

**Global engineering -
Trusted solutions**



OWNER'S MANUAL

Dual Chamber Blast Machine

for 1 to 4 operators

with pneumatic

metering- and air valves

Clemco
International GmbH

Carl-Zeiss-Straße 21
83052 Bruckmühl
Germany

Tel.: +49 (0) 8062 – 90080
Mail: info@clemco.de
Web: www.clemco-international.com

TABLE OF CONTENTS

1 SCOPE OF MANUAL3

2 APPLICATION AND RESTRICTIONS3

 2.1 MINIMUM AND MAXIMUM WORKING PRESSURE 3

 2.2 TYPE OF BLAST MEDIA 3

3 GENERAL DESCRIPTION3

 3.1 HOW THE SYSTEM WORKS (SEE FIGURE 1)..... 5

 3.2 HOW THE REMOTE CONTROLS WORK..... 6

 3.2.1 Pneumatic remote controls (see figure 1).....6

 3.2.2 Electric remote controls (see figure 2)6

 3.3 HOW THE CYCLE TIMER WORKS..... 8

 3.4 QUICK STOP SYSTEM (OPTIONAL) 8

4 SET-UP AND OPERATION9

 4.1 REQUIREMENTS 9

 4.2 SET-UP FOR INITIAL INSTALLATION OR REINSTALLATION 9

 4.3 DAILY SET-UP 12

 4.4 OPERATION 13

 4.5 CYCLE TIMER ADJUSTMENT 15

 4.6 SHUT-DOWN 16

 4.7 SHUT-DOWN WHEN MOVING EQUIPMENT 16

5 MAINTENANCE17

 5.1 GENERAL 17

 5.2 DAILY CHECK LIST 17

 5.3 WEEKLY CHECK LIST 18

 5.4 MONTHLY CHECK LIST 18

6 TROUBLE-SHOOTING.....19

7 REPLACEMENT PARTS (ALSO SEE FIGURE 2)22

1 Scope of manual

This manual covers operation and maintenance of dual chamber blast machines model 2460 with remote controls incorporating the following features:

- Refilling the pot with abrasive is permitted without interrupting the blast process.
- During operation the lower chamber (volume 150 l) is not depressurized.
- For refilling, the upper chamber is periodically pressurized and depressurized.
- The air for blasting is controlled through PVR-A or RMS-1500 air valves.
- The abrasive metering is done through PVR-G or Thompson pneumatic media metering valves.
- The dual chamber blast machine is either stationary or portable.

Additionally the following Owner's Manuals should be considered:

- Pneumatic metering valve PVR-400.
- PT-metering valve
- Remote control valve RMS-2000, RMS-1500, RMS-500.

2 Application and restrictions

Dual chamber blast machines were designed for an independent and simultaneous operation of 1 to 4 operators. Continuous operation is enabled through two working chambers (no interruption of the blast process because of abrasive refill).

2.1 *Minimum and maximum working pressure*

Pot and accessories are rated for a **maximum working pressure** of **12 bar** (see typeplate). Higher working pressure only for special designs.

Danger!

When using RME switch boxes or timers - Permissible input pressure max. 10 bar

On the blast machine a **constant minimum working pressure** of **4 bar (ideal pressure 5,4 to 5,6 bar)** is necessary for the control of the air valve PVR-A and the pneumatic media metering valve PVR-G. When using other media metering valves the data of the manufacturer have to be considered.

2.2 *Type of blast media*

Dual chamber blast machines can be used with all types of abrasive, but a steep conical bottom (special design) is necessary when using media with poor flow characteristics.

3 General description

Figure 1 shows the main components of a dual chamber blast machine with pneumatic remote controls.

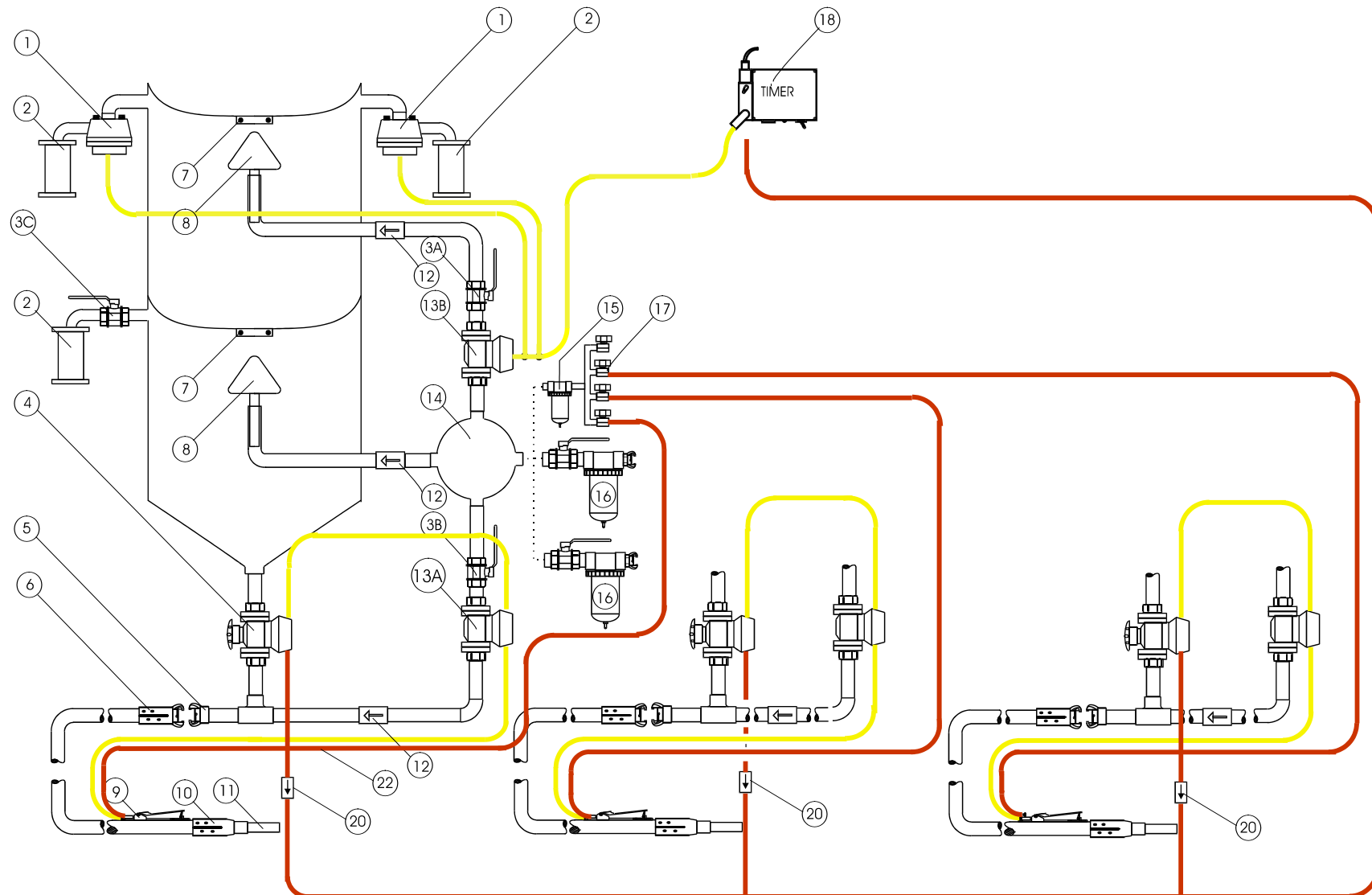


Figure 1 Dual chamber blast machine for 3 operators with pneumatic remote controls.

Figure 1 shows the main components of the dual chamber blast machine with remote controls:

- *Dual chamber pot with*
 - *1 upper chamber (volumina 150 l) and*
 - *1 lower chamber (volumina 150 l).*
 - *1 air manifold (item 14).*
 - *1 air valve (item 13A) per operator to open or close the air supply for the blast process.*
 - *1 air valve (item 13B) to pressurize or depressurize the upper chamber (for example PVR-A, RMS-1500).*
 - *2 outlet valves RMS-500 (item 1) with muffler (item 2) for quickly depressurizing the upper chamber.*
 - *1 media metering valve (item 4) per operator (for example PVR-G, Thompson Valve).*
 - *1 pop-up valve (item 8) with pop-up gasket (item 7) for the upper chamber.*
 - *1 pop-up valve (item 8) with pop-up gasket (item 7) for the lower chamber.*
 - *Non-return valves (item 12 and 20) to prevent a back draft of abrasive into the control system.*
 - *1 ball valve (item 3C) for depressurizing the lower chamber.*
- *1 cycle timer (item 18) for periodically pressurizing and depressurizing the upper chamber (abrasive refill).*
- *1 deadman handle per operator (item 9) with*
 - *twinline hose (item 22) or*
 - *1 electric panel RME-1 and electric cord (item 19 and 21, figure 2) per operator.*
- *1 blast hose per operator with nozzle holder (item 10) and nozzle (item 11)*
(not included in the basic equipment).

The remote controls enable the operator to start or interrupt blasting from a remote position and is a safety device to prevent accidents.

3.1 How the system works (see figure 1)

When the dual chamber blast machine is connected to an air line (compressor) and supplied with compressed air via the moisture separator (item 16), the pop-up valve closes and the upper chamber is pressurized. Simultaneously the control system (connections item 17) is supplied with compressed air via the air manifold (item 14). At this time the upper chamber is depressurized (closed air valve (item 13B)) and can be filled with abrasive.

When the deadman handle is depressed (item 9), the blast process starts (how the remote controls work see chapter 3.2). The corresponding air valve (item 13A) and the media metering valve (item 4) open, and with the blast hose, the abrasive is guided to the nozzle (item 11).

Simultaneously the cycle timer (item 18) is supplied with control air, and periodically pressurizes and depressurizes the upper chamber (how the cycle timer works see chapter 3.3).

When the upper chamber is pressurized, both chambers have the same pressure level. The pop-up valve of the lower chamber opens, and the abrasive from the upper chamber falls into the lower chamber.

As soon as the operator releases the deadman handle, the blast process stops. The periodical pressurization and depressurization is interrupted as soon as none of the deadman handles is depressed.

3.2 How the remote controls work

3.2.1 Pneumatic remote controls (see figure 1)

Compressed air from the air manifold (connections item 17) passes through the moisture separator MM-HMS (item 15) and the brown remote control hose (item 22) to the deadman handle (item 9). When the deadman handle is depressed, the yellow remote control hose guides the air back to the air valve (item 13A), to the media metering valve (item 4) and both valves are opened (for an exact description of the air valve see the owner's manual „Media Metering Valve PVR“ or RMS-1500).

When the deadman handle is released, the air supply for both valves is interrupted, and therefore the flow of air and abrasive is stopped.

3.2.2 Electric remote controls (see figure 2)

In order to reduce the time to stop blasting (especially when using longer blast hoses), the twinline hose between the deadman handle and the connection on the air manifold (item 17) is replaced by an electric cord (item 21) and the electric panel RME-1 with a solenoid valve (item 19). The solenoid valve converts the electric signal into a pneumatic signal.

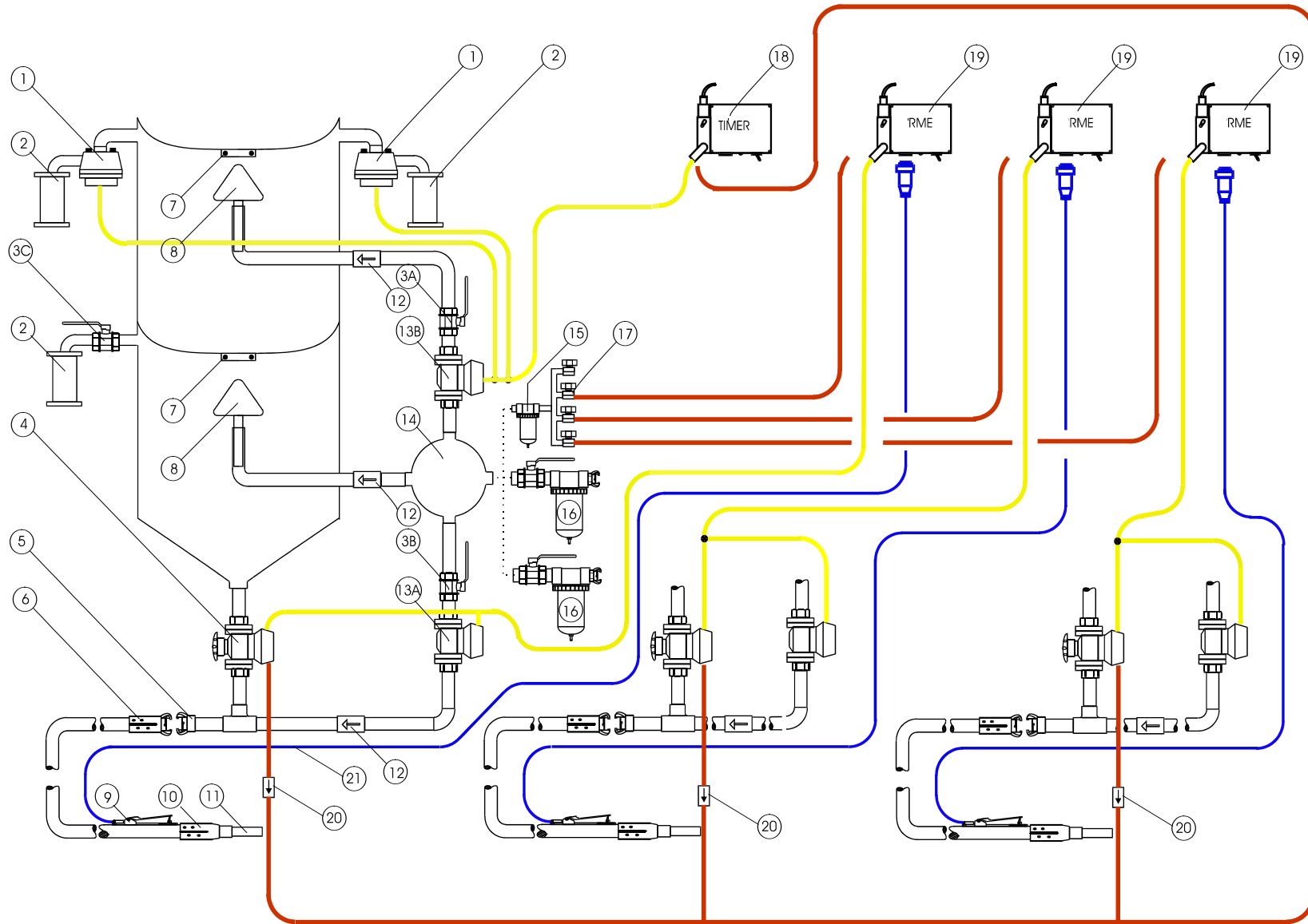


Figure 2 Dual chamber blast machine for 3 operators with electric remote controls.

3.3 How the cycle timer works

As soon as one deadman handle is depressed, the periodical pressurization and depressurization of the upper chamber is started.

When the deadman handle (item 9) is depressed, control air flows to the cycle timer (item 18) after passing a non-return valve (item 20). The non-return valve prevents the mutual influence of the individual control elements. When the control air is released from the solenoid valve, the air valve opens (item 13B), both outlet valves RMS-500 (item 1) close and the upper chamber is pressurized. When the solenoid valve interrupts the flow of control air, the air valve closes, and at the same time the upper chamber is depressurized through the outlet valves RMS-500 and the mufflers. The periodical pressurization and depressurization of the upper chamber is interrupted, when none of the deadman handles is depressed.

3.4 Quick Stop System (optional)

The Quick Stop System SSAS1 is offered in order to reduce the time normally necessary to stop blasting (between 2 and 15 seconds) to **less than 1 second**.

German law demands this equipment.

CLEMCO recommends to use a Quick Stop System for the following applications in other countries:

- Blast pressure ≥ 5 bar
- Length of blast hose ≥ 20 m
- Hard structure abrasive like steel grit

Stock Nr. 90777D

Quick Stop System SSAS1

4 Set-up and operation

4.1 Requirements

- A sufficient air supply is necessary (see table 1).

Nozzle size [mm]	Air consumption [$m^3/min.$] per nozzle and pressure [bar]			
	<u>6</u>	<u>8</u>	<u>10</u>	<u>12</u>
6,5	2,0	2,6	3,2	4,7
8	3,4	4,8	5,4	6,4
9,5	4,8	6,2	7,6	9,0
11	6,4	8,3	10,1	12,0
12,5	8,4	10,7	13,1	15,4

Table 1 Air consumption.

- You have to make sure, that the individual working space of the operators is separated from the others in order to prevent danger. If a spatial separation is not possible, a **safety distance of minimum 20 metres** between the individual operators is absolutely necessary. **ATTENTION! Not complying with this measure can lead to death!**

4.2 Set-up for initial installation or reinstallation

(1) Place the blast machine.	On an even and firm ground.
(2) Install an air supply for the working pressure indicated on the pot.	<ul style="list-style-type: none"> – Place the compressor upwind near the blast machine (no contaminated air should enter the compressor). – Start the compressor and bring it up to operating temperature (5 to 10 min.). Only use compressors whose rating do not exceed the maximum working pressure of 12 bar! – Attach an air line (appropriate dimension) with all necessary gaskets in place to the air outlet of the compressor and safety lock the couplings. Escaping air is dangerous and lowers efficiency! – Carefully open the air valve of the compressor to blow debris and moisture out the attached air line. – Close the air valve.

	<ul style="list-style-type: none"> - Install an appropriate coupling to the air inlet of the blast machine (safety coupling). - Connect the air line to the blast machine and safety lock it. - For troublefree blasting we recommend an air supply free of oil and water (air cooler with cyclone and automatic drain).
<p>(3) Attach the blast hose and nozzle to the blast machine.</p>	<ul style="list-style-type: none"> - Check the gasket of the coupling for wear. - Connect the blast hoses to the length needed (All gaskets must be in place!), attach them to the blast machine and safety lock them. - Choose an appropriate nozzle and attach it to the nozzle holder (with a gasket).
<p>(4) Install the deadman handle and remote control hoses (pneumatic controls), electric cord (electric controls) with electric panel RME and cycle timer.</p>	<ul style="list-style-type: none"> - Pneumatic remote controls: <ul style="list-style-type: none"> ⇒ Connect the remote control hoses (yellow/brown) to the corresponding remote control hoses coming from the air manifold, the media metering valve and air valve. ⇒ Connect the yellow and the brown remote control hose to the corresponding yellow and brown nipples of the deadman handle. Warning! A reversed connection of the remote control hoses causes malfunction and danger of injuries! - Electric-remote controls: <ul style="list-style-type: none"> ⇒ Connect the extension cord to the plugs on the deadman handle and the electric panel RME. ⇒ Connect the electric panel RME with the corresponding remote control hoses (yellow / brown) to the air supply (air manifold). - Cycle timer: <ul style="list-style-type: none"> ⇒ Connection to the power supply (do not switch on). ⇒ Connect remote control hoses (corresponding colours). - With two nylon ties band the deadman handle to the blast hose just behind the nozzle holder. - Every 1,5 m band the twinline hose or the electric cord to the blast hose (sufficient freedom of movement, because

	under pressure the blast hose expands).
<i>(5) Bring the abrasive metering valves PVR-G (item 4) and air valves PVR-A (item 13) into operation.</i>	<p>First read the attached owner's manual "PVR-400 Pneumatic Remote Controls" if the function of the abrasive metering valve PVR-G and the air valve PVR-A is unknown!</p> <p>The valves are shipped with tightened springs, in order to avoid damage of the pinch tube. Therefore lock studs with nuts are installed. Only after the lock studs are removed, the valves are ready for operation.</p> <p>The following steps are necessary:</p> <ul style="list-style-type: none"> ⇒ Turn the abrasive metering knob to the right until a counter force is detected (only PVR-G). ⇒ Remove the nut with a 19 mm wrench. ⇒ Turn the lock stud 90° to the left and remove it. ⇒ Secure the lock stud into the storage tube with the nut. ⇒ Install the plastic cap in the lock stud port, in order to protect the valve from getting dirty.
<i>(6) Put on the protective equipment.</i>	<ul style="list-style-type: none"> – Abrasive-resistant clothing. – Airfed helmet with connection to the breathing air supply (air filter) and adjustment of the air volume with an air control valve attached to the belt. – Leather gloves and safety shoes. – Ear protection.
<i>(7) Check the moisture separator, the remote controls, control of the blast process and remove moisture from the blast machine.</i>	<p>This action requires an empty pot (no abrasive).</p> <ul style="list-style-type: none"> – Check and correct the following adjustments: <ul style="list-style-type: none"> ⇒ Ball valve (item 3A) opened. ⇒ Ball valve (item 3C) for depressurization closed. ⇒ Ball valves (item 3B) opened. – Switch on the cycle timer (green light). – Open the air valve on the compressor. – Open the ball valve on the moisture separator (item 16) to pressurize the lower chamber. – Check the remote controls for each operator.

	<ul style="list-style-type: none"> ⇒ Depress the deadman handle (item 9). Air or a blend of air and abrasive must come out of the nozzle. Point the nozzle to a surface to prevent injuries from debris left in the pot! ⇒ Release the deadman handle after a few seconds. Blasting must stop within a few seconds. – Check the cycle timer. <ul style="list-style-type: none"> ⇒ Depress one deadman handle. ⇒ Depending on the adjustments of the cycle timer the upper chamber has to be pressurized and depressurized periodically. ⇒ release deadman handle. ⇒ The upper chamber has to be depressurized. – Removal of moisture. <ul style="list-style-type: none"> ⇒ Depress one deadman handle (item 34) for minimum 5 minutes. ⇒ Depress the other deadman handles for 1 minute (removal of moisture from the blast hoses). – Adjust the drains of the moisture separators (item 15 and 16), so that a constant stream of liquid and air is expelled under pressure.
--	--

4.3 Daily set-up

Not necessary if an initial installation or reinstallation was performed (see chapter 4.2).

(1) <i>Air supply.</i>	Start the compressor and bring it up to operating temperature (5 to 10 min.).
(2) <i>Put on the protective equipment.</i>	<ul style="list-style-type: none"> – Abrasive-resistant clothing. – Airfed helmet with connection to the breathing air supply (air filter) and adjustment of the air volume with an air control valve attached to the belt. – Leather gloves and safety shoes. – Ear protection.
(3) <i>Check the moisture separator, the remote controls, control of the blast process and remove</i>	<p>This action requires an empty pot (no abrasive).</p> <ul style="list-style-type: none"> – Check and correct the following adjustments:

<p><i>moisture from the blast machine.</i></p>	<ul style="list-style-type: none"> ⇒ Ball valve (item 3A) opened. ⇒ Ball valve (item 3C) for depressurization closed. ⇒ Ball valves (item 3B) opened. – Switch on the cycle timer (green light). – Open the air valve on compressor. – Open ball valve on moisture separator (item 16) to pressurize the lower chamber. – Check the remote controls for each operator. <ul style="list-style-type: none"> ⇒ Depress the deadman handle (item 9). Air or a blend of air and abrasive must come out of the nozzle. Point the nozzle to a surface to prevent injuries from debris left in the pot! ⇒ Release the deadman handle after a few seconds. Blasting must stop within a few seconds. – Check the cycle timer. <ul style="list-style-type: none"> ⇒ Depress one deadman handle. ⇒ Depending on the adjustments of the cycle timer the upper chamber has to be pressurized and depressurized periodically. ⇒ release deadman handle. ⇒ The upper chamber has to be depressurized. – Removal of moisture. <ul style="list-style-type: none"> ⇒ Depress one deadman handle (item 34) for minimum 5 minutes. ⇒ Depress the other deadman handles for 1 minute (removal of moisture from the blast hoses). – Adjust the drains of the moisture separators (item 15 and 16), so that a constant stream of liquid and air is expelled under pressure.
--	--

4.4 Operation

<p>(1) <i>Load abrasive into the blast machine.</i></p>	<ul style="list-style-type: none"> – Close media metering valve. When using a PVR-media metering valve (model PVR-G) consider the owner’s manual.
---	--

	<ul style="list-style-type: none"> - Close ball valve (item 3A). - Pour the abrasive into the concave head of the pot (filling port). - Open ball valve (item 3A) again.
(2) <i>Blasting.</i>	<ul style="list-style-type: none"> - Point nozzle to the surface being blasted and depress the deadman handle to start blasting. - Open media metering valve (abrasive metering knob to the left), until the flow of abrasive is sufficient (optimum blend of abrasive and air when the abrasive barely discolor the air when it comes out the nozzle). - Refill the pot with abrasive (switching cycle of cycle timer). <p>Make sure, that the pot is maximum 3/4 full.</p>

4.5 Cycle timer adjustment

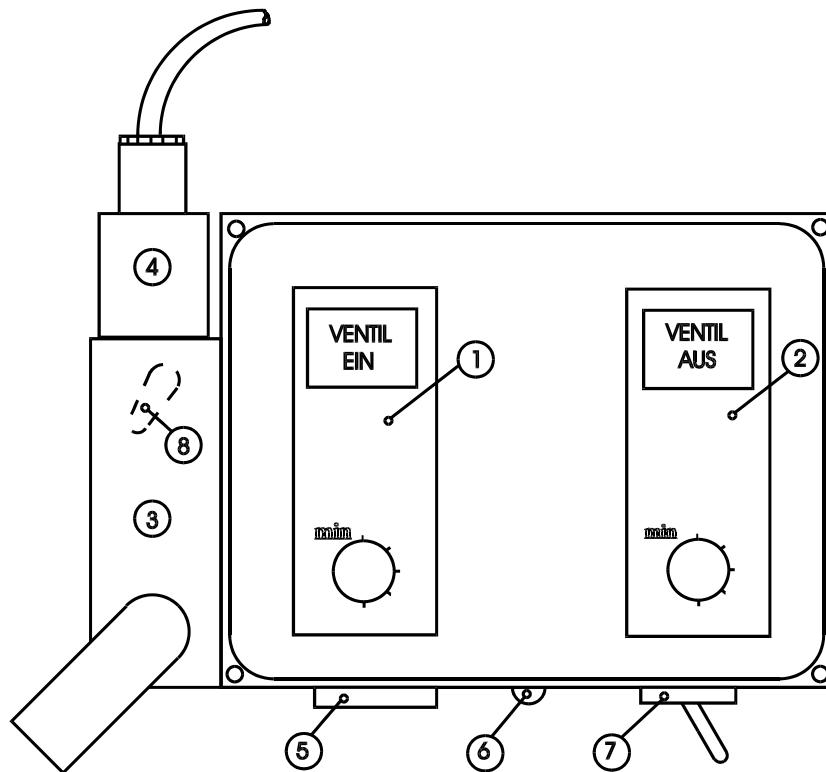


Figure 3 Cycle timer.

No.	Description
(1)	Timer „Valve ON“ to adjust the time the upper chamber is pressurized
(2)	Timer „Valve OFF“ to adjust the time the upper chamber is depressurized
(3)	3-way valve
(4)	Solenoid coil
(5)	Fuse
(6)	Lamp (timer ON / OFF)
(7)	ON / OFF switch
(8)	Lever on the backside of the valve to select between manual and automatic control (adjustment shown is for automatic control)

Both timers are adjustable between 16 seconds and 10 minutes. In most cases the best adjustment is between **4 and 5 minutes**. **Too many cycles lead to extreme wear and should be avoided!**

4.6 Shut-down

(1) Completely empty po of abrasive.	Standstill > 1 day.
(2) Depressurize blast machine.	<ul style="list-style-type: none"> – Close ball valve for air supply. – Slowly open ball valve (item 3C).
(3) Power supply.	Switch off cycle timer and electric panel RME.
(4) Reinstall lock studs of the abrasive metering valves PVR-G (item 4) and air valves PVR-A (item 13)	<p>Only when PVR-A and PVR-G valves are in use.</p> <p>To avoid pinch tube deformation (standstill > 1 week).</p> <ul style="list-style-type: none"> – Turn the abrasive metering knob to the left (only PVR-G). – Remove the plastic cap from the lock stud port. – Remove the lock stud from the storage tube. – Install lock stud (put it into the lock stud port and turn it 90° to the right). – Tighten the spring through turning the nut (wrench 19 mm). Maximum torque is 68 Nm. – Put the plastic cap into the opening of the storage tube.

4.7 Shut-down when moving equipment

No special measures required.

5 Maintenance

5.1 General

During operation blast machines are exposed to wear. In order to ensure safe operation and high efficiency the blast machines should be maintained according to the following check lists.

Prior to maintenance, make sure that the air valve of the compressor is closed and the whole system is depressurized!

5.2 Daily check list

(1) Pot.	<ul style="list-style-type: none"> – Check the gasket of the filling port (item 7) of the upper chamber and replace it at the first sign of wear (replacement possible from the outside). – Check the pop-up valve (Item 8) and replace it at the first sign of wear.
(1) Air line and blast hose.	<p>Check the hoses for sharp bends, causing high loss of energy and rapid wear.</p> <p>No vehicles should pass over hoses!</p>
(1) Nozzle and nozzle holder.	<ul style="list-style-type: none"> – Check the nozzle gasket and replace it at the first sign of wear. – Check the nozzle and the nozzle holder (thread) for wear and replace them if necessary.
(1) Abrasive metering valves PVR-G, air valves PVR-A and deadman handle.	<p>ly when PVR-A and PVR-G valves are used.</p> <ul style="list-style-type: none"> – Check by hand if air escapes from the small hole in the valve body of the PVR valves. When air escapes replace the pinch tube because it is damaged. – Check the rubber button of the deadman handle (item 9) for tight fit and replace it when it is worn.

5.3 Weekly check list

(1) <i>Upper chamber.</i>	<p>Check pop-up gasket and pop-up valve of the upper chamber.</p> <ul style="list-style-type: none"> ⇒ Open both inspection doors. ⇒ Replace pop-up gasket and pop-up valve at the first sign of wear.
(1) <i>Moisture separator (item 15 and 16).</i>	<p>Remove and check the filter element. If necessary clean the filter and the sight glass with soap and warm water and dry it with compressed air.</p> <p>A dirty filter causes loss of pressure in the system!</p>
(3) <i>Muffler (item 2).</i>	<p>Check for wear or blockage and clean or replace the interior body.</p>
(4) <i>Air hose and blast hose.</i>	<ul style="list-style-type: none"> – Check all couplings and screws for wear or breakage and replace them if necessary. – Check the whole blast hose by hand for soft spots (reduced wall thickness) and replace it immediately when soft spots are detected. – Check the air line (air supply) and replace it when it is worn. – Check the gaskets of the couplings for wear and replace them if necessary.

5.4 Monthly check list

(1) <i>Remote controls, valves.</i>	<ul style="list-style-type: none"> – Check all pneumatic connections for leakage. – Check the plugs of the electric cords for tight fit (electro-pneumatic remote controls).
(2) <i>Muffler.</i>	<p>Check condition of muffler and corresponding piping.</p>

6 Trouble-shooting

<i>Problem</i>	<i>Probable cause</i>	<i>Remedy</i>
<i>(1) Neither abrasive nor air comes out the nozzle.</i>	Air valve of the compressor is closed.	Open the air valve.
	Blocked moisture separator item 15 or item 16.	Check and clean the moisture separator.
	Air valve PVR-A (item 13A) does not work.	<ul style="list-style-type: none"> – Check if air comes out the small hole in the valve body when the valve is in operation. If this occurs the pinch tube or the diaphragm is damaged. – Repair or replace air valve PVR-A. Read owner's manual "PVR-400".
	Pneumatic remote controls: Deadman handle (item 9) or remote control hose (item 22) leaky.	Check and replace remote control hose or rubber button of deadman handle if necessary.
	Electric remote controls (with or without dual function): Magnetic valve(s) of the electric panel RME (item 19) are blocked.	Disassemble and clean them.
	Pressure or air volume for the control of the pneumatic valves is not sufficient ($p < 4$ bar).	Increase pressure / air volume. ATTENTION! This effect also occurs, when the nozzle is worn and the air volume is not sufficient anymore.
<i>(2) Air but no abrasive comes out the nozzle.</i>	Closed media metering valve (item 4).	Open media metering valve (turn metering knob to the left). See corresponding owner's manual.
	Defective media metering valve (item 4).	<ul style="list-style-type: none"> – Check if air comes out the small hole in the valve body when the valve is in operation. If this occurs the

		pinch tube or the diaphragm is damaged (media metering valve PVR-G). – Repair or replace metering valve. Read corresponding owner's manual.
	Switching cycle of the cycle timer (item 18) wrongly adjusted or defective cycle timer. Abrasive cannot flow from the upper to the lower chamber.	Check cycle timer adjustments or repair cycle timer.
	Moist abrasive prevents flow of abrasive in the bottom of the pot.	– Open the inspection door and clean the pot. – Install an aftercooler for the air supply. – If moist abrasive is used, do not completely open the choke valve (item 3B).
<i>(3) Irregular flow of abrasive comes out of the nozzle.</i>	Incorrectly adjusted abrasive metering valve.	Check adjustment and open it completely if necessary.
	Clogging.	Check nozzle and gasket of nozzle for wear and replace them if necessary.
	Not correctly adjusted choke valve (item 3B).	Adjust correctly.
<i>(4) Too much abrasive comes out of the nozzle.</i>	Media metering valve opened too much (item 4).	Check and correct adjustments (metering knob).
	Choke valve (item 3B) not completely opened.	Check and open completely if necessary.
<i>(5) Pop-up valve does not remain closed.</i>	Insufficient air volume or pressure.	– Check air pressure of compressor with needle gauge. – Close ball valves (item 3B). When the pop-up valve does not close, the air volume is not sufficient.

(6) <i>Pop-up valve does not seal off filling port after pressurization.</i>	Worn pop-up valve and / or gasket.	Replace the pop-up valve and / or the gasket.
	Blocked guide for the pop-up valve.	Open the inspection door and clean the blast machine.
(7) <i>Blast process does not stop when deadman handle is released.</i>	Deadman handle is clogged (item 9).	Clean it.
	Remote control hoses incorrectly connected.	Exchange connections.
	Electric remote controls: Lever on the magnetic valve in position "1". (manual control).	Put lever in position "0" (automatic control).
(8) <i>Upper chamber is not depressurized.</i>	Defective outlet valves RMS-500.	Check and repair.
	Solenoid valve of the cycle timer does not close (item 18).	Repair.
(9) <i>Upper chamber is not pressurized.</i>	Blocked or defective solenoid valves of the cycle timer (item 18).	Repair.

7 Replacement parts (also see figure 2)

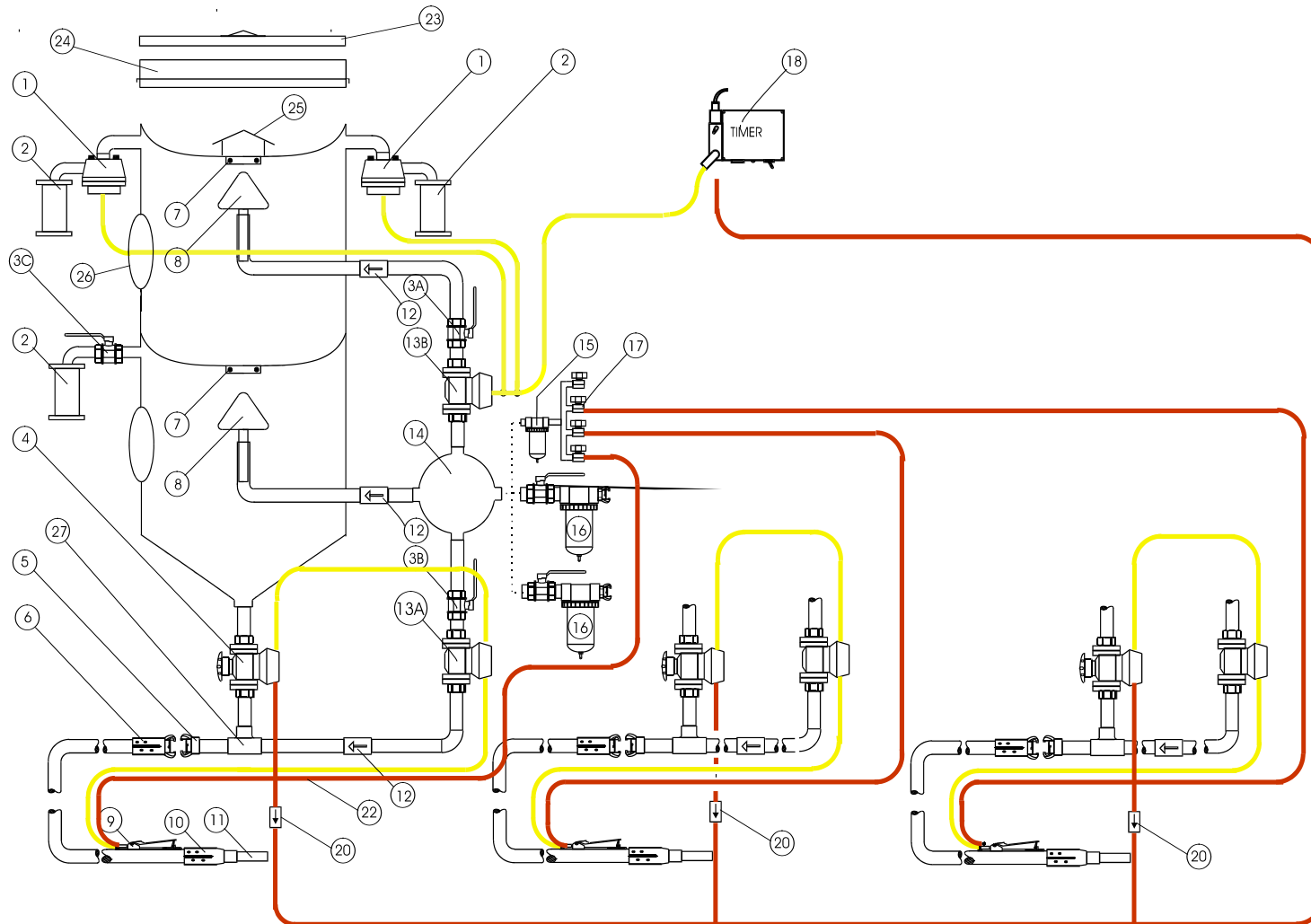


Figure 4 Replacement parts.

No.	Stock No.	Number	Description
(-)	90552D	1 per operator	Rubberized hexagon nipple P 32
(-)	02350D	2	Wheel (portable version)
(-)	90670D	2	Retaining ring for wheel (portable version)
(1)	100030	2	RMS-500
(2)	90738D	3	Silencer RMS-110
(3)	02397D	4+1 x per operator	1 1/4" ball valve
(4)	07359I	1 per operator	Metering valve PVR-G
(4)	90378D	1 per operator	PT-Valve
(5)	91011D	1 per operator	Coupling cast iron 11/4"
(7)	99157D	2	O-ring P-5
(8)	02321I	2	Pop-up valve P2 with external sleeve
(12)	99746D	2+1 x per operator	Non return valve UK 1 1/4"
(13A)	04320I	1 per operator	Air valve PVR-A
	100028	1 per operator	Inlet valve RMS-1500
(13B)	04320I	1	Air valve PVR-A
	100028	1	Inlet valve RMS-1500
(14)	02418D	1	Air manifold
(15)	90256D	1	1/2" moisture separator MM-HMS
(16)	90545D	2	1 1/2" moisture separator HMS
(18)	03439D	1	Cycle timer
(20)	90897D	1 per operator	1/4" Non return valve
(25)	02339D	1	Umbrella
(26)	02323D	2	Inspection door assembly
(27)	90276D	1 per operator	T-flange for PVR-G
Options			
(-)	99641D	2	Clamp for air hose connection
(-)	90038D	2	Union
(-)	90664D	1	Screen insert
(-)	04256D	1 per operator	Blast hose 32 x 8 SM-1
(6)	08413D	1 per operator	Nylon coupling CQP-2 for blast hose 32 x 8
(9)	10565D	1 per operator	Pneumatic deadman handle RLX-II
(10)	04127D	1 per operator	Nylon-nozzle holder NHP-2 for blast hose 32 x 8
(11)		1 per operator	Nozzle
(19)	90887D	1 per operator	RME-1 electric panel with deadman handle RLX-E item 9 (electric remote controls)
(21)	94181D	1 per operator	Electric cord with connector (electric remote controls)
(22)	90081D	1 per operator	20 m twinline hose (pneumatic remote controls)
(23)	02336D	1	Cover
(24)	02332D	1	Screen