REGULATING UNIT

Type : PMR-07

GENERAL MANUAL
USE AND MAINTENANCE

ORDER : **S.N. :**

Habasit Italiana S.p.A. - Via A. Meucci 8 Zona Industriale - I - 31029 Vittorio Veneto
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Habasit Italiana S.p.A.
Vittorio Veneto 31029 (TV)
Tel.: ++39(0)438.9113
Fax. ++39(0)438.200545

Author: A.T. / KM
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FOREWORD

IMPORTANT

BEFORE INSTALLING, SETTING UP AND OPERATING THE REGULATING UNIT, THE CUSTOMER MUST CAREFULLY READ THIS MANUAL AND CAREFULLY FOLLOW THE INSTRUCTIONS IT CONTAINS IN ORDER TO ENSURE THE REGULATING UNIT IS USED SAFELY AND CORRECTLY. ALL OPERATORS AND/OR MAINTENANCE PERSONNEL MUST KNOW THIS MANUAL TO ENABLE THEM TO WORK SAFELY ON THE REGULATING UNIT.

SUMMARY

SUMMARY OF THE FIGURES

SUMMARY OF TABLES

A. REGULATIONS AND GENERAL WARNING NOTES

A.1 READING ASSISTANCE NOTES

Meanings of notes used in this manual:

ATTENTION

Note of particular interest for the safety of the people running and maintaining the regulating unit.

WARNING

Note of particular interest concerning the safety of the regulating unit.

NOTE

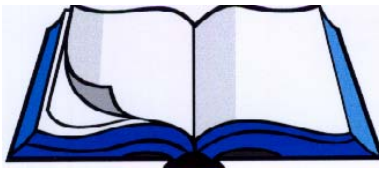
A request for the reader's attention referred to the subsequent paragraph.

A.2 HOW THE MANUAL IS ORGANIZED

This regulating unit was designed, built and tested by expert technicians. The high quality materials used to build the regulating unit make it operationally highly reliable.

For further, more detailed information or in regard to problems, please contact the following address:

Habasit Italiana S.p.A.
Via A. Meucci 8
Zona Industriale
31029 VITTORIO VENETO (TV) - ITALY
Tel.: 0039.438.9113
Fax: 0039.438.200545



This manual observes the organizational rules and requirements of Directive 98/37/CE, duly amended, being the Directive of the Council of the European Community of June 14, 1989, concerning the reconciliation of the laws of member states regarding machines, also known as the «Machine Directive», and also all the other Directives and Regulations referred to in the said Machine Directive, inspired by criteria which, in addition to illustrating the technical characteristics of the machine and its use, maintenance and troubleshooting methods, also clearly indicate the following:

All the protection measures adopted on the regulating unit, fully integrating design safety planning and construction safety.

All protection measures to be adopted to meet those risks that cannot be completely eliminated.

All indications for the training of personnel using the regulating unit, while indicating where it is necessary to provide for individual safety protection devices.

The manual is divided up into sections. Each section deals with a specific subject in which every aspect of safety is considered and clearly highlighted in the text.

A.3 USE CRITERIA

HABASIT requests the Customer to fully read this manual on delivery of the regulating unit it accompanies, and always before attempting any action on the regulating unit. This manual is arranged to supply all the instructions, indications and warnings the user may need in order to know the equipment, understand its operating principles, and to be adequately informed to ensure safe use.

In addition to the instructions in this manual, we would ask users to observe any specific current laws.

This manual must be considered as an essential part of the equipment. It contents must be made known to the entrusted maintenance persons and users.

The purpose is to provide all the information required for good, correct use of the equipment.

The manual must be kept throughout the equipment's life and must be updated in the event of modifications aimed at improving the regulating unit's performance.

The manual must be available to qualified personnel.

Consultation of this manual is facilitated by the general index on the first page, which makes it possible to immediately find the subject of interest.

If the subject dealt with is particularly important it is highlighted with references to the type of technical personnel required to intervene.

All updates HABASIT considers necessary to improve the quality of the regulating unit will be communicated by way of sending of further specific documentation or a new manual to replace the previous one.

If the equipment is sold to another customer, the manual must accompany it and the new customer must be notified to HABASIT for any future modifications and updates.

A copy of this manual, delivered with the equipment, is meant for the maintenance operators, who shall read and keep it near the equipment, and consult it before undertaking any action on the equipment.

A.4 GUARANTEE CONDITIONS

A.4.1 GUARANTEE TERMS AND VALIDITY

The manufacturer guarantees the product against any faults either in materials or in workmanship, for 2 (two) years from the date of installation of the product at the buyer's premises. In this case, the manufacturer shall limit itself to replacing or repairing any part or parts returned to the manufacturer, which was/were found to be faulty.
Furthermore, the manufacturer, may, at its discretion, replace or repair any part or parts, returned by the buyer, which, subject to the manufacturer's confirmation, are found to be faulty.
The following shall be charged to the buyer and/or its customer: transport costs and other handling costs of parts returned to the manufacturer.
The manufacturer shall have the sole right to decide if such parts shall be repaired or replaced.
In no other case shall the manufacturer be responsible for collateral or incidental damage.
The guarantee does not apply to systems that were repaired by third parties NOT authorized by the manufacturer.
Spare parts supplied by the manufacturer must be used. Any deviation from this rule will mean the guarantee will not apply.

A.4.2 WHEN THE GUARANTEE CAN BE VOIDED

The manufacturer's guarantee for the equipment may be annulled as a result of improper intervention or repairs.
The manufacturer's guarantee for the equipment may be annulled as a result of the use of improper materials or materials not supplied by the manufacturer.
The instructions in this manual must be observed to prevent the guarantee cover from being voided.

IMPORTANT

HABASIT CANNOT BE HELD RESPONSIBLE FOR ANY DAMAGE CAUSED BY IMPROPER, INCORRECT AND UNREASONABLE USE OF THE REGULATING UNIT.

A.5 VISUAL SIGNS

ATTENTION

Visual signs – indicator notices – are applied to the regulating unit. A knowledge of their meaning helps ensure that safety regulations are observed to prevent accidents and assure good operation.

All people approaching the regulating unit must have a clear understanding of the symbol and its meaning. Non observance may cause accidents entailing damage to personnel and to the regulating unit.

A.5.1 SIGNS

The signs affixed to the regulating unit are shown below. Such signs enable staff operating or working on the regulating unit to know about and so prevent the dangers and risks of not observing the principal safety rules.

TABLE 1 - DANGER SIGNS

	**Attention: DANGER OF ELECTRIC SHOCKS** Indicates the personnel involved that, if the described operation is not performed while observing safety regulations, there is a risk of suffering an electric shock.

TABLE 2 - PRESCRIPTIVE SIGNS

	**GENERAL obligation** An obligation to carry out the operation as described and in accordance with safety rules so as avoid risks and accidents. This is usually accompanied by notices explaining the obligation.

TABLE 3 - TERMS AND DEFINITIONS

TERM	*DEFINITION*
PROTECTION DEVICES	Safety measures involving the use of specific technical means called protection devices (guards, safety devices) to protect persons from dangers that cannot be reasonably eliminated or sufficiently reduced in the design of the machine.
GUARD	A part of the machine specifically used to provide protection by the use of a physical barrier. Depending on how it is made, a guard may be called a cowling, cover, screen, door or fence etc. **Note 1** - A guard may act: - alone; in this case it is effective only when closed. - associated with a locking device with or without locking the guard; in this case protection is assured whatever the position of the guard. **Note 2** - "Closed" means, in the case of a fixed guard, "kept in position".
FIXED GUARD	Guard kept in position (i.e. closed), by means of a fastening (screws, bolts etc.) that make its removal/opening impossible without the use of tools.
MOBILE GUARD	Guard that is generally mechanically connected to the frame of the machine or to nearby fixed element (by means for example of hinges or guides), and that can be opened without the use of tools.
INTERLOCKED MOBILE GUARD	Guard associated with an interlock device so that: The machine's dangerous functions "protected" by the guard cannot be carried out unless the guard has been closed. If the guard is opened during the unfolding of the machine's dangerous functions, a stop command is given. The closure of the guard permits execution of the machine's dangerous functions "protected" by the guard but it does not control the start up.

TERM	*DEFINITION*
SAFETY DEVICE	(No guard) that eliminates or reduces the risk, either alone or in association with a guard.
INTERLOCK DEVICE (INTERBLOCK)	A mechanical or electrical or other kind of device whose aim is to prevent elements of the machine from functioning under specified conditions (generally until the guard is closed).
PROTECTION STRUCTURE	A physical obstacle such as a guard or part of the machine, that limits the movement of the body and/or one of its parts. The safety distances have been determined on the basis of the requisites at point 4.1.1 of the standard EN294.
SAFETY DISTANCE	The minimum distance a protective structure must be positioned with respect to a dangerous area. The safety distances have been determined on the basis of the requisites at point 4.1.1 of the standard EN294.
INDIVIDUAL PROTECTION DEVICE	Safety devices such as gloves, shoes, helmet, visor, earplugs etc. aimed at protecting parts of the body.
CONTROL CIRCUIT	A circuit used to control the working of the machine and protect the power circuits.
CONTROL DEVICE	A device inserted into a control circuit and used to control the working of the machine (e.g. position sensors, manual control switches, relays and electromagnetic valves).

A.6 SAFETY WARNINGS

When using industrial machines and systems, one should be aware that moving mechanical parts (linear or rotary movement), high voltage electrical parts, and any parts at high temperature, etc, can cause serious damage to persons and materials.

In designing and building the regulating unit, the Manufacturer focused special attention on safety in order to supply a SAFE regulating unit and, therefore, the Manufacturer has provided protective and safety devices considered necessary according to the Risk Analysis carried out by expert personnel. People in charge of system safety must make sure that the following essential safety regulations are observed:

	Do not run the regulating unit with the fixed and mobile protective devices dismantled or disabled.
	Do not run the regulating unit with the fixed and mobile protective devices dismantled or disabled. It is forbidden to switch off safety devices installed on the regulating unit or create by-pass systems to limit switches or micro-switches.
	Operations with reduced safety devices must be carried out strictly observing the instructions in the relevant descriptions, and must be performed by specialized technicians aware of the risk, under the direct supervision of the company person responsible for safety. Active protective devices must be restored as soon as possible, limiting this high risk status to the minimum.
OF 	Cleaning and maintenance operations must be performed with the electrical and pneumatic cutout devices switched OFF. To this end, the regulating unit is provided with emergency push buttons which shut down the system. It is good practice to use them as safety lock-outs to avoid accidental starting during inspections or mechanical jobs.
	Clean covers and control panel with soft, dry cloths lightly dampened in detergent; do not use solvents as they could damage the surfaces.
	Do not modify the regulating unit or its parts. Otherwise, the manufacturer shall not hold itself responsible for damage to persons and materials. Request any modifications/customizing directly from the manufacturer.

A.7 REMAINING RISKS

The use of equipment following the instructions in this manual involves no remaining risks. The user is responsible for taking care during transportation and movement of the equipment so as to avoid bumps or bumping into and crushing persons in the area of these operations.

Ensure during equipping and maintenance operations that the stages in the chapters of the manual are scrupulously adhered to and have these operations carried out only by suitably prepared and qualified persons.

A.8 QUALIFICATIONS OF PERSONNEL

Each task must be assigned to a person trained in the work to be carried out and trained in correct usage as well as fully aware of any remaining risks and dangers in that work. Personnel must not carry out work outside their area of competence, knowledge and responsibility.

TABLE 4 - QUALIFICATIONS

	**FIRST LEVEL MACHINE CONTROL OPERATOR** Indicates non qualified personnel i.e. without specific competencies and able only to carry out simple tasks, including in practice running the machine with the use of the controls on the push-button panel and loading and unloading materials used during production. Furthermore, this operator can work with the machine while the machine's protective devices are enabled, to carry out simple, ordinary jobs for adjusting, starting or re-starting production following enforced downtime.
	**MECHANICAL MAINTENANCE PERSON** A qualified technician able to run the machine under normal conditions, to intervene on mechanical parts to make all adjustments as well as the necessary mechanical maintenance and repair jobs, also with the protective devices disabled.
	**ELECTRICAL MAINTENANCE PERSON** A qualified technician able to run the machine under normal conditions, and also with the protective devices disabled; s/he is entrusted with all electrical jobs involving adjustment, maintenance and repairs. This operator is able to work while the interior of the cabinets and the connector blocks are electrically live.
	QUALIFIED TECHNICIAN A person who is by training, experience, education and knowledge of accident prevention regulations and procedures able to perceive and avoid possible dangers and who is authorized by the plant's safety officer to carry out all necessary mechanical and electrical intervention.
	SPECIALIZED SUPERVISOR An expert, specialized technician provided by the Manufacturer to carry out complex operations in particular situations, installation, first start-up, instruction of the Customer's personnel, as well as overhauls of and modifications to the machine.

A.9 REFERENCES AND STANDARDS

A.9.1 APPLICABLE EU DIRECTIVES

EU Directive N° 98/37 of 23.07.98 known as the "Machines directive".
EU Directive N° 60/ 204 known as the ”Low-tension directive”.
EU Directive N° 89/336 for the convergence of Member State law on electromagnetic compatibility.

Application of the above directives is formalized through the signing of the MANUFACTURER'S DECLARATION OF CONFORMITY drawn up once the inspection test has been carried out at the place of installation.

This machine has been constructed in a country that is part of the European Community and therefore meets the safety requirements of EEC directive 98/37/CE, in force from July 23, 1998.

This conformity is certified and the machine bears the CE mark of compliance. (See figure)

A.9.2 EU DIRECTIVES CONCERNING SAFETY IN THE WORKPLACE

EU Directive N° 89/391 concerning the improvement of the safety and health of workers during work, in addition to the following particular directives: EEC N° 89/654 and N° 89/655.

A.9.3 EU DIRECTIVES CONCERNING PERSONAL PROTECTION

EU Directive N° 77/576 and N° 79/640 concerning safety signs in the workplace.

A.9.4 EU DIRECTIVES CONCERNING ENVIRONMENTAL PROTECTION

EU Directive N° 89/686 concerning the use of personal protection devices.

EU Directive N° 75/442 on the disposal of waste.
EU Directive N° 78/319 concerning disposal of toxic and harmful waste.

B. TECHNICAL SPECIFICATIONS

B.1 PURPOSE OF THE REGULATING UNIT

The regulating unit PMR-07 has been specifically designed to control the joining process in the HABASIT fabrication presses using **Thermofix** and **Flexproof** method.

The **Thermofix** process includes all the flat belts and other Habasit conveyor belts with right-angled or oblique-angled joins.
The **Flexproof** process includes most of the Food and Standard conveyor belts from Habasit as well as the thermoplastic transmission belts.

Further details about these processes can be obtained at:

For the **Thermofix** process (see technical manual Thermofix)
For the **Flexproof** process (see technical manual Flexproof)

NOTE

By connecting to the company's IT net H/Net it is possible to access current valid process data.

The regulating unit PMR-07 has been developed exclusively for the applications described herein. No other or inappropriate applications are permitted.

ATTENTION

ANY USE OF THE REGULATING UNIT OTHER THAN FOR WHICH IT WAS DESIGNED MAY BE IMPROPER USE AND RESULT IN NOT BEING SAFE FROM THE POINTS OF VIEW OF THE OPERATOR, MAINTENANCE WORKER AND OF THE REGULATING UNIT ITSELF.
HABASIT SHALL NOT BE HELD LIABLE FOR THE CONSEQUENCES OF ANY BREACHES OF THESE RULES.

B.1.1 IDENTIFICATION DATA OF THE EQUIPMENT

A plate fitted to the structure of the regulating unit indicates the device's identification data. These data are shown in the following figure.

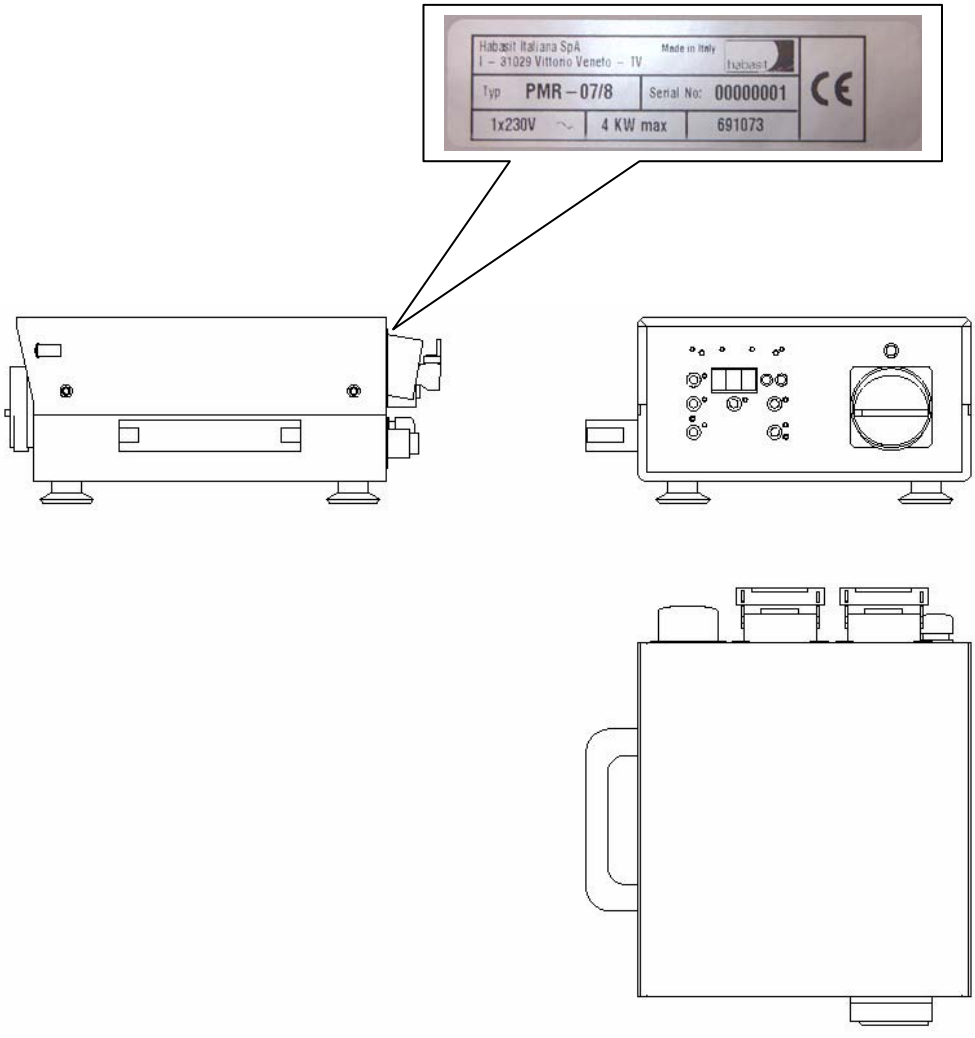


FIGURE 1 - MACHINE IDENTIFICATION PLATE

B.2 TECHNICAL SPECIFICATIONS

TABLE 5 - DIMENSIONS AND CONSUMPTION

Characteristics	PMR-07
Tension [V]	1 x 230V / 1 x 120V
Max. current [A]	16A / 32A
Dimensions (width x height x depth)	323 x 155.5 x 365 (mm) *12.7 x 6.12 x 14.37 (inch)*
Weight	9.2 kg / *20.24 lbs*

TABLE 6 - TABLE OF ELECTRICAL OUTPUTS

	Tension [V]	Max. current [A]
Water recirculation pump	1 x 230V	2
Compressor	1 x 230V	7

B.3 EQUIPMENT AND ACCESSORIES PROVIDED

The regulating unit is supplied with an electrical supply cable without plug.

B.3.1 OPTIONALS

Pos.	Description	MU	Quantity	ASSEMBLY CODE	PART CODE
	COOLING UNIT PMC-07	N°	1	691080	
	CABLE CONNECTION PAIR regulator PMR-07/8 and outlet PM	N°	1	691011	
	CABLE CONNECTION PAIR regulator PMR-07/8 1x230V and outlet PM	N°	1	691005	
	CABLE CONNECTION PAIR regulator PMR-07/6 1x120V and outlet PM	N°	1	691006	
	CABLE CONNECTION PAIR regulator PMR-07/8 and outlet PM-156/60 – PM-300 230V	N°	1	691007	
	CABLE CONNECTION PAIR regulator PMR-07/6 and outlet PM-156/60 – PM-300 120V	N°	1	691008	

B.4 ORDERING ACCESSORIES/SPARE PARTS

IMPORTANT

To order accessories or spare parts, please do the following:

Mention the name of the regulating unit.
Mention the position of the part.
Mention the description of the part.
Mention the technical code.

When making your request, briefly illustrate the causes of failure of the part being ordered, and provide all information which may be useful for understanding the malfunction; this will make it possible to pinpoint any shortcomings or incorrect procedures which may have caused the damage.

When ordering spare parts, we recommend using the fax and not just placing your order by phone.

Habasit Italiana S.p.A.
Via A. Meucci 8
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I - 31029 Vittorio Veneto
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Fax: 0039.438.200545

The parts marked P and N are available at the headquarters of Habasit Reinach, Switzerland.

C. INSTALLATION

C.1 PREPARATION OF WORKING AREA

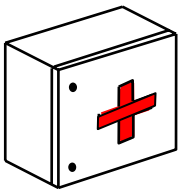
ATTENTION

The regulating unit must be placed on a floor or support of suitable size that is able to take the weight and bulk of the equipment.
The machinery must be placed in a room with sufficient lighting, avoiding dazzling and stroboscopic effects. Personnel entrusted to control the regulating unit must be able to work under normal light conditions (usually provided by neon lights fitted on the ceiling). If the lighting is not adequate, the customer must provide additional lighting. Since the equipment's panel has back lighting but does not have its own lighting system in the (rear) non-operational areas.

The work area must be well ventilated and have an air cycling and emission system compliant with the law of the country of installation, such as to ensure the operator is working under the proper working conditions.

The free space around the regulating unit must be sufficient for work and maintenance operations and permit access to the panel according to its position.
The customer must provide the required electrical power as indicated in Technical specifications.

Ensure that there is a properly stocked first aid box on site nearby.



ATTENTION

The main switch of the electrical panel must be in its “OFF” position when the regulating unit is being connected up.

C.2 PACKING AND HANDLING

ATTENTION

The movement of the packaging and machinery should be carried out by authorized operators.
Suitable equipment must be used to move the regulating unit, with adequate strength to deal with its weight and bulk.
The equipment must be completely disconnected before it is transported.
There are two handles at the side for lifting the equipment.
Never use the electrical cables connected to the equipment to lift it.
When unpacking, check that no small parts remain in the case, and carefully check the general conditions.
Packing materials (wood, nails, plastic, barrier bags, etc.) can be sources of danger and should be placed in collection points, especially if polluted or non-biodegradable.
Concerning disposal of packing materials, the user must observe the current laws of the country of installation.

IMPORTANT

REPORT ANY DAMAGE NOTED ON THE REGULATING UNIT AT DELIVERY TO THE CARRIER AND SUPPLIER.

ATTENTION

ALL HANDLING OPERATIONS OF THE REGULATING UNIT MUST BE PERFORMED SLOWLY WITHOUT ANY SUDDEN MOVEMENTS, TO AVOID DAMAGING PERSONS AND MATERIALS.

C.3 FITTING AND INSTALLATION

C.3.1 PRELIMINARY CHECK

Carry out a visual check on the regulating unit's appearance and on any accompanying equipment to see if there are signs of damage or breakage that may have occurred in transit. If such damage and/or failures are noted, contact HABASIT immediately. We advise you to also produce photographic evidence of the damage.

C.3.2 POSITIONING

IMPORTANT

Check there are no dangers in the environment such as water, damp or their consequences.

Make sure there is sufficient operational space for working on the regulating unit.

Position the equipment so that it is stable.

Check visually to make sure that no rags, work tools, etc. remain on the regulating unit.

C.3.3 ELECTRICAL AND UTILITIES CONNECTION

ATTENTION

Ensure all the plant providing the equipment corresponds with its own specifications.

Ensure the main switch is set at “OFF”.

Connect the cables to the hot-pressing device and the PMC-XX cooling unit.

Plug in to provide power to the equipment.

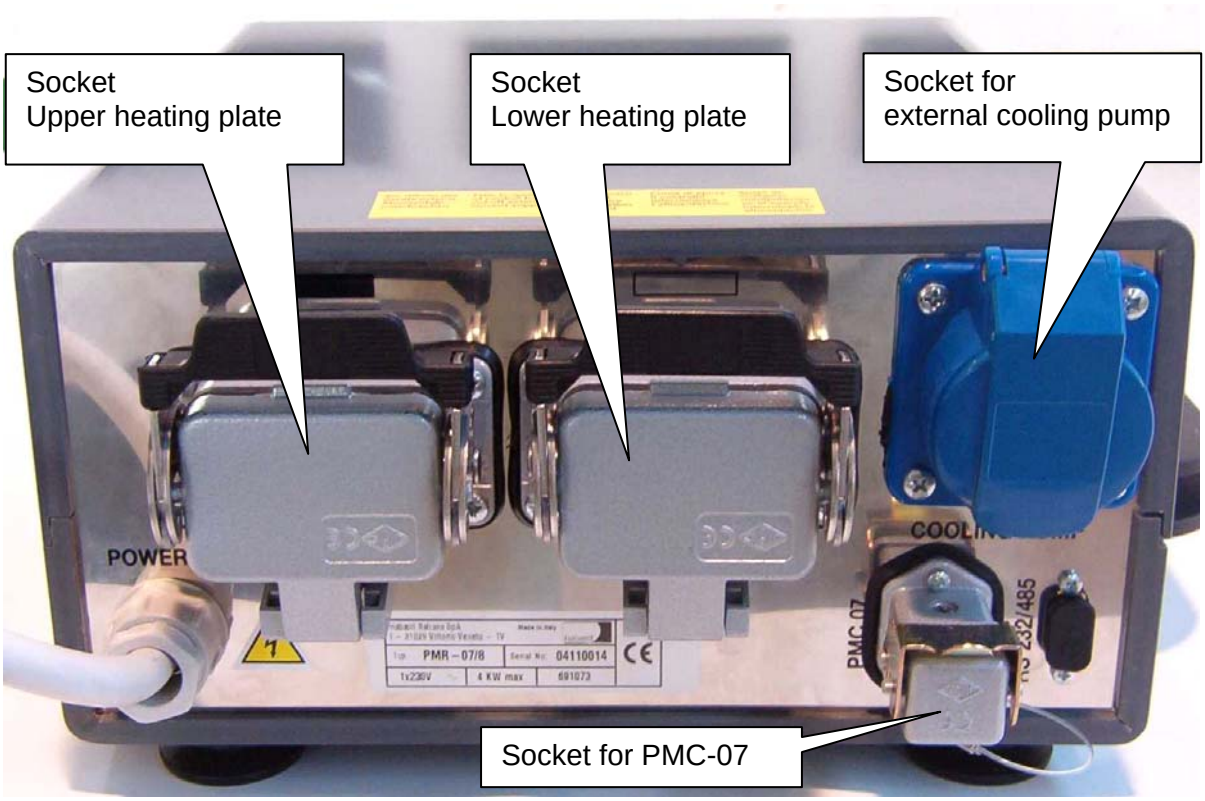


FIGURE 2 - CONNECTION TO ELECTRICAL SUPPLY AND UTILITIES

C.4 EQUIPMENT DISASSEMBLY

Regulating unit dismantling operations must be performed by:

Technicians of HABASIT Assistance Service.

Technicians authorized by HABASIT, with experience of:
Installation/disassembly of machinery.
Installation/ disassembly of the electrical, pneumatic and hydraulic plant, consulting the corresponding diagrams.

ATTENTION

BEFORE CARRYING OUT ANY KIND OF WORK ON THE REGULATING UNIT IT IS ESSENTIAL TO ENSURE THAT THE SYSTEMS (ELECTRICAL, PNEUMATIC AND WATER) ARE DISCONNECTED FROM ENERGY SUPPLIES, THAT PNEUMATIC AND WATER IS PROPERLY DEPRESSURISED AND THAT THERE IS NO REMAINING POTENTIAL ENERGY IN THE MOVING PARTS.

Disconnect the electrical circuit.

Proceed with mechanical dismantling.

If the regulating unit has to be stored for a certain time, prepare it as indicated in the next section, but if it has to be handled immediately, refer to the appropriate section.

C.5 STORAGE

IMPORTANT

The regulating unit must be stored in a dry room free from seepage of liquids.

NOTE

Never, on any account, store the regulating unit out of doors! As a general rule, observe the following environmental conditions.

TABLE 7 - STORAGE CONDITIONS

	ENVIRONMENTAL CONDITIONS FOR STORAGE
Min/Max ambient temperature of storage	In the range of +5 °C to +40 °C
Relative humidity of place of storage	In the range of 50% to 70%

If the regulating unit, its accessories and spares have to remain in storage for a prolonged period, they must be protected from dust and damp.

We recommend the following:

Clean the regulating unit in general.

Apply PROTECTIVE SILICONE OIL to **un**-painted or **un**-treated parts.

Cover the regulating unit with a sheet to protect it from dust.

Before being oiled or greased for good preservation, some parts can, if necessary, be cleaned with a specific, rust-proofing detergent.

C.6 DISPOSAL

IMPORTANT

The regulating unit PMR-07 is built with different types of material. When they have reached the end of their useful life, such materials must be disposed of at specialized centers, according to the prescriptions of the laws in force in the country of destination.

ATTENTION

The materials and substances making up the regulating unit MUST be eliminated according to the Laws/Regulations on disposal of individual waste in force in the country where the regulating unit is installed.

IN ANY EVENT, NO COMPONENT OF THE REGULATING UNIT MUST BE LEFT IN THE ENVIRONMENT.

CONTACT AN AUTHORIZED COMPANY TO CARRY OUT THIS TYPE OF OPERATION.

D. OPERATION

D.1 GENERAL WARNINGS

The operator and/or maintenance technician must use the equipment in the manner described in this manual and must avoid creating situations that could cause danger to persons who may come into contact with the equipment or things connected to it.

IMPORTANT

THE INFORMATION DEVICES (SIGNS) AND SAFETY NOTICES MUST BE KEPT CLEAN AND LEGIBLE.

ATTENTION

DO NOT IN ANY WAY ALTER THE EQUIPMENT'S SAFETY SYSTEM.

ATTENTION

IT IS ABSOLUTELY FORBIDDEN TO REMOVE THE PROTECTIVE DEVICES INSTALLED ON THE REGULATING UNIT.

ATTENTION

CARRYING OUT CLEANING AND MAINTENANCE JOBS WHILE THE SYSTEMS ARE LIVE IS ABSOLUTELY FORBIDDEN.

ATTENTION

DO NOT REMOVE THE GUARDS WHICH REQUIRE TOOLS FOR THEIR REMOVAL.

D.2 GUARDS INSTALLED

The regulating unit has the following protection devices:

Guards.

The GUARDS are classified as:

Fixed guards.

IMPORTANT

The regulating unit has been designed and built in conformity with European EN and IEC safety standards.

All the potentially harmful or dangerous electrical parts have been rendered inaccessible to the operator. Guards, covers and electric safety devices have been installed for this purpose.

The production head must ensure that these protection devices are not removed.

ATTENTION

READ THE ACCIDENT PREVENTION SIGNS WITH CARE. DO NOT COVER THEM FOR ANY REASON AND REPLACE THEM IMMEDIATELY IF THEY GET DAMAGED.

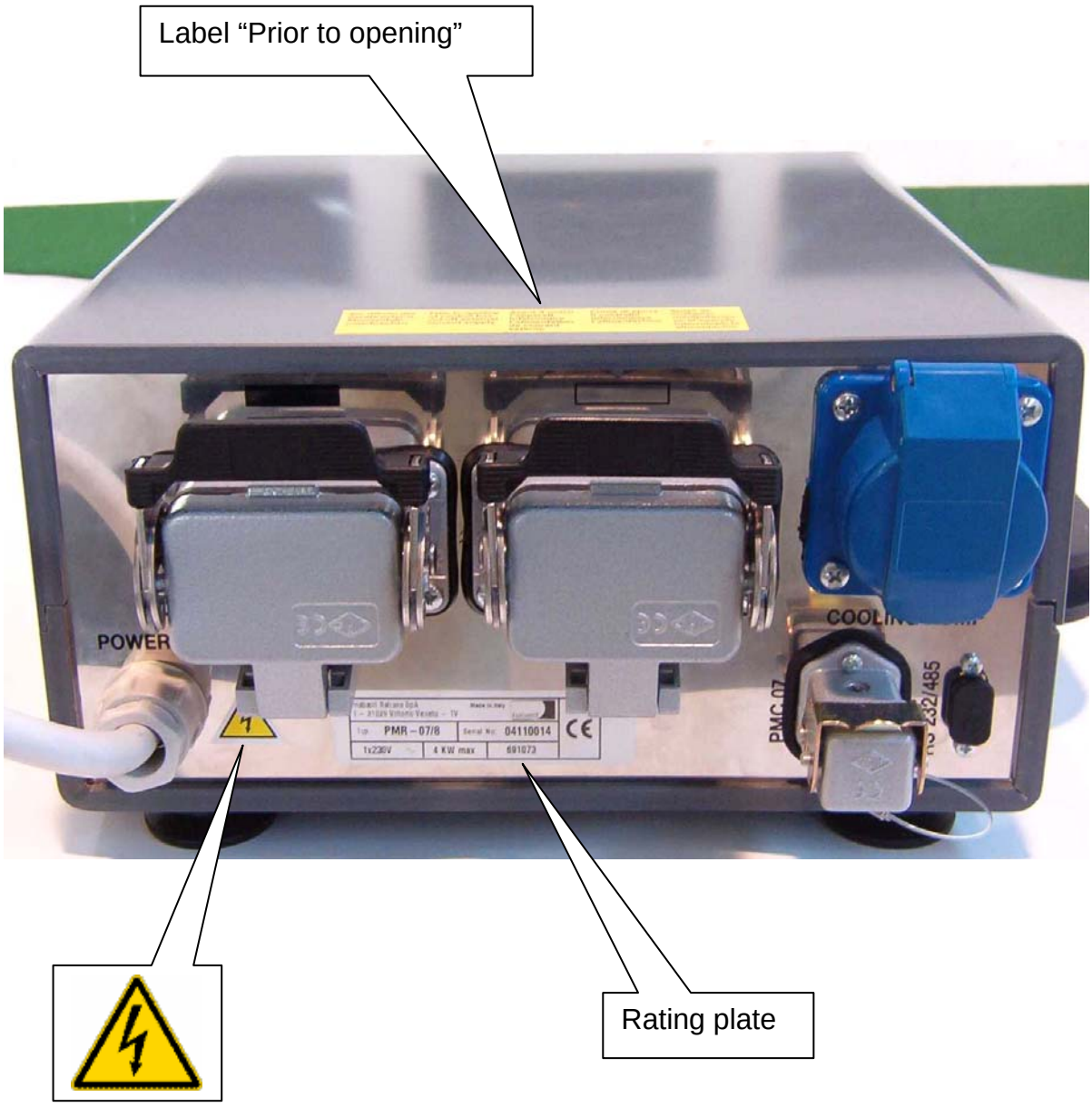


FIGURE 3 - PMR-07 LOCATION OF SIGNS

D.3 EQUIPMENT PARTS IDENTIFICATION

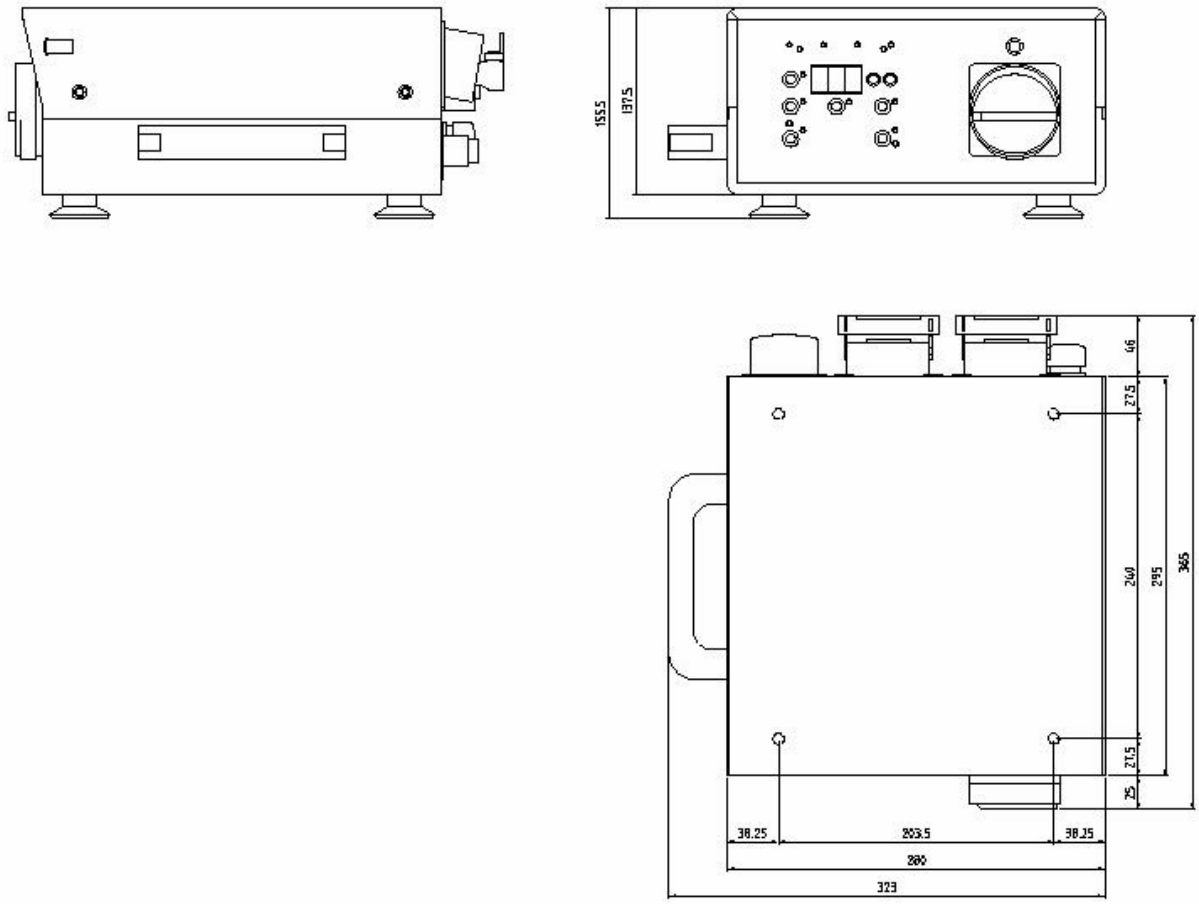


FIGURE 4 - VIEW OF PMR-07

E. CONTROL UNIT

E.1 FRONT PANEL

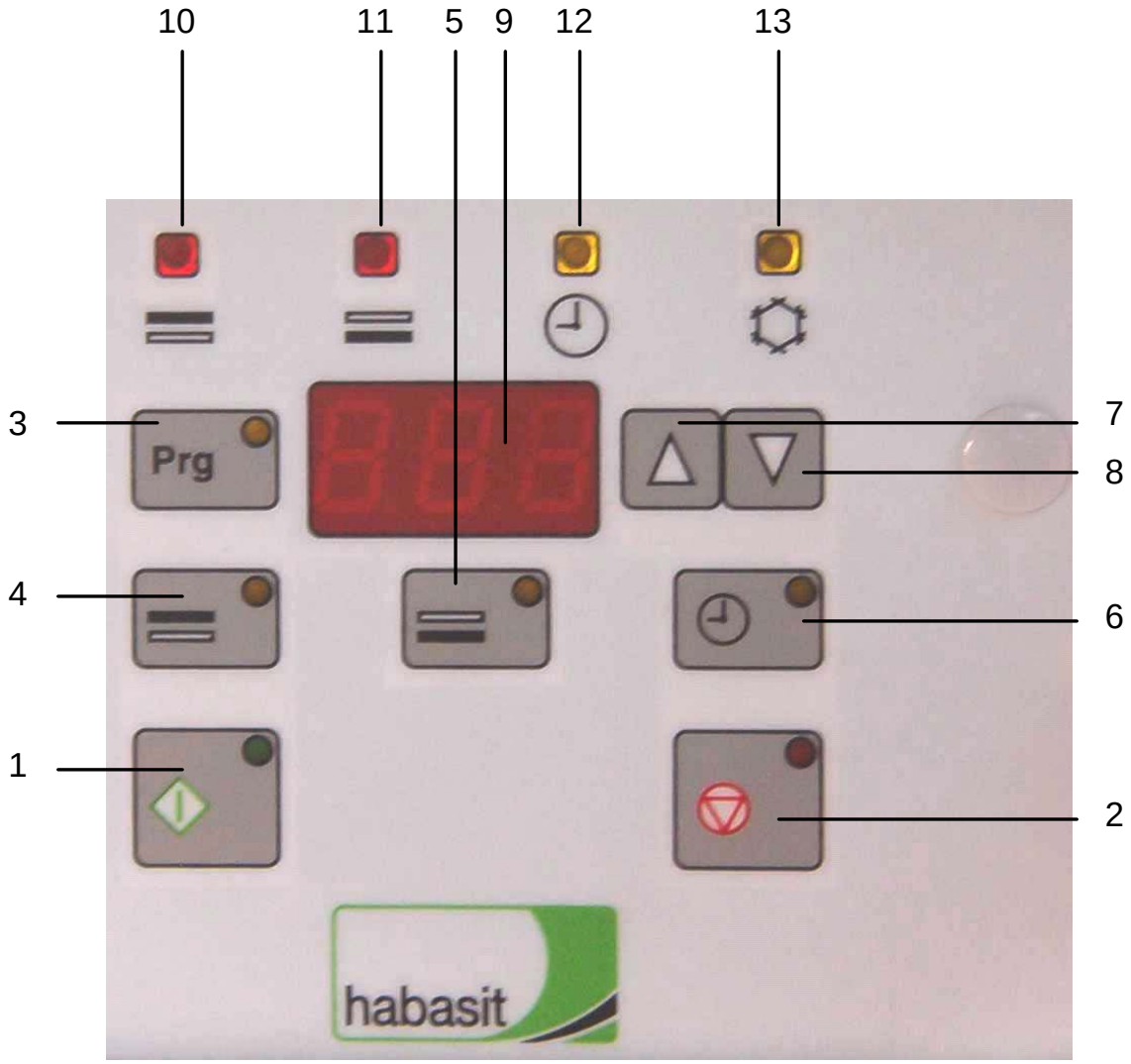


FIGURE 5 - FRONT PANEL

E.1.1 ELEMENTS AND THEIR FUNCTIONS

TABLE 8 - TABLE OF ELEMENTS AND THEIR FUNCTIONS

Label	Name	Function
1	[START]	Starts the joining cycle Its green indicator is on while the joining cycle runs Its red indicator blinks while the cycle is interrupted and the controller is waiting for the operator's decision
2	[STOP]	Breaks the joining cycle Its red indicator blinks while the cycle is interrupted and the controller is waiting for the operator's decision The indicator is steadily lit in standby mode (cycle completed or control waiting for input of data)
3	[PROG]	In Standby mode, switches to programming mode (during which parameters can be input). During the joining cycle, temporarily switches to display of the set value. Its yellow indicator is lit when in programming mode.
4 5 6	[TOP TEMPERATURE] [BOTTOM TEMPERATURE] [PRESSING TIME]	These three mode switches select input or display mode for the respective parameter. The yellow indicator of the active parameter is lit.
7, 8	[UP, DOWN]	In programming or parameterization mode: increase or decrease current parameter. With interrupted joining cycle: select cycle phase to continue with.
9	[DISPLAY]	Multifunction three-digit display.
10 11	<TOP HEATER ON> indicator <BOTTOM HEATER ON> indicator	Lit while respective heater receives power (constantly lit during heating up, starts to cycle after reaching temperature, (heater is holding temperature))
12	<PRESSING TIME ON> indicator	Lit as soon as joining time count down has started (as soon as both plates have reached their setting temperatures)
13	<COOLING PHASE> indicator	Lit during the cooling cycle (after joining time has counted down)

E.2 OPERATION OF THE CONTROL UNIT

E.2.1 ENTERING JOINING PARAMETERS

Make sure the control unit is in standby mode (Red indicator [STOP] lit).

Enter programming mode by pressing [PROG]
→ Yellow [PROG] indicator lights.
→ Display switches to showing set values.

Select parameter that you want to set ([TOP TEMPERATURE], [BOTTOM TEMPERATURE] OR [PRESSING TIME]. → respective yellow indicator lights.

Using [UP] and [DOWN] arrow keys, set the respective parameters. Defined by a parameter, pressing time can be set in seconds (no decimal point in display) or minutes (decimal point at the extreme right of the display).

Exit programming mode by pressing [PROG] again
→ Yellow [PROG] indicator goes off.
→ Display switches to showing actual values.

E.2.2 RUNNING THE JOINING CYCLE

Start the joining cycle by pressing [START]
→ Green [START] indicator lights
→ Red [STOP] indicator goes off
→ Indicators <TOP HEATER ON>, <BOTTOM HEATER ON>, <PRESSING TIME ON> and <COOLING PHASE> display the progress of the joining cycle.

This is the sequence of operations:

Both red <HEATER ON> indicator lights, heating plates heat up to their set values (Phases 1 and 2).

When temperature has reached about 75% of set point, the controller reduces power for a short period (red <HEATER ON> indicators start to cycle) to check response of the system and optimize regulation parameters.

When set temperatures are reached power input is reduced (red <HEATER ON> indicators start to cycle to hold the temperature set), yellow <PRESSING TIME ON> indicator lights and count down of [PRESSING TIME] starts (Phase 3).

After [PRESSING TIME] has counted down, yellow <COOLING PHASE> indicator comes on. Cooling fans are started; the hot pressing device is cooled down to a temperature preselected by a control parameter (Phase 4).

During the joining cycle the display shows the temperatures or the time according to the active – indicated by the LED - button. You can perform the following operations without interrupting the cycle:

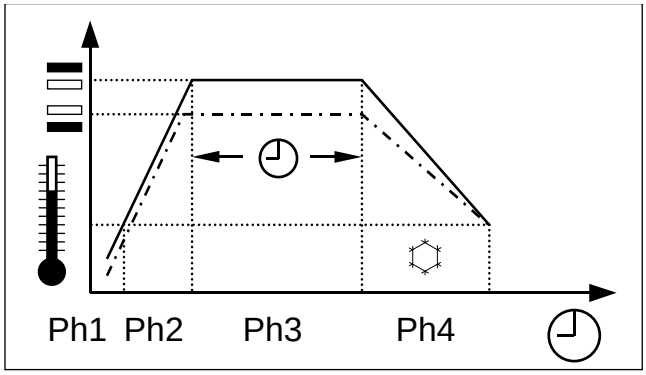
Switch on display of the desired parameter by pressing [TOP TEMPERATURE], [BOTTOM TEMPERATURE], [PRESSING TIME] respectively.

Temporarily switch to display of set (as opposed to actual) value by pressing and holding [PROG]

INDICATION	Once the joining cycle is started, parameters can not be changed. Interrupt the cycle, change parameters and re-start if you wish to do so.

E.2.3 INTERRUPTING THE JOINING CYCLE

When the joining cycle is interrupted with the [STOP], button, various courses of action can be taken. Which ones are possible depends on the current phase of the joining cycle:



Press [STOP] to interrupt the joining cycle.
→ Red [STOP] and green [START] indicators blink.
→ Power to all components of the hot pressing device is shut off [no cooling, no heating]
→ The display shows the phase of the joining cycle to which the control will proceed when [START] is pressed.

Select the desired phase with the [UP] and [DOWN] arrow keys.

Resume the cycle in the selected phase by pressing [START]

or

Leave the joining cycle altogether by pressing [STOP] again. In this case the press has to cool down on its own.

So the following exit paths are possible:

Phase 1 (heating up, below cooling end-temperature) to Standby

Phase 2 (heating up, above cooling end-temperature) to Phase 4 or Standby

Phase 3 (count down of pressing time) to Phase 4 or Standby

Phase 4 (cooling) to Standby

CAUTION	Opening the press before cooling down temperature is reached may have a negative impact on joining quality.

E.3 PARAMETRIZATION OF THE CONTROL UNIT

Some of the parameters determining the behavior of the control unit can be set by the user. The sequence for this is as follows:

With the control unit in standby mode, press (and keep pressed) the [PROG] key for 5 seconds.
-> The display shows: `PAS`

Press the [PROG] key again
-> The display shows: `0`

With the [UP] and [DOWN] arrow keys select the value `55`

Press [PROG] again.
-> The display shows the ID of the first parameter: `SPr` (Set point for stop cooling). See table below about parameter IDs and their meanings.

Press [PROG] again to see the value of this parameter:
-> current value of this parameter is displayed: `50` (This is the default, you may see something different). See table below as to how to interpret these values.

Change the value with the [UP] and [DOWN] arrow keys.

Scroll down through the list with the [PROG] key. The sequence of display is:
Parameter ID
Parameter value
Next parameter ID
Parameter value
...

Each time a value is displayed you can set it using the [UP] and [DOWN] arrow keys.

To exit the setting mode:

1. Using the [PROG] key scroll all the way down through the parameter list, or
2. Do nothing for 30 s: the control unit falls back to standby mode automatically.

E.3.1 EQUIPMENT FUNCTION

The PMR-07 equipment manages the joining cycle by a process control system with an operator interface in the form of:

- a data display screen
- a selection keyboard on the sides of the screen
- an alphanumeric keyboard for entering data a values into the control unit

On the front there are lights that indicate current operations in progress:

FIGURE 6 - FRONT VIEW OF THE PMR-07

Availability of power supply on sockets according to main electrical supply. All sockets are located on the back panel.

Main electrical supply	Cooling pump socket
1x230V	YES
1x120V	YES

HINT: In case cycle has been stopped during cooling phase, provide to remove water from press circuit by starting a cycle with following parameters:

Upper temperature:	65°C
Lower temperature:	65°C
Welding time:	5 sec.

Start the cycle. When temperature reaches 60 °C, press STOP CYCLE button. Then select the cooling phase and wait until cycle is finished automatically.

Alternatively, clean water circuit manually with compressed air.

CAUTION	Ensure there is no liquid in the cooling circuit. This may jeopardize the next joining cycle with resulting defective joints.

E.3.2 USE WITH EXTERNAL COOLING PUMP

The joining cycle is managed as follows:

The PMR-07 regulating unit will manage the heating and thermosetting stages for the time set.

When the time set has run out, the PMR-07 regulating unit will activate the rear electrical outlet the cooling pump is connected. When the temperature of the heating plates reach 50 °C, press the STOP CYCLE button and go in stand-by mode.

INDICATION	The regulating unit does not stop automatically!

The removal of remaining water from tubes has to be carried out with a jet of compressed air.

E.4 TECHNICAL ASSISTANCE

Our experts will be available for you to consult on the use of the equipment. If you have any technical queries regarding the working and the status of the regulating unit, contact the manufacturer at the address indicated in this manual.

TABLE 9 - TABLE WITH WORKING PARAMETERS OF PMR-07

WORKING PARAMETERS OF PMR-07			(*) The Passwords "5" and "101" are not modifiable							
Ord. Vis.	Pass-word	PARAMETER	PLANNING			CONFIGURATION				
			from	to	Unit	from	to	Default	code	Unit
Key led		Upper Plate Set-Point	UP1	dn1	1 / °C					
Key led		Lower Plate Set-Point	UP2	dn2	1 / °C					
Key led		Welding time set	0	999	1 / sec (Unt=1) 1 / min (Unt=60)					
1	**101**	Cooling phase stop set-point				20	70	**50**	**SPr**	1 / °C
2	**101**	Welding time scale				1	60	**60**	**Unt**	1 / 60
3	**101**	Upper NTC sensor off-set				-20	20	**0**	**OF1**	0,5 / °C
4	**101**	Lower NTC sensor off-set				-20	20	**0**	**OF2**	0,5 / °C
5	**101**	Valve of air blowing ON:1 OFF:0				1	0	**1**	**Ar**	1 / unit
6	**101**	Air blowing time				0	500	**60**	**SAr**	1 / second
7	**101**	RS485 Address of central unit				1	32	**1**	**Add**	1 / unit
8	**101**	Upper plate: max set-point value				100	200	**200**	**UP1**	1 / °C
9	**101**	Upper plate: min set-point value				20	50	**20**	**dn1**	1 / °C
10	**101**	Lower plate: max set-point value				100	200	**200**	**UP2**	1 / °C
11	**101**	Lower plate: min set-point value				20	50	**20**	**dn2**	1 / °C
12	**101**	Window of sensibility of calculation (+/- from Set-Point value)				0	20	**0**	**InS**	0,5 / °C
13	**101**	Window of tolerance (+/- from Set-Point value)				3	10	**3**	**tOL**	1 / °C
14	**101**	PID valve (+)				0	70	**10**	**dP1**	1 / unit % UP1/UP2
15	**101**	PID valve (-)				0	70	**10**	**dP2**	1 / unit % UP1/UP2
16	**101**	Proportional constant				0	20	**7**	**cP**	1 / unit
17	**101**	Derivative constant				0	99	**35**	**cd**	1 / unit
18	**101**	Integral constant				0	20	**2**	**cI**	1 / unit
19	**101**	Min time power relay on				1	30	**1**	**tOn**	0,5 / second
20	**101**	Min time power relay off				1	30	**1**	**tOF**	0,5 / second
21	**101**	Min recalculative time PID function				1	20	**4**	**tPd**	1 / second
22	**101**	NTC sensor calibration for TC coupler				T° NTC - 10°C	T° NTC + 10°C	**-**	**ntc**	0,5 / °C
23	**5**	Upper plate: lower point calibration				dn1	100	**-**	**t11**	1 / °C
24	**5**	Upper plate: upper point calibration				120	UP1	**-**	**t12**	1 / °C
25	**5**	Lower plate: lower point calibration				dn2	100	**-**	**t21**	1 / °C
26	**5**	Lower plate: upper point calibration				120	UP2	**-**	**t22**	1 / °C

Habasit Italiana S.p.A.
Vittorio Veneto 31029 (TV)
Tel.: ++39(0)438.9113
Fax. ++39(0)438.200545

Regulating Unit PMR-07

WORKING PARAMETERS OF PMR-07 with **PM-304 – 305 – 306/160**			(*) The Passwords "5" and "101" are not modifiable							
Ord. Vis.	**Pass-word**	**PARAMETER**	**PLANNING**			**CONFIGURATION**				
			from	**to**	**Unit**	**from**	**to**	**Default**	**code**	**Unit**
Key led		Upper Plate Set-Point	UP1	dn1	1 / °C					
Key led		Lower Plate Set-Point	UP2	dn2	1 / °C					
Key led		Welding time set	0	999	1 / sec (Unt=1) 1 / min (Unt=60)					
1	**101**	Cooling phase stop set-point				20	70	**50**	**SPr**	1 / °C
2	**101**	Welding time scale				1	60	**60**	**Unt**	1 / 60
3	**101**	Upper NTC sensor off-set				-20	20	**0**	**OF1**	0,5 / °C
4	**101**	Lower NTC sensor off-set				-20	20	**0**	**OF2**	0,5 / °C
5	**101**	Valve of air blowing ON:1 OFF:0				1	0	**1**	**Ar**	1 / unit
6	**101**	Air blowing time				0	500	**60**	**SAr**	1 / second
7	**101**	RS485 Address of central unit				1	32	**1**	**Add**	1 / unit
8	**101**	Upper plate: max set-point value				100	200	**200**	**UP1**	1 / °C
9	**101**	Upper plate: min set-point value				20	50	**20**	**dn1**	1 / °C
10	**101**	Lower plate: max set-point value				100	200	**200**	**UP2**	1 / °C
11	**101**	Lower plate: min set-point value				20	50	**20**	**dn2**	1 / °C
12	**101**	Window of sensibility of calculation (+/- from Set-Point value)				0	20	**0**	**InS**	0,5 / °C
13	**101**	Window of tolerance (+/- from Set-Point value)				3	10	**3**	**tOL**	1 / °C
14	**101**	PID valve (+)				0	70	**0**	**dP1**	1 / unit % UP1/UP2
15	**101**	PID valve (-)				0	70	**10**	**dP2**	1 / unit % UP1/UP2
16	**101**	Proportional constant				0	20	**7**	**cP**	1 / unit
17	**101**	Derivative constant				0	99	**99**	**cd**	1 / unit
18	**101**	Integral constant				0	20	**0**	**cI**	1 / unit
19	**101**	Min time power relay on				1	30	**1**	**tOn**	0,5 / second
20	**101**	Min time power relay off				1	30	**6**	**tOF**	0,5 / second
21	**101**	Min recalculative time PID function				1	20	**4**	**tPd**	1 / second
22	**101**	NTC sensor calibration for TC coupler				T° NTC - 10°C	T° NTC + 10°C	**-**	**ntc**	0,5 / °C
23	**5**	Upper plate: lower point calibration				dn1	100	**-**	**t11**	1 / °C
24	**5**	Upper plate: upper point calibration				120	UP1	**-**	**t12**	1 / °C
25	**5**	Lower plate: lower point calibration				dn2	100	**-**	**t21**	1 / °C
26	**5**	Lower plate: upper point calibration				120	UP2	**-**	**t22**	1 / °C

F. CONNECTIONS

F.1 CONNECTIONS OF PMR-07

Below are the connections between the regulating unit PMR-07, the cooling unit PMC-07 and a joining press indicated.

F.1.1 STATIONARY USE PMR-07/PMC-07/PM-XXXX

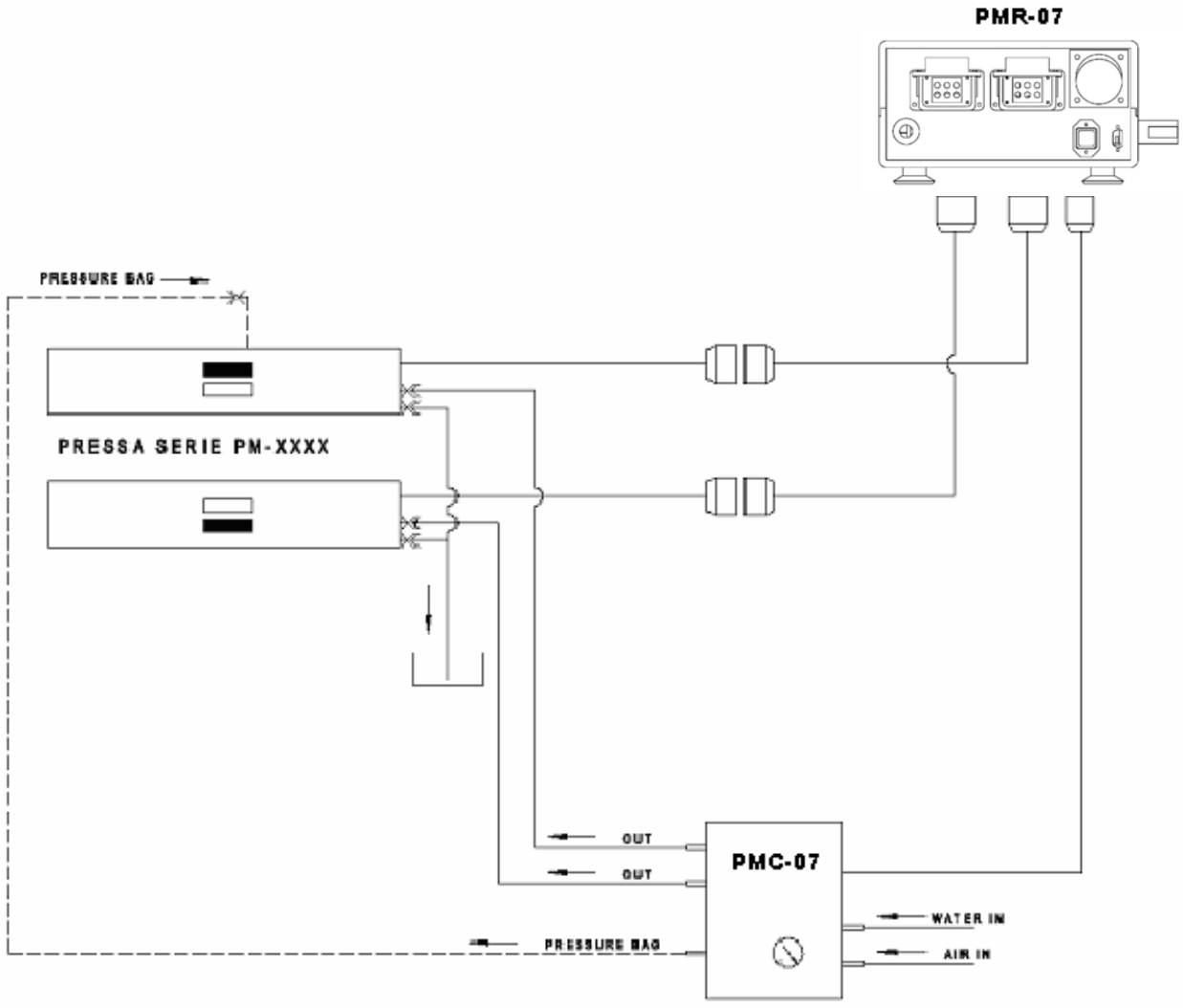


FIGURE 7 - CONNECTIONS PMR-07/PMC-07/PRESS PM-XXXX

F.1.2 MOBILE USE PMR-07/PMC-07/PM-XXXX

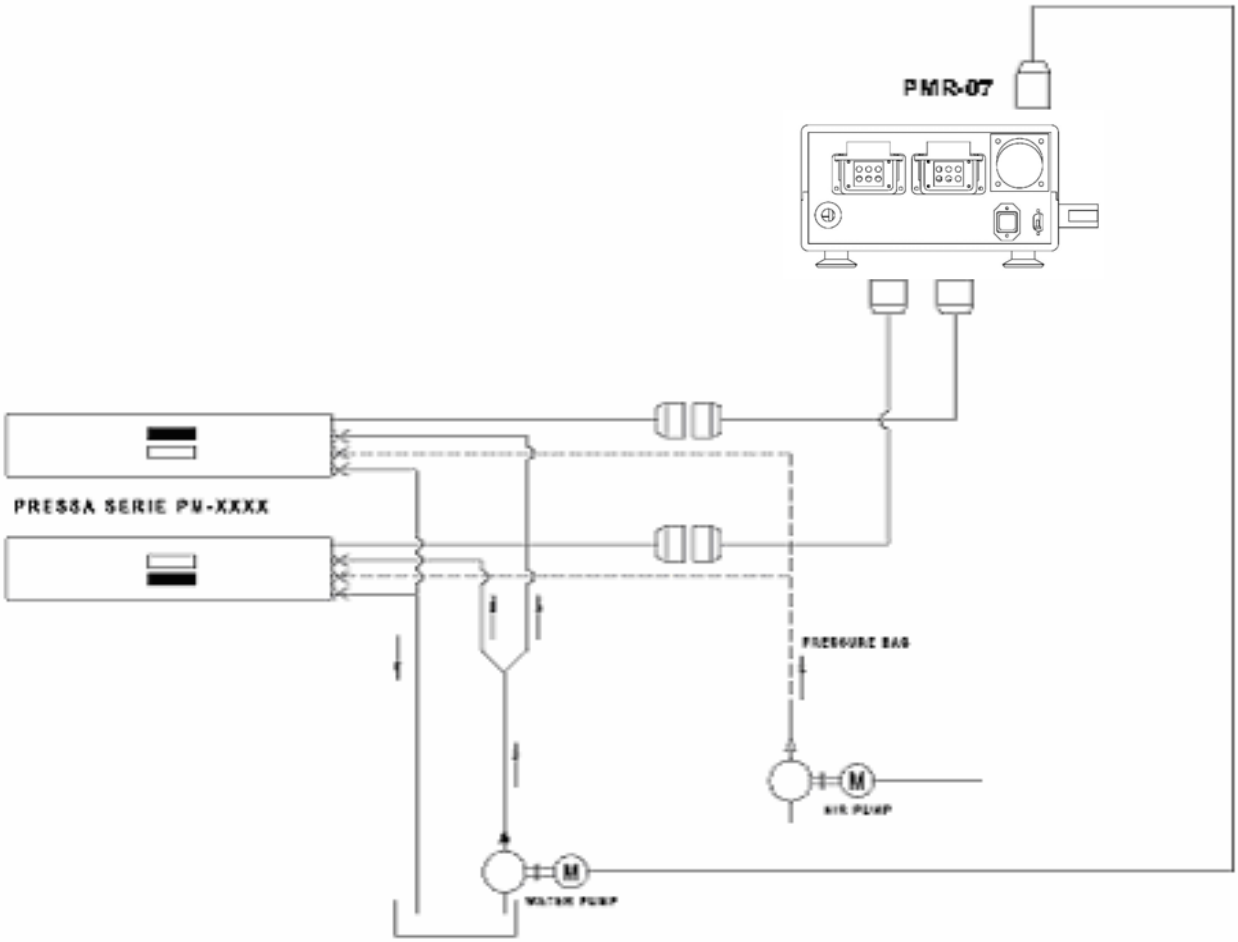


FIGURE 8 - CONNECTIONS MOBILE USE PMR-07/PRESS PM-XXXX

F.2 TROUBLESHOOTING

ATTENTION

Maintenance, repairs and replacement operations for electrical components must be carried out by an ELECTRICAL MAINTENANCE TECHNICIAN or a QUALIFIED TECHNICIAN able to perform the works in accordance with safety regulations.

TABLE 10 - TROUBLESHOOTING

FAULT	REMEDY
No air	Check there is air in the supply line.
No current	Check if the main switch is in the ON position.
Indicator light SL2 on rear panel off.	Safety fuse FU3 blown. Follow the manual's replacement procedure.
Display off	Fuses FU1 and/or FU2 blown; electronic card faulty or broken. Replace fuses or order a new electronic card.
Magneto thermal switch tripped - Fuses broken	Reset the magneto thermal switch IMT1 and/or replace fuses FU1, FU2, FU3. Disconnect the equipment from the mains electricity supply. Unscrew the 6 side screws and remove the top cover. Identify the components concerned (magneto thermal switch and fuse box) with the help of the photographs. Reset the switch or change the broken fuses. Close the cover and tighten the screws.

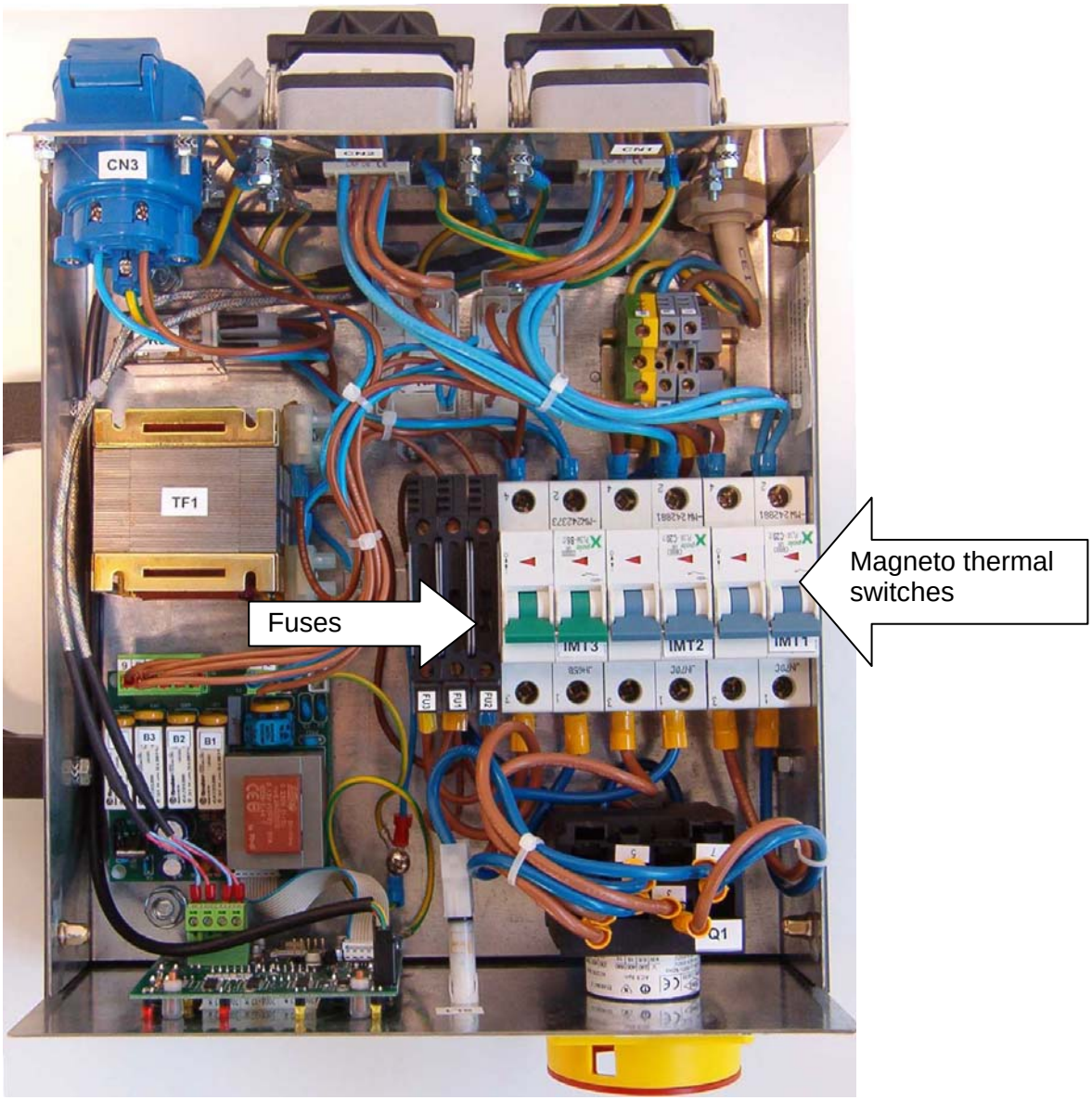


FIGURE 9 - FUSE AND MAGNETOTHERMAL SWITCH POSITIONS

TABLE 11 - FUSES TABLE

Code	Type
FU1	6x32mm ceramic T 1A 250V
FU2	6x32mm ceramic T 1A 250V
FU3	6x32mm ceramic T 1.6 A 250V

F.3 ELECTRICAL CONNECTIONS

F.3.1 CIRCUIT DIAGRAM OF PMR-07 - 230V

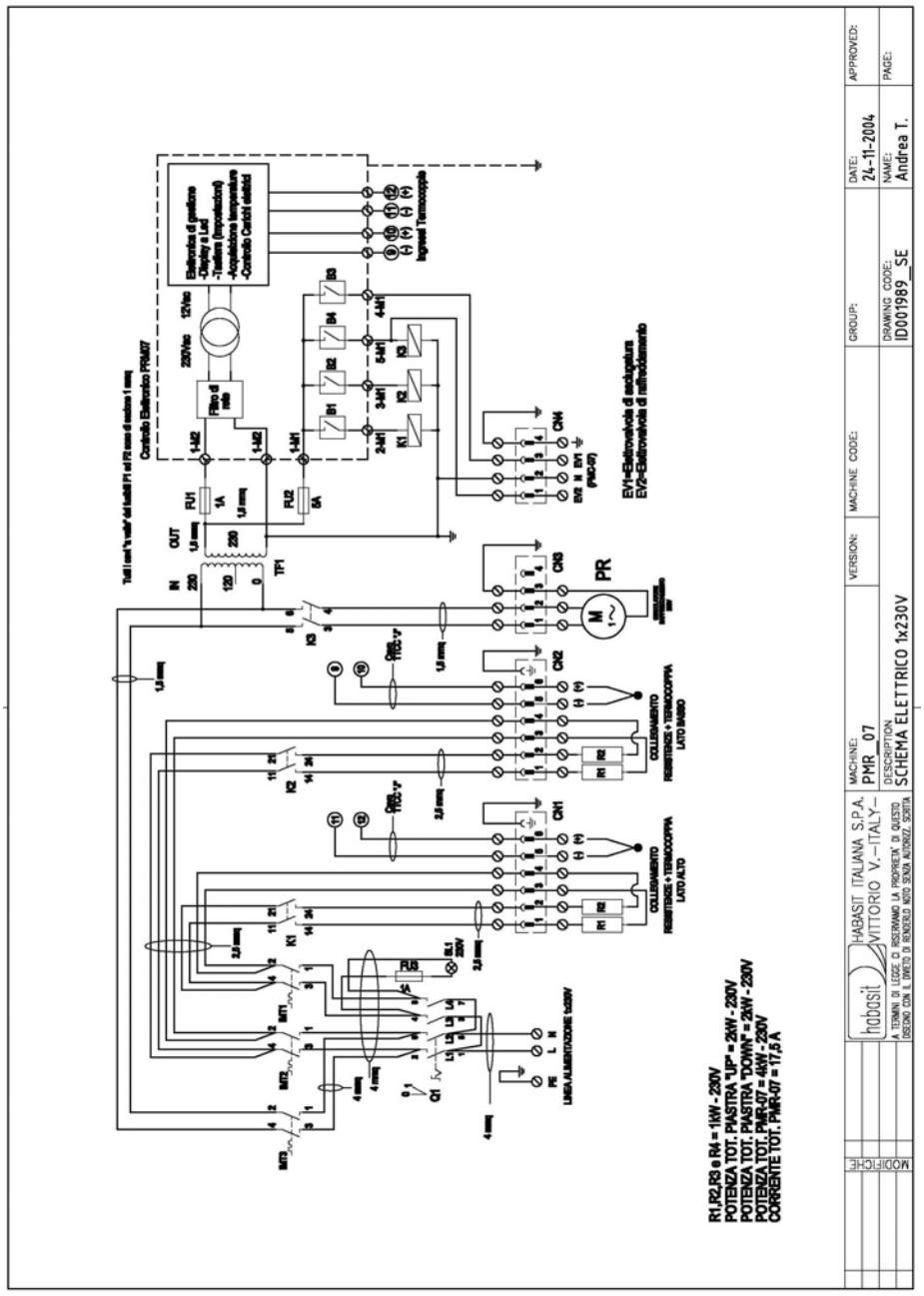


FIGURE 10 - ELECTRIC LAYOUT PMR-07 - 230V

F.3.2 CIRCUIT DIAGRAM OF PMR-07 - 120V

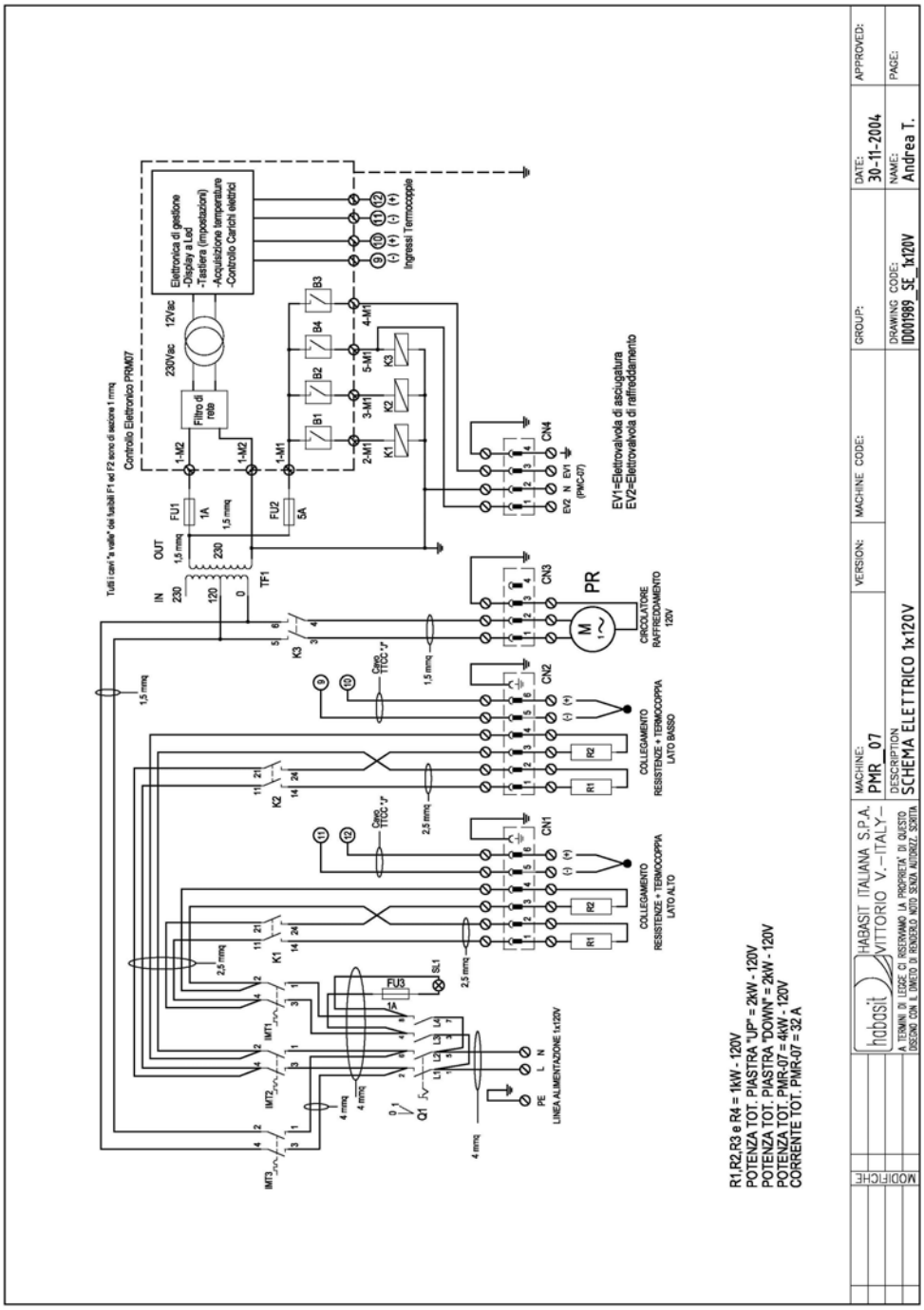


FIGURE 11 - ELECTRIC LAYOUT PMR-07 - 120V

G. GLOSSARY

TABLE 12 - GLOSSARY TABLE

Terms	Description
PMR	Equipment for the regulation and control of the temperature rise of the hot-pressing device while managing the device's electrical circuitry.
PMC	Control unit to cool a hot-pressing device and maintain the compressed air circuit management.
Thermofix	Belt joining process (see technical manual Thermofix)
Flexproof	Belt joining process (see technical manual Flexproof)

H. PMC-07

H.1 PURPOSE OF THE DEVICE

The PMC-07 cooling unit works only in combination with the PMR-07 regulation unit and enables the flow of cooling air and liquid (water) to the hot pressing device to be controlled.

The cooling unit PMC-07 has been developed exclusively for the applications described herein. No other or inappropriate applications are permitted.

ATTENTION

ANY USE OF THE COOLING UNIT OTHER THAN FOR WHICH IT WAS DESIGNED MAY BE IMPROPER USE AND RESULT IN NOT BEING SAFE FROM THE POINTS OF VIEW OF THE OPERATOR, MAINTENANCE WORKER AND OF THE COOLING UNIT ITSELF.

HABASIT SHALL NOT BE HELD LIABLE FOR THE CONSEQUENCES OF ANY BREACHES OF THESE RULES.

H.2 IDENTIFICATION DATA OF THE EQUIPMENT

A label fitted to the cover of the device indicates the identification data. These data are shown in the following figure.

FIGURE 12 - IDENTIFICATION LABEL PMC-07

H.3 TECHNICAL SPECIFICATIONS

TABLE 13 - DIMENSIONS AND CONSUMPTION PMC-07

Characteristics	PMC-07
Dimensions (width x height x depth)	255 x 156.5 x 319 (mm) *10.04 x 6.16 x 12.56 (inch)*
Weight	approx. 5 kg / *10 lbs*
Connections dimension	¼"

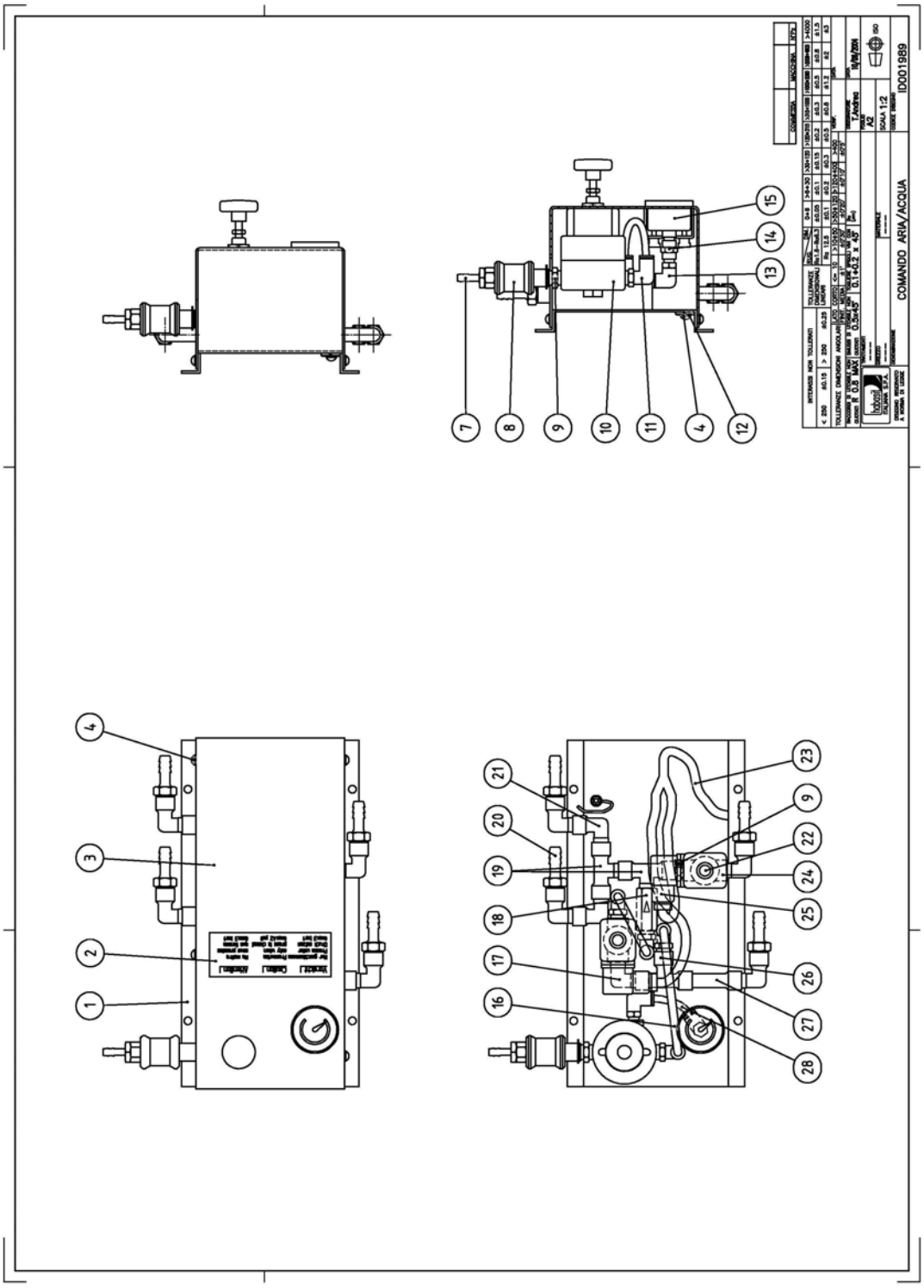


FIGURE 13 - MECHANICAL DRAWING PMC-07

TABLE 14 - PARTS LIST OF PMC-07

	ID001989	Air-water control PMC-07		
ITEM	**CODE**	**DESCRIPTION**	**Meas. Unit**	**Quantity**
1	205E1150	BASE PLATE OF CONTROL BOX	N°	1
2	205E1040	“CAUTION PRESSURIZE” LABEL	N°	1
3	205E1160	BOX COVER	N°	1
4	IN010516	SCREW VTBEI UNI-ISO 7380-M4x8 ZINC.	N°	6
7	IN020407	HOSE-END FITTING 6x1/4` Code 1,13234	N°	1
8	IN020443	NIPPLE-TAP F.F. 1/4" Code 60601/4	N°	1
9	IN020408	NIPPLE M. M. 1/4"	N°	2
10	IN020378	AIR PRESSURE REGULATOR EIR2010-F02	N°	1
11	IN020662	KQ2L-06-02S CONNECTOR D6 x 1/4"	N°	4
12	IN010764	WASHER UNI 6593-4.3x16 ZINC.	N°	3
13	IN020538	KQ2L-06-01S CONNECTOR D6 x 1/8"	N°	2
14	IN020425	NIPPLE 1/8" Code 2103001	N°	1
15	IN020409	MAN. POST. M3 F40 0-4 PS Cod.9063056	N°	1
16	IN020083	COMPRESSED AIR PIPE PUN 6x1 cod. 152586	m	1,0
17	IN020457	ELBOW CONNECTOR M.M. 1/4	N°	1
18	IN020380	SINGLE-ACTING VALVE F.F. VNR 1/4" FFV VITON	N°	1
19	IN020372	COMPRESSED AIR CONNECTOR 1/4" f/m/f	N°	2
20	IN020371	TUBE CONNECTOR 12x1/4` CH. 17	N°	4
21	IN020375	ELBOW CONNECTOR M.F. 1/4' cod. 14301	N°	2
22	IN020549	ZB09 220/230V 50/60Hz COIL	N°	2
23	IN020975	WIRING KIT FOR ELECTROVALVES Code 11212	N°	1
24	IN020629	PM146 YV Solenoide valve 1/4"	N°	2
25	IN020550	CONNECTOR CGN 182	N°	2
26	IN021108	TEE F.F.F. 1/4` Code 2003 CAMOZZI	N°	1
27	IN020852	NIPPLE 1/4M - 1/4F Code 2525 50 H43	N°	1
28	IN020083	COMPRESSED AIR PIPE PUN 6x1 Code 152586	m	0,4

H.3.1 SIGNS

The signs affixed to the device are shown below.
Such signs enable staff operating or working with the machine to know about and so prevent the dangers and risks if not observing the principal safety rules.

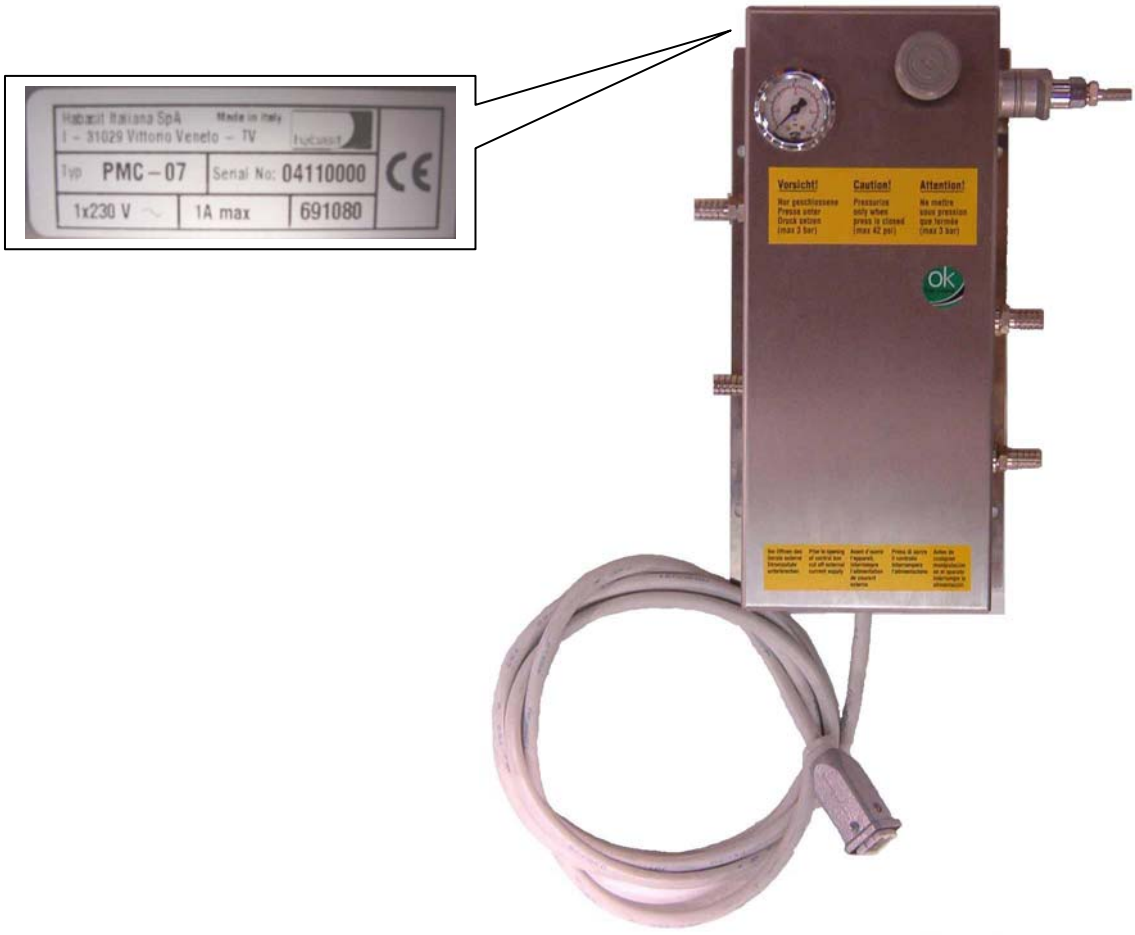


FIGURE 14 - SIGNS PMC-07

H.3.2 CONNECTIONS

For connections see the specifications for the PMR-07 regulating unit.

FIGURE 15 - IN/OUT INDICATIONS PMC-07

H.3.3 WATER/PNEUMATIK LAYOUT

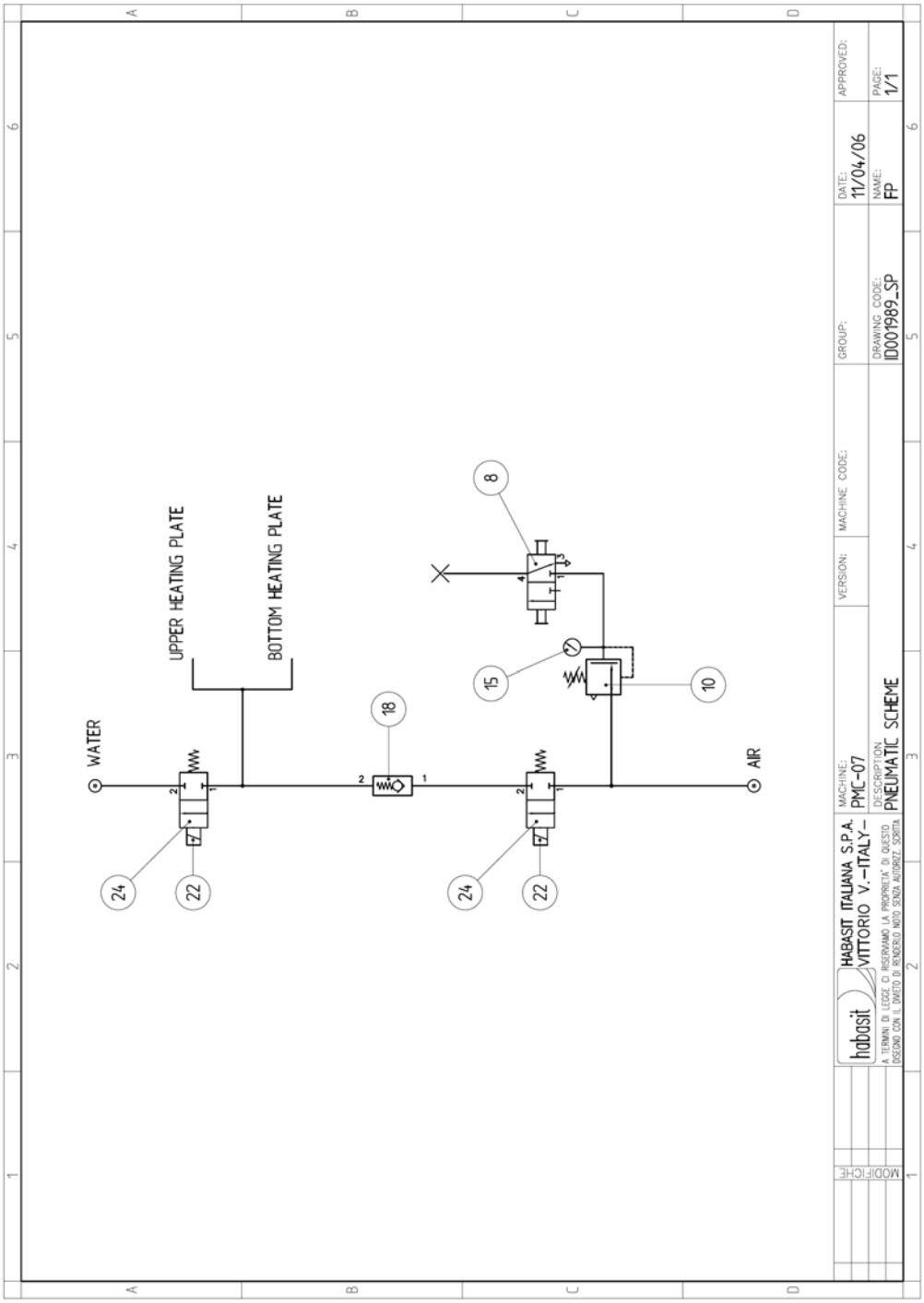


FIGURE 16 - WATER/PNEUMATIC LAYOUT PMC-07

	691080	**Air-water control PMC-07**		
Pos.	**Code**	**Description**	**Meas. Unit**	**Quantity**
8	IN020443	NIPPLE-TAP F.F. 1/4" Code 60601/4	N°	1
10	IN020378	AIR PRESSURE REGULATOR EIR2010-F02	N°	1
15	IN020409	MAN. POST. M3 F40 0-4 PS Cod.9063056	N°	1
18	IN020380	SINGLE-ACTING VALVE F.F. VNR 1/4" FFV VITON	N°	1
22	IN020549	ZB09 220/230V 50/60Hz COIL	N°	2
24	IN020629	PM146 YV Solenoide valve 1/4"	N°	2

Habasit Italiana S.p.A.
Vittorio Veneto 31029 (TV)
Tel.: ++39(0)438.9113
Fax. ++39(0)438.200545

Author: A.T. / KM
Edition: 04/2006
Replaces: 10/2005

APPENDIX

Product liability, application considerations

If the proper selection and application of Habasit products are not recommended by an authorized Habasit sales specialist, the selection and application of Habasit products, including the related area of product safety, are the responsibility of the customer.
All indications / information are recommendations and believed to be reliable, but no representations, guarantees, or warranties of any kind are made as to their accuracy or suitability for particular applications. The data provided herein are based on laboratory work with small-scale test equipment, running at standard conditions, and do not necessarily match product performance in industrial use. New knowledge and experiences can lead to modifications and changes within a short time without prior notice.

BECAUSE CONDITIONS OF USE ARE OUTSIDE OF HABASIT'S AND ITS AFFILIATED COMPANIES CONTROL, WE CANNOT ASSUME ANY LIABILITY CONCERNING THE SUITABILITY AND PROCESS ABILITY OF THE PRODUCTS MENTIONED HEREIN. THIS ALSO APPLIES TO PROCESS RESULTS / OUTPUT / MANUFACTURING GOODS AS WELL AS TO POSSIBLE DEFECTS, DAMAGES, CONSEQUENTIAL DAMAGES, AND FURTHER-REACHING CONSEQUENCES.