Multilayerpresse RMP 210 Touch/3545 Touch

Original operating instructions



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General

RMP 210 Touch and RMP 3545 Touch – Multilayer press

The RMP 210 Touch and RMP 3545 Touch multilayer presses are used to produce multilayers on an industrial scale. The number of layers is limited only by the maximum stroke height.

Behind the compact housing, closed with doors, there are two heating plates, which can be set differently with separate thermostats, the pressing device and the unit for pressure generation. The two thermostats, a timer, a pressure regulator with display, and (safety) switches serve as control elements.



The production of multilayers in this line takes place in the following steps:

- Pinning and insertion of the prepreg stack
- Pressure generation
- Switching on the heating
- Heating cycle
- Pressing cycle at set temperature
- Cooling cycle
- Removal of the multilayer





The entire process takes about 3 hours if you start at 20°C. With appropriate precautions, the press pile can of course be removed at higher temperatures and the new pile inserted. In this way, cycles of 45 min. are possible.



The useful size of the plates is $210 \times 300 \text{ mm} (300 \times 400)$ with a raw size of $250 \times 350 (350 \times 450)$ for the prepregs. The space between the heating plates is approx. 40 mm. If you use our standard pressing plates and separate the 1.5mm thick multilayers with 1.5mm pressing plates, you can press about 7 multilayers at the same time.

Since the pressing force is generated pneumatically, it is ensured that the pressure is distributed evenly over the surface.

To pin the prepreg stacks, you can use the registration hole function of our IsoCam software, for example. The holes are best drilled with the Bungard CCD and pinned with the Favorit.



Technical data

	RMP210 Touch	RMP3545 Touch Touch
Plate Size:	brutto 250 x 350 mm net 210 x 300 mm	brutto 450 x 350 mm net Approx. 400 x 300 mm
Pressure:	> 12 t	> 24 t; max. approx. 30t
Compressor:	0-15 bar included in delivery	0-15 bar included in delivery
Temperature:	250 °C	250 °C
Heating time:	Approx. 30 min.	Approx. 30 min.
Pressing time:	Approx. 60 min.	Approx. 60 min.
Cooling down:	Approx. 120 min.	Approx. 120 min.
Dimensions:	Approx. 650 x 650 x 1300 mm	Approx. 830 x 820 x 1600 mm
Space requirement:	700 x 1500 mm ²	870 x 1500
Weight:	Approx. 130 kg	Approx. 350 kg
Electrical connection	230 V 50 Hz 16 A	400V 50Hz 5000W 16 A Fuse
Maximum press pile	Distance between heating plates: 42-43 mm, pressing plates $2x10mm \rightarrow approx$. 22mm pressing stack height	Distance between heating plates: 38-40 mm, pressing plates $2x10mm \rightarrow approx$. 18mm pressing stack height

Technical changes possible and reserved at any time.





EC Declaration of Conformity

EG-Konformitätserklärung/Declaration of Conformity

Hersteller / Supplier:	Bungard Elektronik GmbH & Co. KG Rilkestraße 1 51570 Windeck Germany
Bevollmächtigte Person für die Zusammenstellung der technischen Unterlagen: Person in charge	Jürgen Bungard, Geschäftsführer /general director Rilkestraße 1 51570 Windeck Germany
Produkt:	Multilayerpresse RMP 210 Touch und RMP3545 Touch Touch

Hiermit erklären wir, dass die oben beschriebenen Maschinen allen einschlägigen Bestimmungen der Maschinenrichtlinie 2006/42/EG entspricht.

Die oben genannte Maschine erfüllt die Anforderungen der nachfolgend genannten Richtlinien und Normen:

We hereby declare that the machines described above complies with all relevant provisions of the Machinery Directive 2006/42/EC.

The above machine meets the requirements of the following guidelines and standards:

- Maschinenrichtlinie 2006/42/EG / Machinery Directive 2006/42/EC
- EMV-Richtlinie 2014/30/EG / EMC Directive 2014/10830EC
- Niederspannungsrichtlinie 2014/35/EG / Low Voltage Directive 2014/35/EC
- **DIN EN 60204-1** Sicherheit von Maschinen Elektrische Ausrüstung von Maschinen Teil 1: Allgemeine Anforderungen / Safety of machinery - Electrical equipment of machines - Part 1: General requirements
- DIN EN ISO 14121-1 Sicherheit von Maschinen Risikobeurteilung Teil 1: Leitsätze / Safety of machinery Risk assessment Part 1: Principles
- **DIN EN ISO 12100-1** Sicherheit von Maschinen Allgemeine Gestaltungsleitsätze, Risikobeurteilung und Risikominderung / Safety of machinery - Basic concepts, risk assessment and risk reduction
- **DIN EN 55014-1 2012-05** Elektromagnetische Verträglichkeit, Anforderungen an Haushaltsgeräte, Elektrowerkzeuge und ähnliche Elektrogeräte, Teil 1: Störaussendung / Electromagnetic compatibility Requirements for household appliances, electric tools and similar electrical appliances Part 1: Emission
- **DIN EN 55014-2-2009-06** Elektromagnetische Verträglichkeit Anforderungen an Haushaltgeräte, Elektro-werkzeuge und ähnliche Geräte - Teil 2: Störfestigkeit - / Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 2: Immunity
- Niederspannungsrichtlinie / Low Voltage Directive 2014/35/EG
- Maschinenrichtlinie / Machinery Directive 2006/42/EG/37/EG

Windeck, 10.1.2023

Jürgen Bungard Geschäftsführer





Quick guide

Commissioning:

Remove the packaging and check the machine for transport damage.

Read the instructions thoroughly and observe all safety instructions.

Lift the machine from the pallet with the aid of a forklift. The RMP can then be rolled to your installation site.

Operation:

Place the pressing plates in the pressing chamber for a function test.

Switch on the power switch (on the rear of the machine). The compressor starts.

The touch display can be used, among other things, to set various parameters, select programs, and read off the current process sequence.

For material from the RMP starter set at a press stack size of 250 x 350mm (RMP210 Touch) set 12 bar as standard (for the RMP3545 Touch and press stack size 350x450 8 bar applies).

Allow the press stack to cool down sufficiently before removing it or wear appropriate protective gloves.



Intended use

The RMP 210 Touch and RMP 3545 Touch multilayer presses are designed for the production of multilayers on an industrial scale.

All other applications require our written consent or are at the full risk of the user.

Safety instructions

General

Please read the following text carefully and pay particular attention to the notes on work safety and startup.

Please keep this folder in a safe place. It contains notes which are also important for subsequent maintenance or cleaning work.

The machines are not intended for integration or interconnection with other machines or systems. They may only be operated in rooms equipped for this purpose and only by qualified personnel. Children and pets must be kept away!

Transport

Only use suitable lifting and transport equipment such as forklift trucks or lift trucks. Secure the machine against slipping/tipping. Attention, high center of gravity!

Transport the machine only horizontally! Do not carry lying down!

Installation site

The machine must stand level and there must be sufficient space around the machine for operation and maintenance work.

The installation environment is decisive for trouble-free work with the RMP. You must therefore place particular emphasis on a room that is as dust-free as possible and a room air free of corrosi-ve vapors to ensure proper functioning.

Electrical system

The machine is manufactured using tested parts in accordance with the usual guidelines for electrical safety. However, this does not release the user from his duty of care when handling electrically operated equipment.

The red main switch disconnects the machine from the power supply. The fuse protection of the circuit and the fault circuit must be carried out by the customer.

After finishing work, the main switch should always be switched off.

Before carrying out any work on the machine (cleaning, etc.) switch off the machine and disconnect the mains plug.

Work safety

The machine is equipped with a door safety switch. When the door is opened, the compressed air for the press is deactivated.

This can destroy your multilayer circuit, but is an important safety feature of this machine.

Please check the function of the position switch regularly.

Machine may only be used with pressing plates in the pressing unit.

Personal protective equipment

Protective gloves must be worn when handling hot objects. The safety instructions of the manufacturer or supplier must be observed.



Make sure that suitable materials are used to avoid fire and the associated financial losses.

Furthermore, pay attention to suitable pressing temperatures in order to avoid burning of the PCB material and thus the possible formation of toxic and health-endangering gases.

Allow the machine to cool down to a maximum of 50°C (approx. 30 - 45min) to avoid severe skin burns during removal, or wear suitable gloves.

At temperatures above 200°C, purely optical color changes of the press plates may occur. These do not represent any technical defects.

Exhaust air

Exhausting the room air in the area above the machine body is recommended with regard to possible PCB outgassing. The necessity of exhaust depends on the materials used and the set temperatures.

Pressure

When the compressor starts after being switched on, there must not be anything between the upper and lower press plates of the machine that could damage the machine or that could burst and be ejected from the machine.

Machine must not be operated without the two 10 mm pressing plates!

Compressor

WHILE THE COMPRESSOR IS RUNNING, DO NOT TURN OFF THE MACHINE OR OPEN THE DOOR TO THE PRESSING ROOM.

As soon as you have switched on the machine via the main switch, the compressor starts noisily for approx. 1 minute. Now please make sure that there is nothing between the upper and lower pressing plates of the machine that could damage the machine or even burst and be ejected from the machine.





Structure

Commissioning

The machine is delivered in a special wooden packaging. Please first check the condition of the packaging upon receipt of the goods. Only acknowledge receipt of the goods to the carrier as okay if the packaging is in perfect condition. Otherwise you endanger possible claims to the transport insurance.

If you only notice damage when unpacking the goods, please also report this as concealed damage immediately in writing to the carrier, your transport insurance company and also to us.

To unpack the machine, please first remove the top and side chipboards. The machine will then stand on a pallet in front of you.

Only use suitable lifting and transport equipment such as forklift trucks or lift trucks. Secure the machine against sliding/tipping. Attention, high center of gravity!

Transport the machine only horizontally! Do not carry lying down!

The machine must stand level and there must be sufficient space around the machine for operation and maintenance work.

Installation and assembly may only be carried out by a qualified electrician! Otherwise there is a risk of fire or electric shock!

Only connect to the voltage and frequency specified on the type plate / time switch!

Lock the rollers before the first use.

Clean the machine from possible transport contamination.

Connect the machine to the electrical supply specified on the type plate. If necessary, consult a qualified electrician (RMP3545 Touch).

Carry out a test run. Make sure that the two pressing plates are correctly positioned in the pressing chamber.

Switch on the unit using the switch on the rear of the machine. The compressor now starts.

The machine is equipped with a special compressor, which is located in the rear machine body. You can reach it by unscrewing the rear wall of the machine (under the machine plug).

CAUTION: DO NOT OPEN THE MACHINE UNLESS YOU HAVE PREVIOUSLY DISCONNECTED THE POWER PLUG. OTHERWISE THERE IS DANGER TO LIFE.

When the compressor starts after being turned on, there should be nothing between the upper and lower press plates of the machine that could damage the machine or that could burst and be ejected from the machine.

CAUTION:

WHILE THE COMPRESSOR IS RUNNING, DO NOT TURN OFF THE MACHINE OR OPEN THE DOOR TO THE PRESSING ROOM.

For proper pressure setting, please refer to the blank material manufacturer's processing instructions. As a guide, please set a pressure of $12 \text{ tons/m}^2 = 12 \text{ bar for a plate of } 250x350 \text{ mm}^2$. Details on pressure setting can be found in the appendix.

CAUTION: If the set temperature is too low or the process time too short, this can lead to scrap and delamination. Both destroy the multilayer circuit.



Control operation



Touching the logo takes you to the overview page or to the Overview menu item. On this overview page, all information necessary for operation is displayed at a glance. The bottom section of the screen contains the menu bar that navigates through the individual submenus. The button of the currently selected submenu is highlighted in bold font for better orientation. If there are further detailed menus within a submenu, this is indicated by a submenu bar arranged on the left edge of the screen.

Overview:



The current status of the plant is displayed here in plain text. In addition, a previously selected SOP (Standard Operating Procedure) can be started and stopped. Only when the current SOP is started, the SOP time runs out and all controllers and control units are active. The pause function allows to pause the current runtime, but the controllers and control units continue to run. In the fields below the runtime, the current step and the progress are displayed.

Here it is possible to select a new SOP from the editing memory, provided that no SOP is currently started. To do this, press the following button:





A list of 10 previously edited SOPs appears. Click here to load one of the SOP is loaded from the process memory.

General	SOP edit sele	ct		El#/272	
Temperature	Mess	eDemo	J.E	Bu	
Pressure	Kue	Kuehlen		est	
SOP	test		PROFIL-DEMO		
	empt	y Providence	empty		
	FEHLE	FEHLERTEST		IL 2	
Overview	Parameter	Data	Trend	Report	

Parameter:

The parameters of this plant are password protected. Clicking on the "Parameters" menu bar navigates to the password page.

		Multilayer press			
System password	9				
BUNGA	type in System	n password			
		6			
Overview	Parameter	Data	Trend	Report	

The correct password must be entered here. After entering, the green unlock button must be pressed. If the correct password has been entered, you will be forwarded to the parameter level. Otherwise, the overview page is navigated to.



General parameters:

BUNGARD	Multilayerpresse					
	Parameter - A	Parameter - Allgemein				
	NA Relais Einschaltz	eit max.	0000	m s		
	NA Relais Ausschalt	zeit max.	0000	ns		
Übersicht	Parameter	Dat	ten	Т	rends	Meldungen

The emergency stop relay located on the load board has a two-channel feedback circuit and thus monitors itself in both states. The maximum permissible time discrepancy between activation and feedback can be defined here.

Temperature parameters:

BUNGARD		Multilaye	rpre	esse		
	Parameter - T	emperaturreg	elung	1		
	Temperatu	Temperaturregelung oben			Temperaturregelung unten	
1	P-Anteil	00.0		P-Anteil	00.0	
	I-Anteil	0000	ms	I-Anteil	0000	ms
	minimaler Ausgang	gswert 000	%	minimaler Ausgangswe	rt 000	%
	maximaler Ausgan	gswert 000	%	maximaler Ausgangswe	ert 000	%
-	Regeltotband	000	*C	Regeltatband	000	°C
Übersicht	Parameter	Daten		Trends	Meldung	jen

P component: Proportional gain of the controller referred to the setpoint value

I-component: integral time in milliseconds of the controller



Minimum output value: Minimum value that the controller assumes when SOP is started, regardless of current setpoints or actual values. Maximum output value: Value that the controller assumes as a maximum when SOP is started, regardless of current setpoints or actual values.

Controller dead band: If the difference between setpoint and actual value is < than the controller dead band, the controller remains with its control value until the control difference exceeds the controller dead band again.

SOP Editing: BUNGARD Multilayerpresse SOP zum Editieren auswählen. SOP Name Temp. oben ["C] Temp. unten [°C] Druck [bar] Kühlung Loufzeit [mm:ss] 000 000 000 00 00 1 0 2 000 000 000 0 00 00 3. 800 000 000 0 80 80 000 000 000 00 00 Parameter Übersicht Daten Trends Meldungen

Up to 10 different SOPs can be edited here. The procedure is as follows:



Pressing this button takes you to a selection page where you can select one of the ten existing SOPs to edit its parameters. After selection, the selection page automatically returns to the editing page. The selected SOP, its name and its parameters are displayed. Parameters can now be set.



After editing, the SOP can be saved to one of the ten memory locations. The memory location after editing does not necessarily have to be the memory location from which the SOP was loaded for editing. This has the advantage that you can load an SOP, modify it easily and save it under a different name at a different location.



The editing function has a buffer. An SOP loaded for editing can be copied into the buffer using the Copy button. Another SOP loaded at a later time can then be overwritten with the values of the buffer using the Paste button. This is particularly useful if several similar SOPs with only slightly modified parameters are to be edited.



A previously opened SOP can be written with default values using the delete button, so that the SOP can be saved with these empty default values without any problems.



Data:

	Multilayer press					
General	General process	data				
SOP	target temp TOP	000	*C	target pressure	000	bar
	target temp BOT	000	*C	actual pressure	000	bar
	actual temp TOP	024	*C			
	actual temp BOT	025	*C	gate value	000	%
	gate value TOP	000	%			
	gate value BOT	000	%			
Contact						
Overview	Parameter	Data		Trend	Repoi	rt

In the General area, all current process data, actual values and controller control values are displayed at a glance.

SOP data:

	P	Multilayer press			
General	SOP process dat	а			
COR	actual SOP				
30P	actual step				
	Runtime		00 : 00		
	Runtime current		00 : 00		
	Runtime remaining		00 : 00		
	0%			100%	
Contact					
Overview	Parameter	Data	Trend	Report	

All process data concerning the currently selected SOP are displayed here.



Contact:

	ſ	Multilayer press		
General	Kontakt			
SOP	BUNGF	IRD		
		Bungar Rilkest D-5157	d Elektronik GmbH & Co rasse 1 0 Windeck	KG
 Contact		Telefor Fax: +4 support	n: +49 2292 / 9 28 28 - 0 19 2292 / 9 28 28 - 29 t@bungard.de	
Overview	Parameter	Data	Trend	Report

Here are the most important contact details for the company Bungard Elektronik.



Trend:

Scaled trend displays are shown for the temperature curves as well as the pressure curves. The sampling rate of these trend displays is 1s.





Pressure curves:





Report:

All currently pending fault messages are displayed on this page in a list in plain text.

		Multilayer pre	ess	
error message				
emergency stop tripp	ed			
				D .
Overview	Parameter	Data	Irend	Report

The green acknowledgement button can be used to acknowledge/delete the fault messages after they have been eliminated.

The SOP can only be restarted on the overview page if there are no more fault messages on this page.

Arbeitsablauf

The workflow described here is a sample. It can and must be adapted to the prepreg manufacturer's specification and to the ply specification.

a) If you do not use floating pressing (only possible with 4-ply boards), it is best to pin the boards outside the pressing plates to align the plies correctly with each other. To do this, drill holes in all plies and also provide these holes as registration marks in the film. We recommend cutting the prepregs smaller than the registration mark gaps to prevent resin from flowing into the registration mark holes.

- b) Now place your press piles between the press plates.
- c) Protect the press plates from sticking by using kraft paper or Tedlar foil (demolding foil). Make sure that suitable materials are used to prevent fire and thus considerable financial losses.
- d) Also ensure that suitable pressing temperatures are used to prevent the PCB material from burning and thus the possible formation of toxic and hazardous gases.
- e) Set the pressing pressure for a board of 210x300mm² to 12 bar (RMP3545 Touch for board 330 x 420mm² to approx. 8 bar)
- f) Set a temperature of 155 175°C for normal FR4 prepregs.

g) Normally one FR4 pressing cycle takes between 1 and 2 hours (depending on prepreg type and freshness of the product), depending on start and take-out temperature.



- h) Let the machine cool down to a maximum of 50°C (approx. 30-45min) to avoid severe skin burns during removal, or wear suitable gloves.
- i) under no circumstances should the plate material be removed at more than 100°C. The resin will not have solidified yet and the stack could delaminate.
- j) Finally, remove the stack of plates from the unit and remove the pinning.

The total process takes up to 3 hours. The raw format of the plates generally decreases from 250x350 mm to 210x300mm² (due to the flow behavior of the resin/keyword: low resin).

If you take suitable measures to protect the plate stacks when they are already removed from the oven at a temperature of 100°C, the process times are reduced to up to half an hour. However, this adjustment is the sole responsibility of the operator and we decline any liability for it.



Structure of the press pile

You can press up to 4 layers floating. Provide the inner layers with reference holes and align your trace pattern for the inner layers with these.



Innenlage/Inner Layer

Außen-/Innenlage Top/Bottom-Layer

You can insert the reference holes in your layout using IsoCam's alignment hole function, for example, and drill them with the Bungard CCD.

Cut the prepregs and the outer layers a little smaller as in the picture above, so that the resin does not stick the alignment holes during pressing. You will need the alignment holes after pressing to align the board back on the CCD for drilling.

If your board is smaller than the pressing area (250 x 350 mm), then we recommend adjusting the pressure for your board area according to the following formula:

 $\mathsf{P}_{\mathsf{A}} = (\mathsf{P}_{\mathsf{W}} \times \mathsf{A}_{\mathsf{W}}) / \mathsf{A}_{\mathsf{A}}$

P_A = Desired pressing pressure on your blank in bar

P_W = Differential pressure (pressure display RMP 210 Touch) in bar

 A_W = Pressing area of the machine (compensator area =830 cm² = 8,3dm²

 $A_A =$ Pressing area of your board in dm²

Example:

If you want to press a board of 120 x 120 mm with a pressure of 16 bar, rearrange the formula as follows: (PA x AA) / AW= PW (16 bar x 1.44 dm²) / 8.3 dm² = 2.77 bar Please set the pressure of 2.77 bar on the machine. For small blanks, we generally recom-

bar on the machine. For small blanks, we generally recommend generating utility and thus increasing the pressing area.



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If you want to press more than

4 layers, then it is necessary to pin the individual layers during the pressing process to prevent them from shifting. You can insert the reference holes into your layout again with the adjustment hole function of IsoCam and drill them with the Bungard CCD.

Reference rivets D3.0x5.4mm can be purchased from us in packs of 100.

These rivets must be mounted outside the pressing area as shown in the picture above, so that they can be removed from the stack after the pressing process.

A section through a pressing stack is shown in Fig. 3. The pressing plates protect the pressing surface from mechanical damage. The separating foil protects the press plates and press platens from contamination by resin flow.



Cleaning and maintenance

The machine itself is maintenance-free. During the pressing process, make sure that any resin that escapes is collected via the Teflon sheets. Press plates can be cleaned of impurities with brushing machines and special cleaners.

Spare parts list

Article	Short Name	Deutsch	English	Picture
80173	RMP 210 Touch STARTER KIT	Startpaket Multilay- erpresse RMP 210 Touch, 100	consumables starter kit for Multilayer Press RMP	
80173-2	RMP 210 Touch TRENNBLECHE	Trennbleche 250x350 mm	Metal separator sheets 250x350mm	
80173-3	RMP 210 Touch TEDLAR- FOLIE	TEDLAR Entfor- mungsfolie 250x350mm	TEDLAR separation foil 250x350mm	
	RMP 3545 Touch Touch Touch STARTER KIT	Startpaket Multilay- erpresse RMP 3545 Touch : 100 Decklagen FR4 350x450x0.3mm 18/00 100 Prepregs 350x450x0.2mm 50 Innenlagen FR4 350x450x0,5mm 35 /35 10 Tedlar- Entfor- mungsfolien 360x460mm 6 Pressbleche 350x450x1.5mm	starter kit for Multilayer Press RMP 3545 Touch: 100 topboards FR4 350x450x0.3mm 18/00 100 prepregs 350x450x0.2mm 50 inner layers FR4 350x450x0.5mm 35/35 10 Tedlar separating foils 360x460mm 6 press plates 350x450x1.5mm	
	RMP 3545 Touch TED- LARFOLIE	Multilayer Trenn-/ Entformungsfolie 360x460mm	Multilayer PCBs separation foil 360x460mm	
	RMP 3545 Touch TRENNBLECHE	Alu-Pressbleche 350x450x1,5 mm für RMP3545 Touch	Alu press sheets 350x450x1,5mm for RMP3545 Touch	
6000	Magnetentlastungsventil1/8 " 0 - 16 bar FPM M5	Magnetentlastungs- ventil1/8" 6014 C 1,5 FPM M5	Solenoid valve 1/8" 0-16 bar 6014 C 1,5 FPM M5	
6000	Druckregler 1/4"	Druckregler 1/4" 0 - 16 ba	Pressure reducer 1/4" 0-16 bar	
6000	Relais für RMP210 Touch	Relais für RMP210 Touch	Relais for RMP210 Touch	



Article	Short Name	Deutsch	English	Picture
6000	Einbau/Manometer mit Klemmbuegel hinten ¼, 0- 16 bar	Manometer für RMP	Manometer for RMP	
	(Artikel Empeo 14504 R63.12 0-16 bar, G1/4 mittig, Messing, Klemmbü- gel, Stehbolzen			
6000	Pressplatte unten für RMP3545 Touch 450x350x10mm Alu hart- coatiert	Pressplatte unten für RMP3545 Touch 450x350x10mm Alu hartcoatiert	Press plate bottom for RMP3545 Touch 450x350x10mm Alu hard coated	
6000	Pressplatte oben für RMP3545 Touch 450x350x10mm Alu hart- coatiert	Pressplatte oben für RMP3545 Touch 450x350x10mm Alu hartcoatiert	Press plate top for RMP3545 Touch 450x350x10mm Alu hard coated	
	Pressplatte unten 210	Pressplatte unten, hartcoatiert für RMP210 Touch	Lower press plates hard coated RMP210 Touch	
	Pressplatte oben 210	Pressplatte oben, unbearbeitet,hartco. RMP210	Upper press plates hard coated RMP210 Touch	
	Pressplatte unten 3545	Pressplatte unten für RMP3545 Touch	Press plate below for RMP3545 Touch	
	Pressplatte oben 3545	Pressplatte oben für RMP3545 Touch	Press plate top for RMP3545 Touch	
	PE-Gleitstück Enlass Pressplatte RMP, bitte Maschinentyp angeben	PE-Gleitstück En- lass Pressplatte RMP, bitte Maschinentyp an- geben	PE sliding piece Enlass press plate RMP, please specify machine type	



Warranty

All machines are tested for function and fatigue strength before delivery. We grant our customers a factory warranty of 12 months from the date of purchase on the machine with regard to freedom from defects in material and workmanship. We provide warranty at our discretion by replacing defective parts or by repairing the machine in our factory. Old parts become our property.

Disclaimer

Bungard GmbH & Co. KG reserves the right to make such changes or improvements in machines or machine specifications as it deems necessary in its sole discretion and assumes no obligation with respect to the implementation of said changes in machines previously sold.

Bungard products and services are subject to the prices and terms then in effect. These prices and conditions are subject to change without notice.

The information in this document is subject to change and does not constitute a representation by Bungard.

This manual contains information for the RMP210 Touch and the RMP3545 Touch and is the original.

Terms of sale and delivery: These are available to the purchaser no later than the execution of the contract. We do not guarantee or accept liability for damage to material or injury to persons if caused by any of the following:

Improper use of the machine

Incorrect assembly, set-up and operation of the machine or inadequate service

Use of the machine with defective safety devices

Failure to follow the manual regarding transport, storage, assembly, setup and service of the machine

Unauthorized modifications to the machine

Improper or incomplete repairs

Destructive forces applied to the machine as a result of foreign bodies or strong external violence

Use of non-original spare parts

Wear parts are excluded from the warranty.

We cannot accept claims for compensation or consequential claims arising from damage to or destruction of workpieces processed in the machine, since the influencing variables during operation of the machine are largely beyond our control.

This applies analogously to claims arising from damage to objects, buildings and persons as well as the environment.

All information has been compiled with care. However, we reserve the right to make errors and technical changes, even without prior notice.

<u>Operation in aggressive, dusty, humid, extremely hot or explosive environments is at the user's</u> own risk and responsibility.

The user is responsible for taking appropriate precautions and providing protective equipment. Any liability for damage resulting from operation in such an environment is hereby expressly excluded.

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Pressure settings

RMP 3545 Goliath	Compensator with nominal width 500mm has effec- tive area of 2091 cm ²						
Pressure	1 bar	=	10 N/cm ²				
Compressor pressure in bar	ompressor ressure in ar effective area 2091cm ²		Pressure in bar at 875 cm² (Press plates RMP210	Pressure in bar at 160 cm ² (Eu- rocard	Pressure in bar at 1575 cm² (Press plates RMP 3545	Pressure in bar at 630 cm² (Din A 4 210 x	
	in Newton	In Kilo	In Tonnen	250x350mm)	100x160mm)	450x350mm)	297)
1	20910	2091,0	2,091	2,4	13,1	1,3	3,3
	41020	4102,0	4,102	4,0	20,1	2,7	0,0
	02730	9264.0	0,273	1,2	50,2	4,0	10,0
5	104550	10455.0	10 455	11.9	65.3	5,5	16,5
6	125460	12546.0	12,546	14.3	78.4	8.0	19,9
7	146370	14637.0	14.637	16.7	91.5	9.3	23.2
8	167280	16728,0	16,728	19,1	104,6	10,6	26,6
9	188190	18819,0	18,819	21,5	117,6	11,9	29,9
10	209100	20910,0	20,910	23,9	130,7	13,3	33,2
11	230010	23001,0	23,001	26,3	143,8	14,6	36,5
12	250920	25092,0	25,092	28,7	156,8	15,9	39,8
13	271830	27183,0	27,183	31,1	169,9	17,3	43,1
14	292740	29274.0	29 274	33.5	183.0	18.6	46.5

RMP210 normal	Compensator with nominal width 300mm has effec- tive area of 830 cm ²			Pressure in bar at	Pressure in bar		
Compressor pressure in	Gravitational force on Compensator area RMP 210: effective area 830 cm ²		875 cm ² (Press plates RMP210	at 160 cm ² (Eu- rocard	Pressure in bar at 630 cm ² (Din A 4 210		
bar	in Newton	In Kilo	In Tonnen	250x350mm)	100x160mm)	x 297)	
1	8300	830,0	0,830	0,9	5,2	1,3	
2	16600	1660,0	1,660	1,9	10,4	2,6	
3	24900	2490,0	2,490	2,8	15,6	4,0	
4	33200	3320,0	3,320	3,8	20,8	5,3	
5	41500	4150,0	4,150	4,7	25,9	6,6	
6	49800	4980,0	4,980	5,7	31,1	7,9	
7	58100	5810,0	5,810	6,6	36,3	9,2	
8	66400	6640,0	6,640	7,6	41,5	10,5	
9	74700	7470,0	7,470	8,5	46,7	11,9	
10	83000	8300,0	8,300	9,5	51,9	13,2	
11	91300	9130,0	9,130	10,4	57,1	14,5	
12	99600	9960,0	9,960	11,4	62,3	15,8	
13	107900	10790,0	10,790	12,3	67,4	17,1	
14	116200	11620,0	11,620	13,3	72,6	18,4	

Effective Area Com- pensator in cm ²		Pressfläche	Bezeichnung	Verhältnis
2091	RMP3545	875,000	Pressplatte RMP210	2,390
2091	RMP3545	1575,000	Pressplatte RMP3545	1,328
2091	RMP3545	160,000	Eurokarte	13,069
2091	RMP210	875,000	Pressplatte RMP210	2,390
830	RMP210	1575,000	Pressplatte RMP3545	0,527
830	RMP210	160,000	Eurokarte	5,188

