 A / 30 mA; power consumption 2.2 kW.

2a Power switch 16 A; 140 cm above floor;

2b Machine connection: Socket incl. earth 60 cm above floor.

3a Water connection: Water consumption 1.9 l/min; Water temperature may not be below 5°C;

3b Water stop cock 3/4" washing machine connection.

4 Ventilation of darkroom is necessary.

5 Drainage hose, diameter 50 mm, acid resistant; odour preventor with connection for 10 mm hose.

6 Drainage for Developer; connection for 10 mm hose. Respective collecting containers have to be supplied. Local water board regulations have to be complied with!

7 Drainage for Fixer; connection for 10 mm hose. Respective collecting containers have to be supplied. Local water board regulations have to be complied with!

8 Sink with hot/cold water and flexible hose; Inner dimensions are 60x40x30 cm deep; Material: ceramics, stainless steel, plastics.

9 The replenishment containers can be placed under the processor or can be installed externally.

10 Wall break through for film exit through the wall infeed (page 35): Processor is installed outside the darkroom, the film exits into the light-room. For the alteration “Through the wall mounting infeed” the assembly kit no. 1280-0-0000 is necessary..

11 Wall break through for film exit through the wall output (page 36): Processor is installed inside the darkroom, the film exits through the wall to the light-room. For the alteration “Through the wall mounting film output” the assembly kit no. 1281-0-0000 is necessary.

Film exit through the wall

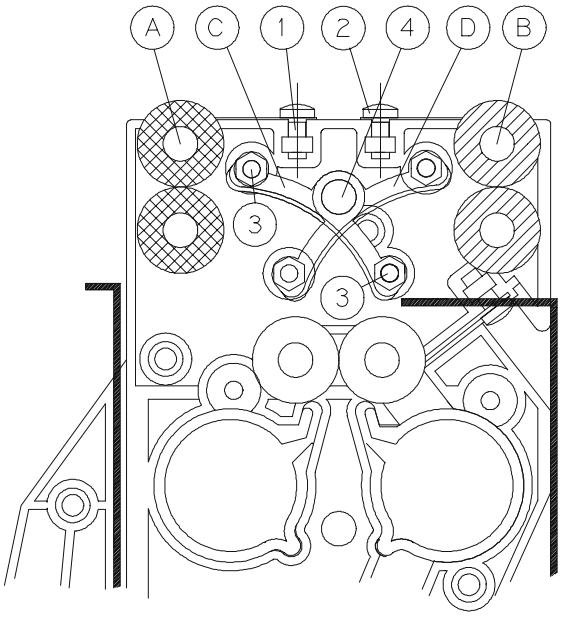
On machines which have the film exit through the wall into the light room, the following modifications have to be made:

Dryer rack

Remove the two rollers from pos. A. To do this open bolt from spring at pos. 1 and remove gear from lower roller.

Move curved guide bar from pos. C to D. To do this open bolt 3 and 4.

Install the two rollers in pos. B. Mount spring at pos. 2.



Machine cover

The front film exit opening in the machine cover has to be closed with the screen contained in the assembly kit.

For the alteration “Through the wall mounting film output” the assembly kit no. 1281-0-0000 page 48 is necessary.

Trouble Shooting

Summary

1 Algae

1.1 Excessive algae growth in water tank

Algae growth inside the water tank is not only anoying, it causes increased cleaning work and leaves residue on the films. When algae growth increases, countermeasures are in demand:

- When work has been completed at the end of the day, drain water out of the machine.
- Clean dryer-water rack regularly. Use soft sponge and soap to remove residue from the rollers.
- Install a particle filter system in the fresh water supply for the processor.
- If no other solutions can be found, then usage of Anti-Algae-Agents can be a great improvement (automatic dispensers work the best). However, it is known that cleaning agents containing chlorine may corrode rubber rollers and high-grade steel in the tank area (check before use).

2 General

2.1 Mains switch “ON” - no function

- Ensure that electrical socket has power supply.
- Check machine fuses.

Pleasse use as replacement fuses only the PROTEC®s.These fuses are optimized for use under existing conditions.

- While power switch is on, check the following components: Voltage on contact of main switch - If there is no voltage, replace the respecitve component.

2.2 No display but circulation pumps run

- Check entry current of 5 V - on the contacts no. 7 and 8 of 8-pole-plug X23 from the control unit's PCB. If voltage is present, then exchange the control unit.
- Check fuse (5 A) on the power PCB.
- Disconnect temperature sensor developer bath (X25) and check display again.
- Disconnect temperature sensor dryer (X24) and check display again.

3 Drive

3.1 Machine does not start automatically

- When machine is switched on place a film in the infeed until it reaches the pull-in-rollers. Eventually move the film sidewards to activate the light barrier. If the display shows two bars with decimal points, then the light barrier is in order. Check each of the four eyes on the light barrier. Each eye must start the machine - if not then exchange light barrier. Check the connection of the light barrier. If there is no reaction on the display then exchange the light barrier, eventually the control unit has be changed.
- The display shows “E1”: The cover switch is not actuated by the latch on the cover. Cover switch has no current passage when activated: Replace.
- Developer-temperature button is flashing: see “Developer bath temperature is not reached” on page 40.

3.2 Machine doesn't stop automatically, motor and fan run continuously

- Display is flashing: Control is in the manual mode. Switch back to Automatic Mode (see page 16).
- The display continuously shows two bars with decimal points: Light sensors on light barrier are dirty or the light barrier is defect. Clean with soft cloth. If the need arises dismount light barrier to clean it. If the switches are defective, the machine can still be used in the manual mode (see page 16).
- PCB is possibly faulty - then exchange.

3.3 Drive motor does not run

- Display shows “E1” or “E3”: see “Error messages” on page 28.
- If current can be registered on motor, then motor is defect - exchange.
- Dryer fan runs but no voltage on motor: exchange power PCB.

3.4 Display shows error message “E2”

- Check plugins between main drive motor and power PCB. If “E2”" appears again, then exchange main drive motor. In rare cases the PCB causes the error (see “Error messages” on page 28).

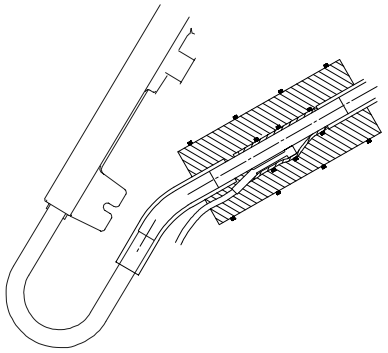
4 Baths

4.1 No circulation in developer or fixer baths

- Circulation pump runs but no circulation can be registered. Air lock in heating and circulation system. To ventilate: see “1. Test run” on page 8 item b).
- Particles in the pump chamber. The pump chamber can be easily opened by removing the four screws. Before opening the pump drain the bath. After cleaning re-close and ensure that the seal is correctly re-inserted and not damaged.
- Pump does not run. Check voltage on the connections X3 and X4 of the power PCB. If no voltage can be registered, see see “Mains switch “ON” - no function” on page 39. If however voltage can be registered, exchange pump.

4.2 Developer bath temperature is not reached

- No circulation:
  1) Circulation pump has no current or is defective.
  2) Air in circulation system: see “1. Test run” on page 8 item b).
- Check temperature safety switch on heat-exchanger. For temperatures up to 90°C, the temperature limiter must have current passage.
- Check heating element: Current flow resistance should read approx. 66 Ω.
- Check temperature sensor: Voltage at X25 on the control unit between pin 3 (green) and pin 2 (brown). The value should read 0. 32 V at a temperature of 32 °C.
- Increase the temperature and check the current on the control unit of clip X13. Voltage should be between mains and 60 Volts. If this is not the case, exchange the electronics.



4.3 Developer bath temperature is higher than the set temperature, display shows two crossbars, developer temperature button blinks

- see above
- Check current on power PCB at clip X13. There may be no current. If current is registered, exchange electronics.

4.4 Developer bath temperature too high or too low (display shows values of 20 °C or 42 °C)

- Check temperature sensor. Sensor is either not connected or defective.

4.5 Calibration of bath temperature / actual bath temperature is different from displayed value

Differences between displayed temperature and measured value in the developer bath can be adjusted. An adjustment may be necessary for example after exchanging the bath temperature sensor. A calibration has to be done, if the difference is higher than +/- 0.5 °C. Adjustment range is +/- 2 °C.

Calibration process

1. Switch processor off. While pressing developer temperature button switch machine on. Display will show developer bath temperature measured by sensor.
2. Measure actual temperature inside developer bath using a calibrated thermometer.
3. At first adjust displayed value in 1-degree-steps using the arrow buttons and. To adjust the decimal, hold developer temperature button down and press resp. arrow-button.
4. Switch machine off again.

5 Film defects

5.1 Films will not dry

- Hot air comes out of air channel, but the film is still not dried to satisfaction. Check chemicals and film type. If this leads to no solution then the transport speed of the machine can be reduced (see Processing time, page 14).

5.2 The film does not transport correctly

- Check the positioning of the roller racks and ensure that levers are closed. Check the gears on the roller racks. Check the positioning of the guide bars and roller pressure.
- Check gears on motor and worm gear of drive shaft.

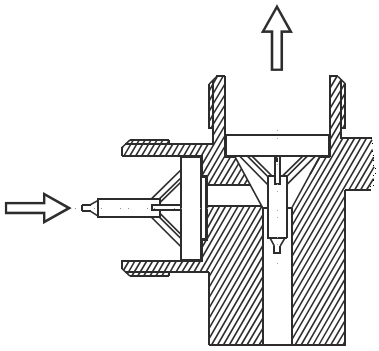
5.3 Scratches, pressure marks, dirt on film

- Straight scratches in infeed direction suggest a fault on the guide bars. Check roller racks individually and adjust guide bars. In case the guide bars are damaged - exchange.
- Pressure marks caused due to polluted or damaged rollers. If necessary exchange rollers.

6 Replenishment

6.1 Replenishment pump does not work or works insufficiently

- Clean valves inside connection tube of pump.



Install valve-insert correctly:Pay attention to flow-through direction!

- Replenishment pump sucks air in. Check hoses and connections.
- Check eccentric position. Capacity approx. 710 ml/min (850 ml/min with 60 Hz power mains) at setting to 100%. Minimum setting must not be below 50 %.
- Activate replenishment (in the manual mode) and while on, check the voltage of connection X6 (DEV) and X7 (FIX) on the power PCB. If no voltage can be registered - exchange power PCB.

7 Dryer

7.1 Display shows error message “E4”

Following parts should be checked and if faulty be replaced:

- Power PCB (in stand-by no voltage at X12)
- Temperature sensorsee “Dryer temperature display exceeds the set value” on page 42
- Dryer fan (see “Dryer ventilation does not function, no water inflow when water cock opened” on page 41 and see “Dryer ventilation is too weak” on page 42)
- Dryer heating element

7.2 Dryer ventilation does not function, no water inflow when water cock opened

- Start machine in manual mode (see page 16). Check current on X9 and X10 connections on power PCB. If no voltage can be registered - exchange power PCB. Otherwise ventilation has been connected wrongly or is defective.

7.3 Dryer ventilation is too weak

- If the ventilation is connected incorrectly, it runs very slowly (heating element in the air channel starts to glow).

Dryer ventilation connection:

X9	L	black
X9	Z	brown
X10	N	blue
X10	PE	yellow / green

7.4 Dryer temperature cannot be reached

- Check temperature sensor: Measure voltage at X24 on the power PCB between pin 3 (green) and pin 2 (brown). The value should read 0.32 V at a temperature of 32 °C.
- Only cold air flows from air channel: Heating element in air channel is defective. Disconnect X12 clip on the power PCB and measure resistance of heating element (approx. 26 Ω).
- Enter dryer temperature of 70 °C. Check voltage of X12 on power PCB. If no voltage can be registered - exchange control unit.

7.5 Dryer temperature display exceeds the set value

- Check temperature sensor: Measure voltage at X24 on the power PCB between pin 3 (green) and pin 2 (brown). The value should read 0.32 V at a temperature of 32 °C.
- Enter dryer temperature of 35 °C. Check voltage of X12 on power PCB. If no voltage can be registered - exchange control unit.

7.6 Dryer temperature cannot be reached or is too high (display shows values approx. 30 °C and 75 °C)

- Check temperature sensor. Sensor is either not connected or defective.

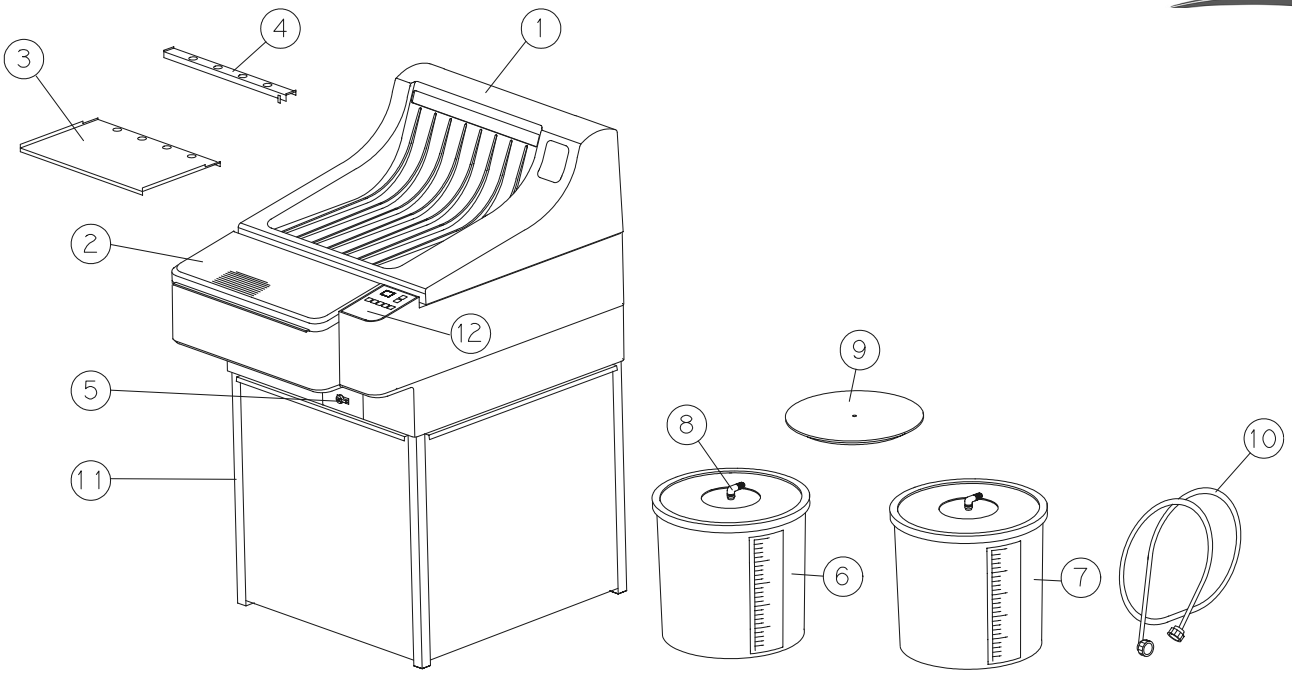
8 Water

8.1 Rinsing water does not flow, ventilation runs

- Water pressure in the water system is too low: Minimum pressure 2 bar (29 psi).
- Valve activates, no flow passage - filter at inflow is blocked.
- Check solenoid valve.

8.2 Water tank overflows

- Water drainage hose (overflow) should have a constant fall. The hose end should be positioned above the drainage level in the syphon.›Ω‹
- Check water drainage in the tank and hose for blockage and pollution.
- When extreme algae growth is noticed, the overflow can be connected directly at the back of the water tank.

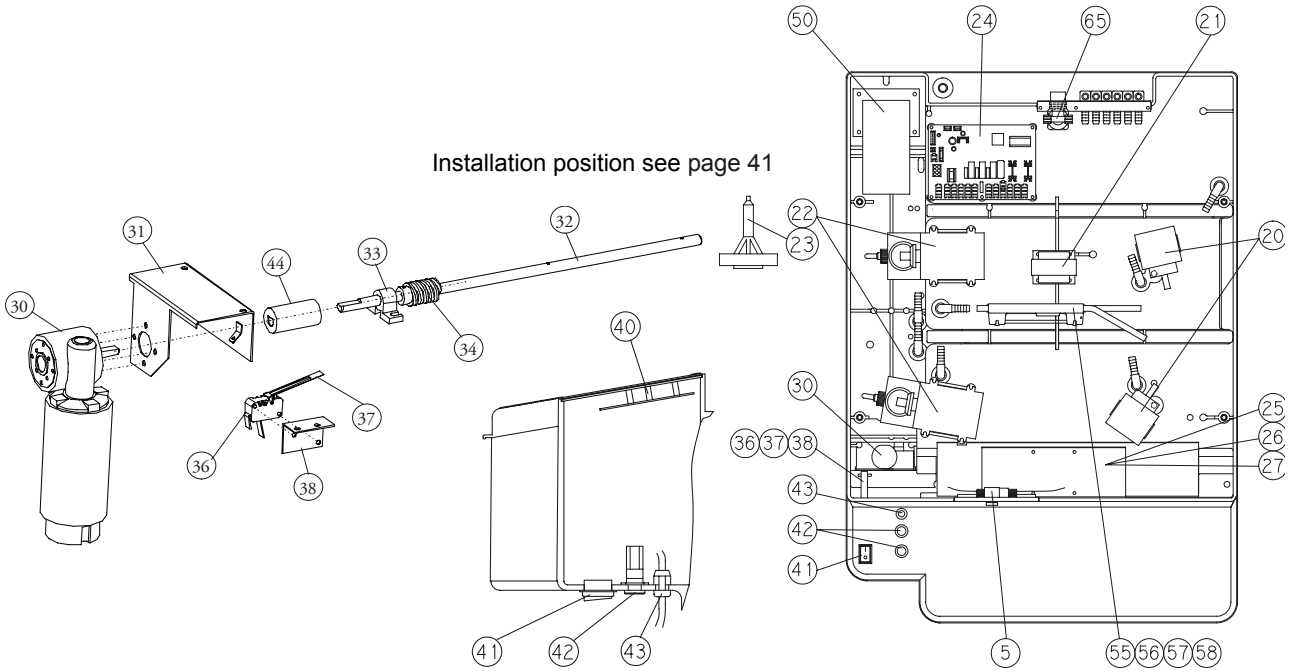


Pos.	Order No.	Description:
1	1190-0-0200	Machine cover
2	1190-0-3101	Light protection cover
3	1190-0-0105	Film infeed tray
4	1191-0-0105	*Film infeed tray, graphics art
5	2006-0-0005	Drain stop cock 10 mm
6	1101-0-2000	Replenisher tank dev. 25l
7	1101-0-2100	Replenisher tank fix. 25l
8	1101-0-1700	Suction pipe w. filter f. 25 l tank
9	1101-0-4100	Floating cover developer
10	2018-0-0001	Water inlet tube
11	1190-0-0011	Processor base cabinet (closed)
	1190-0-0010	Processor base stand (open)
12	1190-0-1201	Control panel foil
-	2018-0-0005	Tube 4x1mm, green
-	2018-0-0003	Tube 9x2mm, clear
-	2018-0-0007	Tube 16x4mm, clear, reinforced
-	2018-0-0008	Tube 10x2mm, red, reinforced
-	2018-0-0009	Tube 10x2mm, blue, reinforced
-	2018-0-0012	Tube 10x2mm, clear, reinforced
-	2022-0-0004	Tube clamp
-	2022-0-0019	Wire tube clamp
-	2022-0-0026	Wire tube clamp
-	2022-0-0028	Wire tube clamp
-	2022-0-0030	Wire tube clamp
-	2015-0-0001	Floating balls

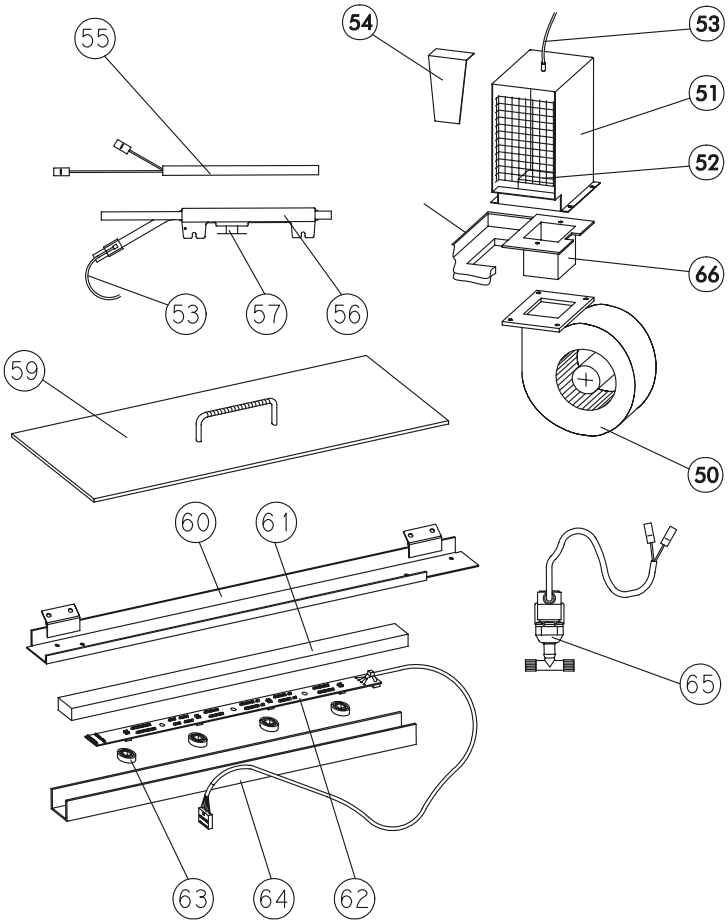
Wires and cables

Pos.	Order No.	Description:
-	1190-0-0108	Transformer > power PCB 20V
-	1190-0-0112	Power PCB > transformer 230V UL
-	1190-0-0110	Power PCB > controller PCB
-	1190-0-0111	Motor > Power PCB
-	1190-0-0114	Fuse holder > Power PCB UL
-	2004-0-0010	Electrical power lead
-	2004-0-0016	Electrical power lead UL
-	2004-0-0012	Main switch > fuse holder UL

*Parts for graphic arts version only.



Pos.	Order No.	Description:
20	2002-1-0011	Circulation pump MD-10 (circulation)
21	2036-1-0001	Safety-transformer UL
22	0002-1-0001	Bellows pump KB2X 230V, 50Hz
	0002-2-0001	Bellows pump KB2X 230V, 60Hz
23	0002-1-0008	Valve insertion f. pos. 22
24	0190-0-0900	Power PCB Additional information concerning Compact 2 NDT see on page 57
25	2008-5-0006	Axial fan
26	0190-0-1801	Fan plate
27	1190-0-1802	Light protection plate
30	2001-9-0006	Main drive motor, new
31	1190-0-1102	Motor bracket, variation 2
32	1190-0-1503	Drive shaft, variation 2
33	1170-0-1502	Bearing block
34	1170-0-1503	Worm-gear Additional information concerning Compact 2 NDT see on page 57
36	0170-0-2400	Micro switch (Cover)
	0170-4-2400	Micro switch (Cover) UL
37	2007-0-0010	Operator for micro switch
38	1190-0-0902	Bracket for cover switch, variation 2
40	1190-9-1200	Controller PCB
41	2028-0-0023	Power switch
42	2010-0-0004	Fuse holder
-	2010-0-0010	Fuse slow blow in gold, T 10A/250V
43	2027-0-0012	Traction relief
	0190-0-2700	Traction relief for UL power cord
44	1190-0-0117	Coupling

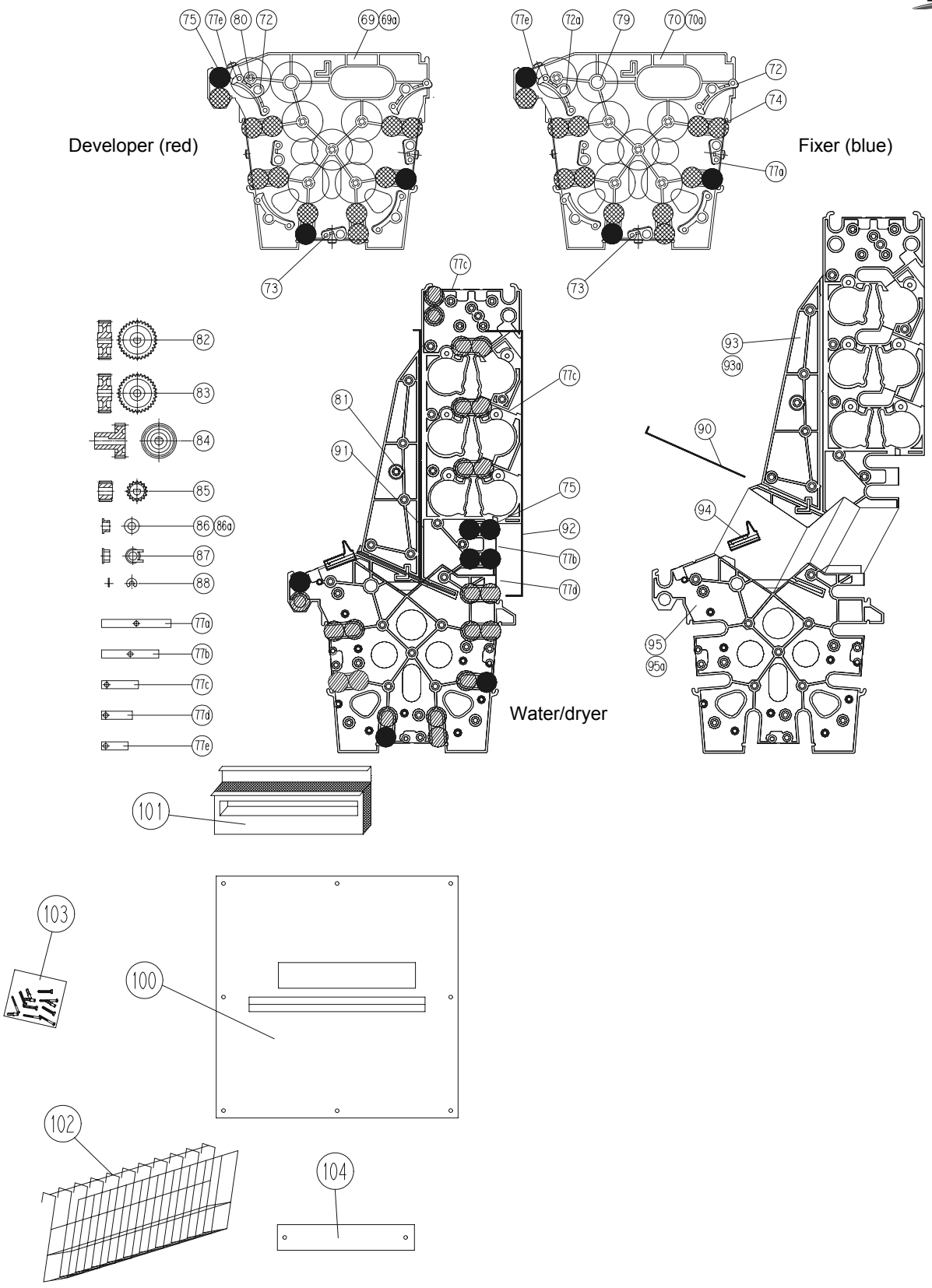


Pos.	Order No.	Description:
50	2008-5-0007	Ventilation 230 V (dryer)
	2008-7-0007	Ventilation 230 V (dryer) UL
51	1190-0-1301	Air channel
52	0190-0-1300	Heating element 2kW/230V (dryer)
	0190-7-1300	Heating element 2kW/230V (dryer) UL
53	0190-0-2200	Temperature sensor (same for bath and dryer heating)
54	1190-0-1302	Plate for air channel
55	2003-5-0002	Heating element (bath heating)
	2003-7-0002	Heating element 800 W UL
56	1190-0-2101	Heat exchanger
57	2005-0-0005	Temperature limiter
59	1190-0-4100	Condensation cover E
60	1190-0-0103	Light barrier support
61	2030-0-0014	Rubber inlet
62-63	0190-0-0800	Lightbarrier support, compl.
64	1190-0-0107	Light barrier casing
65	1120-5-1900	Solenoid valve 230 V
66	1190-0-1304	Channel dryer heating

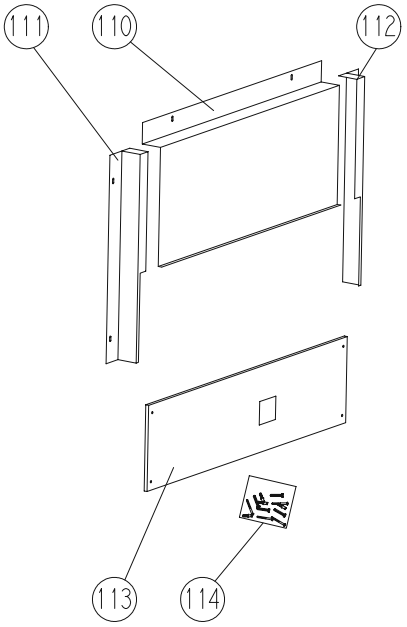
Standard roller racks

Pos.	Order No.	Description:
-	1190-0-0300	Developer standard Additional information concerning Compact 2 NDT see on page 57
-	1190-0-0400	Fixer standard Additional information concerning Compact 2 NDT see on page 57
-	1190-0-0600	Water/dryer standard Additional information concerning Compact 2 NDT see on page 57
-	1191-0-0300	Developer graphics art
-	1191-0-0400	Fixer graphics art
-	1191-0-0600	Water/dryer graphics art
69	1190-0-0301	Side plate dev. right

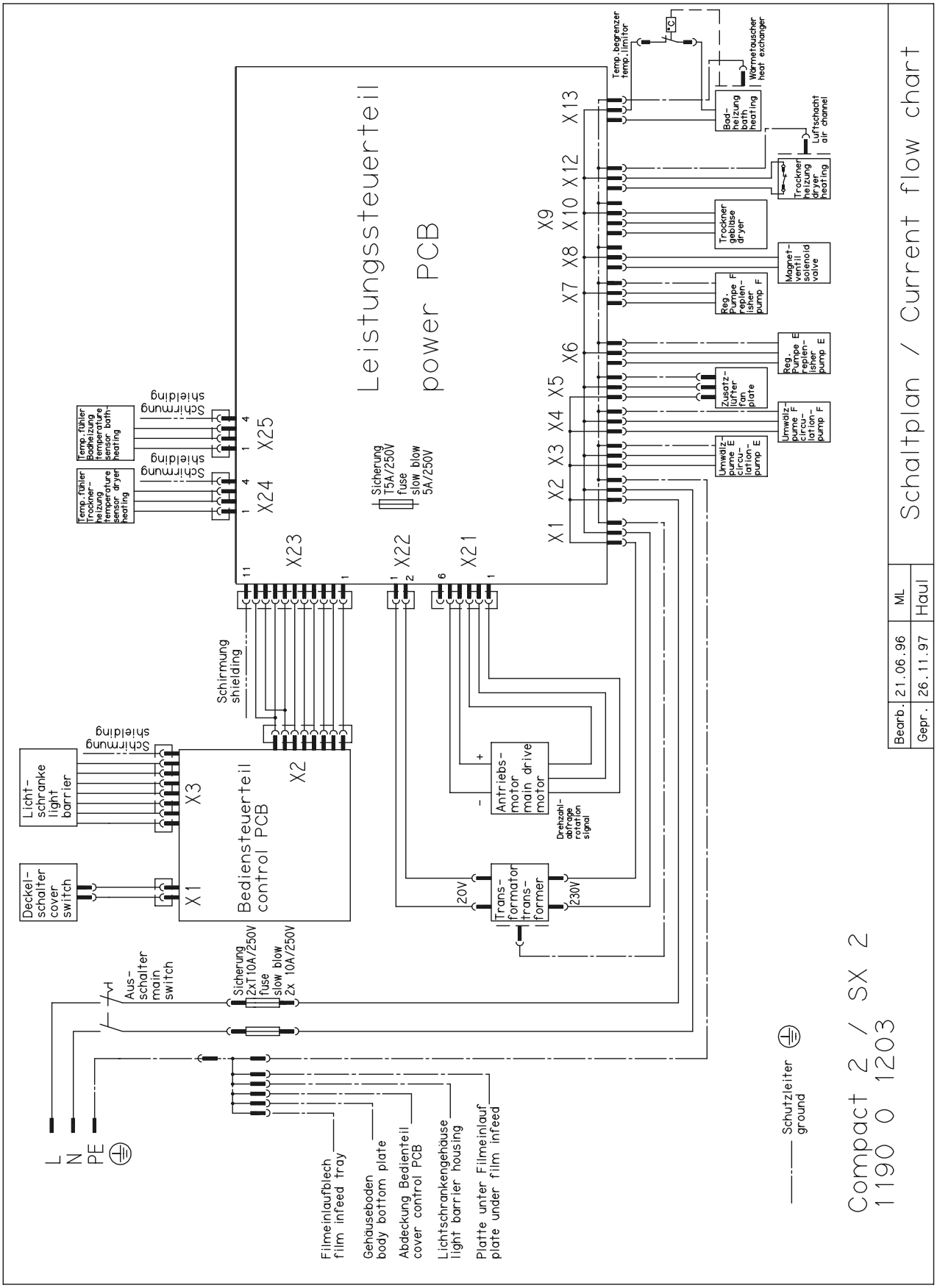
Pos.	Order No.	Description:
69a	0190-0-0301	Side plate dev. left w. shafts
70	1190-0-0401	Side plate fix. right
70a	0190-0-0401	Side plate fix. left w. shafts
72	1101-0-3700	Guide bar 2, curved with nose
72a	1101-0-4500	Guide bar 2, curved with nose
73	1190-0-3600	Guide bar straight, short
74	1101-0-0306	PU-roller ground
75	1101-0-0307	Rubber roller Additional information concerning Compact 2 NDT see on page 57
77a	1190-0-0302	Flat spring 68
77b	1170-0-0304	Flat spring 55
77c	1170-0-0303	Flat spring 36
77d	1101-0-0315	Flat spring 30
77e	1190-0-0303	Flat spring 26
79	1190-0-0310	Drive shaft rack C 2 Additional information concerning Compact 2 NDT see on page 57
80	1101-0-0316	Shaft
81	1101-0-0311	Distance bar
82	1101-0-0303	Gear t = 32, D-hole
83	1101-0-0304	Gear t = 32, R-hole
84	1170-0-0302	Worm wheel Additional information concerning Compact 2 NDT see on page 57
85	1101-0-0302	Gear t = 16, D-hole
86	1101-0-0305	Bearing bush, white
86a	1101-0-0317	Bearing bush, black
87	1102-0-0401	Bearing w. clearance
88	2014-0-0001	Circlip
90	1190-0-0604	Dryer plate, small
91	1190-0-0603	Dryer plate, large
92	1190-0-0605	Dryer plate, rear
93	1190-0-0609	Side plate D top right
93a	0190-0-0608	Side plate D top left (with shafts)
94	1190-0-0607	Slide for dryer separation
95	1190-0-0606	Side plate W/D bottom right
95a	0190-0-0606	Side plate W/D bottom left (with shafts)

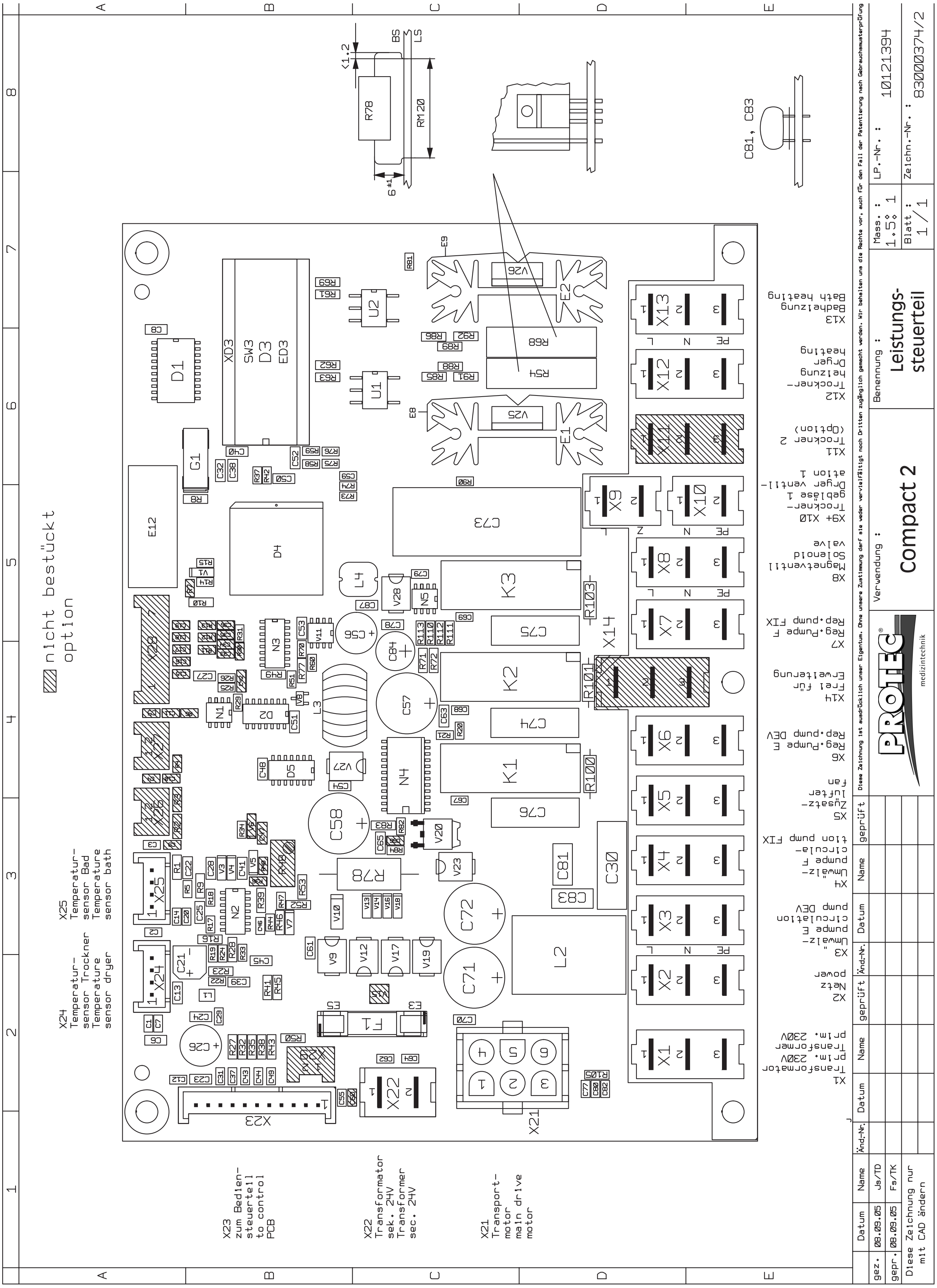


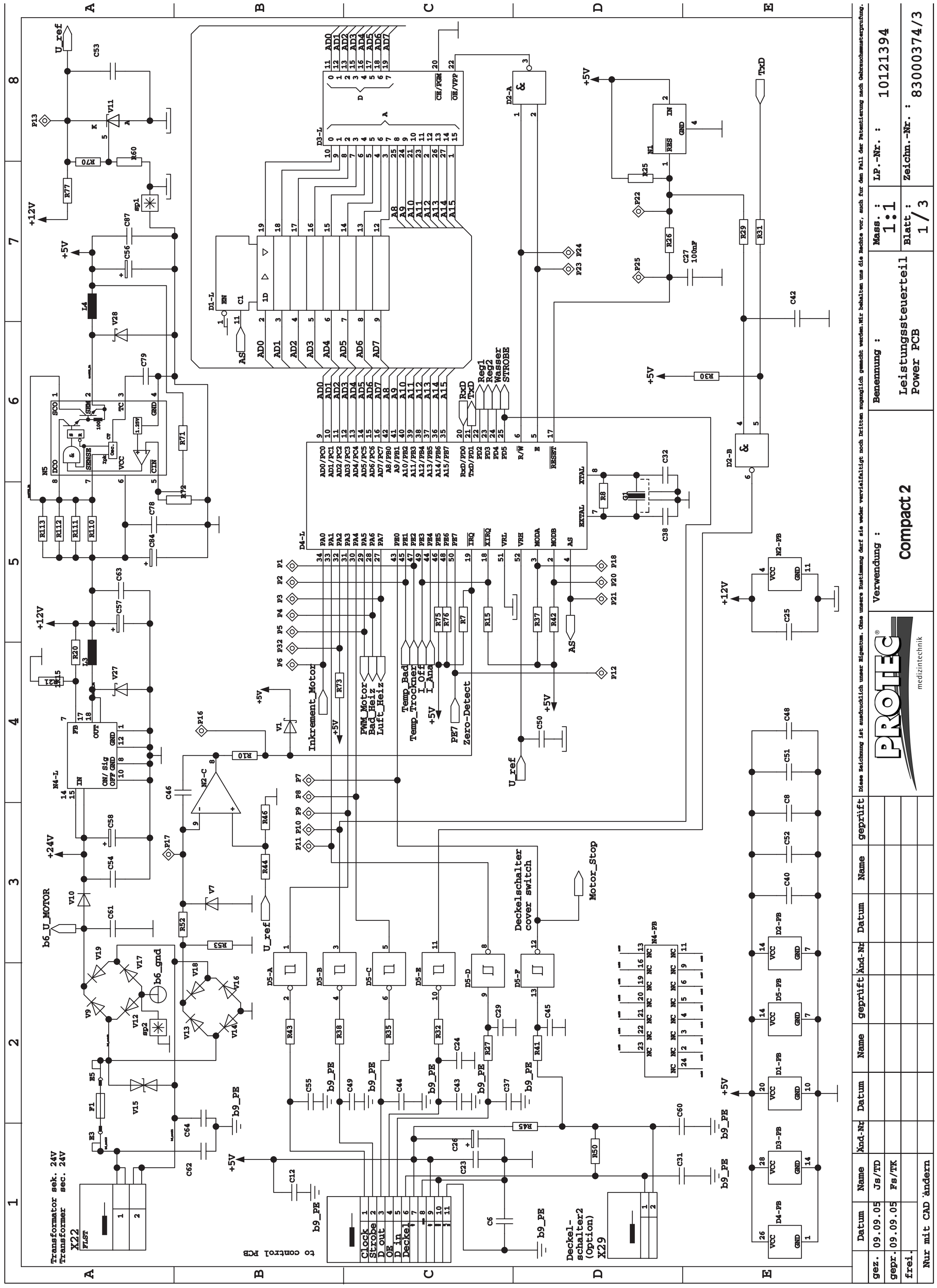
Pos.	Order No.	Description:
100-104	1281-0-0000	Mounting set “Through the wall mounting set film output”
100	0281-0-0201	Wall plate
101	0281-0-0100	Sealing wedge
102	1253-0-0001	Catch basket
103	0281-0-0202	Mounting kit
-	0281-0-0204	Strap
104	0281-0-0203	Blind plate 2

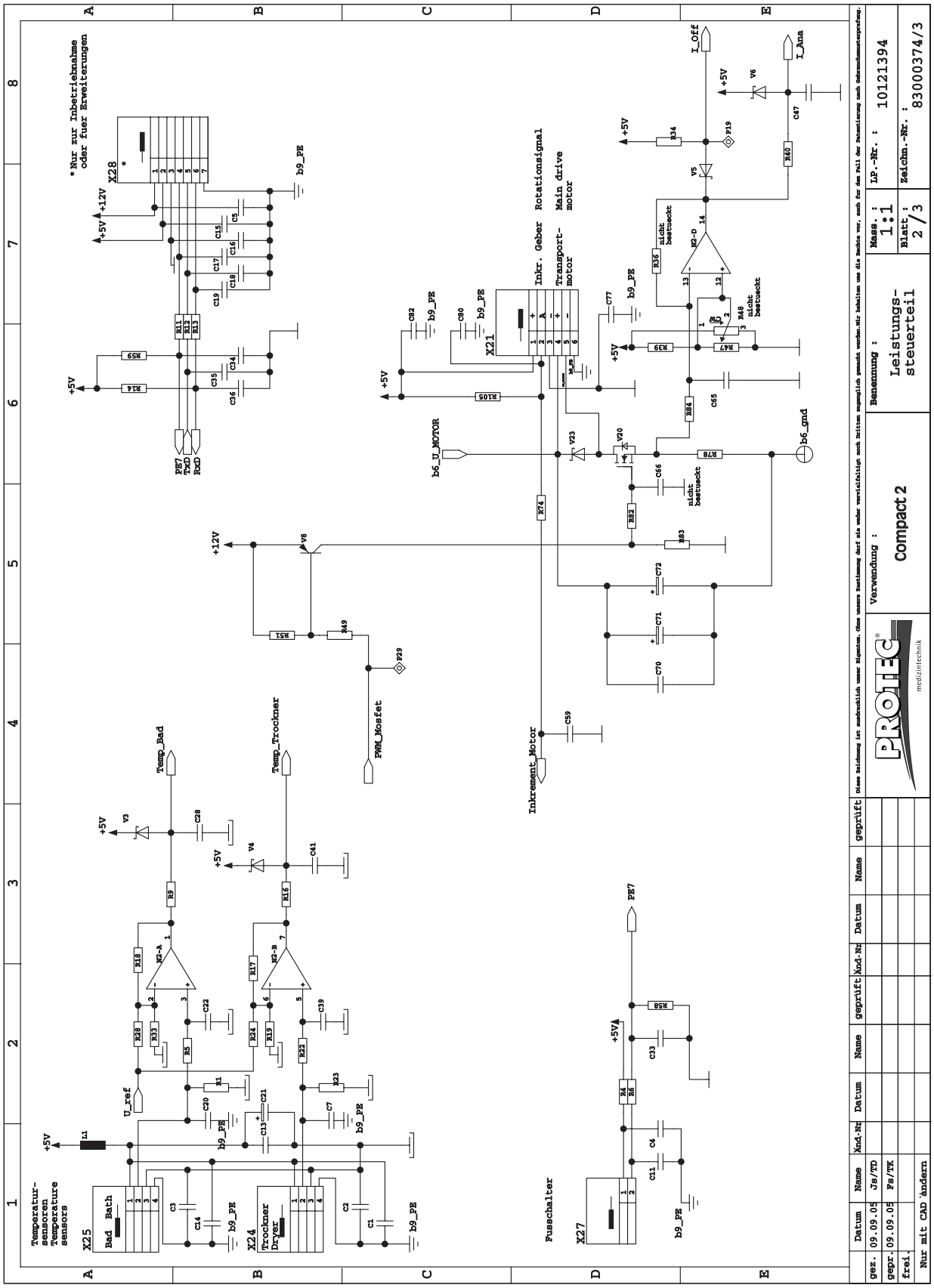


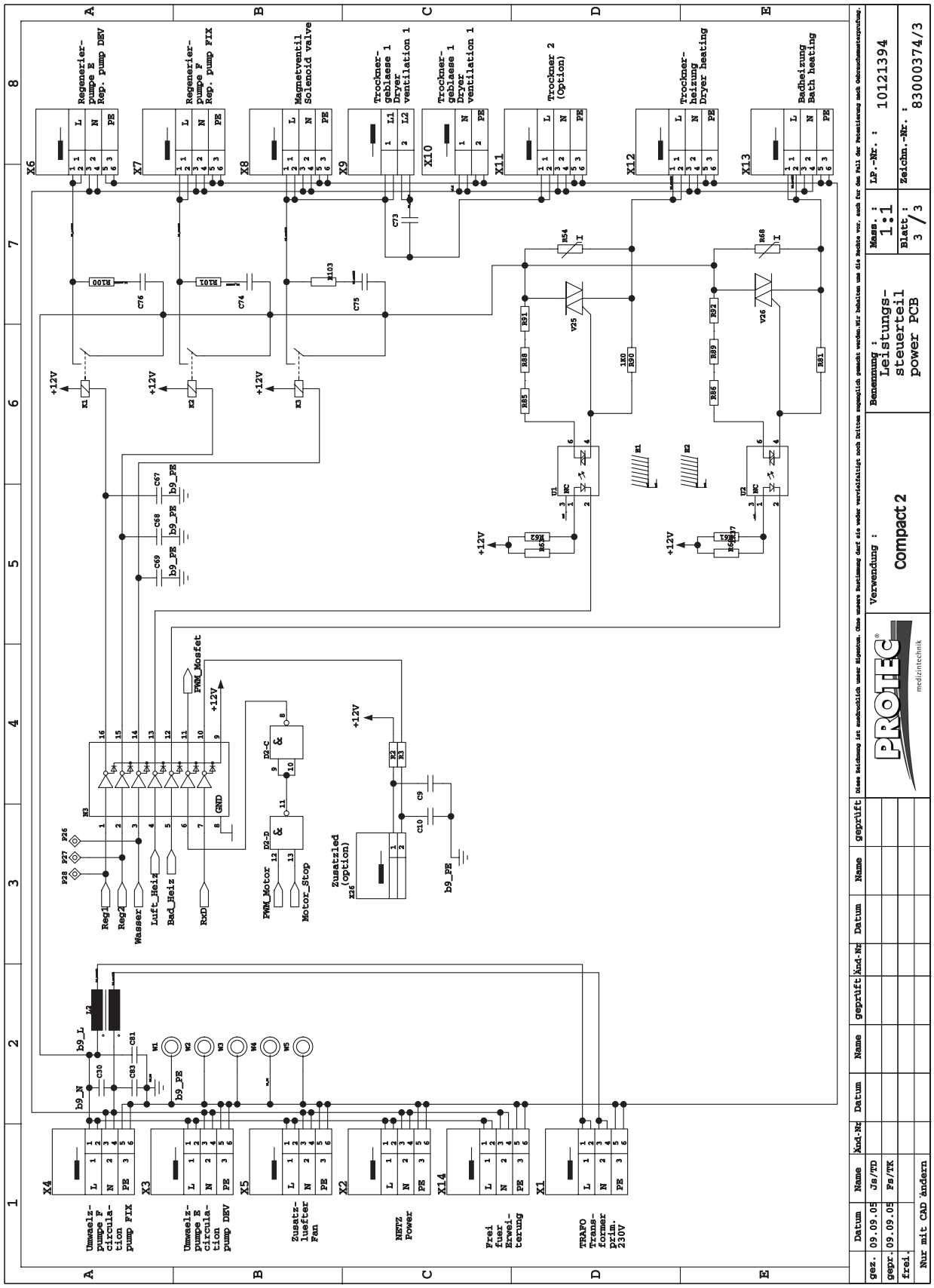
Pos.	Order No.	Description:
110-115	1280-0-0000	Mounting set “Through the wall mounting set film feed”
110	0280-0-0102	Light protection
111	0280-0-0103	Light protection, left
112	0280-0-0104	Light protection, right
113	0280-0-0105	Wall plate smal
114	0280-0-0110	Mounting kit

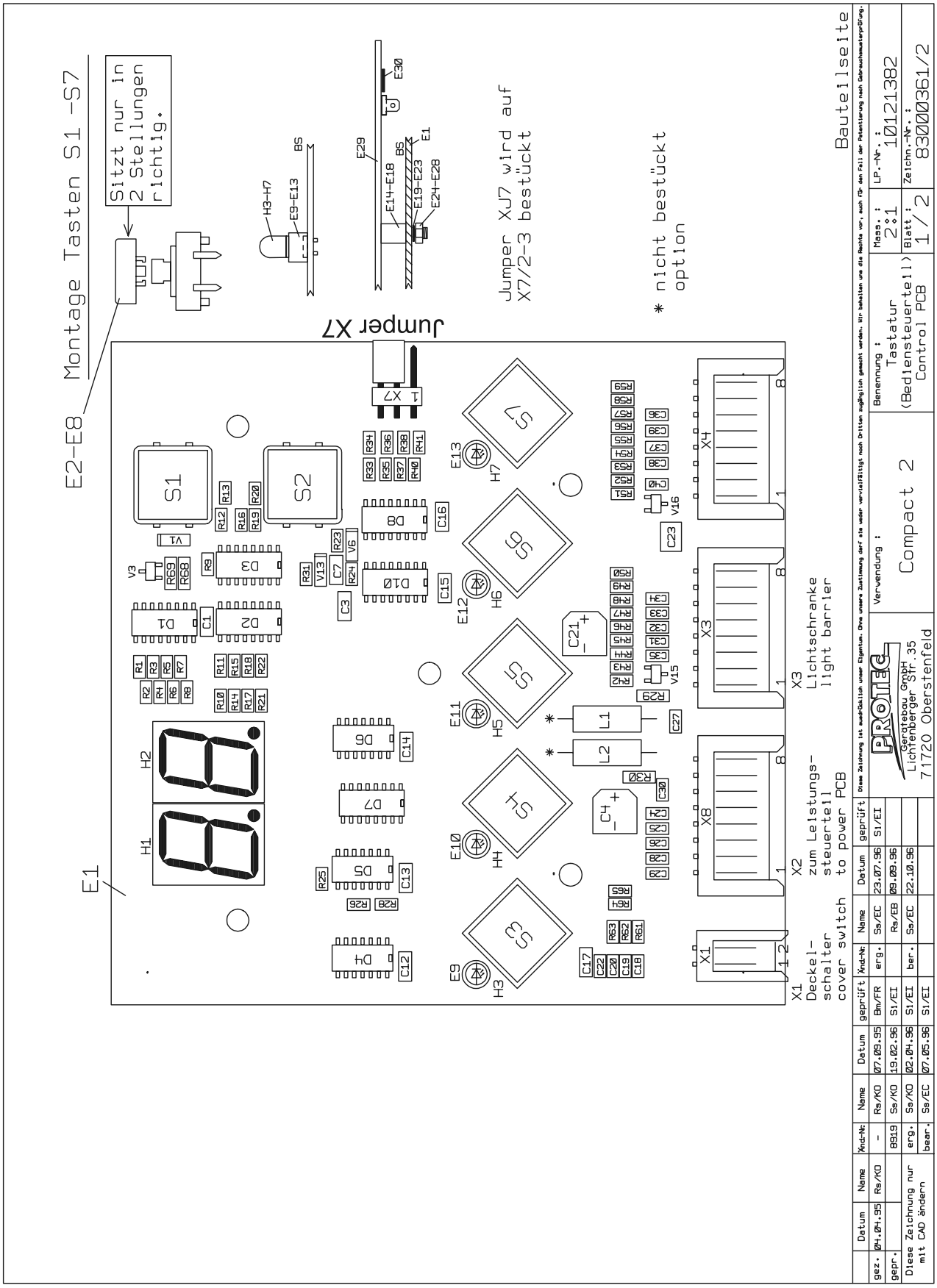

Schaltplan / Current flow chart
Leistungssteuerteil
power PCB
Bedienteuerteil
control PCB
Compact 2 / SX 2
1190 0 1203
Bearb. 21.06.96 ML
Gepr. 26.11.97 Haul
Temp.begrenzer
temp. limitor
Wärmetauscher
heat exchanger
Bad-heizung
bath heating
Luftschacht
air channel
Trockner-heizung
dryer heating
Trockner-gebläse
dryer
Magnet-ventil
solenoid valve
Reg. Pumpe F
replen-isher pump F
Reg. Pumpe E
replen-isher pump E
Zusatz-lüfter
fan plate
Umwälz-pume F
circu-lation pump F
Umwälz-pume E
circu-lation pump E
Temp.fühler Trockner-heizung
temperature sensor dryer heating
Temp.fühler Badheizung
temperature sensor bath-heating
Schirmung
shielding
Sicherung
T5A/250V
fuse
slow blow
5A/250V
Schirmung
shielding
Licht-schranke
light barrier
Deckel-schalter
cover switch
Aus-schalter
main switch
Sicherung
2xT10A/250V
fuse
slow blow
2x 10A/250V
Antriebs-motor
main drive motor
Drehzahl-abfrage
rotation signal
Trans-formator
trans-former
20V
230V
L
N
PE
Schutzleiter
ground
Filmeinlaufblech
film infeed tray
Gehäuseboden
body bottom plate
Abdeckung Bedienteil
cover control PCB
Lichtschrankengehäuse
light barrier housing
Platte unter Filmeinlauf
plate under film infeed


Leistungs-
steuerteil
compact 2
Benennung :
Verwendung :
LP.-Nr. : 10121394
Zeichn.-Nr. : 83000374/2
Mass. : 1.5 : 1
Blatt : 1/1
nicht bestückt
option
X1 Transformator prim. 230V
Transformer prim. 230V
X2 Netz power
X3 Umwälz-pumpe E circulation pump DEV
X4 Umwälz-pumpe F circulation pump FIX
X5 Zusatz-lüfter fan
X6 Reg.-Pumpe E Rep.-pump DEV
X14 Frei für Erweiterung
X7 Reg.-Pumpe F Rep.-pump FIX
X8 Magnetventil Solenoid valve
X9+ X10 Trockner-gebläse 1 Dryer ventilation 1
X11 Trockner 2 (Option)
X12 Trockner-heizung Dryer heating
X13 Badheizung Bath heating
X21 Transport-motor main drive motor
X22 Transformator sek. 24V Transformer sec. 24V
X23 zum Bedien-steuerteil to control PCB
X24 Temperatur-sensor Trockner Temperature sensor dryer
X25 Temperatur-sensor Bad Temperature sensor bath
gez. 08.09.05 Js/TD
gepr. 08.09.05 Fs/TK
Diese Zeichnung nur mit CAD ändern
PROTEC medizintechnik

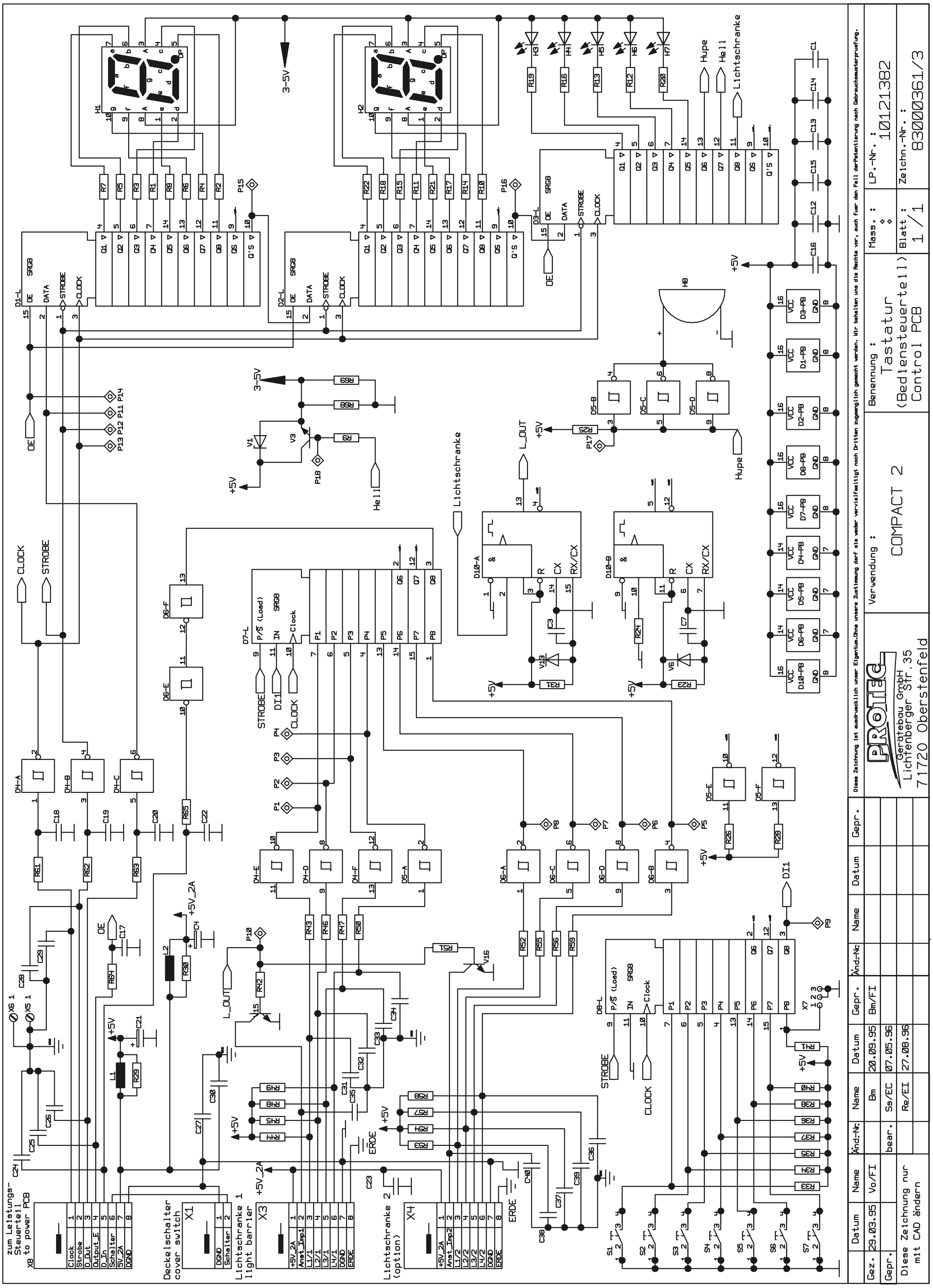

Transformator sek. 24V
Transformer sec. 24V
X22
to control PCB
Deckelschalter
cover switch
Motor_Stop
Deckel-
schalter2
(Option)
X29
Inkrement_Motor
PWM_Motor
Bad_Heiz
Luft_Heiz
Temp_Bad
Temp_Trockner
I_Off
I_Ana
Zero-Detect
Benennung :
Leistungssteuerteil
Power PCB
Verwendung :
compact 2
Mass. : 1:1
Blatt : 1/3
LP.-Nr. : 10121394
Zeichn.-Nr. : 830000374/3
Nur mit CAD ändern


Verwendung : Compact 2
Benennung : Leistungs-steuerteil
Mass. : 1:1
Blatt : 2/3
LP.-Nr. : 10121394
Zeichn.-Nr. : 83000374/3
Temperatur-sensoren Temperature sensors
X25
Bad Bath
X24
Trockner Dryer
X27
Fusschalter
X28
X21
Inkr. Geber Rotationsignal
Transport-motor
Main drive motor
Temp_Bad
Temp_Trockner
PWM_Mosfet
Inkrement_Motor
U_ref
b6_U_MOTOR
b6_gnd
I_Off
I_Ana
b9_PE
+5V
+12V
PE7
TxD
RxD
nicht bestueckt


Verwendung : Compact 2
Benennung : Leistungs- steuerteil power PCB
Mass. : 1:1
Blatt : 3 /3
LP.-Nr. : 10121394
Zeichn.-Nr. : 83000374/3
Regenerier- pumpe E Rep. pump DEV
Regenerier- pumpe F Rep. pump FIX
Magnetventil Solenoid valve
Trockner- gebläse 1 Dryer ventilation 1
Trockner- gebläse 1 Dryer ventilation 1
Trockner 2 (Option)
Trockner- heizung Dryer heating
Badheizung Bath heating
Reg1
Reg2
Wasser
Luft_Heiz
Bad_Heiz
RxD
PWM_Motor
Motor_Stop
Zusatzled (option)
Umwälz- pumpe F circula- tion pump FIX
Umwälz- pumpe E circula- tion pump DEV
Zusatz- lüefter Fan
NETZ Power
Frei für Erwei- terung
TRAFO Trans- former prim. 230V



Important: For machine type COMPACT 2 Jumper no. X7 should be placed in pos. 2-3.


Benennung : Tastatur (Bediensteuerteil) Control PCB
Verwendung : COMPACT 2
LP.-Nr. : 10121382
Zeichn.-Nr. : 83000361/3
Blatt : 1/1
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Lichtenberger Str. 35
71720 Oberstenfeld
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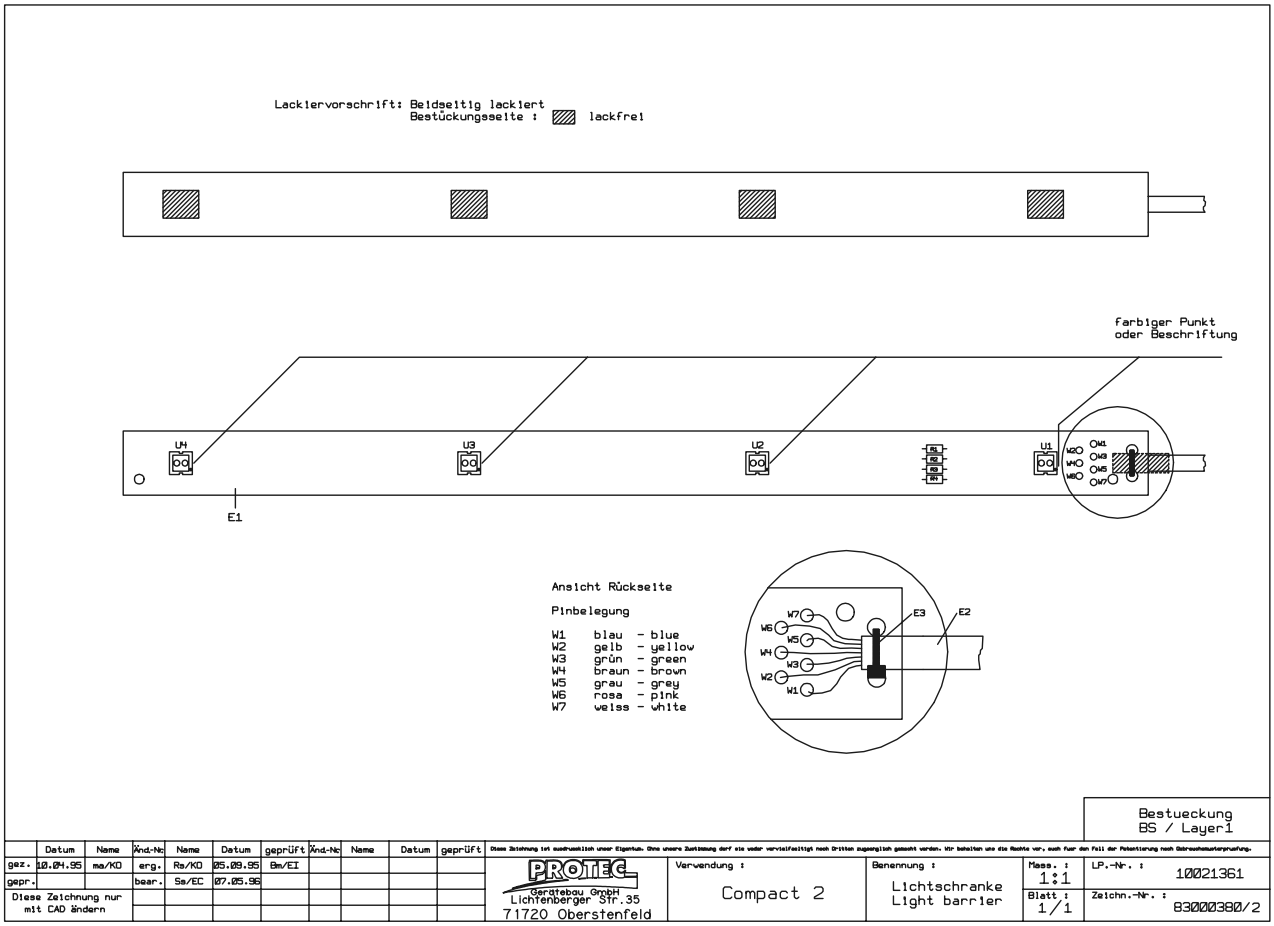

Bestueckung
BS / Layer1

	Datum	Name	Änd-Nr.	Name	Datum	geprüft	Änd-Nr.	Name	Datum	geprüft
gez.	10.04.95	ma/KD	erg.	Ra/KD	05.09.95	Bm/EI				
gepr.			bear.	Sa/EC	07.05.96					
Diese Zeichnung nur mit CAD ändern										

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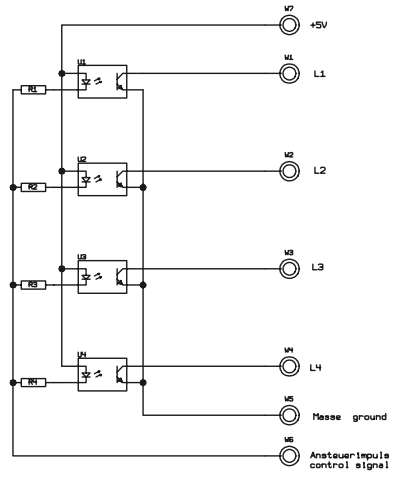
Verwendung :	Benennung :	Mass. :	LP.-Nr. :
Compact 2	Lichtschranke Light barrier	1:1	10021361
		Blatt : 1/1	Zeichn.-Nr. : 83000380/2



	Datum	Name	Änd-Nr.	Name	Datum	Gepr.	Änd-Nr.	Name	Datum	Gepr.
Gez.	14.03.95	Vo/FI		Bm	08.09.95	Bm/FI				
Gepr.			bear.	Sa/EC	07.05.96					
Diese Zeichnung nur mit CAD ändern										

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Verwendung :	Benennung :	Mass. :	LP.-Nr. :
Compact 2	Lichtschranke Light barrier		10021361
		Blatt : 1/1	Zeichn.-Nr. : 83000380/3

X:	1	50 Hz	Y:	0	Open working table
	2	60 Hz		7	Closed base

The Film Processor Compact 2 series was extended by a further version.

Introduction

Processing time and developer temperature of the Compact 2 NDT processor have been adjusted to the requirements of NDT-films. This results in the following modifications compared with the Compact 2 standard processor.

General

To maintain constantly good film quality the NDT-roller (upper roller of first roller pair of fixer rack) has to be changed every 3 - 6 months, depending on the quantity of films processed, the chemicals and films used. Three replacement rollers are delivered together with each machine. These rollers are subject to wear and tear and therefore excluded from the warranty!

Important!

Please take care that the film does not carry any dirt into the processor.

Technical Specifications (compare page 4)

Processing capactiy:	174 films 24x30 cm (crosswise), at lowest processing time
Process time:	2 - 10 min
Linear speed:	15.5 - 76.5 cm/min
Developing time:	28 - 142 s
Developer temperature	26 - 40 °C

Processing time (compare page 14)

Processing time from 2 - 10 min

Processing and developer time relation		
Processing time (min)	Developer time (s)	Infeed speed (cm/min)
2,0	28	76
2,5	35	61
3,0	42	51
3,5	49	45
4,0	57	38
4,5	64	34
5,0	71	31
5,5	77,5	28
6,0	84	25,5
6,5	91	24
7,0	98	22,5
7,5	106	21
8,0	114	19
8,5	121	18
9,0	128	17
9,5	135	16
10,0	142	15,5

Developer temperature (compare page 14)

Developer temperature from 26 - 40 °C

Spare parts list (compare pages 40 to 44)

Pos.	Order No.	Description:
24	0193-0-0900	Power PCB NDT
34a	0193-0-1500	Worm gear kit C2 NDT
-	1193-0-0300	Roller rack developer NDT
-	1193-0-0400	Roller rack fixer NDT
-	1193-0-0600	Roller rack water/dryer NDT
79	1193-0-0310	Drive shaft C2 NDT
84	1193-0-0302	Tooth gear diagonal NDT
93	1193-0-0307	Roller NDT (input roller of fixer rack)