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Operating Instructions
36004

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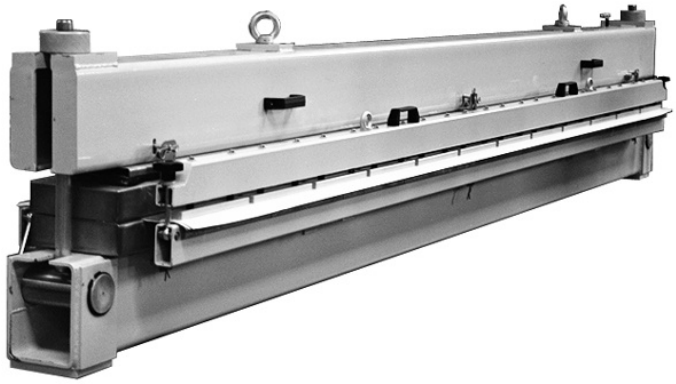
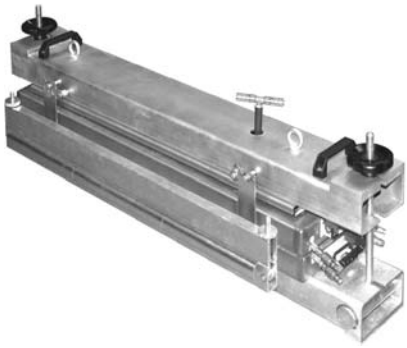
Hot-pressing devices PM-804, PM-1604, PM-2404, PM-3204, PM-3604, PM-4204





The PM-xx04 are a range of hot-pressing devices for joining of Habasit belts. They are capable of Thermofix (skived), Flexproof (finger) and Step-Flex (finger over finger) joining of all Habasit belts which can be joined in the standard temperature range. For available sizes see technical data.

Their most distinguishing features are:

- ❑ Uniform pressure generated with compressed air bellows
- ❑ Uniform temperature distribution
- ❑ Water cooled
- ❑ Sturdy design
- ❑ Can be used for a wide range of belt thicknesses

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1. General information

1.1 Application

The PM-804, PM-1604, PM-2404, PM-3204 and PM-4204 hot-pressing devices have been specifically designed for hot-pressing of Habasit power transmission and conveyor belts with the Thermofix and Flexproof systems.

Thermofix system (Manual 3210):

For all Habasit high-efficiency flat belts and conveyor belts, cut at right angles and diagonally (for width and thickness, see technical data, chapter 6).

Flexproof system (Manual 3220 or 3225):

For most Habasit standard and food conveyor belts and for thermoplastic power transmission belts (for width and thickness, see technical data, chapter 6).

The hot-pressing devices PM-804 ... 4204 have been designed for this sole purpose only; other inappropriate, unsuitable applications are not recommended. Habasit shall not be held responsible for the consequences due to such applications.

The PM-804 ... 4204 are manufactured according to state-of-the-art technology and fulfill the EC safety regulations.

These operating instructions imply that all assembly, maintenance, and repair work, as well as operation of the press, be carried out by skilled personnel or checked by responsible specialists.

For reasons of scope, these instructions cannot cover all possible aspects of operation, maintenance, or repair. The indications given herein refer to the use of the machines according to their designated purpose by skilled personnel. In case of doubt or if further detailed information is required, please consult the manufacturer, see chapter 1.4).

1.2 Relevant safety terms

In these operating instructions you will find the terms WARNING, CAUTION and INDICATION. They signal dangers or special information to be borne in mind.

WARNING	If disregarded, there is a danger of severe injury, and/or serious material damage may be caused.
CAUTION	If disregarded, there is a danger of injury, and/or material damage may be caused.
INDICATION	Technical information is emphasized if it is important and not readily apparent, even for skilled personnel.

Please also observe all indications for assembly, operating, and maintaining the machines, as well as all technical data! This will prevent possible trouble and/or damage to people or materials.

Skilled personnel refer to persons authorized to perform the required tasks. These people have been sufficiently trained and introduced to their field of activity so that they are able to recognize and prevent dangers. They are aware of the pertinent provisions and safety regulations.

1.3 Equipment and accessories

1.3.1 Scope of supply: fixed-version press

1 hot-pressing device PM-804 ... PM-4204 with operating instructions

❑2 connector cables between regulator and press

❑4 hose couplings ¼´´(for water cooling)

❑1 hose coupling ¼´´ (for compressed air)

❑1 water hose (for cooling), 20 m

❑1 compressed-air hose, d = 6/12 mm, 5 m

❑12 hose clips

❑2 hose couplings 12x¼´´

❑3 hose clamps for compressed-air hose

❑1 hose clamp 6x¼´´

❑4 hose nipples, copper ¼´´

❑1 set of heat equalizing plates with clamping bars,
narrow and wide equalizing plates for cover plates

❑1 regulator PMR-04 (State connection voltage when placing order.)

❑1 control unit PMC-04 for automatic cooling and pressure controller for air bag

1.3.2 Scope of supply: mobile-version press

1 hot-pressing device PM-804 ... PM-4204 with operating instructions

❑2 connector cables between regulator and press

❑1 set of heat equalizing plates with clamping bars,
narrow and wide equalizing plates for cover plates

❑1 regulator PMR-04 (State connection voltage when placing order.)

❑1 cooling unit

❑1 mobile compressor

1.3.3 Accessories required for mobile operation

Accessories			Order No.
1	mobile mini-air compressor	230 V~	691017
		120 V~	691018
1	cooling unit with water tank, electric pump and necessary fittings	230 V~	691016
		120 V~	691015

The 230 V version (Order No. 691016) plus an adapter cable are required for the direct connection of the electric pump for the cooling unit to the regulating unit PMR-04.

Adapter cable for direct connection: N-26964

1.3.4 Available accessories

Accessories		Order No.
1	pair of gloves	N-29090
1	temperature measuring instrument	N-28714 or N-28715
1	roll of silicon embossing paper, mat surface	N-28638
1	roll of silicon embossing paper, structured	N-28637
	various embossing foils (ask our specialists)	
1	roll of molleton	N-28665

1.4 Ordering of accessories/spare parts

Spare parts are to be ordered directly from the manufacturer.

Address:

Habasit Italiana S.p.A.
Via A. Meucci 8, Zona Industriale
I - 31029 Vittorio Veneto/TV
Tel. ++39 438 91 13
Fax ++39 438 91 2374

Please specify the ordered parts clearly.

Parts with indicated order no. starting with N- are available from Habasit Austria.

Address:

Habasit GmbH
Hetmanekgasse 13
A - 1234 Wien
Tel. ++43 1 690 66
Fax ++43 1 690 66 10

WARNING	The use of foreign parts not meeting Habasit specifications is not recommended. Habasit declines all responsibility for the consequences if non-Habasit parts are used.

1.5 Warranty

All tools undergo a strict final inspection. On the assumption of correct handling, they are warranted against material and manufacturing defects for 1 year.

1.6 Technical advice

Our specialists will be pleased to advise you. For technical questions concerning function and condition of the hot-pressing device, please contact the manufacturer (see Chapter 1.4 for the address).

2. Mode of operation

2.1 Hot-pressing device

- The heating plates (7) are each heated by 2 resistance elements. In the center of each heating plate (7) a Fe-CuNi sensor is placed, which transmits the measured temperature of the heating plate (actual value) to the regulator (9). Between the hot-pressing device and the regulator, a special cable with integrated Fe-CuNi equalizing leads assures accurate transmission of the measured data.
- To compensate the heat losses at the ends of the heating plates, the heating elements are higher powered at the ends. Nevertheless, the temperature profile in the thermal stationary stage drops somewhat at the ends. This is an advantage; without this drop, the increased energy flow in the end sectors would overcook the belt during fusion.
- The rubber air bag (bellows) assures uniform distribution of the pressure over the whole length of the hot-pressing device. The actual pressure applied to the product (with the heating plate fully covered) is about 10 % below the adjusted pneumatic pressure.
- Tap water is used for cooling. For stationary installation we recommend using demineralized water. Detailed instructions on request.

2.2 Regulating unit PMR-04

- Each heating plate is individually controlled by an electronic regulator (9). The regulators have been adjusted to the tolerance values given under "technical data" (chapter 6).
- Each regulator (9) is equipped with a limit signal. These signals have been adjusted in such a way that they release the built-in time relay shortly before both heating plates reach the set values (provided the "auto" pushbutton (15) is switched on). A second limit signal makes sure that in the case of malfunction the temperature of the heaters will not be exceeded.
- The time relay (13) switches off the heating power after the preset time has elapsed. The regulators (9), however, are still switched on, so that the heating plate temperature can be monitored on the digital actual display (11) during the subsequent (cooling) period. The yellow pilot lamp (16) indicates that the heating plates have been switched off. At the same time a contact is closed which serves to control the cooling water valve. To switch off the cooling circuit, switch off the control voltage on the regulator (pushbutton (17)), or disable the time relay (13) by pushing the "auto" pushbutton (15). The heating process is restarted by pressing pushbutton (17). A deviation of ± 1°/1.8°F of the digital display from the set value is normal, also in the thermal equilibrium.
- The green pushbutton (27) starts air-pressure supply to the slide valve (30).
- The auto circuit breakers (22) (fuses) on the rear of the regulating unit (12) switch off the power supply in case of short circuit. They are not to be used for normal switching off and on. For this purpose the main switch (14) is provided.
- Operation of regulators (9): Select the temperature set point by pressing the “arrow” buttons. The buttons “MAN” and “FUNC” are provided for programming only. They are not needed for normal operation.
- Operation of time relay (13): Presetting of required time in seconds by pressing the “arrow” buttons.

CAUTION	The regulating unit (12) must be connected to the mains according to the electrical diagram enclosed. The applicable voltages are indicated on the rating plate (19). Other voltages to be used only after consultation with the manufacturer. Choose the cable cross section according to local regulations.

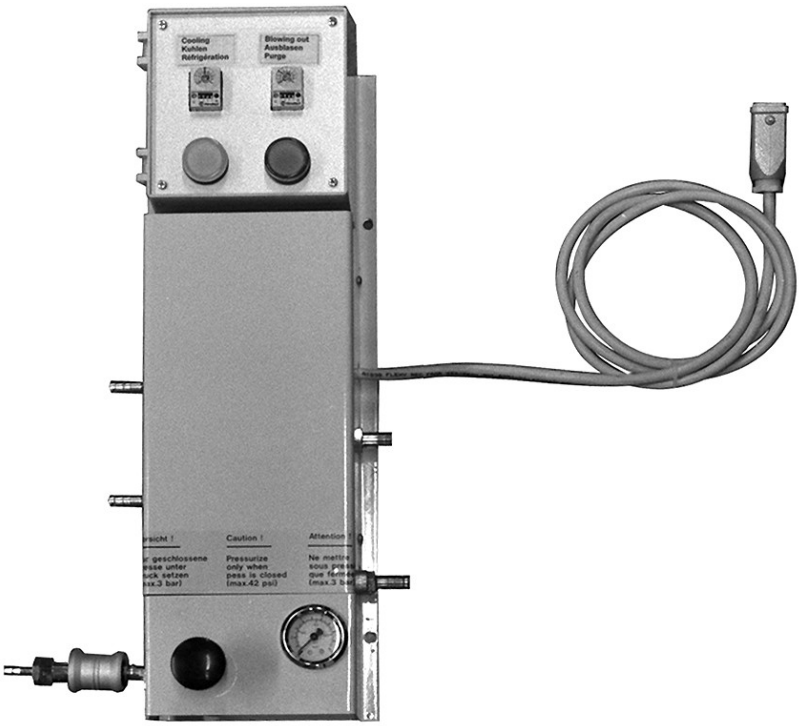
Regulating unit PMR-04

2.3 Control unit PMC-04 for cooling and air-pressure supply (stationary use)

❑Connect cable (29) of this unit (31) with the control outlet (21) of the regulating unit (12). Also connect this unit (31) to a compressed-air supply (6 bar/87 psi). The cooling circuit is automatically engaged by the control signal of the regulating unit (12) and switched off again by a time relay (25). The time relay is factory set at 4 minutes. Once the cooling water flow is interrupted, the residual water is blown out by a jet of compressed air. The corresponding time relay (26) has been set at 3 minutes by the factory. Depending on the installation, it may be convenient to increase this time to make sure that the residual water is blown out completely (consult our specialists). The white pilot lamp (28) is lit as soon as the unit is powered up (at the end of the heating cycle of regulating unit (12)). The yellow pilot lamp (32) indicates the end of the cooling cycle.

❑Slide valve (30) opens the air pressure output. Air pressure to the air bag remains on until the main switch (14) is turned off and/or the manual slide valve (30) is closed.

WARNING	Always close the protection cover after actuation of an element on this control box.
INDICATION	If the cooling system is switched off before the end of the cooling cycle, the pipes are not blown out with compressed air. The water remaining in the heating plates affects the temperature profile (which may result in defective joints).



Control unit PMC-04 unit for cooling

2.4 Regulating unit PMR-06 and control unit PMC-06

The hot pressing devices PM-804 … 4204 can be controlled alternatively by the regulating unit PMR-06 and / or the control box PMC-06.

For the connecting diagram and proceeding for operation preparations and the use see operating instructions of PMR-06.

Regulating unit PMR-06

3. Operating preparations

CAUTION	Operation of these presses requires handling of heavy components. Take care not to drop any component. Do not drop the locking spindles when opening the press.

3.1 Transport

The two steel hoops (3) serve for lifting the press. Prior to lifting, engage locking spindles at both press ends and tighten them uniformly.

WARNING	Never use any other points for lifting the press than the round-steel hoops (3) provided. Both locking spindles (4) must be correctly closed.

3.2 Electrical connection

- ❑For connection to the mains the regulator box has to be opened. For removing the cover of the box please refer to fig. 4 later in this manual: Push the recessed plates (23) for releasing the securing plates (24) and giving access to the 4 bolts.
- ❑Remove the bolts and lift off the cover, insert the prepared cable through cable fitting (20) and connect it according to the wiring diagram.

CAUTION	Make sure the regulator (12) is connected to the correct voltage and the regulator racks (9) are correctly matched with the top and bottom heating plates (7), as indicated on the designation label. The wiring diagram of the regulating unit (12) is attached to the inside of the casing and enclosed in this manual.

3.3 Mobile operation

❑To make transport easier, the hot-pressing device can be disassembled into the following parts:
- Top part (1) (beam with heating element)
- Bottom part (6) (beam with heating element)
- Heat equalizing plate with clamping device (8)

❑Make sure the regulator racks (9) are correctly matched with the top and bottom heating plates (7), as indicated on the designation label.

3.4 Stationary operation

The stationary operation is best done with the press installed on a stand as shown in the layout in chapter 8:

❑Install regulating unit (12) and control unit (31) on stand, as indicated in the layout.

❑Connect supplied cooling-water hoses with control unit (31) and cooling-hose couplings (5) to the press. The return pipes should be connected to a fixed drain pipe with adequate ventilation.

❑Connect heating plates (7) with cables to regulating unit (12).

CAUTION	Make sure the hose nozzle and clip connections are perfect. Steam pressure at 180° C/*356° F* reaches approx. 10 bar / *145 psi.*

4. Hot pressing of the product

4.1 Heating up

❑Always close the hot-pressing device for heating up to save energy and time.

❑For continuous heating, switch off the "auto" pushbutton (15) for the time relay. Once the hot-pressing device is heated up, the time relay can be started any time by pressing the "auto" pushbutton (15).

4.2 Air bag (pressure bellows)

❑The connection (2) for the air bag (bellows) is mounted on the surface of the top press part (1). Compressed air is supplied by a mini-compressor or from a permanent compressed-air supply via a precision pressure regulator or, if existing, via control unit PMC-04 (31).

❑Open pressure supply to slide valve (30) by pressing the green pushbutton (27) on the regulating unit PMR-04 (12).

❑Open the slide valve (30).

WARNING	Never put air bag (pressure bellows) under pressure unless the press is closed according to instructions. Do not exceed the maximum admissible pressure of 3 bar / *43.5 psi*.

4.3 Hot pressing

4.3.1 Stationary operation

❑For pressing data and procedure, see manual 3210, 3220, 3225, or individual product data sheets.

❑Disengage locking spindles (4) and lift off top press part (1).

❑Put belt on heat equalizing plate (8) and clamp it down according to the instructions.

❑With bottom part of press (6) covered with the heat equalizing plate (8), the clamped-on belt, and necessary insets, put top part of press (1) on it.

❑Flip up both locking spindles (4), engage and tighten them uniformly on both sides of the press. Continue according to explanations 4.3.1 or 4.3.2.

❑Pump up the air bag (pressure bellow) to the desired pressure as follows:
- Open the manual slide valve (30) at the control unit (31).
- Press pushbutton (27) to open the pressure supply to the air bag.

❑At the regulating unit (12), set upper and lower pressing temperature on the regulators (9) by pressing "arrow" buttons.

❑On the time relay (13) set pressing time.

❑Switch on the control with pushbutton (17). Green pilot lamp will illuminate.

❑Switch on time relay (13) with pushbutton (15), white pilot lamp will illuminate and heating cycle will start.

❑After heating time has elapsed both heating circuits are switched off and the yellow pilot lamp (16) at the regulator unit (12) will illuminate.

❑The cooling cycle will now be switched on automatically and the pilot lamp (19) will illuminate. After the cooling cycle has elapsed the yellow pilot lamp (32) at the control unit PMC-04 (31) will illuminate.

INDICATION	If the cooling system is switched off before the end of the cooling cycle, the pipes are not blown out with compressed air. The water remaining in the heating plates affects the temperature profile (which may result in defective joints).

CAUTION	Steam pressure at 180° C/*356° F* reaches approx. 10 bar / *145 psi!*

❑After cooling cycle has elapsed, close manual slide valve (30) at the control unit PMC-04 (31) to deflate the air bag (bellow).

❑For production in series it is advisable to let the press cool to at least 80° C/*176° F*, but no further. This saves time and energy for the following heating up cycle.

❑Open hot-pressing device and remove belt carefully. Let belt cool down to ambient temperature.

CAUTION	Use gloves! Do not touch hot press parts with unprotected hands!

4.3.2 Mobile operation

❑For pressing data and procedure see manual 3210, 3220, 3225, or individual product data sheets.

❑Disengage locking spindles (4) and lift off top press part (1).

❑Put belt on heat equalizing plate (8) and clamp it down according to the instructions.

❑With bottom part of press (6) covered with the heat equalizing plate (8), the clamped-on belt, and the necessary insets, place top part of press (1) on it.

❑Flip up both locking spindles (4), engage and tighten them equally on both sides of the press. Continue according to explanations 4.3.1 or 4.3.2.

❑Pump up the air bag (bellow) to the desired pressure using the mobile mini-compressor or a foot pump.

❑At the regulating unit (12) set upper and lower pressing temperature on the regulators (9) by pressing "arrow" buttons.

❑On the time relay (13) set pressing time.

❑Switch on the control with pushbutton (17). Green pilot lamp will illuminate.

❑Switch on time relay (13) with pushbutton (15), white pilot lamp will illuminate and heating cycle will start.

❑After heating time has elapsed both heating circuits are switched off and the yellow pilot lamp (16) at the regulator unit (12) will illuminate.

❑Connect water hoses of mobile cooling unit and start electric pump (see 1.3.3 Accessories required for mobile operation).

CAUTION	Use gloves! Do not touch hot press parts with unprotected hands!

CAUTION	Steam pressure at 180° C/*356° F* reaches approx. 10 bar / *145 psi*!

❑After the required cooling time has elapsed, disconnect hose of foot pump from connection (2) at top part of press (1) to deflate the air bag (pressure bellow).

❑Open hot-pressing device and remove belt carefully.

❑Make sure that all cooling water is removed from the press after cooling cycle has been finished.

INDICATION	In mobile use, it is important to fully drain the press after the cooling procedure. If the pipes are not blown clear with compressed air, residual water in the heating plates can affect the temperature profile (which may lead to faulty joints).

5. Service

5.1 Malfunctions

WARNING	Any maintenance and/or repair work on exposed electrical components is to be carried out by authorized personnel.

- ❑If the indicated temperature, Actual Value (green) (11) of a heating plate (7) deviates from the preset Set Value (10) by more than 2° C/3.6° F, the reason for this malfunction is probably the regulator (9) rather than the heating plate (7).
- ❑This can easily be determined by switching the plugs (18) on the rear of the regulating unit (12) and checking whether the deviation is remaining with the same regulator (9).
- ❑If this is the case, the cause for the malfunction is located in the respective regulator (9).
- ❑However, if the deviating Actual Value changes to the other regulator (9), the malfunction is in the heating plate (7) or its connection line to the regulating unit (12).
- ❑In any case, if Actual Value (11) deviates, the heating plate temperature should be measured (see 5.2).
- ❑With malfunctions of this or other kinds, the manufacturer should be contacted. Defective heating plates (7) and regulators (9) can be repaired or replaced by the manufacturer.
- ❑Hints for electrical malfunction:
  If the electronic control fails, always check first the auto circuit breakers. The circuit breakers (22) are controlling the heating-power supply. There are additional circuit breakers securing the control power only. They are installed inside the regulator box. For opening the box see paragraph 3.2 and fig. 4 later in this manual.

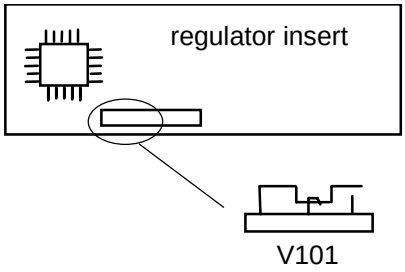
5.2 Measuring of the heating plate temperature

Measure heating plate temperature once a month as follows:

- ❑Place heat-resistant silicone foam rubber pad on bottom heating plate. Close press according to instructions. Generate max. 1 bar/14.5 psi pressure in the air bag (bellow). Switch on heating, set rated value at 180° C/356° F and switch off time relay.
- ❑After heating up for 40 min. open press, slightly lift top heating plate, and place the sensor of a precision thermometer on the silicone foam rubber pad exactly in the center of the heating plate.
- ❑Close press (without applying pressure). Read temperature after about 3 minutes.
- ❑Repeat with the bottom heating plate (place sensor underneath the silicone foam rubber in the center of the heating plate). The measured temperature should read 180° C ± 2° C/356° F ± 3.6° F (including the measuring accuracy of max. ± 1° C/1.8° F of the instrument).

5.3 Calibration of regulator (adjustment of temperature display)

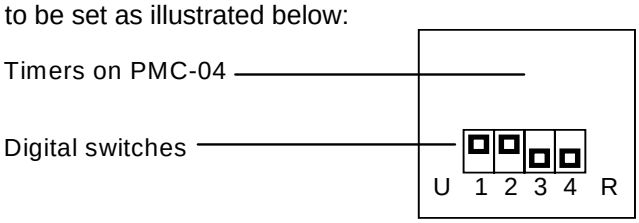
It is possible that the temperature indicated on the regulator display deviates from the real temperature on the press plate surface (center of the heating plate). The sensor for regulating the temperature is not measuring on the surface of the plate but inside, between heating element and plate surface. The difference between the temperatures of these two locations has been compensated at the factory. It can be necessary to repeat the calibration after change of any component of the system. These manipulations have to be done by an electronic specialist or by trained maintenance personnel only. Procedure:



- ❑Switch off the Regulating unit PMR-04 (main switch (14)).
- ❑Loosen the screw on the regulator rack (9) and remove the regulator insert from its housing.
- ❑Open the internal "hook-switch" V101 (see sketch).
- ❑Reinstall the regulator insert and switch on the regulating unit PMR-04.
- ❑The display indicates "COnF". (If "CAL" should be indicated, immediately push button σ).
- ❑Press pushbutton "FUNC" repeatedly until the parameter P23 is indicated.
- ❑Now the offset of the sensor signal can be adjusted to both sides in steps of 1°C by pressing the buttons σ or τ.
- ❑Switch off the regulating unit. Remove the regulator insert and engage the "hook-switch" again.
- ❑Put the regulator back into the housing.
- ❑Test the result with a full heating cycle, measuring the temperature of the press plate as explained in paragraph 5.2. If necessary repeat the procedure.

5.4 Correct setting of the digital switches on the timers (25) and (26)

For proper functioning of the timers (25) and (26) on the cooling control PMC-04, their digital switches have to be set as illustrated below:



5.5 Maintenance

- ❑See preventive maintenance in appendix.
- ❑If it is necessary to open the temperature regulator box (12), please refer to fig. 4 later in this manual. Push the recessed plates (23) for releasing the securing plates (24) and giving access to the 4 bolts.

WARNING	Any maintenance and/or repair work on exposed electrical components is to be carried out by authorized personnel.

6. Technical data

Criteria	PM-804	PM-1604	PM-2404	PM-3204	PM-3604	PM-4204
Belt/tape width max.	800 mm / *31.5 in*.	1600 mm / *63 in.*	2400 mm / *94.5 in.*	3200 mm / *126 in.*	3600 mm / *141.5 in.*	4200 mm / *165 in.*
Belt/tape thickness max.	10 mm / *0.4 in.*	10 mm / *0.4 in.*	10 mm / *0.4 in.*	10 mm / *0.4 in.*	10 mm / *0.4 in.*	10 mm / *0.4 in.*
Belt/tape length min.	920 mm / *36 in.*	1000 mm / *40 in.*	1100 mm / *44 in.*	1200 mm / *48 in.*	1200 mm / *48 in.*	1400 mm / *55 in.*
Heating plate width	160 mm / *6.3 in*.	160 mm / *6.3 in*.	160 mm / *6.3 in*.	160 mm / *6.3 in.*	160 mm / *6.3 in.*	160 mm / *6.3 in.*
Power consumption	2 x 2000 W	2 x 4200 W	2 x 5400 W	2 x 6000 W	2 x 5300 W	2 x 6000 W
Voltage at the regulating unit	230 V~ 3P+E 400 V~ 3P+E	230 V~ 3P+E 400 V~ 3P+E	230 V~ 3P+E 400 V~ 3P+E	230 V~ 3P+E 400 V~ 3P+E	230 V~ 3P+E 400 V~ 3P+E	230 V~ 3P+E 400 V~ 3P+E
Pressure max.	3 bar / *43.5 psi*	3 bar / *43.5 psi*	3 bar / *43.5 psi*	3 bar / *43.5 psi*	3 bar / *43.5 psi*	3 bar / *43.5 psi*
Temperature max.	199° C / *390° F*	199° C / *390° F*	199° C / *390° F*	199° C / *390° F*	199° C / *390° F*	199° C / *390° F*
Temperature profile	+ 2°/- 4° C *+ 3.6° / - 7.2° F*	+ 2°/- 4° C *+ 3.6° / - 7.2° F*	+ 2°/- 4° C *+ 3.6° / - 7.2° F*	+ 2°/- 4° C *+ 3.6° / - 7.2° F*	+ 2°/- 4° C *+ 3.6° / - 7.2° F*	+ 2°/- 4° C *+ 3.6° / - 7.2° F*
Max. deviation of plate temp. from the nominal value	+/- 2° C / *3.6° F*	+/- 2° C / *3.6° F*	+/- 2° C / *3.6° F*	+/- 2° C / *3.6° F*	+/- 2° C / *3.6° F*	+/- 2° C / *3.6.° F*
Heating up time to 180° C at 230V at 400V	14 min 20 min	14 min 20 min	20 min 25 min	30 min 40 min	32 min 42 min	40 min 50 min
Continuous water cooling	yes	yes	yes	yes	yes	yes
Cooling time 180° C to 80° C	4 min	6 min	7 min	8 min	8 min	9 min
Dimensions (LxWxH) incl. clamping device	1160x380x420 mm *45.7 x 15 x 17 in.*	2000x380x460 mm *79 x 15 x 18 in.*	2950x380x565 mm *116x15x23 in.*	3655x380x665 mm *144 x 15 x 26 in.*	4135x380x665 mm *163 x 15 x 26 in.*	4660x380x865 mm *184x15x34 in.*
Weights - total press	119 kg / *262 lbs.*	180 kg / *396 lbs.*	450 kg / *992 lbs.*	620 kg / *1367 lbs.*	726 kg / *1600 lbs.*	860 kg / *1896 lbs.*
- top part	51 kg / *112 lbs.*	91 kg /*200 lbs.*	200 kg / *441 lbs.*	250 kg / *551 lbs.*	296 kg / *652 lbs.*	350 kg / *772 lbs.*
- bottom part	49 kg / *112 lbs.*	89 kg / *196 lbs.*	177 kg / *390 lbs.*	226 kg / *498 lbs.*	268 kg / *591 lbs.*	320 kg / *706 lbs.*
- equalizing plate	19 kg / *51 lbs.*	35 kg / *77 lbs.*	73 kg / *161 lbs.*	144 kg / *318 lbs.*	162 kg / *457 lbs.*	190 kg / *419 lbs.*
- regulator box	18 kg / *40 lbs.*	18 kg / *40 lbs.*	18 kg / *40 lbs.*	18 kg / *40 lbs.*	18 kg / *40 lbs.*	18 kg / *40 lbs.*

7. Illustrations

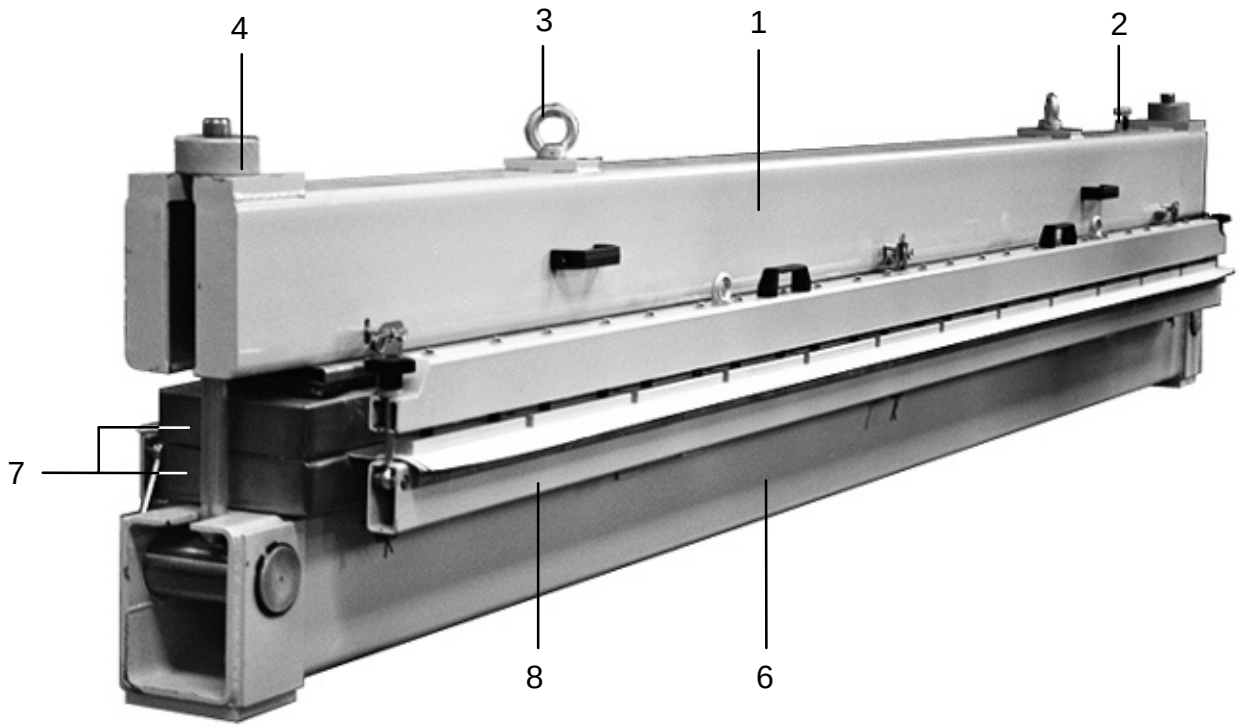
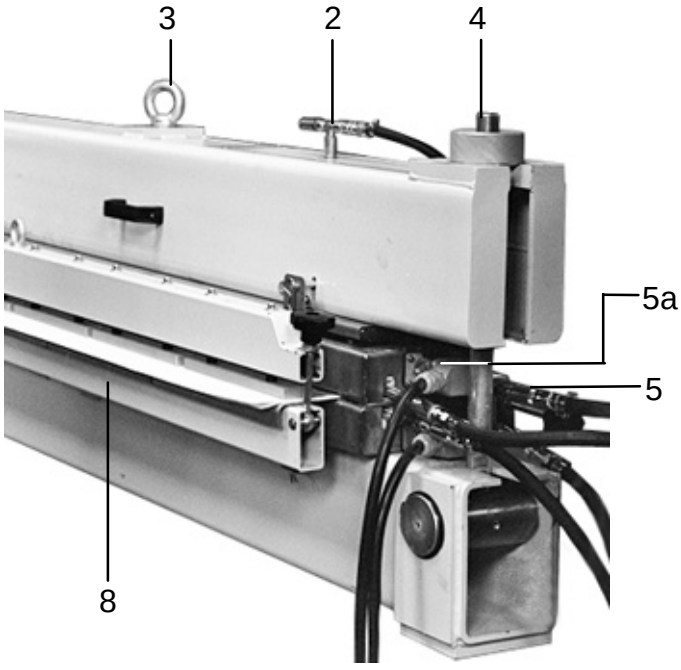


Fig. 1: Overall view of PM 3204

1	Top part of press
2	Connection for air bag
3	Round-steel hoop
4	Locking spindle
5	Water-hose coupling
5a	Electric connections (plugs)
6	Bottom part of press
7	Heating plates
8	Heat-equalizing plate with clamping device



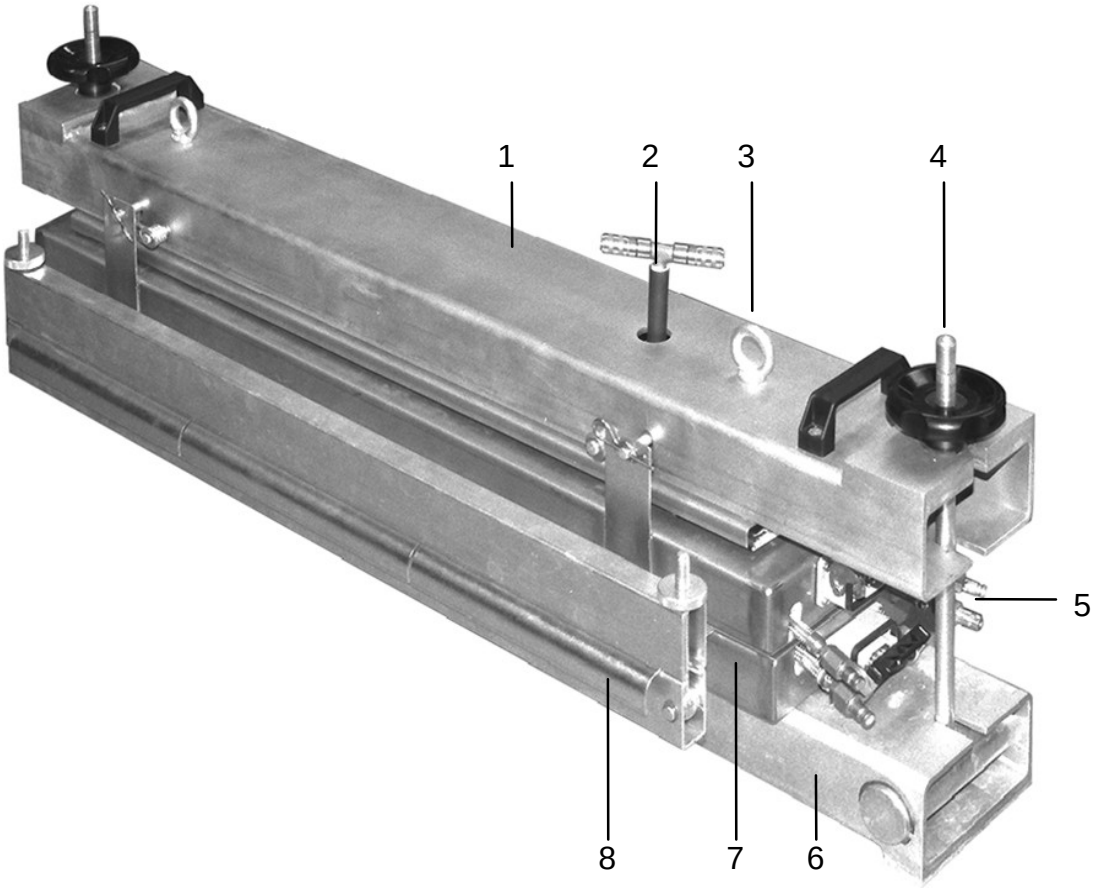


Fig. 2: Overall view of PM-804/1604

1 Top part of press
2 Connection for air bag (bellow)
3 Round-steel hoop
4 Locking spindle
5 Water-hose coupling
6 Bottom part of press
7 Heating plate
8 Heat-equalizing plate with clamping device

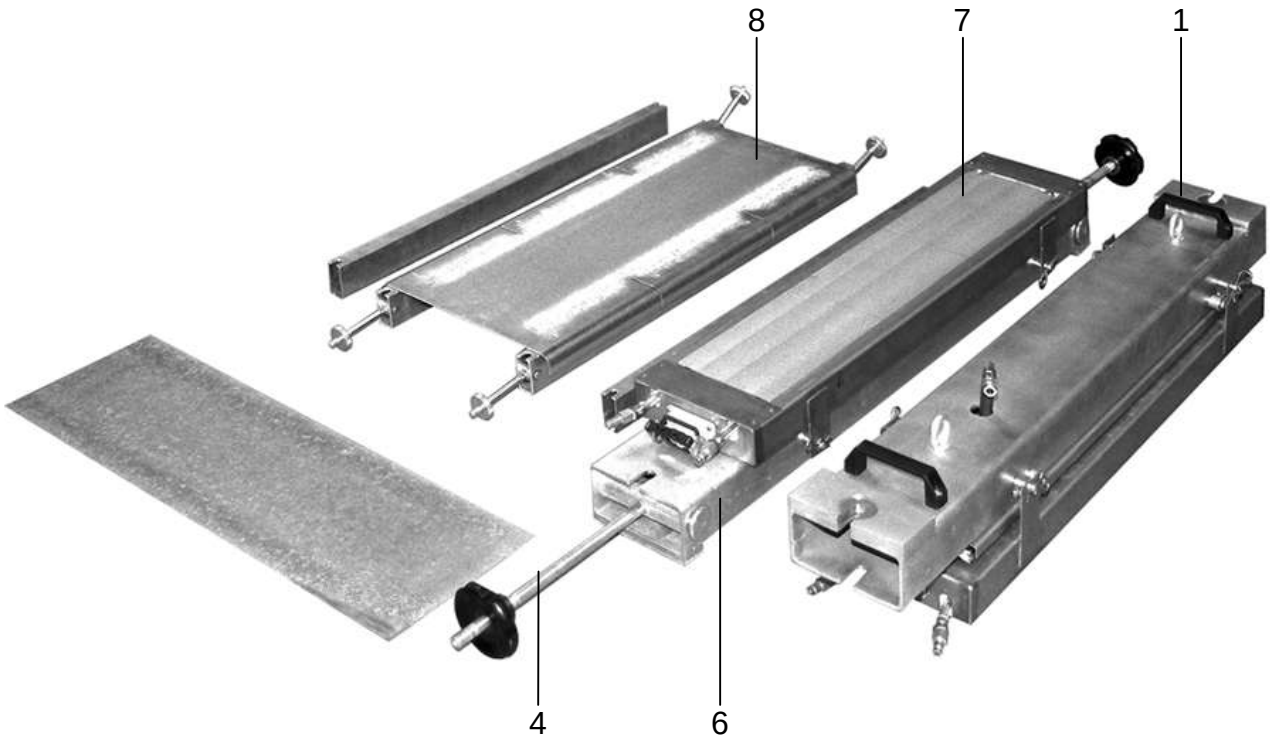


Fig. 3: Main parts of PM-804/1604

1 Top part of press
4 Locking spindle
6 Bottom part of press
7 Heating plate
8 Heat-equalizing plate with clamping device

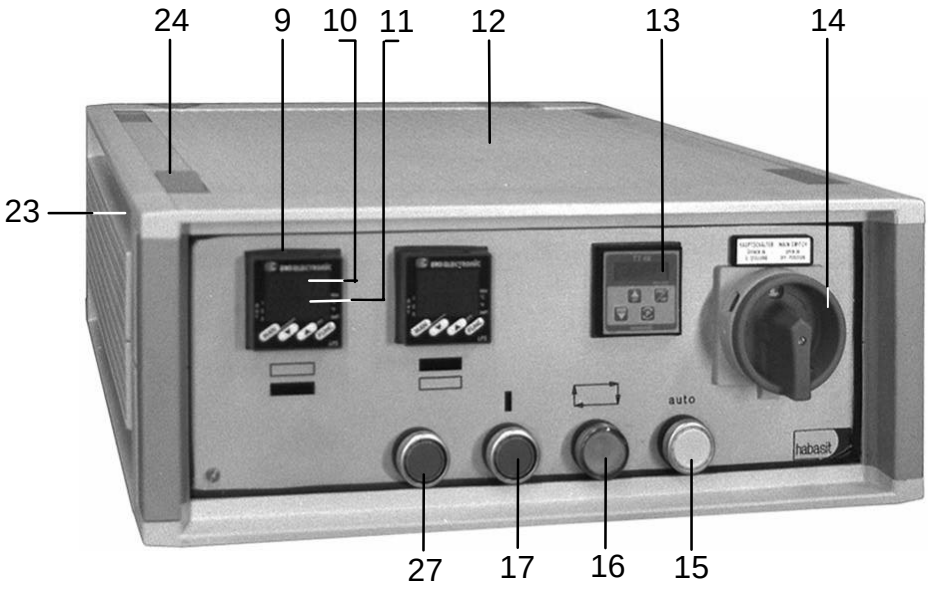


Fig. 4: Front view of regulating unit PMR-04

9	Controller module	16	Pilot lamp "heating off" (cycle finished), yellow
10	Digital display Set Point (orange)		
11	Digital display Actual Value (green)	17	Pushbutton "on", green
12	Regulating unit	23	Releasing push-plates
13	Time relay	24	Securing cover plates
14	Main switch	27	Pushbutton (green) for switching on air-pressure supply to air bag
15	Pushbutton "Time relay on" (auto), white		

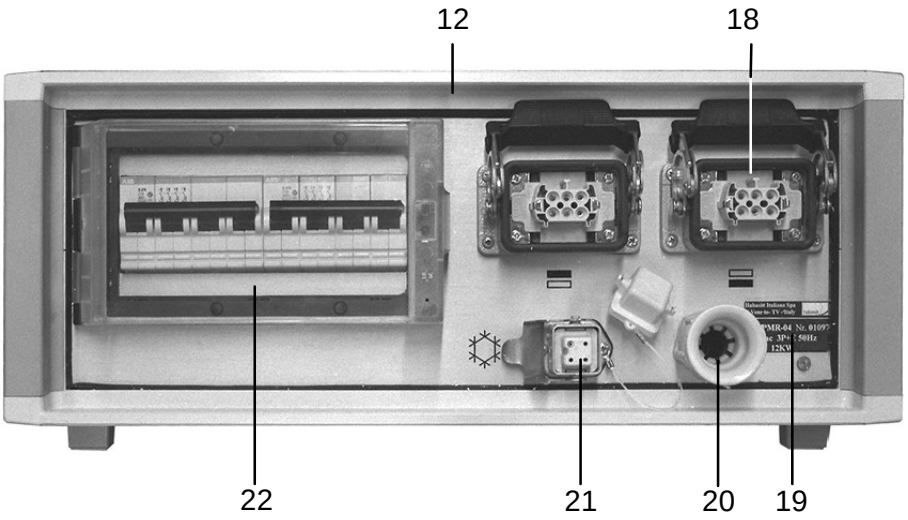


Fig. 5: Back view of regulating unit PMR-04

12	Regulating unit	20	Fitting for power-supply cable
18	Socket for plug and cable to press	21	Connection for control unit PMC-04 (cooling)
19	Rating tag	22	Auto circuit breakers

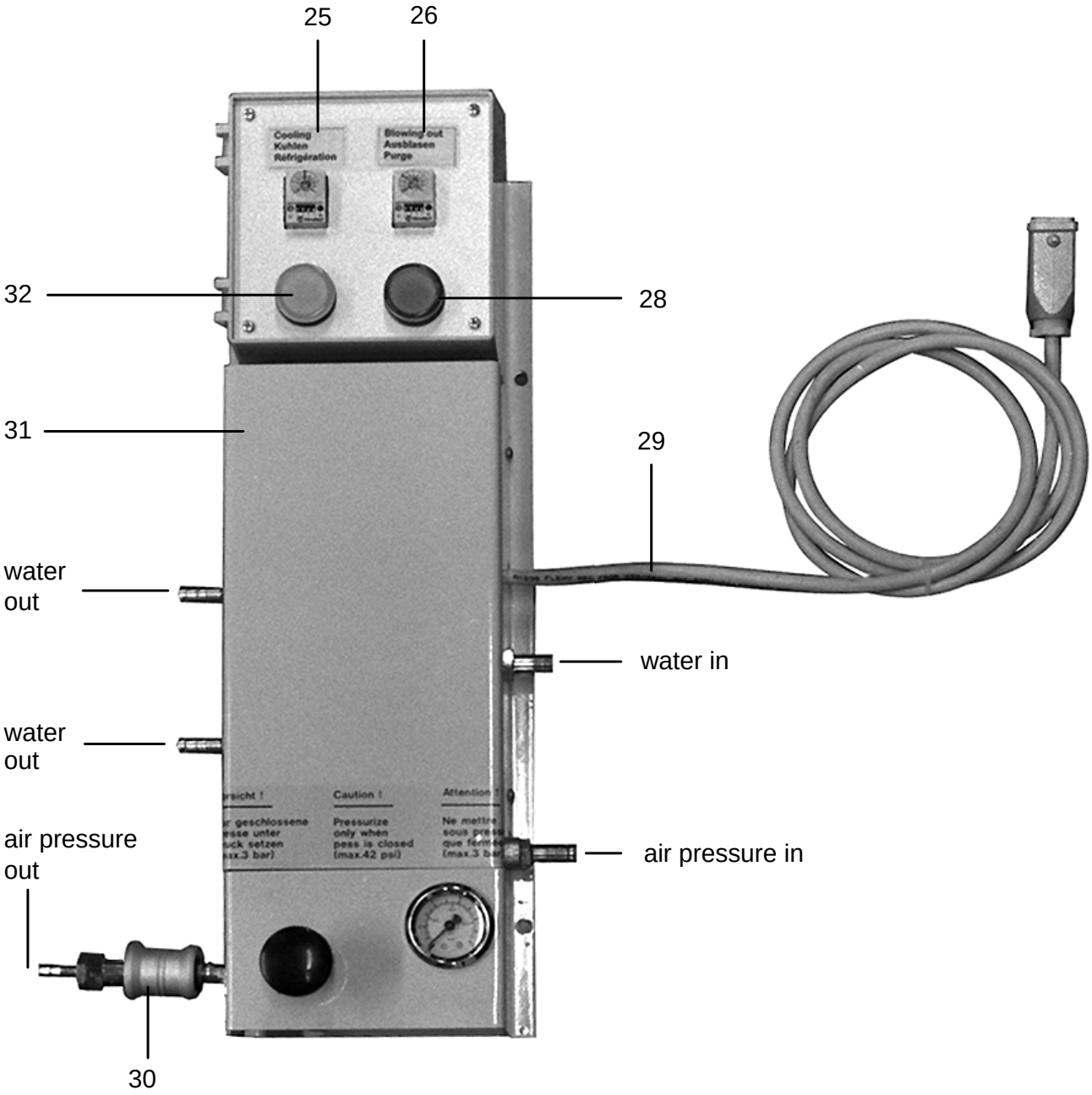
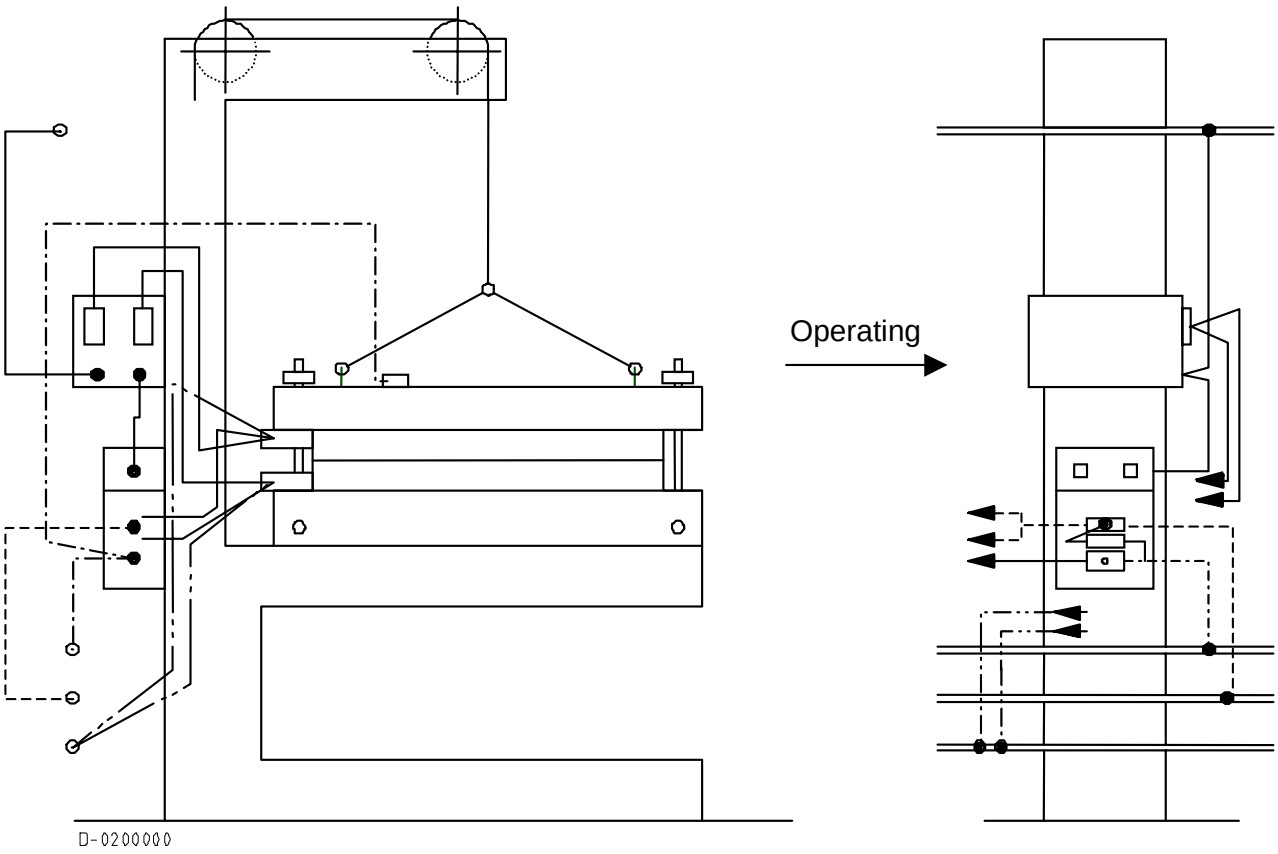


Fig. 6: Control unit PMC-04 for cooling

25	Cooling time relay
26	Blowing-out time relay
28	Pilot lamp (white): cooling cycle ON
29	Connecting cable to regulator
30	Manual slide valve on control unit
31	Control unit
32	Pilot lamp (yellow): cooling cycle OFF

8. Layout for stationary installation



———————	electric	– – – – – – – – – –	cooling water supply
–·–·–·–·–·–·–	compressed air	–··–··–··–··–··–	cooling water drain

Responsible persons: **A: Machine Operator**
B: Maintenance Technician

Operations to be carried out (for further instructions and reference numbers see operating manual No. 36004)		**Execution periodic (months)**				**Spare Part No. Criterion**
		daily	**1**	**6**	**remarks**	
1.	**Cleaning**					
1.1	Clean press after use. Remove residual matter.	A				
2.	**Checking of water connections**					
2.1	Check water hose connections for tightness. Existing leaks can be indicated by lime deposits.		B			moisture, lime deposit
3.	**Checking of compressed-air connections**					
3.1	Check compressed-air connections for leaks.		B			noise of blowing air
4.	**Checking of all cables**					
4.1	Check all cables and plugs for defects.		B			defective insulation, plug fittings, etc.
5.	**Measuring of the heating plate temperature**					
5.1	Proceed according to the operating manual 36004, section 5.2.		B			

Remarks and notes:

Machine type:

Machine no.: **Start-up date:**

Operations to be carried out - refer to checklist (daily work not recorded)	next check	checked sign.	checked date	next check	checked sign.	checked date	next check	checked sign.	checked date	next check	checked sign.	checked date
2.1 Check water-hose connections for tightness												
3.1 Check compressed-air connections for leaks												
4.1 Check all cables for defects												
5.1 Measuring of the heating plate temperature												

Observations, repairs:

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