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User and Maintenance Manual



MPA *Pneumatic failsafe*

Model MPA-N

Model MPA-1N



ISO 9001 - Certificate N°0238

Translation of the original instructions
EN 130701 REV. 1



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	Date: 2013/07/01	Revision: 1	www.coremo.it

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1. Introduction

The purpose of this manual is to provide the user with all the information necessary to use the product properly, independently and safely.

This manual constitutes an integral part of the safety features and must be read in its entirety before installation and use of the product. It must therefore be kept in a safe place should future reference be necessary before proceeding with any kind of work.

The user is strongly advised to read it carefully and to follow the rules and procedures contained in it as these provide important information concerning safe use and maintenance.

If any doubt should arise concerning the correct interpretation of the instructions, contact our technical department for the necessary clarification.

It is prohibited for anyone to disclose or modify the content of this manual or to use it for personal purposes.

2. Manufacturer

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3. General information

Correct use of the product: In compliance with Italian Legislative Decree 17/2010 and DIRECTIVE 2006/42/EC the operating limits for ideal and safe use of the product are stated in this manual.

Design parameters: COREMO OCMEA caliper brakes have been designed for use in conformity with the performance and conditions stated in the catalogue and Chapter 5.1 of this manual. It is advisable not to exceed these limitations.

Model selection: Selection of the correct model for a given application is of basic importance. The technical department of COREMO OCMEA can provide you with information, suggestions and assistance regarding correct application and use.

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Use: Compliance with the assembly and maintenance instructions prevents not only costly down time but also accidents due to incomplete knowledge of the product.

Rotating parts: The caliper brakes are coupled mainly with rotating parts. In this case the moving parts must be protected in conformity with the requirements of DIRECTIVE 2006/42/EC and Italian Legislative Decree 17/2010 or equivalent legislation in force in the countries in which they are used.

Power source for pneumatic brakes: Use air not contaminated with oil or water and a 25 micron filter with automatic condensation discharge.

Failsafe spring brakes: Failsafe spring brakes must be handled with special care as they contain mechanically preloaded springs. To avoid the risk of accidents during maintenance it is necessary to follow the instructions in this manual and those highlighted in red on the label attached to the brake.


Friction material: All COREMO OCMEA caliper brakes are fitted with friction material which is absolutely free of asbestos and is declared as NON toxic/harmful in full observance of health and environment regulations and laws. In any case it is better not to inhale dust produced by them and to wash hands thoroughly before eating or drinking.

Oils, greases, lubricating components: These are used in extremely limited quantities. Personnel suffering from allergies to these substances are advised to wear gloves or use protective cream which must be washed off thoroughly before eating or drinking.

Product markings: All the data on the plates must always be kept legible. Use the data shown on the plates when contacting the manufacturer for spare parts, information or assistance for example.


Disposal: Worn brake lining pads and other materials of which brakes are made are classified as special NON toxic/harmful products and therefore must be disposed of in accordance with the laws in force in the countries in which they are used.

4. Warnings

	<p>Failure to follow the instructions in this manual and on any plates attached to the product exposes persons to risks and may cause damage to other equipment and machinery.</p>
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- The product must not be used at an ambient temperature lower than -20 °C.
- The disc must be made of iron alloy (cast iron or steel) having a hardness in the range 190 to 220 HB.

The technical department of COREMO OCMEA can provide additional information in order to ensure correct application and use of the product.

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Dangers caused by a power failure: A power failure will cause the brake to be applied suddenly. It is therefore necessary to provide an uninterrupted power supply or, if the case requires, use suitable power failure warning systems as a brake failure may cause personal injury and damage to property.

Danger of breakage during operation: To reduce the risk of breakage during operation carry out the periodic inspections shown in this manual.

Risks connected with changes in operating conditions: The product is designed for the purposes stated in this user and maintenance manual therefore the minimum power supply pressure necessary to allow the brake to open and the maximum pressure required for the brake to work safely and reliably are indicated. The operating conditions also vary depending on the diameter of the brake disc used; this manual contains an equation to calculate the dynamic torque provided as a function of the disc diameter. Please note that an erroneous calculation may result in a braking torque different to the desired value which could compromise aspects of safety.

Residual risk: Residual risk can be attributed to the operator not following all the procedures stated in the user and maintenance manual and not giving due consideration to the warnings.

5. Technical data

5.1. Product performance

The failsafe brake is to be used for emergency stops or holding stops.




Use of the product for any purpose other than those indicated may represent a risk to any aspect of safety.

The type “MPA” failsafe caliper brakes are different basically due to the dimension of the pneumatic actuator (MPA-N and MPA-1N); the table below shows the tangential force for each brake type considering a coefficient of friction of 0.4

Warning: The value of the friction coefficient is purely theoretical as it depends on environmental conditions and on how the product is used.

TYPE	Tangential Force
MPA-N	970 N
MPA-1N	2750 N

The table shows the values obtained with 3 springs for a MPA-N brake and with 4 springs for a MPA-1N brake. To open the pneumatic brake a minimum supply pressure of 4.5 bar is necessary.

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- **Dynamic torque**

The dynamic torque provided by the brake will be a function of the diameter of the disc used for each single type of product and can be determined using the following equation:

$$\text{Dynamic torque [Nm]} = \text{Tangential force [N]} \times (\text{radius of the disc [m]} - 0,024)$$



An error in calculation will result in a braking torque different to the desired value and a risk to aspects of safety.
 The technical department of COREMO OCMEA can provide information, suggestions and assistance for correct application and use of the product.

5.2. Brake lining wear



The thickness of each single new lining is 5 mm. A maximum overall lining wear of 6 mm is allowed. Failure to remain within the above limit may represent a risk to aspects of safety.

5.3. Special note

During braking kinetic energy is converted into heat caused by friction between the surfaces of the brake linings and the brake disc. It is therefore fundamentally important to consider the amount of heat that can be dissipated.




Ignoring the heat produced during braking affects brake lining wear and may jeopardize the safety of the operators and the reliability of the product. Since a brake can be used for many applications, it is advisable to contact the technical department of COREMO OCMEA for further explanation in this regard.

6. Transport and storage



Personnel assigned to this work must wear suitable PPE such as gloves, safety footwear and take any other precautions necessary before proceeding with transport, handling and storage of the this part.

1. **Transport:** When handling it is important to bear in mind the dimensions and weight of each single type of product as shown in the product drawing enclosed with this manual and in the catalogue of the brake type in question.

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2. **Storage:** When storing brakes it is important to bear in mind that a considerable weight is concentrated in a small space. Personnel assigned to this work must wear suitable PPE (safety footwear, gloves, etc.) in order to avoid the risk of injury.

7. Installation



THE BRAKE MUST BE INSTALLED WITH THE MACHINE OFF.

Personnel assigned to this work must wear suitable PPE such as gloves, safety footwear and take any other appropriate precautions to ensure adequate protection and avoid the risk of injury.

1. Mount the brake on a rigid flat surface of the machine or on a support capable of withstanding a certain tangential force as shown in Table 1.

Tangential force	Brake model
1067 N	MPA-N
3025 N	MPA-1N

Table 1

2. The brake must be mounted in a horizontal position as shown in Figure 1 so that the weight of the thruster does not bear on the levers.

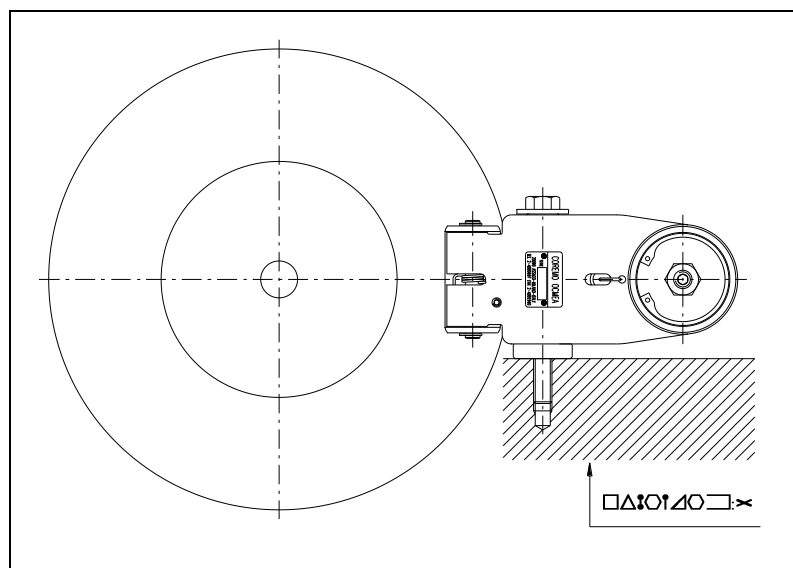



Figure 1

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3. Connect the thruster piston of the brake to the power line using a 1/4" gas fitting and a flexible hose of sufficient length to allow the thruster a wide range of movement.
4. The control pressure must not exceed 6 bar or drop below 4.5 bar to ensure that the brakes always open completely. The air must not be contaminated with oil or water, therefore a 25 micron filter with automatic condensate discharge should be used.
5. Anchor the brake to the supporting base using 1 class 8.8 M10 screws and a tightening torque of 45 Nm.
6. Power up the thruster and substitute the safety screw TE with the grub screw C61589 complete with nut C61608 for MPA-N brake or with the grub screw C61587 complete with nut C61598 for MPA-1N brake. Adjust the play between the brake linings using the grub screw C61589 rotating it in the appropriate direction with a n. 5 or C61587 rotating it in the appropriate direction with a n. 8 until the optimal play of 1 mm is obtained between the disc and each brake lining.
7. Adjust the brake shoes using the grub screw C61726 rotating it in the appropriate direction with a n. 2 Allen key; the friction surface of the brake linings must be parallel to the surface of the disc (Figure 2) with a play of 1mm.

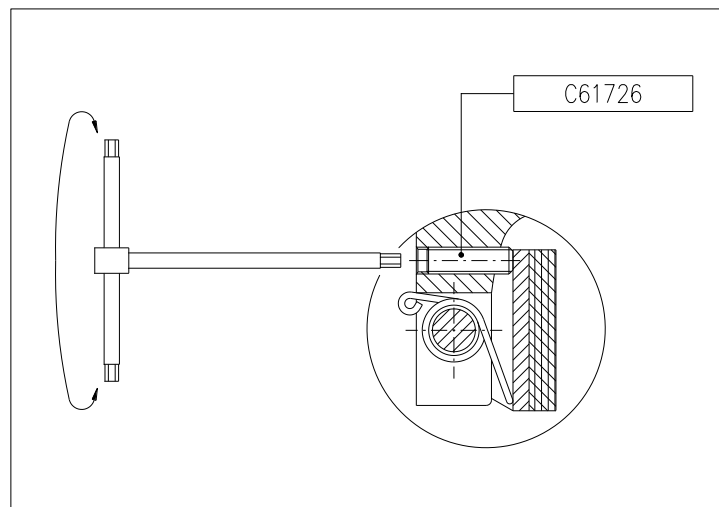



Figure 2

	<p>Do not apply the brake without the disc positioned between the brake linings; failure to follow this rule could result in fingers being crushed and other dangers in addition to damage to the brake itself.</p>
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8. **BEDDING-IN:** The initial braking torque may be from 30% to 50% less than the rated value until the brake lining adjusts to the disc.

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8. Operation

8.1. Power supply of the safety component

The control pressure must not exceed 6 bar or drop below 4.5 bar to ensure that the brakes always open completely.

The technical department of COREMO OCMEA can provide information, suggestions and assistance for correct application and use of the brake.

8.2. Improper use

The products considered here must be used exclusively as described in Chapter 5 of this manual. Any other use is to be considered improper. The manufacturer declines all responsibility for damage caused by erroneous or unreasonable use of the product.



Use of the product for purposes other than those stated in this manual may compromise any aspect of safety.

9. Maintenance and cleaning



ALL TYPES OF WORK ON THE BRAKE MUST BE DONE WITH THE MACHINE OFF.


Staff assigned to this work must wear suitable PPE such as gloves and safety footwear and take any further precautions necessary to ensure adequate protection and prevent injury. Failure to follow the instructions given for maintenance and cleaning of the product may compromise personal safety and cause damage to equipment and machinery.



High temperatures may be produced after braking on the surfaces of the disc brake and the brake linings. Personnel must therefore wait for parts subject to overheating to cool down and wear suitable protective gloves and PPE.

9.1. Readjusting the play

Supply the thruster with a minimum pressure of 4.5 bar and maximum of 6 bar. This is necessary to keep the brake open.

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1. Loosen the nut C61608 for MPA-N brake or C61598 for MPA-1N brake, rotate the grub screw C61589 for MPA-N brake or C61587 for MPA-1N brake in the clockwise direction, until an optimal play of 1 mm is obtained between the disc and each brake lining.
2. Lock the nut C61608 (MPA-N), or C61598 (MPA-1N).

9.2. Changing the lining pads

Power up the thruster to open the brake.

1. Remove the seeger rings C62145 fixed to the articulation pin of the brake shoe.
2. Pull out the pin C62140.
3. Remove the pad with the worn lining, replace it with new one and reassemble following the sequence in point 2 and 1 in reverse order.
4. Repeat for both pads.
5. Readjust the play between the disc and lining as described in Chapter 9.1.

9.3. Cleaning the friction surfaces

1. Remove the lining pads as described in Chapter 9.2.
2. Remove any oil or grease from the surface of the disc using a non-pollutant detergent.



Personnel suffering from allergies to used substances are advised to wear gloves or use protective cream which must be washed off thoroughly before eating or drinking.

3. If the lining pads are contaminated only superficially it is better to clean them using fine emery cloth. If the contamination of the linings is deep or at the maximum wear limit as indicated in Chapter 5.2 and stated in the catalogue, replace them with new linings.

9.4. Changing the thruster springs


1. Power up the thruster.
2. Unscrew the ring nuts C61133 and remove the thruster from the brake.
3. Cut off the pressure to the thruster and disconnect the power line.

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4. Completely loosen the nut C61608 and rotate the grub screw C61589 until the tension in the spring is completely released.
5. Remove the seeger ring C61301 and the plates C61014 and C61013.

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6. Completely loosen the nut C61598 and rotate the grub screw C61587 until the tension in the springs is completely released.
7. Remove the seeger ring C61304 and the plates C62082 and C62081

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Take the utmost care in these operations as the thrusters contain preloaded springs. Therefore proceed gradually with the utmost care and attention until they are completely released and no longer represent a threat to safety.

8. Replace all the springs including those which seem to be in good condition.
9. Put back the two plates, seeger ring, grub screw and the nut.
10. Reconnect the flexible hose and power up the thruster.
11. Remount the thruster on the brake.
12. Readjust the play between the disc and the lining as described in Chapter 9.1.
13. Apply the brake a number of times to ensure that the internal thruster slides perfectly and check for any air leaks.

9.5. Changing the gaskets


1. Follow the instructions from point 1 to point 7 of Chapter 9. 4.
2. Remove the internal thruster D71004 (MPA-N), Z50230 (MPA-1N), the damaged gaskets and replace them with new ones. Before placing the new gaskets in their seats, lubricate with lithium soap grease, mineral oil and solid lubricants. Grease the thruster stem too before mounting.
3. Insert the internal thruster D71004 (MPA-N), Z50230 (MPA-1N), and follow the procedure from point 9 to 13 of Chapter 9.4.

9.6. Changing the brake shoe alignment springs

1. Power up the thruster.
2. Remove the seeger rings C62145, the pin C62140 and remove the brake shoe Z50261 also.
3. Remove the shoe alignment spring C62141 from its seat and replace it with a new one.
4. Remount the brake shoe following the procedure in point 2 in reverse.
5. Readjust the play between the disc and the lining as described in Chapter 9.1.

9.7. Changing the lever balance springs

1. Power up the thruster.
2. Unscrew the ring nuts C61133 and remove the thruster.
3. Bring the two levers close to each other, remove the spring between the levers C62142 and replace it with new one.
4. Reassemble the brake following the sequence in point 2 and 1 in reverse order.
5. Readjust the play between the disc and lining as described in Chapter 9.1.

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9.8. Periodic maintenance



All inspections must be done with the machine switched off.

Although the intervals between these inspections depend on the frequency of use of the brake, they should be done every 3 months in any case so as not to compromise all aspects of safety.

1. Check the play between each lining pad and the friction disc and reset it to the distance as indicated in Chapter 9.1. When the wear of each lining reaches 3 mm replace it as described in Chapter 9.2.
2. Check that the surfaces of the linings and the disc are not contaminated with grease, oil or similar substances because these prevent the brake from working effectively.
3. Check that the anchoring screws of the brake and the brake units are correctly tightened.
4. Check the condition of the flexible hoses.
5. Apply the brake a number of times to check the condition of the gaskets, the operation of the springs and correct sliding of the stem.

10. Spare parts list

To avoid costly down time we recommend keeping a stock of spare parts adequate for the number of brakes as listed below:

Lining pads:	Cod. N° Z50261	
Thruster springs:	Cod. N° C61012	MPA-N brake
	Cod. N° C61948	MPA-1N brake
Shoe alignment springs:	Cod. N° C62141	
Lever balance springs:	Cod. N° C61039	
Gaskets:	Cod. N° C61721-C61129	MPA-N brake
	Cod. N° C62083-C61129	MPA-1N brake

These spare parts must be kept in a place that is preferably dark, cool and far from substances that could reduce their functionality.