elcometer

User Guide

Elcometer Contractor Abrasive Blast Machine

WARNING

Read and understand these operating instructions before using this Abrasive Blast Machine.

Failure to follow operating instructions could result in death, serious injury or damage to equipment.

Elcometer Abrasive Blast Machines have been designed to be safe when properly used and are designed, manufactured and tested in accordance with the Pressure Equipment Directive (PED) and CE 2014/68/EU. It is imperative that all users of this Abrasive Blast Machine read and fully understand this user guide BEFORE using or servicing any Abrasive Blast Machine.

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continued...

CONTENTS (continued)

For the avoidance of doubt, please refer to the original English language version of this user guide. The most recent version is available to download via the blasting section of the Elcometer website, blast.elcometer.com

Please ensure that all product packaging is disposed of in an environmentally sensitive manner. Consult your local Environmental Authority for further guidance.

1 DECLARATION OF CONFORMITY

We, Elcometer Limited, declare that the supplied equipment when installed and used in accordance with these operating instructions, complies with the requirements of the EU Directives listed within this declaration by meeting the following standards:

2014/68/EU & PE(s)R:2016	Pressure Equipment Directive	Pressure Equipment Regulations
PD 5500:2015+A3:2017	Specification for unfired fusion welded pressure vessels	
Conformity assessment module:	Module B & Module D	
Name and address of the notified body:	Lloyd's Register Nederland B.V.K.P. van der Mandelelaan 41a Postbus 701 3000 AS ROTTERDAM	Lloyd's Register Verification Limited 71 Fenchurch Street London EC3M 4BS
Identification number:	0343	0038
Certificate number:	0343/BHM/PED/PRJ1110 0314162/1	0038/UK/PER/PRJ111003 41462/1

2 PRODUCT IDENTIFICATION

There is a product identification plate rivetted to the front of the machine stating the following information:

- Model and Serial Number;
- Maximum Working Pressure (bar / psi);
- Operating Temperature (°C / °F);
- Capacity (litre / cu ft);
- Test Pressure (bar / psi);
- Date of test (d/m/y);
- Year of Construction;
- Pressure Directive

3 WARNINGS & SAFETY PRECAUTIONS

The warnings included within this instruction manual are included for the health and safety of both the operator and any person within the immediate vicinity.

1 This Abrasive Blast Machine has been designed to be safe when used in the proper manner, any person intending to operate or service this Abrasive Blast Machine or any person intending to be in the vicinity of this Abrasive Blast Machine **MUST** receive proper training from a fully trained and competent supervisor, employer, or supplier **BEFORE** use.

2 Any person intending to operate this Abrasive Blast Machine or any person intending to be in the vicinity of this Abrasive Blast Machine who is unable to read and fully understand this instruction manual must be made fully aware of all dangers, warnings and safety notices within this instruction manual and its safe operation, prior to use, by a fully trained and competent supervisor, employer or supplier.

3 Never use damaged or malfunctioning equipment. Inspect the Abrasive Blast Machine and any personal protective equipment to ensure that it is in good working order before each use.

4 DO NOT operate, sell or rent this or any Abrasive Blast Machine without the appropriate remote control system (also referred to as 'deadman's controls').

5 Failure to use remote control systems may cause serious injury or death.

6 DO NOT operate this Abrasive Blast Machine unless there is an appropriate safety pressure relief valve within the pressurized system as a whole. Elcometer Abrasive Blast Machines have a maximum working pressure of 12bar / 170psi. Once fitted, the safety pressure relief valve will vent the pressurized system should the pressure within the system exceed the maximum rating of the safety pressure relief valve. If one is not located within the system already, this Abrasive Blast Machine has a 1.9cm / ¾" port which can be used to fit an appropriate safety pressure relief valve.

7 DO NOT use any abrasives which contain free silica. Silica can cause silicosis and other related respiratory damage.

3 WARNINGS & SAFETY PRECAUTIONS (continued)

8 DO NOT use this Abrasive Blast Machine in areas that could be considered to be a hazardous location. Ensure that the Abrasive Blast Machine is positioned on flat horizontal ground to avoid accidental tip over.

9 DO NOT operate or be in the vicinity of this Abrasive Blast Machine without appropriate personal protective equipment including, but not limited to, protective clothing, approved breathe air respirators / filters, abrasive blast helmets, foot, eye and ear protection.

10 Appropriate warning signs should be positioned around the blasting area of operation and measures must be taken to ensure that only permitted personnel, wearing appropriate personal protection equipment enter the area of operation.

11 Should any person enter the area of operation who is not wearing sufficient personal protection equipment, the Abrasive Blast Machine Tender (Pot Tender) must immediately shut down the abrasive blast machine by opening the safety petcock valve situated on the remote control valve and/or the abrasive blaster must release the lever of the remote control handle.

12 This Abrasive Blast Machine contains a pressurised vessel which contains a large amount of stored energy which can cause serious injury or death if safety procedures are not followed. DO NOT carry out any maintenance or attempt to open any connection ports of this pressure vessel for any reason without first de-pressurising the system and disconnecting the compressed air hose (sometimes referred to as a bull hose) from the Abrasive Blast Machine.

13 This Abrasive Blast Machine or any other pressurised vessel MUST be depressurised and disconnected from the air supply BEFORE any maintenance is carried out.

14 DO NOT modify, re-configure, weld, grind or blast this Abrasive Blast Machine, or its control system without written confirmation from Elcometer or an Elcometer authorised blasting distributor. Doing so will void your certification and may damage your Abrasive Blast Machine.

15 DO NOT use this Abrasive Blast Machine for anything other than in the manner that it is intended.

3 WARNINGS & SAFETY PRECAUTIONS (continued)

16 The repair or replacement of any part of this Abrasive Blast Machine, remote control system or media valve must only be carried out using Elcometer authorised replacement parts. Use of non-Elcometer approved parts may result in equipment failure which may result in serious injury or death. Use of non-Elcometer authorised parts will void all warranties. For a complete list of repair/replacement items, see Section 10 ‘Elcometer ABM Drawings & Parts Lists’ on page en-37.

17 Only use dry compressed air which is free from debris in this Abrasive Blast Machine. Failure to do so can cause an unsafe situation. DO NOT supply compressed air to this Abrasive Blast Machine which exceeds 12bar / 170psi.

18 Compressed air can be dangerous. Ensure that all precautions relating to the use of compressed air and compressors are carried out.

19 This Abrasive Blast Machine is heavy. DO NOT attempt to lift without the use of appropriate lifting facilities.

20 All Elcometer Abrasive Blast Machines should only be lifted using the appropriate lifting lugs. DO NOT exceed the maximum lifting weight, see Section 6 ‘Technical Specification’ on page en-15 for further information. The lugs are carefully positioned to ensure that the unit tilts back slightly upon lifting, this is to ensure that the wheels, and not the front leg, touch the ground first when set down.

21 DO NOT use this Abrasive Blast Machine if tired or under the influence of drugs or alcohol. Please read any prescription drug information to determine if your judgment or reflexes may be impaired. If in doubt DO NOT operate this Abrasive Blast Machine.

22 Ensure the water/moisture separator is set to permanently “spit”. Closing the water/moisture separator drain valve will cause the risk of water/moisture surging into the machine. If the compressed air supply is dirty, it may be necessary to clean moisture separator and drain valve.

23 Valves, pipework, hose, gaskets, couplings and blast nozzles are all subject to wear and should be checked daily to ensure that they are in safe working order at all times.

3 WARNINGS & SAFETY PRECAUTIONS (continued)

24 DO NOT use this Abrasive Blast Machine in confined areas without sufficient ventilation.

25 Temperature can affect the properties of the steel and as the Abrasive Blast Machine is under pressure, it MUST NOT be used outside of the allowable surface temperature range as displayed on the product identification plate (0-60ºC / 32-140ºF). Failure to do so could result in the rupture of the pressure vessel which could cause serious injury or death. Please note that the Abrasive Blast Machine temperature may be higher than the ambient temperature due to solar heating.

26 To avoid accidental disconnection, ensure that all blast and air hoses are correctly connected and fastened with appropriate coupling safety pins and whip checks are installed at each connection.

27 DO NOT point or aim the blast hose at any person or any loose object.

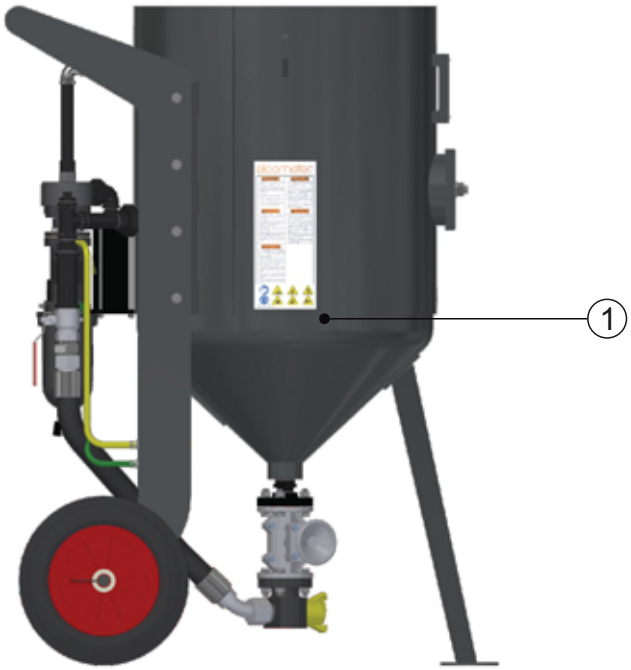
28 Ensure that the environment around you is clear of any loose objects and make sure that the object being blasted is appropriately fastened down.

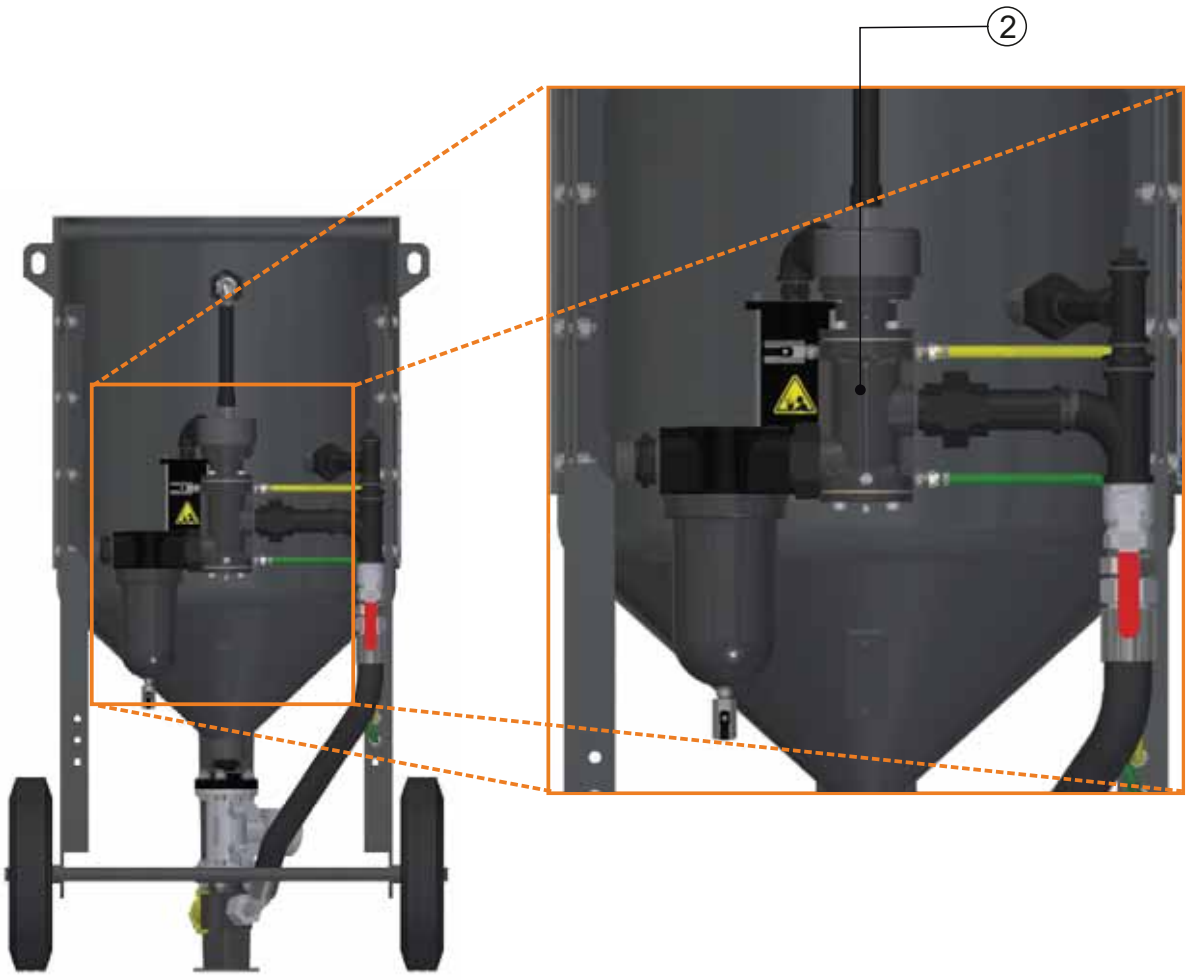
29 In the event of a blockage, or in the event where no abrasive or air is flowing through the blast nozzle when the deadman's handle is in operation, or when replacing the blast nozzle, always disengage the deadman's handle and de-pressurise the Abrasive Blast Machine prior to carrying out any work.

30 Remove all abrasive from the Abrasive Blast Machine before transporting or tipping the Abrasive Blast Machine on its back.

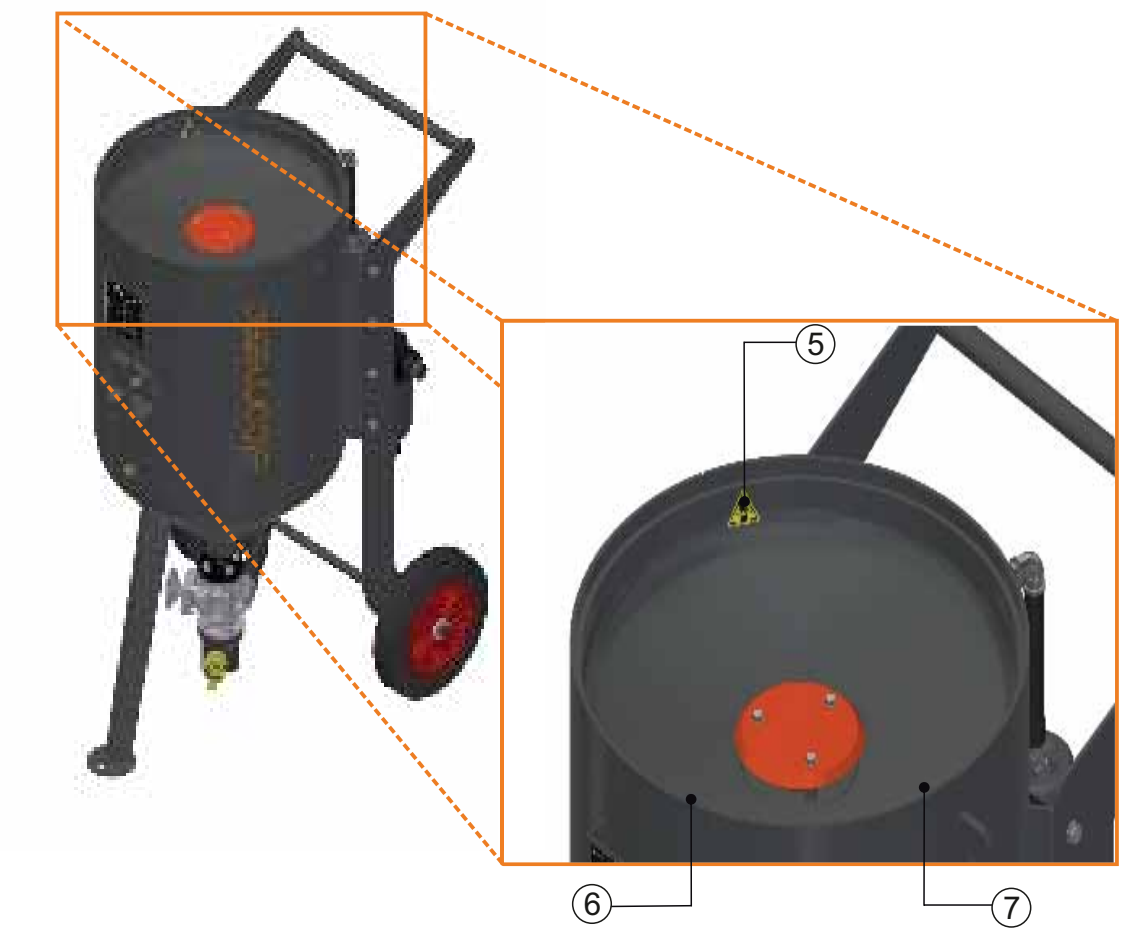
31 Ensure that all warning labels are attached, in the correct locations and are clearly visible at all times. Warning labels must never be covered. For correct placement see Section 4 ‘Safety Symbols & Safety Label Information’ on page en-8.

4 SAFETY SYMBOLS & SAFETY LABEL INFORMATION





4 SAFETY SYMBOLS & SAFETY LABEL INFORMATION (cont.)



4 SAFETY SYMBOLS & SAFETY LABEL INFORMATION (cont.)

4.1 ELCOMETER ABRASIVE BLAST MACHINE WARNING LABEL

To prevent injury or death, read and understand all warnings and safety procedures in the operation manual.

All personnel in the area must receive proper training and wear health and safety approved respiratory equipment, eye and ear protection.

Depressurise machine before any maintenance, loading or relocation.

To prevent delayed lung injury, do not use sand or any silica product abrasives.

Failure to properly use blasting equipment could result in silicosis and death.

Contractor Warning Label

Part Number: MT29603-4
Quantity: 1
Location: 1

	Read and understand this instruction manual before using this machine. Failure to follow the operating instructions could result in death, serious injury or damage to equipment.
	Pressurised vessel. Propelled objects will cause serious injury or death. Depressurise vessel before performing any maintenance. cont...

4 SAFETY SYMBOLS & SAFETY LABEL INFORMATION (cont.)

	Incorrect or damaged handway / manway cover components can result in failure. Servicing whilst pressurised can cause severe injury. LOCK OUT source and RELIEVE PRESSURE before servicing. Consult this user guide for instructions.
	This product and associated equipment are not under any circumstances to be used with sand or silica products of any type and use of such materials will void any warranty.
	Pinch point. Keep hands and fingers clear.
	Loud noise and flying debris hazards. Ear and eye protection must be worn. The manufacturer, distributor or reseller assume no responsibility arising from the failure to use proper safety equipment or the failure to properly train employees in the use of products and equipment.
	Loud noise and flying debris hazards. Ear and eye protection must be worn. The manufacturer, distributor or reseller assume no responsibility arising from the failure to use proper safety equipment or the failure to properly train employees in the use of products and equipment.
	Lifting hazard. Single person lift could cause injury. Get help or use lifting machinery when lifting.

4 SAFETY SYMBOLS & SAFETY LABEL INFORMATION (cont.)

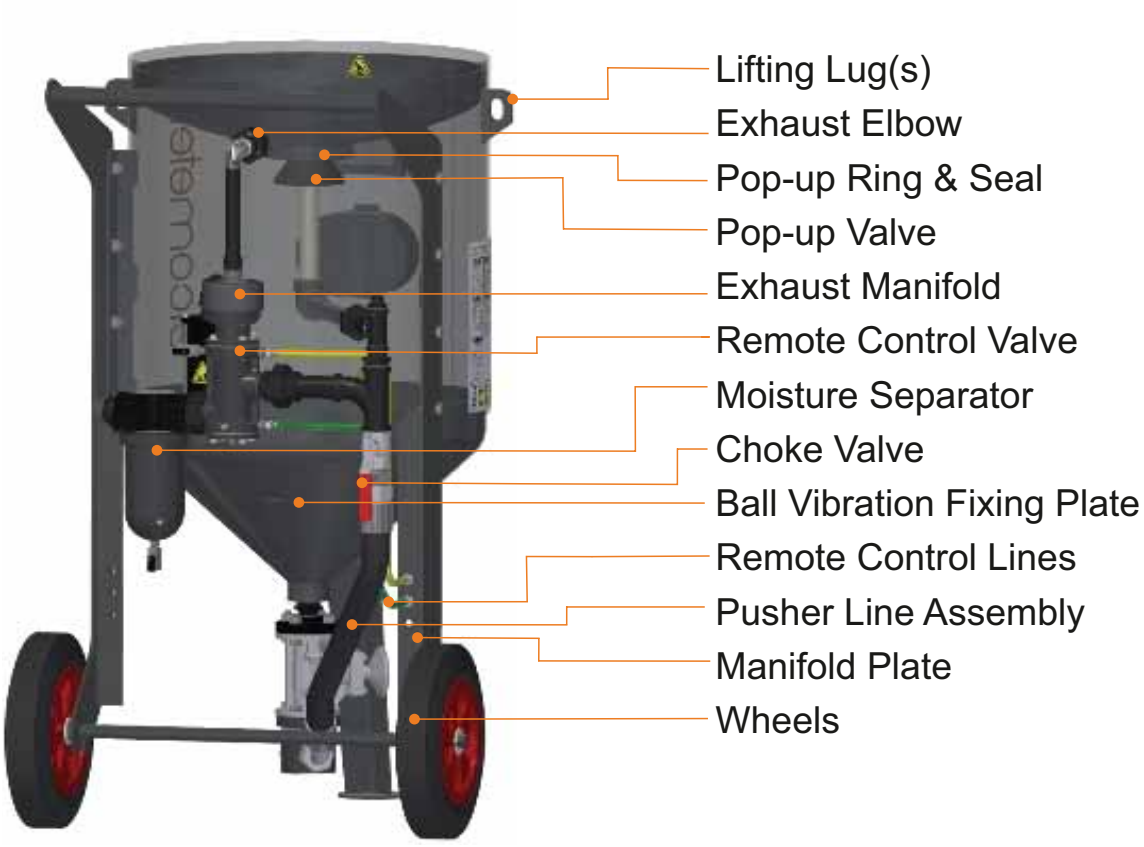
	Crush hazard. This machine and heavy objects being blasted can tip causing serious injury or death. This machine and any objects being blasted must be on level ground.

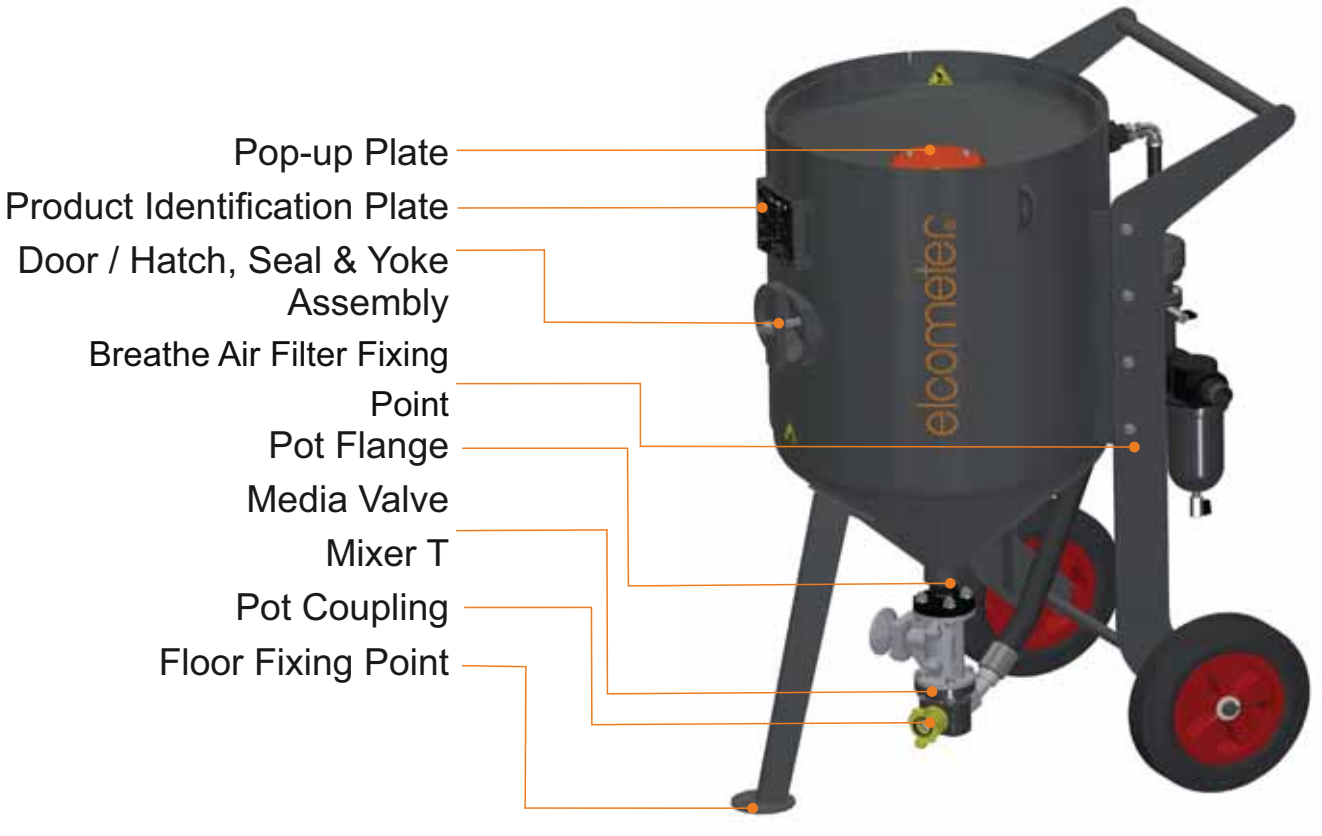
4.2 OTHER WARNING LABELS EXPLAINED

	**Pressurised Device Warning Label** Pressure relief device in this area **Part Number:** MT29028 **Quantity:** 2 **Location(s):** 2 and 3
	**Pressurised Device Warning Label** Pressurised device, de-pressurise before opening or servicing **Part Number:** MT29028 **Quantity:** 1 **Location(s):** 4
	**Pinch Point Label** Pinch point, keep hands and fingers clear **Part Number:** MT29030 **Quantity:** 3 **Location(s):** 5, 6 and 7
elcometer	**Elcometer Logo Label** **Quantity:** 1 **Location(s):** 8

Elcometer ABM Contractor Safety Label Kit: MT29603-4
Safety Label Kit Contains: Contractor ABM Warning Label (x1), Pressurised Device Warning Label (x3), Pinch Point Label (x3),

5 PRODUCT OVERVIEW - THE ABRASIVE BLAST SYSTEM





6 TECHNICAL SPECIFICATION

	M40B-G	M100B-G	M200B-G
Maximum Working Pressure	12bar	12bar	12bar
	174psi	174psi	174psi
Minimum Working Pressure[a]	3.5bar	3.5bar	3.5bar
	50psi	50psi	50psi
Pipe Diameter	32mm	32mm	32mm
	1¼"	1¼"	1¼"
Volume (approximate)	40l	100l	200l
	1.5ft^3	3.5ft^3	7.0ft^3
Vessel Diameter (approximate)	355mm	508mm	610mm
	14"	20"	24"
Height (maximum)	1070mm	1180mm	1385mm
	42.0"	46.4"	54.5"
Width (maximum)	615mm	668mm	809mm
	24.20"	26.3"	31.85"
Weight[b] **(empty)**	110kg	160kg	220kg
	243lb	353lb	485lb
Maximum Lug Lifting Weight	1500kg	1500kg	1500kg
	3000lb	3000lb	3000lb
Approximate Media Capacity: Garnet	94kg	234kg	468kg
	206lb	515lb	1031lb
Approximate Media Capacity: Steel Shot	176kg	440kg	880kg
	388lb	971lb	1942lb
Maximum Operating Temperature	60°C	60°C	60°C
	140°F	140°F	140°F
Minimum Operating Temperature	0°C	0°C	0°C
	32°F	32°F	32°F

[a] Minimum working pressure of the remote control valve with deadman's handle and 20m (65ft) twinline control hose.

[b] When fitted with an Elcometer GV Media Valve.

7 INSTALLATION CHECKLIST

7.1 LOCATING YOUR ABRASIVE BLAST MACHINE (ABM)

Whilst portable ABM's can be wheeled to the blast location, ABM & static ABM's must only be lifted using the lifting lugs/eyes located at the top of the pressure vessel.

When lifting the ABM, only use the lifting lugs/eyes, never attempt to strap to any other part of the ABM. Disconnect the air supply, abrasive blast and remote control hoses prior to lifting.

Ensure that the ABM is located in a stable position, is level and in an upright position and, in order to avoid media damage to the compressor, downwind of the compressor. The compressor should not be located within the blast area.

A securing hole is located on the front leg plate should the ABM need to be fastened to the floor or a structure.

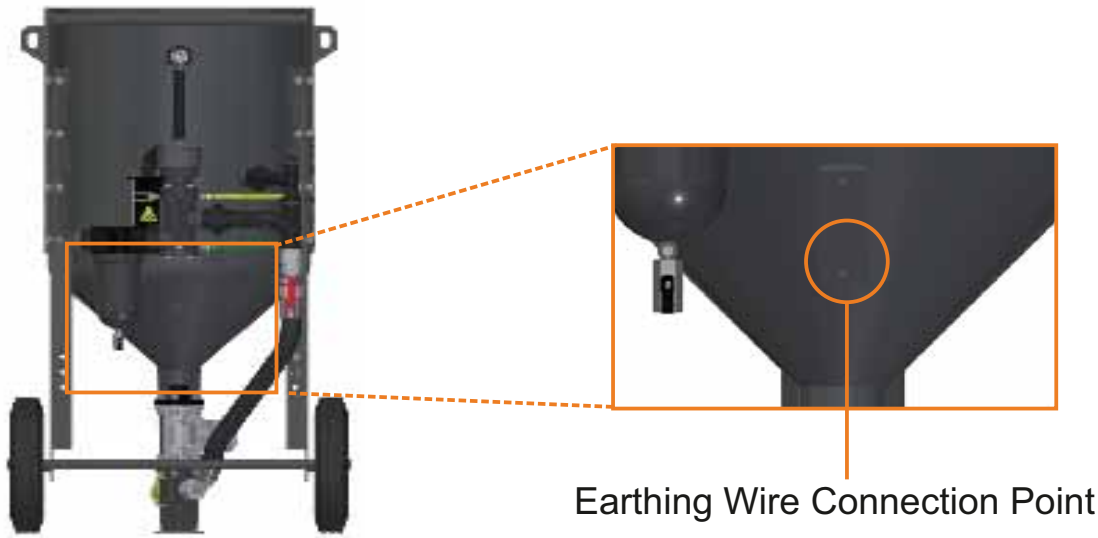
Position the ABM so that there is easy access to all parts and that it is easy and safe to fill with abrasive media.

7.2 EARTHING YOUR ABRASIVE BLAST MACHINE

All Elcometer ABM's have an uncoated area on the underside of the front leg plate which is designed to earth the ABM during use.

Should you require additional earthing, attach the optional Elcometer ABM Earthing Wire (sales part number MT30128) to the Elcometer ABM vibrator plate using the bolt provided - taking care to remove any paint from the thread of the vibrator plate. See diagram below.

DO NOT connect an earthing wire to the ABM's chassis as this will not guarantee an electrical connection.



7 INSTALLATION CHECKLIST (continued)

7.3 COMPRESSED AIR & AIR COMPRESSOR SIZE

Whilst the actual blasting efficiency gains or losses are dependent on a number of variables - the media used, the blast nozzle type and diameter, the hose size, climatic variables, etc.; as a general rule blasting efficiency drops approximately 1.5% for every 1psi below 100psi (6.9bar) of blast pressure at the blast nozzle[1]. For example, blasting at 100psi (6.9bar) can be 26% more efficient than blasting at 80psi (5.5bar) and blasting at 120psi (8.3bar) can improve blasting efficiency by up to 30%. Your desired blasting productivity, determined by the pressure at the nozzle which in turn is determined by the size of the air compressor will determine the approximate air consumption (in CFM or LPM).

The minimum pressure required to operate the Elcometer Abrasive Blast Machine is identified in the table in Section 6 ‘Technical Specification’ on page en-14. Care must be taken when installing a pressure regulator (for low pressure blasting). If blasting below 2bar (30psi) the air supply to the deadman’s controls must be positioned upstream of the pressure regulator.

7.4 COMPRESSED AIR SUPPLY LINE

DO NOT exceed the maximum working pressure of the Elcometer Abrasive Blast Machine (ABM) at any time. The maximum working pressure is clearly marked on the product identification plate on the front of the machine above the door / handway and referenced in the table in Section 6 ‘Technical Specification’ on page en-14.

Only use ABM components that are rated to this working pressure. Elcometer approved components are rated to work safely with all Elcometer Abrasive Blast Machines.

7.5 COMPRESSED AIR QUALITY

Moisture and contamination within the air supply can cause an Abrasive Blast Machine to malfunction as moisture within the air can be absorbed by the abrasive media which can lead to poor media flow, blockages and hardening of the media. A suitable blast system moisture removal device should be fitted.

[1] National Association of Corrosion Engineers (NACE)

7 INSTALLATION CHECKLIST (continued)

7.6 PERSONAL PROTECTION EQUIPMENT (PPE)

Suitable and approved PPE should be used by all personnel within the blast area which should include, but not limited to: protective clothing, gloves, eye and ear protection, air filtration and respirators and air quality monitors such as a carbon dioxide monitor. A range of PPE is available to purchase from Elcometer or your local Elcometer supplier, see blast.elcometer.com for further details.

To ensure clear communication between the person blasting (Blaster) and the Abrasive Blast Machine Tender (Pot Tender) at all times, either a form of signalling should be agreed between both parties, or a communications system, such as an in helmet communication device, should be used.

7.7 ABRASIVE MEDIA

To avoid blockages and damaging the Abrasive Blast Machine (ABM), ensure that the abrasive media is dry and free from debris. A sieve, available to purchase from Elcometer or your local Elcometer supplier, see blast.elcometer.com for further details, can be used to minimize the risk of large particles and large debris from entering the ABM.

To avoid water (rain) from entering into the ABM, a lid can also be used, see blast.elcometer.com for further details.

To avoid moisture absorption, do not leave abrasive media in the ABM.

Some abrasive media may require assistance with the flow through the ABM. The Elcometer ABM can be fitted with an air powered ball vibration device (part number: MT28812) which “fluidizes” the media and ensures even flow through the ABM. The Elcometer Air Powered Ball Vibration Device is quickly attached to the vibration plate at the rear of the Elcometer Abrasive Blast Machine's cone using the bolts supplied with the unit. Note: if using the Elcometer Earthing Wire, ensure that the wire is threaded onto the lower bolt and that any coating within the ABM vibrating plate lower thread is removed prior to attaching to the vibration device.

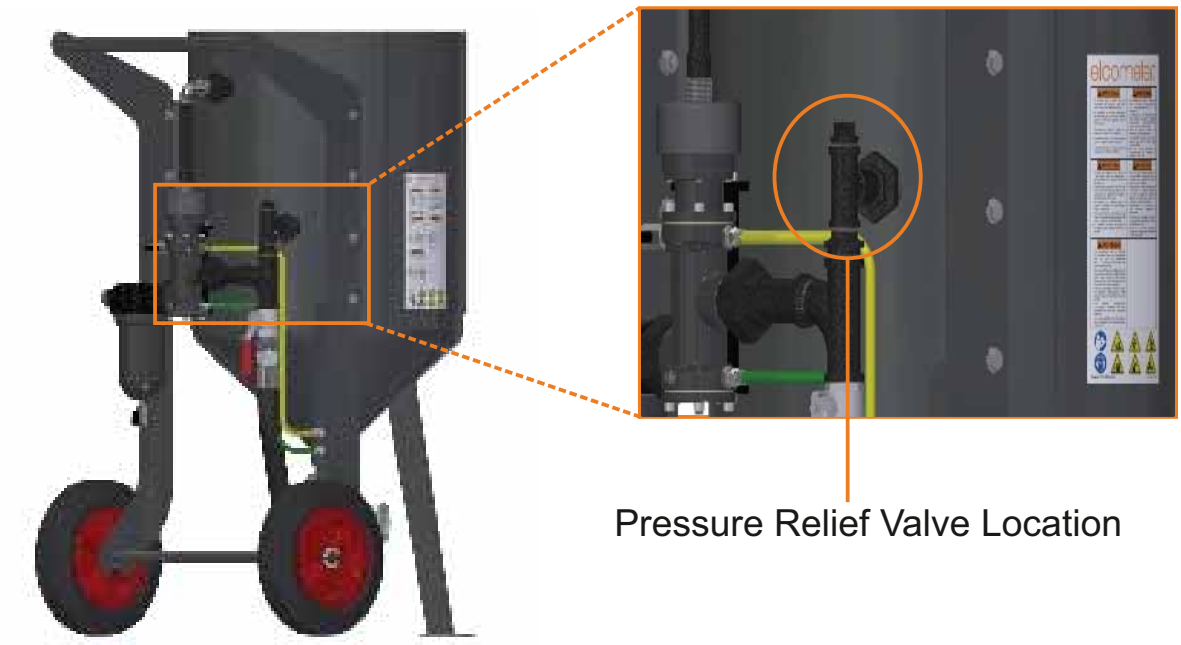
7 INSTALLATION CHECKLIST (continued)

7.8 PRESSURE RELIEF VALVE (PRV)

A pressure relief valve (PRV) is a safety valve used to limit the pressure within the system and is designed to protect the abrasive blast machine from exceeding its maximum working pressure.

A PRV is used in the blast system for safety and it is the Owner's responsibility to ensure that a PRV is fitted which meets the local regulations where the ABM is to be used.

If the compressed air system does not already have a suitable location, Elcometer ABMs have a PRV location on the Choke Pipework.



8 USING AN ELCOMETER ABRASIVE BLAST MACHINE (ABM)

Read and understand these operating instructions before using this machine.

Failure to follow operating instructions could result in death, serious injury or damage to equipment.

8.1 BEFORE SWITCHING ON THE COMPRESSED AIR SUPPLY

1 Ensure that the blast area is clearly marked, no unauthorised personnel are inside the blast area and that all personnel within the blast area are wearing all appropriate personal protection equipment (PPE) and that all PPE[c] is in good working condition.

2 Check the complete abrasive blast system, from the compressor to the blast nozzle, to ensure that all items are in good working order, there are no leaks, that all hose connections are connected properly and that each air or blast hose coupling gasket is fitted correctly and in good working order.

3 Ensure that an appropriate pressure relief valve (PRV) is fitted within the system.

4 Ensure that each coupling is locked with an appropriate locking pin and the whip checks are attached.

5 Ensure that the pop-up valve is in good working order, is positioned correctly and that the pop-up gasket is fitted and in good condition. The alignment of the pop-up valve may have been affected during transit.

6 Check that the pop-up plate is in place and firmly attached.

7 Ensure that the handway / door gasket is attached, in good condition and the handway / door assembly is closed and bolted securely with the yoke/brig in the correct position.

8 Open the safety petcock located on the remote control valve. The valve is open when the tap handle is in line with the silver tap body.

9 Close the drain valve located at the base of the Remote Control Valve air manifold. The valve is closed when the black tap handle is at 90 degrees to the silver tap body.

[c] A range of personal protection equipment is available to purchase from Elcometer or your local Elcometer supplier, see blast.elcometer.com for further details.

8 USING AN ELCOMETER ABRASIVE BLAST MACHINE (ABM)

10 Open the choke valve located above the pusher line so that the o handle of the ball valve is in line with the valve body.

11 Ensure that the remote control twinline air hoses are correctly connected:

a) At the Abrasive Blast Machine:

i. Yellow hose is connected to the yellow hose on the ABM manifold plate
ii. Green hose is connected to the green hose on the ABM manifold plate
iii. If a pressure regulator has been fitted to the ABM, the breathe air filter hose (red) must be connected upstream (before) the pressure regulator

b) At the deadman's remote control handle (DMH):

i. For the Black B-Type DMH (part number RCHB-B): Green hose (or hose from RCV lower connection point) to IN, Yellow hose (or hose to RCV upper connection point) to OUT
ii. For the Silver C-Type DMH (part number RCHC-B): Green hose (or hose from RCV lower connection point) to right, yellow hose (or hose to RCV upper connection point) to left

CAUTION: It is vital for the safe operation of the Remote Control Valve that the Deadman's Handle is correctly connected.

12 If using more than one length of remote control hose, ensure that all connections are fitted correctly and attached to the blast hose with tape to minimise the risk of damage or kinks occurring during operation.

13 Ensure that there are no kinks or tight curves along the length of blast, air or remote control hose. Note: Tight curves will dramatically affect the lifetime of the blast hose, kinks in the air hose and twinline remote control hose will severely affect the performance of the air flow.

14 Make sure that the deadman's remote control handle is firmly attached to the blast hose just behind the nozzle holder and is in good working order and that the rubber sealing gasket is clean and free of damage. Replace the gasket if required.

15 Ensure that the handle of the deadman's remote control springs open freely when released. If it does not, replace the deadman's remote control handle before use.
16 Check that the deadman's handle rubber plug is in good working order, if it is damaged or worn out, replace immediately. Replace the rubber plug if required.
17 Check that the blast nozzle is in good condition and is not blocked. Make sure that the nozzle gasket is also in good working order, replace the gasket if not. Hand tighten the blast nozzle into the nozzle holder.

8.2 SETTING UP AND CHECKING THE AIR MOISTURE SEPARATOR (IF FITTED):

1 Even if an external moisture removal device, such as the Elcometer Air Distribution Manifold is being used, it is beneficial to have a secondary integrated air moisture separator fitted prior to the Abrasive Blast Machine's remote control valve.
2 Only use an integrated air moisture separator which has a working pressure rating equal to or greater than the maximum working pressure of the Abrasive Blast Machine itself - see Section 6 'Technical Specification' on page en-14. Elcometer approved moisture separators have a maximum working pressure of 15bar (217psi).
3 It is important that any integrated air moisture separator does not restrict the air flow by reducing the internal diameter of the pipework.
4 Before switching on the compressed air supply to the ABM, inspect and clean the metal filter element to maximise air flow across the moisture separator.
5 The moisture levels within the moisture separator should never reach the end of the element cone. When in operation, the drain valve, located on the bottom of the moisture separator, should be adjusted so as to give a constant, but slight bleed, of the air/water vapor.

The Elcometer Integrated Air Moisture Separator diagram and spare parts can be seen in Appendix B 'Moisture Separator' on page en-54.

8.3 CHECKING THE EXHAUST SILENCER, EXHAUST ELBOW AND EXHAUST MANIFOLD

Before any work or maintenance is carried out on any part of the Abrasive Blast Machine (ABM), the ABM must be fully depressurised and disconnected from the compressed air supply.

To ensure that the ABM is depressurised, open the safety petcock on the Remote Control Valve, the valve is open when the handle is in line with the silver valve body.

A EXHAUST SILENCER

Each Elcometer Abrasive Blast Machine (ABM) is fitted with an exhaust silencer which is designed to reduce the sound made when the ABM is de-pressurizing. As the abrasive media within the ABM reduces, a small amount of media will mix with the exhaust air (when the ABM depressurizes) and this mix of air and abrasive will exit the ABM via the exhaust.

Much of this media will accumulate within the exhaust silencer and will need to be removed from time to time.

To clean out the exhaust silencer, remove the base plate from the bottom of the exhaust silencer by removing the bottom nuts. Remove the silencer mesh from within the exhaust silencer and clean. Once clean, reinsert the silencer mesh and reassemble the exhaust silencer making sure that all the base plate nuts are securely fastened.

From time to time it is important to assess the amount of internal wear to the re-inforced elbow connecting the exhaust silencer to the exhaust manifold (part number MT28591). This item is prone to wear at the lower part of the elbow, below the re-inforcement area, as abrasive media flows from the exhaust manifold into the exhaust silencer. Replace as required.

B EXHAUST ELBOW

As the air / media mix rushes out of the ABM exhaust during de-pressurisation, the Exhaust Elbow will slowly be abraded. This Exhaust Elbow should be checked as part of your maintenance program and replaced if worn.

CAUTION: When checking or replacing the Exhaust Elbow, make sure that the nut is securely and tightly fastened and sealed with a suitable thread seal tape such as PTFE.

C EXHAUST MANIFOLD

The Exhaust Manifold is located at the top of the Remote Control Valve and is designed to control the exhaust flow from the abrasive blast machine during de-pressurisation. Refer to Appendix A on page en-45 for details of how to inspect and assess the exhaust manifold and how to replace the rubber diaphragm as required.

8.4 CHECKING THE PUSHER LINE ASSEMBLY, MIXER T AND ABRASIVE METERING VALVE

1 Each Elcometer ABM is supplied with a pusher line hose (see Section 10 ‘Elcometer ABM Drawings & Parts Lists’ on page en-37) which supplies the compressed air from the compressor to the mixer T and or metering valve. All Elcometer pusher lines come with swaged hosed fittings and the pusher line assembly has a maximum working pressure of 12bar. The hose and connections should be inspected for damage and / or wear prior to use and periodically thereafter. If damaged, the Pusher Line assembly should be replaced before use.

2 The Elcometer Mixer T (see Section 10 ‘Elcometer ABM Drawings & Parts Lists’ on page en-37) connects the Pusher Line Assembly to the bottom of the Standard Valve, Elcometer GV and AGV range of abrasive media valves. Manufactured from very tough machine tool steel, the Elcometer Mixer T is designed to last a long time. Nevertheless, through use, the inside of the Mixer T will slowly wear as the abrasive abrades the steel. The Mixer T should therefore be assessed from time to time and replaced as needed.

8 USING AN ELCOMETER ABRASIVE BLAST MACHINE (ABM) continued

Best practice is to assess the wear on the Elcometer Mixer T each time the Standard Valve liner is being replaced.

Note: More aggressive abrasive media will wear the Mixer T faster. To check the Mixer T, unscrew and remove the Pot Coupling from the Mixer T (see Section 10 'Elcometer ABM Drawings & Parts Lists on page en-38) and assess the internal wear of the Mixer T. Replace as required.

3 The Elcometer ABM has been designed to work with a range of abrasive metering valves, each abrasive metering valve should be checked for wear and serviced or replaced as required.

I. All Elcometer Abrasive Metering Valves incorporate rubber Valve Liners which are used to protect the valve from damage and failure. These rubber liners will wear out over time and should be replaced before a hole is worn through. Please refer to Appendix C, Section C2 on page en-59 for further information on replacing the valve liner.

8.5 CHOKE VALVE

1 The choke valve, located above the Pusher Line, should remain in the fully open position during normal operation. The choke valve is in the open position when the valve handle is in line with the silver choke valve body.

2 The choke valve can be used to remove any residual abrasive remaining within the ABM and to help unblock the media valve. With the media valve fully open, closing the choke valve slightly, when the deadman's handle is closed, will restrict the flow of air through the blast hose which in turn will create a differential pressure above and below the metering valve, forcing the abrasive media through the metering valve.

8.6 CONNECTING A BREATHE AIR FILTER TO THE ABM

1 If using the breathe air supply from the ABM, connect the breathe air supply hose to the air filter connection in line with the manufacturer's instructions.

2 If using a pressure regulator within the ABM, the breathe air supply should be taken from upstream of the pressure regulator ensuring that the minimum pressure / CFM flow required for breathe air, as identified in the air fed helmet respirator manufacturer's instructions, is available.

3 Refer to the air fed helmet respirator manufacturer's instructions as required.

8.7 FILLING THE ABM WITH ABRASIVE MEDIA

CAUTION: Failure to close the abrasive metering valve before filling the ABM could result in the hose being flooded with abrasive.

1 Close the abrasive metering valve.

2 Ensure that the ABM’s safety petcock located on the remote control valve is open. The valve is open when the tap handle is in line with the silver tap body. This valve should always be open during any manual filling process to avoid accidental pressurization.

3 Ensure that the sieve is in good condition and securely attached.
4 Make sure that the media is dry and free from debris.
5 Carefully and in accordance with health and safety guidelines on lifting heavy items, fill the ABM through the sieve.
6 In order to prolong the service life of the pop-up valve, do not over fill the ABM. The ABM should be filled to just below the bottom of the pop-up valve.
7 Fit the lid onto the top of the sieve and ABM to stop water ingress.
8 Close the ABM's safety petcock located on the remote control valve. The valve is closed when the tap handle is at 90 degrees to the silver tap body.
9 Do not allow the abrasive media within the ABM to fall below 15% of the ABM's maximum capacity as this could cause excessive and avoidable component wear - see Section 6 'Technical Specification' on page en-14.

8.8 ADJUSTING THE HEIGHT OF THE POP-UP PLATE

Elcometer ABMs are fitted with a pop-up plate which:

Protects the Pot Tender (or any other personnel in close proximity) from flying abrasive which may be resting within the dish at the top of the ABM, which can be thrown up when the pop-up valve is engaged during pressurization.

Protects the pop-up valve from being damaged during normal operation when the ABM is being hopper fed.

Whilst the typical angle of slide, the point at which media flows over itself, is 45 degrees from the normal, the actual angle of slide is dependent on the media being used. In order to facilitate the rapid filling of the ABM, the pop-up plate height can be adjusted to accommodate changes in the media's angle of slide.

8 USING AN ELCOMETER ABRASIVE BLAST MACHINE (ABM) continued

	**WARNING: Pinch Point** **The Pop-Up Plate is NOT a finger protection guard.** **During pressurisation, the pop-up valve will rapidly and forcibly close against the abrasive pop-up ring which will cause serious injury if obstructed.**
Before working near the pop-up valve, ensure that the compressed air is disconnected, the ABM is fully de-pressurized, and the ABMs safety petcock (tap handle) located on the remote control valve is open. **The valve is open when the tap handle is in line with the silver tap body.**	

8.9 SWITCHING ON THE COMPRESSED AIR SUPPLY AND GENERAL OPERATION

1 Referring to the air compressor manufacturer's instructions, ensure that the air compressor is regulated to ensure that the pressure does not exceed the maximum working pressure of the ABM.

2 Check that the air supply hose is securely connected and appropriate locking pins and whip checks are attached correctly.

3 Ensure that the ABMs safety petcock (red tap handle) located on the remote control valve is open. The valve is open when the red tap handle is in line with the silver tap body.

4 Switch on the air compressor and open the outlet valve to allow compressed air to flow to the ABM.

5 Adjust the drain valve located on the bottom of the moisture separator (if fitted) so as to give a constant but slight bleed of the air/water vapor.

6 Switch on the air supply to the air fed helmet respirator and check that the correct amount of air is entering into the helmet. Refer to the helmet manufacturer's instructions as required.

7 Check that all personnel within the blast area are wearing appropriate PPE and, if safe to do so, close the red safety petcock valve (red tap handle) located on the remote control valve. The valve is closed when the red tap handle is at 90 degrees to the silver tap body.

In an emergency, opening the red safety petcock valve will depressurize the ABM.

8 Make sure that the choke valve (handle located on the ball valve directly above the pusher hose) is fully open. The valve is open when the valve handle is in line with the silver ball valve body.

9 With the media valve closed, and the nozzle pointed away from any person or loose object, close the deadman's handle. The ABM will now pressurise and the compressed air will now pass through the nozzle.

Note: As the air is under pressure, the air passing through the nozzle will cause a backwards force for the operator. The Blast Operator must be ready for this and be standing in such a way as to hold the backwards force and be holding the nozzle holder and blast hose with a firm hold.

10 If no air passes through the nozzle then release the deadman's handle to depressurise the ABM, open the safety petcock, switch off the air compressor feed and, when safe to do so, check the complete system for blockages and begin this section, Section 8 again.

11 If air is passing through the nozzle, releasing the deadman's handle will now stop the air passing through the nozzle. As the ABM depressurises through the exhaust and silencer, it is important that the Pot Tender, and any other person in close proximity to the ABM, must keep away from the ABM exhaust and silencer at all times.

12 After another check to ensure that all personnel within the blast area are wearing appropriate PPE and have been made aware, firmly hold the blast nozzle holder and blast hose, adopt the appropriate blasting stance and direct the blast nozzle towards the work surface.

13 Close the deadman's handle and once the ABM has pressurised and air is passing through the nozzle, the Pot Tender should now slowly open the media valve, located at the bottom of the ABM, to allow the abrasive media flow and mix with the airflow.

14 Communicating clearly with the Blast Operator, the Pot Tender should now adjust the media valve to ensure that a minimum amount of media is flowing to ensure an even and effective blast.

15 To stop blasting at any time the Blast Operator can simply release the deadman's handle, and/or the Pot Tender can open the safety petcock on the remote control valve.

Note: If using a manual abrasive media valve, media will continue to flow through the valve until the media valve is fully closed. If an automatic media valve (Elcometer AGV) is being used, then the media flow will automatically stop as the deadman's handle is released.

8.10 SHUTDOWN PROCEDURE

1 When blasting has been finished, or is stopped for a period of time, close the abrasive media valve, then, following all of the above safety and operational precautions, close the deadman's handle to purge the system of any residual abrasive media within the hose. This will minimise the chances of blockages.

2 In order to avoid any unnecessary blockages, no abrasive media should be left in the ABM for long periods of time as media may absorb moisture and obstruct the ABM. To remove any residual abrasive remaining within the ABM, slightly close the choke valve located directly above the pusher line and open the metering valve fully, (this will restrict the flow of air through the blast hose and force the abrasive through the media valve). Now, following all of the above safety and operational precautions, close the deadman's handle to purge the system.

3 When no more abrasive is passing through the blast nozzle, release the deadman's handle, open the red safety petcock and, when the ABM has fully depressurised and the Operator, together with any other personnel wearing air fed helmets fed from the system, have removed their helmets, switch off the air compressor.

4 Making sure that the system has been fully depressurised, and the air compressor is switched off, it is now safe to disconnect any hoses.

8.11 THE REMOTE CONTROL VALVE

The Remote Control Valve is one of the most important items on the Abrasive Blast Machine. The RCV, when used in conjunction with the deadman's handle, allows the Blaster to pressurise and depressurise the Abrasive Blast Machine. Through the use of the petcock located on the RCV, the Pot Tender can also ensure the safety of all personnel within the blast area. It is crucial therefore that the remote control valve is in good working order at all times and is regularly serviced.

If the quality of compressed air is poor, debris and moisture may settle at the bottom of the RCV. To remove, simply open the black RCV drain valve and carefully and safely turn the air supply on, the debris will blow out the bottom of the valve when the deadman's handle is closed.

8 USING AN ELCOMETER ABRASIVE BLAST MACHINE (ABM) continued

The black RCV drain valve is opened when the black tap handle is in line with the silver tap body. Once clear, close the drain valve. The valve is closed when the black tap is at 90 degrees to the silver tap body.

Note: The minimum operating pressure to operate the RCV Remote Control Valve is 2bar (29 psi). The minimum operating pressure required to use the Deadman's handle is 3.5bar (50psi).

To service and maintain the Elcometer RCV please refer to Appendix A on page en-45.

9 CARE & MAINTENANCE

This Abrasive Blast Machine has been designed to be safe when used in the proper manner, any person intending to operate or service this Abrasive Blast Machine or any person intending to be in the vicinity of this Abrasive Blast Machine **MUST** receive proper training from a fully trained and competent supervisor, employer, or supplier **BEFORE** use.

Never use damaged or malfunctioning equipment. It is the responsibility of the Owner and / or the User to ensure that this ABM is in good working order at all times and is pressure tested, either by hydrostatic or pneumatic proofing methods, at intervals defined by Region, Country, County, Province or State laws.

A preventative maintenance and inspection schedule should be in place to ensure that this ABM and any personal protective equipment is in good and safe working order at all times and before each use.

This Abrasive Blast Machine contains a pressurised vessel which will contain a large amount of stored energy which can cause serious injury or death if safety procedures are not followed. DO NOT carry out any maintenance or attempt to open any connection ports of this pressure vessel for any reason without first de-pressurising the system and disconnecting the compressed air hose (sometimes referred to as a bull hose) from the Abrasive Blast Machine.

This section, Section 9, is a guide and should not replace your preventative maintenance and inspection procedures. It should be read in conjunction with all sections of this user guide.

9 CARE & MAINTENANCE (continued)

MAINTENANCE TASK	FREQUENCY
ABM Interior and Door Assembly Inspection Empty and inspect the inside of the ABMs pressure vessel. Corrosion and erosion can cause pitting and reduction in the wall thickness of the pressure vessel and the door assembly. If the wall thickness reduces by more than the minimum allowable corrosion allowance thickness (1mm), or if excessive internal corrosion is ever visible the ABM should be removed from service immediately and ABM should be returned to an approved test centre for a complete hydrostatic test. Check all the internal pipe fittings for wear, paying particular attention to the elbow. Replace as required. Check the door sealing gasket and replace if worn or damaged.	Weekly
Vessel integrity pressure testing via pneumatic or hydrostatic testing methods Note the ABM must be clean and dry before re-assembly as moisture and or debris can cause equipment failure.	As defined by your Region, Country, County, Province or State laws
ABM Exterior Damage Inspection Damage caused by dents, bumps, corrosion, etc. can make the ABM unsafe to use. If more than cosmetic damage, the ABM should be removed from service immediately and inspected by a qualified individual, and repaired or replaced as required.	Weekly
Pop-Up Valve and Pop-Up Seal Ring **WARNING** this is a pinch point hazard. Keep hands and fingers away from this area. Disconnect the compressed air supply before undertaking any pop-up valve or seal ring assessment or maintenance. Checking the alignment of the pop-up valve and pop-up seal ring requires the removal of the pop-up plate. Check the integrity of the pop-up seal for wear or damage, replace as required. continued...	Daily

9 CARE & MAINTENANCE (continued)

MAINTENANCE TASK	FREQUENCY
Pop-Up Valve and Pop-Up Seal Ring (continued) Check the alignment of the pop-up valve to ensure that the valve is centred within the abrasive inlet. Adjust as required. Check that the pop-up valve and stem are in good working order and not damaged. Replace as required. *Note: It is best practice to replace the vertical pipe that holds the pop up valve stem at the same time as the elbow.*	Daily
Blast hose, air hose, control lines, pusher line & all external pipework, fittings, couplings and gaskets Inspect all hoses and control lines for weak or soft spots and abrasion, replace as needed. Check all coupling and nozzle gaskets for leaks, damage and wear, replace as required. Ensure that all couplings have pins and whip-checks attached and that they are all in good working order. Check all external pipework for leaks, cracks, holes or other damage and repair or replace as required.	8 hourly
Blast Nozzle Check that the blast nozzle is not damaged. Remove the nozzle from the nozzle holder and inspect the nozzle holder gasket, replace if required. Check the blast nozzle bore diameter using a nozzle bore gauge such as the Elcometer 103. Efficiency is reduced as the nozzle diameter increases. As a rule of thumb the blast nozzle should be replaced if the nozzle diameter has increased by one nozzle orifice size, for example if a #3 Nozzle (3/16”) “becomes” a #4 Nozzle (1/4”).	8 hourly
Exhaust , Exhaust Manifold and Silencer Check the condition of the exhaust , exhaust manifold, silencer and pipework for damage and/or wear. Replace as necessary. continued...	Daily

9 CARE & MAINTENANCE (continued)

MAINTENANCE TASK	FREQUENCY
Exhaust , Exhaust Manifold and Silencer (continued) Check the exhaust silencer and silencer mesh are clean and free of abrasive.	Daily
Exhaust Pipework Check the wear on the Exhaust Pipework, replace if necessary. **CAUTION:** When checking or replacing the Exhaust Pipework, make sure that the Pipes are securely and tightly fastened and sealed with a suitable thread seal tape such as PTFE.	Weekly
Deadman's Handle (DMH) Inspect the deadman's handle for damage and that it springs open easily when released. Replace as required. Ensure that the rubber bung insert is in place and is free of damage, replace as required.	4 hourly
Abrasive Metering Valve	Daily
Safety Petcock Valve The safety petcock valve, located on the side of the Remote Control Valve is designed to quickly depressurise the ABM in an emergency. It is critical that this valve is in full working order and is easy to open at all times. If the safety petcock valve is difficult to open, with the ABM depressurised and disconnected from the compressor, apply a small amount of good quality grease through the valve's exit as you are opening and closing the valve. Remove all excess grease from the outlet. If the valve remains difficult to open, replace immediately.	Daily
Remote Control Valve During the assembly process, in order to prolong the life of the unit, the RCV O-rings and gaskets are greased with lithium grease. continued...	Periodically or after prolonged inactive use

9 CARE & MAINTENANCE (continued)

MAINTENANCE TASK	FREQUENCY
Remote Control Valve (continued) Before use, or if the ABM has been idle for a long period of time the RCV should be taken apart and the O-rings and gaskets should be re-greased with a good quality grease.	Periodically or after prolonged inactive use
Moisture Separator During operation, the moisture separator drain valve should be set to spit. If the compressed air supply is dirty, it may be necessary to clean the moisture separator and drain valve.	Periodically
Personal Protection Equipment (PPE) PPE must be fit for purpose and in full working order at all times. Replace any damaged or worn out items immediately.	4 hourly

Section 10

Elcometer Abrasive Blast Machines Drawings & Parts Lists

10 ELCOMETER ABM DRAWINGS & PARTS LISTS (cont)

10.1 ELCOMETER M40B-G PORTABLE ABM

10 ELCOMETER ABM DRAWINGS & PARTS LISTS (cont)

10.1 ELCOMETER M40B-G PORTABLE ABM (continued)

Item	Part Number	Description
1	MT32050	Pop-Up Valve
2	MT32051-1	Pop-Up Shaft; M40B
3	MT29611	1" Female Equal Elbow
4	MT28617	Moisture Separator
5	MT32053	1-1/4" Pipe
6	MT29664	1/4" Bulkhead Connector - Pack of 3
7	MT32054-1	Twinline Air Hose Assembly (Yellow & Green)
8	MT28627-5	Pop-Up Valve Ring - Pack of 5
9	MT32052	Deflector Plate with Fasteners
10	MT32035	1" Backnut
11	MT29673	1" Female / Female Union
12	MT32036	1" to 3/4" Reducing Hex Nipple
13	MT32037	3/4" 90 Deg BSPP Elbow
14	MT32038-1	3/4" Pipe; M40B
15	MT32039	3/4" Socket
16	MT32024	1" Male/Female Union Taper Seat
17	MT32025-1	1" Choke Pipe; M40B
18	MT32027	1" Equal Tee
19	MT29681	Plug
20	MT32028	1" to 1½" Reducing Bush
21	MT32044	RCV c/w Silencer and Union Elbow
22	MT29656	Petcock Valve Assembly
23	MT32032	1-1/4" Male/Female Equal Union Taper Seat
24	MT32029	1-1/4" Equal Pitcher Tee
25	MT30094	Ball Valve Handle
26	MT32032	1-1/4" Ball Valve
27	MT32033	1-1/4" 60° Cone Male/Male Adaptor
28	MT32043	Silencer c/w Union Elbow
29	MT28616	Elcometer Inspection Hatch Door
30	MT28613	Elcometer Inspection Hatch Door ElcoFit Sealing Gasket
31	MT32049	Elcometer Inspection Door Fixings
32	MT32048	Elcometer Inspection Door Yoke
33	MT32047-1	250mm Single Spare Wheel Kit
-	MT29603-4	Contractor Decal Kit
-	MT32046-1	Contractor 14" 40L 1 1/4" Pusher Hose Assy

10 ELCOMETER ABM DRAWINGS & PARTS LISTS (cont)

10.2 ELCOMETER M100B-G PORTABLE ABM

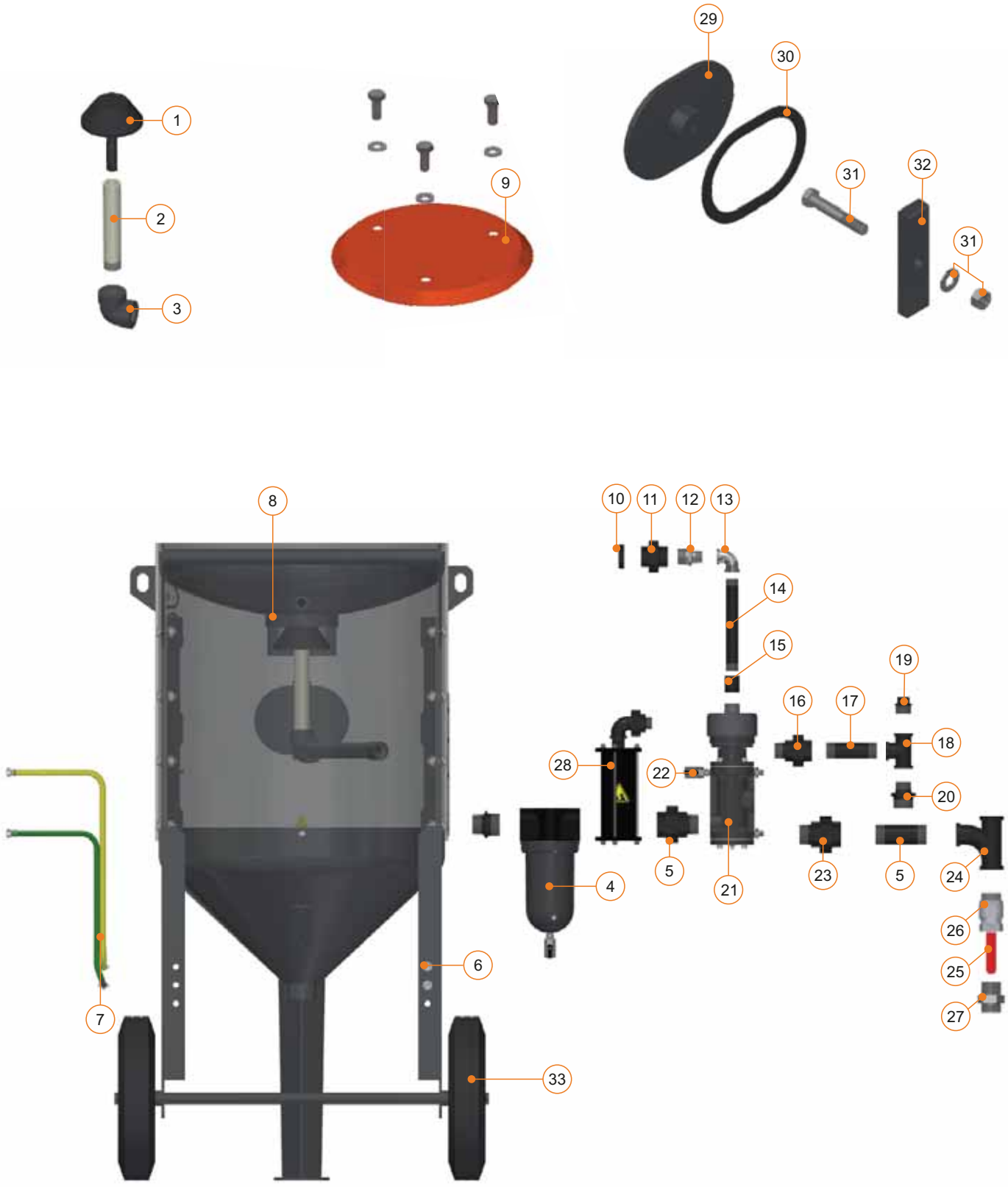
10 ELCOMETER ABM DRAWINGS & PARTS LISTS (cont)

10.2 ELCOMETER M100B-G PORTABLE ABM (continued)

Item	Part Number	Description
1	MT32050	Pop-Up Valve
2	MT32051-2	Pop-Up Shaft; M100B
3	MT29611	1" Female Equal Elbow
4	MT28617	Moisture Separator
5	MT32053	1-1/4" Pipe
6	MT29664	1/4" Bulkhead Connector - Pack of 3
7	MT32054-2	Twinline Air Hose Assembly (Yellow & Green)
8	MT28627-5	Pop-Up Valve Ring - Pack of 5
9	MT32052	Deflector Plate with Fasteners
10	MT32035	1" Backnut
11	MT29673	1" Female / Female Union
12	MT32036	1" to 3/4" Reducing Hex Nipple
13	MT32037	3/4" 90 Deg BSPP Elbow
14	MT32038-2	3/4" Pipe; M100B
15	MT32039	3/4" Socket
16	MT32024	1" Male/Female Union Taper Seat
17	MT32025-2	1" Choke Pipe; M100B
18	MT32027	1" Equal Tee
19	MT32028	1-1/4" to 1" Hex Reducer
20	MT29681	Plug
21	MT32044	RCV c/w Silencer and Union Elbow
22	MT29656	Petcock Valve Assembly
23	MT32032	1-1/4" Male/Female Equal Union Taper Seat
24	MT32029	1-1/4" Equal Pitcher Tee
25	MT30094	Ball Valve Handle
26	MT32032	1-1/4" Ball Valve
27	MT32033	1-1/4" 60° Cone Male/Male Adaptor
28	MT32043	Silencer c/w Union Elbow
29	MT28616	Elcometer Inspection Hatch Door
30	MT28613	Elcometer Inspection Hatch Door ElcoFit Sealing Gasket
31	MT32049	Elcometer Inspection Door Fixings
32	MT32048	Elcometer Inspection Door Yoke
33	MT32047-2	300mm Single Spare Wheel Kit
-	MT29603-4	Contractor Decal Kit
-	MT32046-2	Contractor 20" 100L 1 1/4" Pusher Hose Assy

10 ELCOMETER ABM DRAWINGS & PARTS LISTS (cont)

10.3 ELCOMETER M200B-G PORTABLE ABM



10 ELCOMETER ABM DRAWINGS & PARTS LISTS (cont)

10.3 ELCOMETER M200B-G PORTABLE ABM (continued)

Item	Part Number	Description
1	MT32050	Pop-Up Valve
2	MT32051-3	Pop-Up Shaft; M200B
3	MT29611	1" Female Equal Elbow
4	MT28617	Moisture Separator
5	MT32053	1-1/4" Pipe
6	MT29664	1/4" Bulkhead Connector - Pack of 3
7	MT32054-3	Twinline Air Hose Assembly (Yellow & Green)
8	MT28627-5	Pop-Up Valve O-Ring - Pack of 5
9	MT32052	Deflector Plate with Fasteners
10	MT32035	1" Backnut
11	MT29673	1" Female / Female Union
12	MT32036	1" to 3/4" Reducing Hex Nipple
13	MT32037	3/4" 90 Deg BSPP Elbow
14	MT32038-3	3/4" Pipe; M200B
15	MT32039	3/4" Socket
16	MT32024	1" Male/Female Union Taper Seat
17	MT32025-3	1" Choke Pipe; M200B
18	MT32027	1" Equal Tee
19	MT29681	Plug
20	MT32028	1-1/4" to 1" Hex Reducer
21	MT32044	RCV c/w Silencer and Union Elbow
22	MT29656	Petcock Valve Assembly
23	MT32032	1-1/4" Male/Female Equal Union Taper Seat
24	MT32029	1-1/4" Equal Pitcher Tee
25	MT30094	Ball Valve Handle
26	MT32032	1-1/4" Ball Valve
27	MT32033	1-1/4" 60° Cone Male/Male Adaptor
28	MT32043	Silencer c/w Union Elbow
29	MT28616	Elcometer Inspection Hatch Door
30	MT28613	Elcometer Inspection Hatch Door ElcoFit Sealing Gasket
31	MT32049	Elcometer Inspection Door Fixings
32	MT32048	Elcometer Inspection Door Yoke
33	MT32047-3	2355mm Single Spare Wheel Kit
-	MT29603-4	Contractor Decal Kit
-	MT32046-3	Contractor 24" 200L 1 1/4" Pusher Hose Assy

11 TRANSPORTATION & STORAGE

Before moving or storing an Elcometer Abrasive Blast Machine (ABM) safely disconnect all compressed air and blast hoses and empty the ABM of all abrasive media.
Do not attempt to wheel the ABM over uneven ground. Always use both lifting lugs located on the side of the pressure vessel of the ABM when lifting the ABM. Do not exceed the maximum lug lifting weight as identified in the table in Section 6 ‘Technical Specification’ on page en-14.
Empty the ABM of all abrasive media if leaving the ABM overnight or when not using the ABM for long periods of time.
To avoid moisture and rain water ingress into the ABM always use the appropriate Elcometer ABM lid (available to purchase from Elcometer or your local Elcometer supplier, see blast.elcometer.com for further information).
If left in long term storage, to prevent moisture build up at the base of the ABM, it is recommended that the metering valve is left fully open and the Mixer T (if fitted) is disconnected from the valve. If an Elcometer AGV is fitted, it is recommended that the elcoTOUGH™ Valve Liner is removed.
If you do not wish to remove the Mixer T from the Elcometer ABM, open the metering valve and store the ABM upside down.

12 WARRANTY STATEMENT

Elcometer Abrasive Blast Machines are covered by warranty for 12 months from the date of sale as long as they are fitted with Elcometer approved spares.

Except for fair wear and tear, Elcometer warrants products against defects caused by faulty design, materials or workmanship. At the company's discretion faulty equipment will be replaced or repaired, free of charge, if a fault develops within the warranty period. This warranty does not apply to consumable items.

Using non Elcometer approved spares and accessories will not only invalidate your warranty but, could result in death, serious injury or damage to equipment.

Appendix A

Standard Remote Control Valves

APPENDIX A: STANDARD REMOTE CONTROL VALVE

A1 PRODUCT OVERVIEW

The Standard Remote Control Valves are designed to be used in a dry abrasive blast machine and consist of:

RCV Exhaust Manifold:
This allows air to exhaust from the abrasive blast machine through the silencer.

Remote Control Valve:
This, when used in conjunction with a deadman's handle, pressurises and de-pressurises the abrasive blast machine. The red safety petcock valve on the remote control valve can be used to de-pressurise the abrasive blast machine in an emergency (isolating the deadman's handle).

APPENDIX A: STANDARD REMOTE CONTROL VALVE (continued)

Compressed air is fed though the remote control valve and down the green control hose to the deadman's handle. When the deadman's handle is closed, the air returns to the remote control valve via the yellow control hose which pushes up the exhaust diaphragm (which prevents air from venting through the silencer) and pushes down the air inlet piston, allowing the compressed air to flow into the abrasive blast machine, pressurising the abrasive blast machine and allowing the blast process begin.

When the deadman's handle is released, the exhaust diaphragm drops allowing the abrasive blast machine to depressurise by venting through the silencer via the exhaust manifold.

There are two seal checkpoint holes located on the front of the RCV & RCV. If air is blowing out of these holes, it is likely that the seals within the exhaust manifold require replacing.

A2 DISCONNECTING & RECONNECTING THE RCV

Before carrying out any replacement or maintenance of any part of the Abrasive Blast Machine or any item within the Abrasive Blast System, please read and understand Section 1 of this User Guide.

Depressurise the ABM, bleed all the air supply lines to the ABM and disconnect the ABM from the compressor. Failure to do so could cause serious injury or death.

Please refer to the Elcometer ABM Drawings in Section 10.

1 To disconnect the remote control valve from the abrasive blast machine, first disconnect the yellow (top) and green (bottom) remote control hose from the remote control valve and any other air supplies from the remote control valve & air manifold.

2 Undo the union joint located near the exhaust port and the union joint – connected to the RCV exit port located on the side of the remote control valve and remove the remote control valve, complete with accessories, from the abrasive blast machine.

APPENDIX A: STANDARD REMOTE CONTROL VALVE (continued)

3 Remove the moisture separator, undo the union joint and set down on a clean surface.

4 Remove the silencer by undoing the union elbow joint.

A3 DISASSEMBLING & RE-ASSEMBLING THE RCV

Please refer to the drawings in Section A5 on page en-50.

1 To remove the exhaust manifold from the RCV, remove all four box screws using a special cut down 6mm allen box key (part number MT30072), remove and / or replace the gasket and set both down on a clean surface.
Note: There are 3 seals / o-rings in the RCV that will need to be replaced or greased from time to time; the piston lip seal located on the piston, and two o-rings located on the inlet valve shaft.

2 To remove the piston, fit the allen box key into the box screw positioned in the centre of the piston and, whilst looking through the RCV's exit port, slowly rotate the piston until you see a hole in the inlet valve shaft. Take a rod (or cross headed screwdriver) and pass it through the exit port and into the hole on the piston shaft. You can now undo the box screw located at the top of the piston head. Please note that the piston box screw is held in place with thread lock to prevent it from loosening during operation and will be tight. Taking note of the orientation of the piston (hole recess on top), carefully prise out the piston using a flat head screwdriver taking care not to damage the piston lip seal. Replace and / or grease the piston lip seal as required.

3 To remove the inlet valve shaft, first remove the RCV base plate by removing all 4 box screws using the 6mm allen box key. Remove and / or replace the gasket and set both down on a clean surface.

4 The inlet valve shaft can now be pushed down from the top (once the rod or cross headed screwdriver has been removed). Replace and / or grease the two o-rings.

5 Reassemble using Steps 4 to 1 above, applying grease to the following items: Valve Shaft o-rings, Valve Shaft and Piston.

APPENDIX A: STANDARD REMOTE CONTROL VALVE (continued)

A4 DISASSEMBLING & RE-ASSEMBLING THE RCV EXHAUST MANIFOLD

There is one piston lip seal in the RCV Exhaust Manifold that will need to be replaced or greased from time to time.

There is also a Rubber Valve Seat Diaphragm which will also need inspecting from time to time. This Diaphragm is designed to protect the pistons from damage caused by any abrasive media within the exhaust during depressurisation of the abrasive blast machine.

Please refer to the drawings in Section A5 on page en-50.

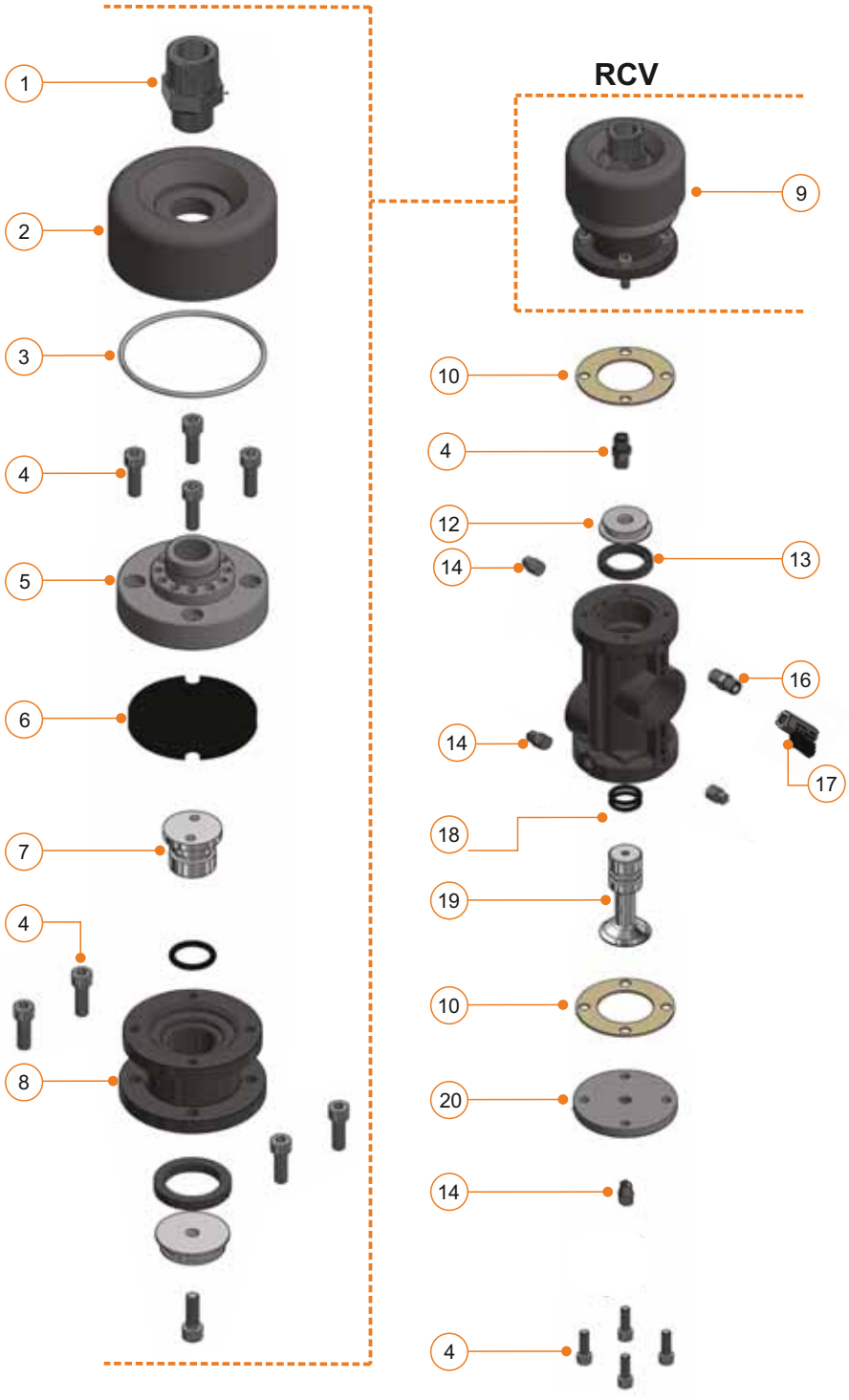
1 Disconnect the RCV from the abrasive blast machine as described in Section A2.
2 To remove the exhaust manifold from the RCV, remove all four box screws using a special cut down 6mm allen box key (part number MT30072), remove and / or replace the gasket and set it, and the RCV, down on a clean surface.
3 With the Exhaust Manifold resting on a clean desk, unscrew and remove the manifold adaptor and lift off the manifold cover. Replace the exhaust manifold sealing ring as required.
4 Using the allen box key, remove the 4 box screws and lift off the top cover.
5 Lift off and inspect the Rubber Valve Seat Diaphragm, and replace if required.
6 Insert the pegs of the Exhaust Manifold Piston Tool (part number MT30072) into the two holes on the base of the manifold cylinder and then remove the box screw located at the top of the piston head. Taking note of the orientation of the piston (hole recess on top), carefully prise out the piston using a flat head screwdriver taking care not to damage the piston lip seal. Replace and / or grease the piston lip seal as required.
7 Reassemble using Steps 3 to 6 above, applying grease to Piston Lip Seal, Exhaust Manifold Sealing Ring,Manifold Cylinder and Piston

Note: When repositioning the exhaust manifold cover, rotate the cover so that the exhaust exit port is orientated to fit the silencer in the correct place. Leave the manifold adaptor finger tight to allow fine adjustment when re-attaching the RCV assembly to the abrasive blast machine and, once the silencer has been positioned correctly, fully tighten the manifold adaptor (item 1).

APPENDIX A: STANDARD REMOTE CONTROL VALVE (continued)

A5 DRAWINGS & PARTS LIST

Part Number	Description
MT32044	1¼" Pneumatic Remote Control Valve



APPENDIX A: STANDARD REMOTE CONTROL VALVE (continued)

A5 DRAWINGS & PARTS LIST (continued)

ELCOMETER SPARE PARTS

Item	Part Number	Description
1	MT29691	¾" 60º Cone Male / Male Adaptor
2	MT30023	Bleed-Off Manifold
5	MT30024	Top Cover
7	MT30025	Bleed-Off Valve
8	MT30026	Bleed-Off Cylinder Housing
9	MT28591	Exhaust Manifold Assembly
12	MT30081	Piston
14	MT28596	¼" Square Head Plug (x4)
16	MT30085	¼" Male Adaptor
20	MT28619	¼" Ball Valve (Black Handle)
19	Mt30083	Inlet Valve
20	MT30084	Base Plate

STANDARD & ELCOMETER RCV4000 & RCV4000+ SERVICE KITS

Item	Part Number	Description
	Mt30055	**Elcometer RCV4000 / RCV4000+ Service Kit 1 (contains the items listed below)**
3	-	O-Ring 3mm Cord x 89.6 ID
6	-	Rubber Valve Seat
10	-	Gasket (x2)
13	-	Piston Lip Seal (x2)
18	-	O-Ring 3.53mm Cord x 23.29 ID (x3)
	MT30056	**Elcometer RCV4000 / RCV4000+ Service Kit 2 contains the items listed below)**
4	-	M8 x 25 Stainless Steel Hex Socket Cap Screw (x8)
	MT30072	**Elcometer RCV4000 / RCV4000+ Service Kit 3 (contains the items listed below)**
-	-	RCV Service Tool
-	-	6mm Allen Key
	MT28605	**Elcometer RCV4000 / RCV4000+ Service Kit 4 (contains the items listed below)**
14	-	¼" Square Head Plug (x3)
23	MT30099	½" Square Head Plug

NOTES

Appendix B

Elcometer Moisture Separator

APPENDIX B: MOISTURE SEPARATOR

B1 REMOVING & REPLACING THE FILTER ELEMENT

Before carrying out any replacement or maintenance of any part of the Abrasive Blast Machine or any item within the Abrasive Blast System, please read and understand Section 1 of this User Guide.

Depressurise the ABM, bleed all the air supply lines to the ABM and disconnect the ABM from the compressor. Failure to do so could cause serious injury or death.

Please refer to the drawing in Section B2 on page en-55.

1 Ensure that the abrasive blast machine is depressurised and disconnected from the compressor and the drain valve (item 11) is open.

2 Taking care not to damage the integrated o-ring seal (item 7) at the base of the moisture separator top thread, carefully unscrew the moisture separator bowl holding ring (item 9) - using a rubber filter strap wrench (part number MT30276) if required - and set the bowl and collar down on a clean surface making sure not to damage the drain valve.

3 Holding the filter element (item 4) in place, carefully unscrew and remove the lower nut (item 6) followed by the plastic dome (item 5) and set down on a clean surface. The filter element and top plastic air deflector (item 3) will now both freely slide off the threaded steel bar (item 2).

4 Clean the filter element and top plastic air deflector with detergent and water and blow dry. Solvents may damage the filter element and should not be used. If the filter element is damaged, it should be replaced.

5 Inspect the integrated o-ring seal (item 7) and replace if required.

6 Re-build the moisture separator, taking care to fit the items in the correct orientation:

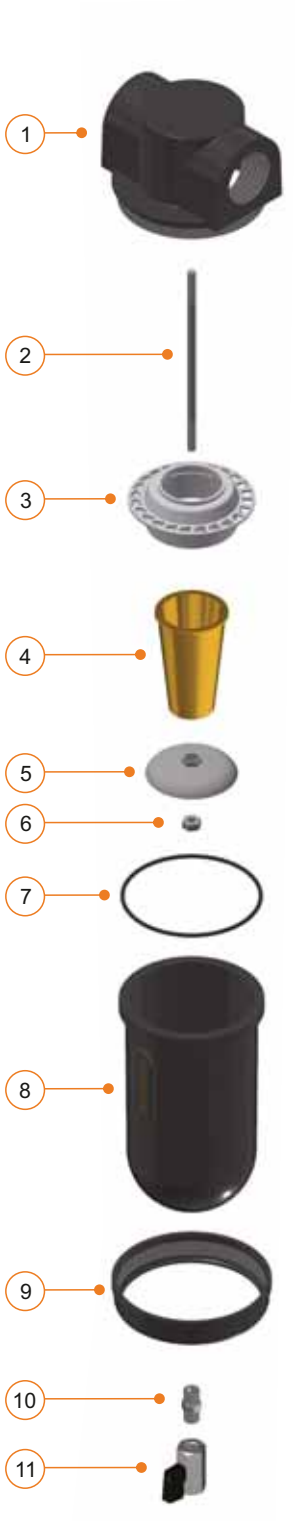
- **Top Plastic Air Deflector:** ribs pointing down the threaded steel bar.
- **Filter Element:** cone downwards - wide diameter at top.
- **Plastic Dome:** Convex surface towards filter element, do not over tighten the dome, it will damage the plastic thread.

Note: Do not over tighten the lower nut as it will damage or break the plastic dome.

APPENDIX B: MOISTURE SEPARATOR (continued)

B2 DRAWINGS & PARTS LIST

Part Number	Description
MT28617	Moisture Separator Assembly



Item	Part Number	Description
1	MT30031	Top Manifold
2	MT30032	Threaded Steel Bar
3	MT30033	Air Deflector
4	MT29435	Filter Element
5	MT30034	Plastic Dome
6	MT30035	Nut
7	MT29436	O-Ring
8	MT30036	Vessel
9	MT30037	Holding Ring
10	MT30085	¼" Male Adaptor
11	MT28619	¼" Ball Valve (Black Handle)
-	MT30276	Strap Wrench Kit, 4” and 6" Diameter For disassembling the Moisture Separator to replace the filter element

NOTES

Appendix C

Elcometer Media Valves

Standard Valve (SV)

APPENDIX C: MEDIA VALVES - SV, GV & AGV

C1 PRODUCT OVERVIEW

Before carrying out any replacement or maintenance of any part of the Abrasive Blast Machine or any item within the Abrasive Blast System, please read and understand Section 1 of this User Guide.

Depressurise the ABM, bleed all the air supply lines to the ABM and disconnect the ABM from the compressor. Failure to do so could cause serious injury or death.

The Elcometer Standard Valve (SV), General Valve (GV) and Automatic General Valve (AGV) can be incorporated within a dry Abrasive Blast System (ABM) to control the flow of dry abrasive media through the valve.

For the SV & GV media valves, the media flow is manually controlled through the turning of the orange knob anti-clockwise or clockwise which opens and closes the valve respectively.

In addition to controlling the amount of media flowing through the valve, the AGV media valve automatically closes the media valve, and hence the flow of abrasive media through the media valve, as soon as the deadman's handle is released.

In this way the AGV prevents media flowing through the valve under gravity and settling at the base of the mixer valve – thereby avoiding any subsequent slug of abrasive flowing down the blast hose to the blast nozzle as soon as the deadman's handle is closed again.

The indicator scale below the orange knob indicates the valve opening position (Fully Open: 100%, Fully Closed: “0%”). For Elcometer Branded Grit Valves.

The Elcometer GV & AGV valve opening position – and hence the media flow rate - can be adjusted either before the ABM is pressurised or whilst the ABM is in use. It is recommended that the Standard Valve (SV) is adjusted when the ABM is powered down.

Note: If the valve opening is to be adjusted whilst the ABM is in use, for added safety of all personnel within the blast area, it is recommended that this is undertaken by the Pot Tender and not the abrasive blaster themselves.

APPENDIX C: MEDIA VALVES - SV, GV & AGV (continued)

The Elcometer Standard Valve (SV), must be used with a Valve Liner which is designed to protect the valve from wear. The valve remains at the selected position during operation and can only be closed manually.

Through use, the valve liner will wear. To maintain the same media flow rate through the valve, the valve opening position may have to be altered as the valve liner wears.

C2 REPLACING THE VALVE LINER

The liner can be replaced without the need to remove the media valve completely from the ABM. Either empty the ABM of all media or, if the ABM is less than half full, carefully tip the ABM on its back, making sure that no abrasive media flows through the exhaust port.

1 Depressurise the abrasive blast machine, bleed all the air supply lines to the ABM and disconnect the ABM from the compressor.
2 If the Shut Off Valve (SOV) is fitted, close the SOV. The SOV is closed when the black handle is at 90° to the SOV body.
3 Loosen, but do not remove the top 4 and bottom 4 flange hex bolts.
4 Loosen, remove and carefully store the 2 valve bolts and washers.
5 Fully loosen, remove and carefully store the top 2 and bottom 2 flange bolts from the same side and carefully remove one half of the media valve body. Set down on a clean surface.

APPENDIX C: MEDIA VALVES - SV, GV & AGV (continued)

6 Remove the old valve liner and fit the new valve liner taking care to ensure that the top and bottom of the valve liner fits in between the flange and the top of the media valve at the top, and in between the media valve and the mixer T at the bottom.
7 Replace the media valve half, making sure that the valve liner is correctly positioned.
8 Re-fit and fully tighten the valve bolts then refit the 4 flange bolts.
9 Fully tighten all 8 flange bolts.
10 If the Shut Off Valve (SOV) is fitted, open the SOV. The SOV is open when the black handle is in line with the SOV body.
11 If the ABM has been laid on its back, re-position the ABM in the correct upright position.
12 Refill the ABM with dry abrasive media.
13 Re-connect the compressed air supply and ensure that all connections are tight throughout the blast system and that all safety pins and whip cords are attached correctly.

C3 REMOVING THE MEDIA VALVE FROM THE ABM

1 Depressurise the abrasive blast machine, bleed all the air supply lines to the ABM and disconnect the ABM from the compressor.
2 If the Shut Off Valve (SOV) is fitted, close the SOV. The SOV is closed when the black handle is at 90° to the SOV body. If the SOV is not fitted, either empty the ABM of all media or, if the ABM is less than half full, carefully tip the ABM on its back, making sure that no abrasive media flows through the exhaust port.
3 If removing the AGV, disconnect the air supply (red hose) from the media valve by unscrewing the coupling from the media valve.
4 Loosen and remove the bottom 4 flange bolts and gently rest the mixer T on the ground.
5 Holding the media valve to avoid it dropping, loosen and remove the top 4 flange bolts and remove the media valve.

APPENDIX C: MEDIA VALVES - SV, GV & AGV (continued)

C4 ELCOMETER SV: DRAWINGS & PARTS LIST

Part Number	Description
MT32042	Standard Valve (SV) -

Technical Specification

Operating Temperature	0ºC to 60ºC (32ºF to 140ºF)
Maximum Working Pressure	12bar (174psi)
Compatible with Models	M40B-G, M100B-G and M200B-G

ELCOMETER SV SPARE PARTS

Item	Part Number	Description
9	GV-LINER1	elcoTOUGH™ Rubber Valve Liner for 1" General Valve
	GV-LINER5	elcoTOUGH™ Rubber Valve Liner for 1" General Valve (x5)
	GV-LINER20	elcoTOUGH™ Rubber Valve Liner for 1" General Valve (x20)

Technical Specification

Operating Temperature	0ºC to 60ºC (32ºF to 140ºF)
Maximum Working Pressure	12bar (174psi)

Elcometer Grit Valves and Automatic Grit Valves can be purchased as an upgrade to this product, please contact your Elcometer distributor for futher details on compatibility.

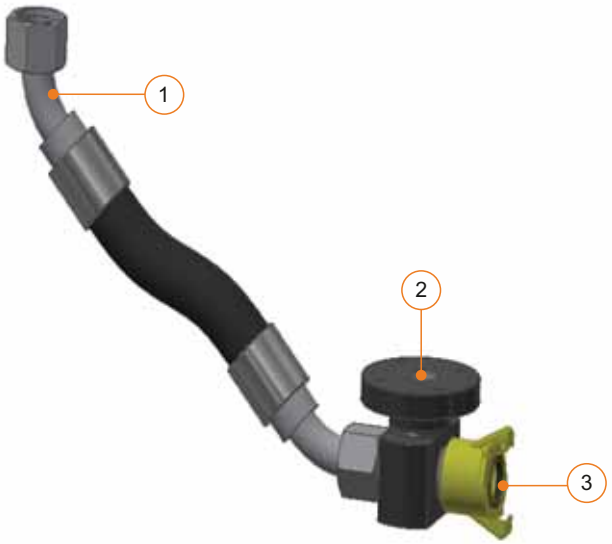
NOTES

APPENDIX C: MEDIA VALVES - GV & AGV (continued)

C5 ELCOMETER: DRAWINGS & PARTS LIST (continued)

ELCOMETER PUSHER LINE SPARE PARTS

Item	Part Number	Description
1	MT32046-1	Elcometer 40 Abrasive Blast Machines
	MT32046-2	Elcometer 100 Abrasive Blast Machines
	MT32046-3	Elcometer 200 Abrasive Blast Machines
2	MT28553	1½” Mixer T
3	MT30002	1½” Pot Claw Coupling



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