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User and Maintenance Manual

Standard Ventilated Clutches

VS

ISO 9001 - Certificate N°0238

Translation of the original instructions
EN 130701 REV. 1

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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 product 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: The "VS" clutches of COREMO OCMEA has been designed to operate in compliance 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.

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: 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: Use air not contaminated with oil or water and a 25 micron filter with automatic condensation discharge.

Friction material: "VS" clutches of COREMO OCMEA 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.

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 friction materials and other materials of "VS" clutch units 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

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.

The product must not be used at an ambient temperature lower than -20 °C.

If the temperature should rise above 100°C check the efficiency of the air chamber since in these conditions it is more subject to rapid aging or carbonization.

Checks for correct use: Check that there are no infiltrations of oil, grease or other lubricants between the brake linings and discs of the product and check the wear of the working surfaces with a frequency that depends on the way the product is used. It is advisable to contact the Technical Department of COREMO OCMEA for further explanations in this regard. If necessary clean the surfaces with fine sand paper or wash with a degreasing solution.

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: "VS" clutches are designed for the purposes stated in this user and maintenance manual, therefore the minimum and maximum feed pressure are indicated for each product type in order to ensure safe reliable use.

Bedding in: The initial dynamic torque may vary from 30% to 50% of the rated value until the brake lining beds into the disc**.**

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

A clutch is a removable mechanical transmission device for transmitting power between a self-propelled machinery/shaft and a recipient machinery/shaft.

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

The "VS" clutches differ basically in their dimensions, values of dynamic torque and maximum speeds allowed, the following table contains the dynamic torques and the maximum speeds allowed for each single type of clutch, if powered at 6 bar, 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	Dynamic torque [Nm]	Maximum speed [min^{-1}]
115 VS	360	1800
215 VS	720	1800
315 VS	1080	1800
108 VS	900	1750
208 VS	1800	1750
308 VS	2700	1750
125 VS	900	1750
225 VS	1800	1750
325 VS	2700	1750
111 VS	2200	1400
211 VS	4400	1400
311 VS	6600	1400
130 VS	2600	1300
230 VS	5200	1300
330 VS	7800	1300
114 VS	5300	1200
214 VS	10600	1200
314 VS	15900	1200
218 VS	13000	1000
318 VS	19500	1000
224 VS	32000	900
324 VS	48000	900

Caution: The initial dynamic torque may vary from 30% to 50% of the rated value until the brake lining beds into the disc.

5.2. Special note

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

Ignoring the heat produced during engaging affects lining wear and may jeopardize the safety of the operators and the reliability of the product. Since the unit 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 unit.

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.
2. **Storage**: When storing the unit 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 UNIT 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.

As regards the mounting of the “VS” clutch you will find two different methods of installation below depending on whether the motion is to be transmitted through a pulley.

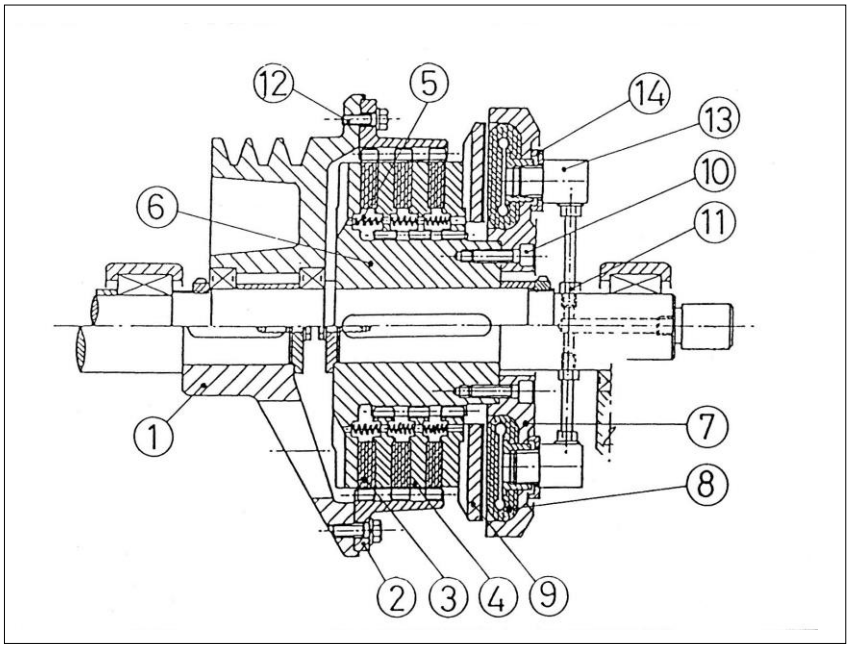


Figure 1 - Assembly diagram

7.1. Installation of the shaft/shaft

1. Position the clutch unit without the drive ring (2) on the shaft of the machine and lock the hub/disc axially (6).
2. Insert the adapter of the machine (1) with the drive ring (2), unlocked, on the second shaft.
3. Align the shafts in the correct position, making sure that the teeth of the lining discs (3) are correctly housed in the toothing of the drive ring (2) and slide freely in it.
4. Lock the drive ring (2) to the adapter of the machine using relative screws (12) tightening as indicated in Table 1.

TYPE	M4	M5	M6	M8	M10	M12	M14	M16	M18
Torque [Nm]	3	6	10	25	50	85	140	210	280

Table 1

5. Mount the rotating joint (which can be supplied on request) on the shaft of the machine.
6. Connect the connections of the air tube (8) to the shaft on which the rotating joint is mounted using the airtight fittings and hoses of the right length (11).
7. Connect the rotating joint using a flexible hose of the right length to the compressed air feed line.
8. Make sure that the control pressure does not exceed 6 bar. To check the air pressure place a pressure gauge on the air delivery near the rotating joint. Since the air must not be

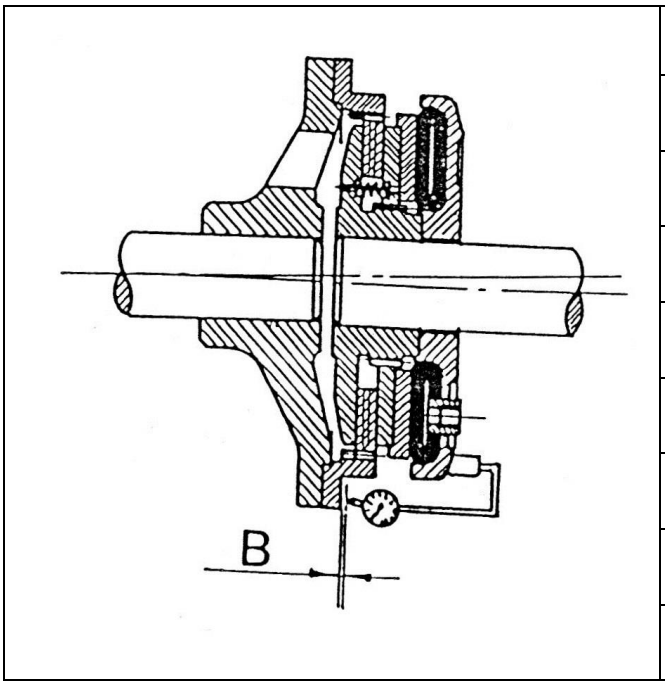
contaminated with oil, water or other impurities use a 25 micron filter with automatic condensate discharge.

9. Even though the clutch is correctly registered before dispatch from the COREMO plant, check that there is the correct play between the discs as shown in Table 2 before starting the machine.
   The data shown in the table concern the play, taken as the axial sliding of the discs. The expansion capacity of the air tube due to wear of the linings increases the play values shown considerably; obviously the times for engaging increase as a consequence. Play values lower than those shown may cause residual torque and anomalous increase in the operating temperature.

TYPE	PLAY [mm]	Maximum excursion of the air tube
115 VS	1	8
215 VS	2	8
315 VS	2	8
108 VS	1,5	10
208 VS	2,5	10
308 VS	2,5	10
125 VS	1,5	10
225 VS	3	10
325 VS	3	10
111 VS	2	12
211 VS	3	12
311 VS	3	12
130 VS	2	12
230 VS	3	12
330 VS	4	12
114 VS	2	14
214 VS	3,5	14
314 VS	5	14
218 VS	4	14
318 VS	6	14
224 VS	4	14
324 VS	6	14

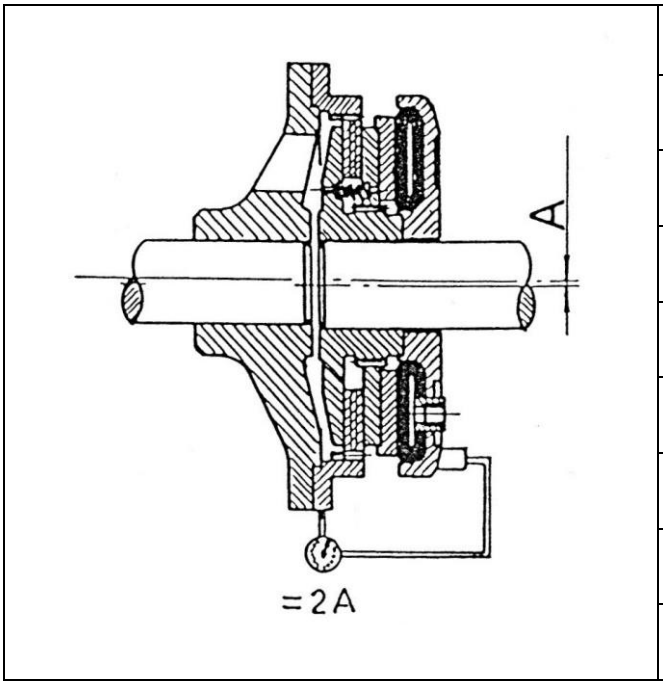
Table 2

10. Use a dial gauge to check that the play limits for angular (Table 3) and parallel (Table 4) misalignment are not exceeded.



TYPE	A [mm]
1/2/315 VS	0,08
1/2/308 VS	0,10
1/2/325 VS	0,10
1/2/311 VS	0,16
1/2/330 VS	0,16
1/2/314 VS	0,18
2/318 VS	0,21
2/324 VS	0,30

Table 3 - Angular misalignment



TYPE	A [mm]
1/2/315 VS	0,08
1/2/308 VS	0,10
1/2/325 VS	0,10
1/2/311 VS	0,16
1/2/330 VS	0,16
1/2/314 VS	0,18
2/318 VS	0,21
2/324 VS	0,30

Table 4 - Parallel misalignment

7.2. Assembly with pulley

1. Flange the drive ring (2) to the pulley already mounted on the shaft of the machine using the relative screws.
2. Position the clutch unit on the shaft of the machine, making sure that the teeth of the lining discs (3) are correctly positioned in the toothing of the drive ring (2) and that they slide freely in it.
3. Lock the hub/disc axially.
4. Mount the rotating joint (which can be supplied on request) on the shaft of the machine.
5. Connect the connections of the air tube (8) to the shaft on which the rotating joint is mounted using airtight fittings and flexible hoses of suitable length (11).
6. Connect the rotating joint using a flexible hose of length suitable for the air feed line.
7. Make sure that the control pressure does not exceed 6 bar. To check the air pressure place a pressure gauge on the air delivery near the rotating joint. Since the air must not be contaminated with oil, water or other impurities use a 25 micron filter with automatic condensate discharge.
8. Even though the clutch is correctly registered before dispatch from the COREMO plant, check that there is the correct play between the discs as shown in Table 2 before starting the machine. The data shown in the table concern the play, taken as the axial sliding of the discs. The expansion capacity of the air tube due to wear of the linings increases the play values shown considerably; obviously the times for engaging increase as a consequence. Play values lower than those shown may cause residual torque and anomalous increase in the operating temperature.
9. Use a dial gauge to check that the play limits for angular (Table 3) and parallel (Table 4) misalignment are not exceeded.

8. Operation

8.1. Power supply

The control pressure for “VS” clutches must not exceed 6 bar.
An erroneous power supply pressure will result in a dynamic torque different from the value indicated in this Manual and the Technical Department of COREMO OCMEA can provide information, suggestions and cooperation for correct application and use of the product.
As regards the methods of connection to the air feed line, Table 5 contains the configuration (C1, C2 or C3) to use depending on the type of clutch being used.

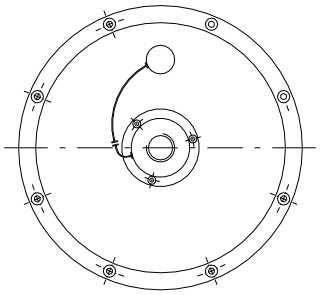
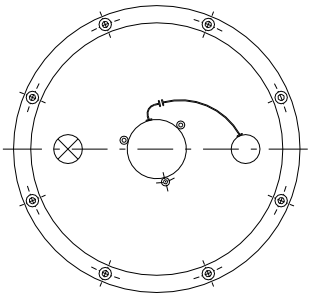
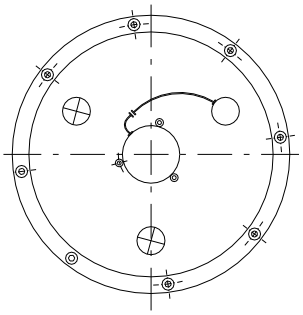
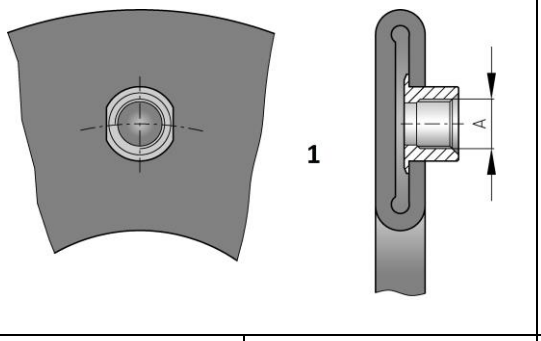
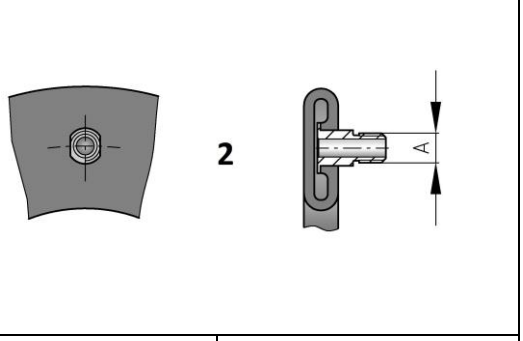
 **C1**	 **C2**	 **C3**
1/2/315 VS	1/2/308 VS	1/2/314 VS
	1/2/325 VS	2/318 VS
	1/2/311 VS	2/324 VS
	1/2/330 VS	

Table 5 – Supply configuration

For the number and dimensions of the connections of the air tubes consult Table 6.

 **1**	 **2**

TYPE	QUANTITY	AIR INLET A	CONNECTION
1/2/315 VS	1	1/8'' gas	2
1/2/308 VS	2	1/2'' gas	1
1/2/325 VS	1-2	1/2'' gas	1
1/2/311 VS	2	1/2'' gas	1
1/2/330 VS	2	1/2'' gas	1
1/2/314 VS	3	1/2'' gas	1
2/318 VS	3	1/2'' gas	1
2/324 VS	3	1/2'' gas	1

Table 6 – Air chamber connection

8.2. Uses not allowed

The units dealt with here must be used exclusively for the uses described in this Manual as indicated in Chapter 5. All other uses are to be considered as improper. The manufacturer declines all responsibility for damage caused by erroneous or unreasonable use of the unit.

9. Maintenance and cleaning

ALL TYPES OF WORK ON THE PRODUCT 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.

9.1. Replacement of the lining discs and the springs

When the axial sliding of the discs shown in Table 2 is no longer guaranteed, it is necessary to replace the lining discs following the procedure below.

1. Cut off the air from the circuit and remove the compressed air connections from the clutch.
2. Remove the clutch from the machine.
3. Remove the clutch unit from the drive ring (2).
4. Unscrew the screws (10), remove the cover (7) and the air tube (8).
5. Remove the disc thruster unit (9), the cylindrical pins if present, and one or more internal toothed discs (4) depending on the clutch type.
6. Remove all the springs and the lining discs.
7. Reassemble following the procedure in the points above in reverse order replacing the springs and the lining discs.
8. Check that the play between the lining disc and the internal toothed ring conforms to the content of Table 2.
9. Check the angular and parallel misalignment as explained in point 10 of Chapter 7.1.

9.2. Replacement of the air tube

1. Cut off the air from the circuit and remove the compressed air connection from the clutch.
2. Remove the clutch from the machine.
3. Remove the clutch unit from the drive ring (2).
4. Unscrew and remove the screws (10), remove the cover (7)
5. Remove and replace the air tube (8) making sure that the springs remain positioned correctly in their seats.
6. Reassemble following the procedure in the points above in reverse order.
7. Check that the play between the lining disc and the internal toothed ring conforms to the content of Table 2.
8. Check the angular and parallel misalignment as explained in point 10 of Chapter 7.1.

9.3. Periodic maintenance

All inspections must be done with the machine switched off.
Even if the frequency of these operations depends on the frequency with which the brake/clutch unit is used, it is necessary to do them every three months in any case in order not to compromise safety aspects.

1. Check that the play between the lining disc and the internal toothed ring conforms to the content of Table 2. If the play found is higher replace the discs and the springs as explained in Chapter 9.1.
2. Check that the surface of the friction discs and discs are free of grease, oil or similar substances, as these prevent the brake or the clutch from working properly.
3. Check that the anchor screws of the brake or the clutch unit are tightened correctly.
4. Check the condition of the flexible hoses.
5. Engage the clutch a number of times to check that it is working properly.

10. List of spare parts

To avoid costly downtime we recommend keeping a stock, adequate in quantity for the number of clutch units in service, of the following spare parts:

- Air chamber (8)
- Friction discs (3)
- Central discs (4)
- Springs (5)

These spare parts must be kept in a dark cool place if possible and far from substances that could damage their ability to perform correctly.
On request “VS” clutches can be supplied with the following:

- Air supply kit with fittings and pipes
- Air supply kit with dump valves + pipes