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INTRODUCTION

1. Assembly instruction manual

The purpose of this Assembly Instruction Manual is an integral part of the documentation and has been developed to provide all necessary information regarding:

- the correct assembly of the partly completed machinery.
- detailed insights into its operation and limitations.

The heads of the organizational units where the partly completed machinery is to be integrated are required, in accordance with current regulations, to carefully review the contents of this Instruction Manual and to ensure it is consulted by the personnel assigned to assembly. The time dedicated to this activity constitutes a necessary investment to ensure the correct operation of the system and its use under safe conditions.

This document assumes that, in the target plants where the partly completed machinery is installed, the current regulatory provisions regarding occupational health and safety are strictly applied.

The instructions contained in this Manual are technical and confidential in nature and constitute the exclusive property of the manufacturer. Therefore, reproduction, even partial, as well as any form of duplication or distribution, total or partial, by any means, is expressly prohibited.

The customer is also required to ensure that, should this document be subject to subsequent modifications by the manufacturer, the updated versions of the Manual are available and effectively used at the points of use, with the subsequent obligation to replace any obsolete versions.

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2. How to use the instruction manual

The Manual is divided into independent chapters and is intended for the assemblers, for whom the skills required to operate the partly completed machinery under safe conditions have been defined. The Instruction Manual consists of a cover and a table of contents with a series of chapters. The page header contains the Instruction Manual revision for the issuance of the entire document, along with the revision level. The units of measurement are those defined by the International System (IS).

3. Preservation of the Instruction Manual

The Instruction Manual must be kept with due diligence and must accompany the partly completed machinery during any transfer of ownership that it may undergo during its life cycle.

Proper preservation of the document must be ensured through appropriate handling, with clean hands and by avoiding contact with contaminated or unsuitable surfaces.

It is prohibited to remove, tear, or modify, even partially and without authorization, any section of the Manual.

The Manual must be stored in a suitable environment, protected from humidity and heat sources, and kept in the immediate vicinity of the partly completed machinery to which it refers.

The manufacturer, upon specific request from the user, may provide additional copies of the Instruction Manual for the partly completed machinery.

4. Instruction Manual Update Criteria

The manufacturer reserves the right to make design changes and improvements to the partly completed machinery without the obligation of prior notice to customers, nor the consequent update of the Manual already delivered to the user.

Should modifications to the partly completed machinery installed at the customer's site be agreed upon with the manufacturer, such that they involve the update of one or more chapters of the Instruction Manual, the manufacturer will provide the documentation holders with only the sections affected by the modification, along with the issuance of the corresponding new global revision level of the Manual.

In any case, the user is responsible for complying with the provisions contained in the updated documentation and for replacing all existing copies with those of the new revision.

The manufacturer assumes responsibility for the descriptions provided in Italian; any translations cannot be fully verified; therefore, if an inconsistency is detected, attention should be paid to the Italian language, and the manufacturer's office may be contacted to perform the modification deemed appropriate.

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5. Who is this manual for?

This Manual is intended for assemblers and personnel responsible for the maintenance activities of the partly completed machinery.

For the purposes of this document, "operator" refers to any person in charge of the assembly and/or maintenance activities of the partly completed machinery.

"Qualified personnel" or "qualified operator" refers to the individual(s) who have acquired specific professional training through specialization courses, technical training, and/or documented experience in the field of assembly and maintenance of the partly completed machinery.

Target Audience Qualifications

The partly completed machinery is intended for exclusively industrial and professional use, consequently excluding applications of a generalized or non-specialized nature. Use is therefore reserved for qualified personnel who cumulatively satisfy the following requirements:

• be of legal age;

• are suitable, from a physical and psychological standpoint, to perform technically complex activities;

• have received adequate training regarding the assembly of the partly completed machinery;

• have received adequate training regarding the maintenance of the partly completed machinery;

• have been formally deemed suitable by the employer to perform the assigned tasks;

• possess the technical skills necessary for the assembly of the specific type of equipment;

• have adequate knowledge and familiarity with the applicable and relevant regulations.

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PARTLY COMPLETED MACHINERY DESCRIPTION

1. Positive toothed electromagnetic clutches with rotating body

1.1. Operating principle

The positive electromagnetic friction clutch is a partly completed machinery intended for the controlled transmission and/or interruption of motion between two rotating components, by means of an electromagnetic field generated by an electrically powered winding.

In rest conditions (absence of electrical power), the friction elements of the clutch are decoupled or not engaged with each other, preventing the transmission of torque between the drive shaft and the driven shaft, depending on the construction configuration (dry or in an oil bath, tension or compression).

Upon activation of the electrical circuit, the coil generates a magnetic field that attracts the moving element (armature or anchor disc), resulting in contact between the friction surfaces. This contact generates a controlled friction force that allows the progressive transmission of the driving torque from the input shaft to the output shaft.

The transmission of torque occurs due to the friction adhesion between the contact surfaces, proportionally to the compression force induced by the electromagnetic field.

When the electrical power ceases, the magnetic field is canceled and, due to return springs or equivalent elastic forces, the friction elements separate, restoring the decoupled condition and interrupting the transmission of motion.

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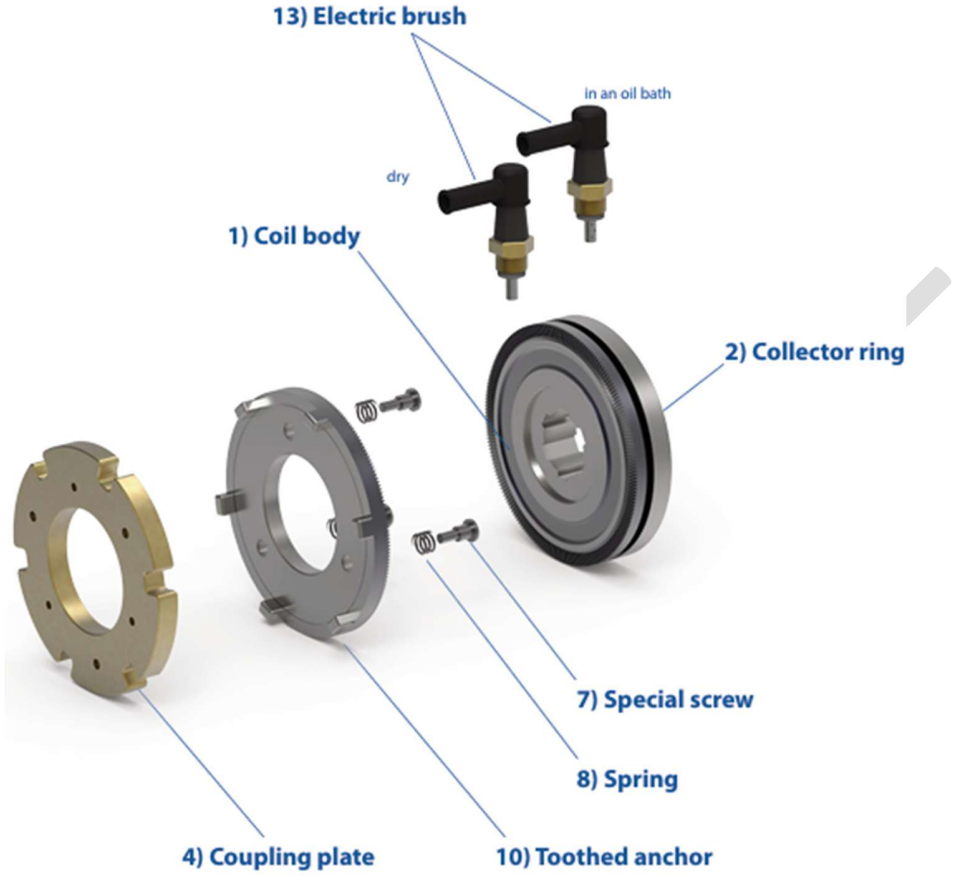
1.2. Main components

Positive toothed electromagnetic clutches with rotating body are composed of a toothed coil body, a slip ring, a coupling plate, a toothed anchor, springs, screws, and an electric brush:



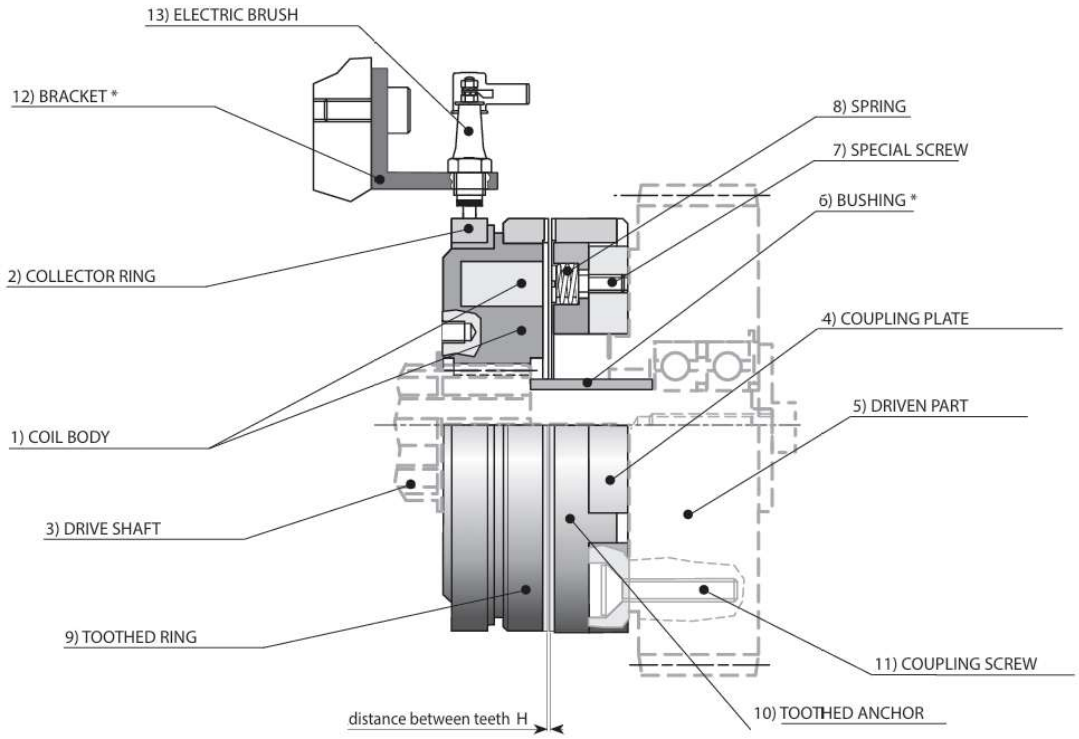
1.3. Environmental conditions

Positive toothed electromagnetic clutches with rotating body contain rubber seals in the brush holder, which may generate toxic gases in the event of a fire. For firefighting personnel in small environments, the use of gas masks is recommended.

1.4. Maintenance

Maintenance status of positive electromagnetic friction clutches with rotating body:

Toothed anchor – toothed ring distance adjustment, dimension "H"



Verify that the distance H between the toothed anchor (10) and the toothed ring (9) is as shown in the following table:

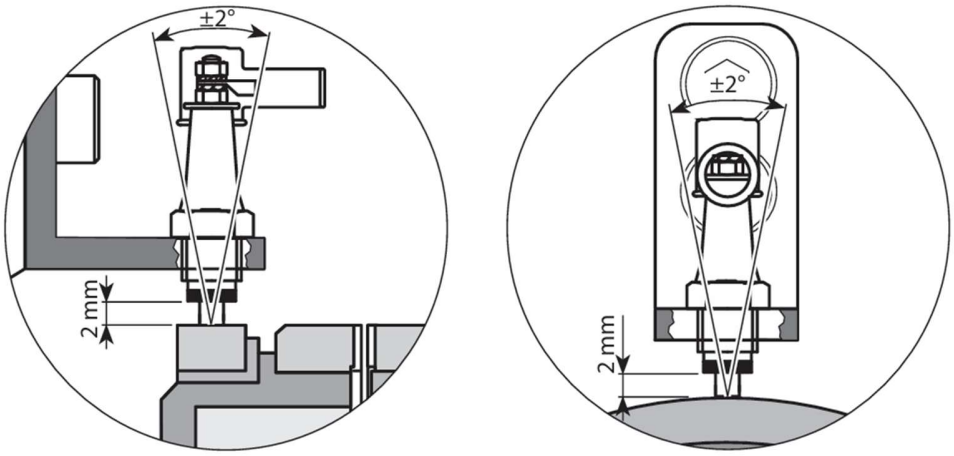
Size	Distance H [mm]
70 ÷ 82	0.3
95 ÷ 258	0.4

If this distance is less than the value indicated in the table, increase the length of the bushing (6) by the difference found.

If this distance is more than the value indicated in the table, decrease the length of the bushing (6) by the difference found.

Check the distance at each maintenance operation.

Brush adjustment



• Verify that the positioning of the support bracket places the brush within 2° of perpendicularity from the slip ring in all directions.

• Position the brush and screw it in fully so that, in the working position, there is a distance of 2mm between the brush body and the slip ring.

Troubleshooting

Issue	Cause	Solution
Clutch not engaging when powered	Coil not receiving power	Check the power supply connection
	Distance “H” too wide	Adjust distance “H” again
	Damaged coil	Replace the coil body (1)
	Damaged brush	Replace brush
	(OIL BATH ONLY) Damaged slip ring	Replace entire clutch
Clutch not disengaging when unpowered	Springs not returning the anchor	Check the state of the springs (8)
	Anchor not sliding	Check that the toothed anchor (10) slides freely along the coupling plate (4)

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2. Positive toothed electromagnetic clutches with fixed body

2.1. Operating principle

The positive toothed electromagnetic clutch with fixed body is a partly completed machinery designed for the controlled transmission and/or interruption of motion between two rotating components, by utilizing an electromagnetic field generated by an electrically powered winding.

In rest conditions (absence of electrical supply), the friction elements of the clutch are decoupled or not engaged, preventing the transmission of torque between the drive shaft and the driven shaft, depending on the construction configuration (dry or oil bath, tension or compression).

Upon activation of the electrical circuit, the coil generates a magnetic field that attracts the moving element (armature or anchor disc), establishing contact between the friction surfaces. This contact generates a controlled friction force that allows for the progressive transmission of the driving torque from the input shaft to the output shaft.

Torque transmission thus occurs through frictional adhesion between the contact surfaces, proportional to the compression force induced by the electromagnetic field.

When the electrical supply ceases, the magnetic field is canceled, and, due to return springs or equivalent elastic forces, the friction elements separate, restoring the decoupled condition and interrupting the transmission of motion.

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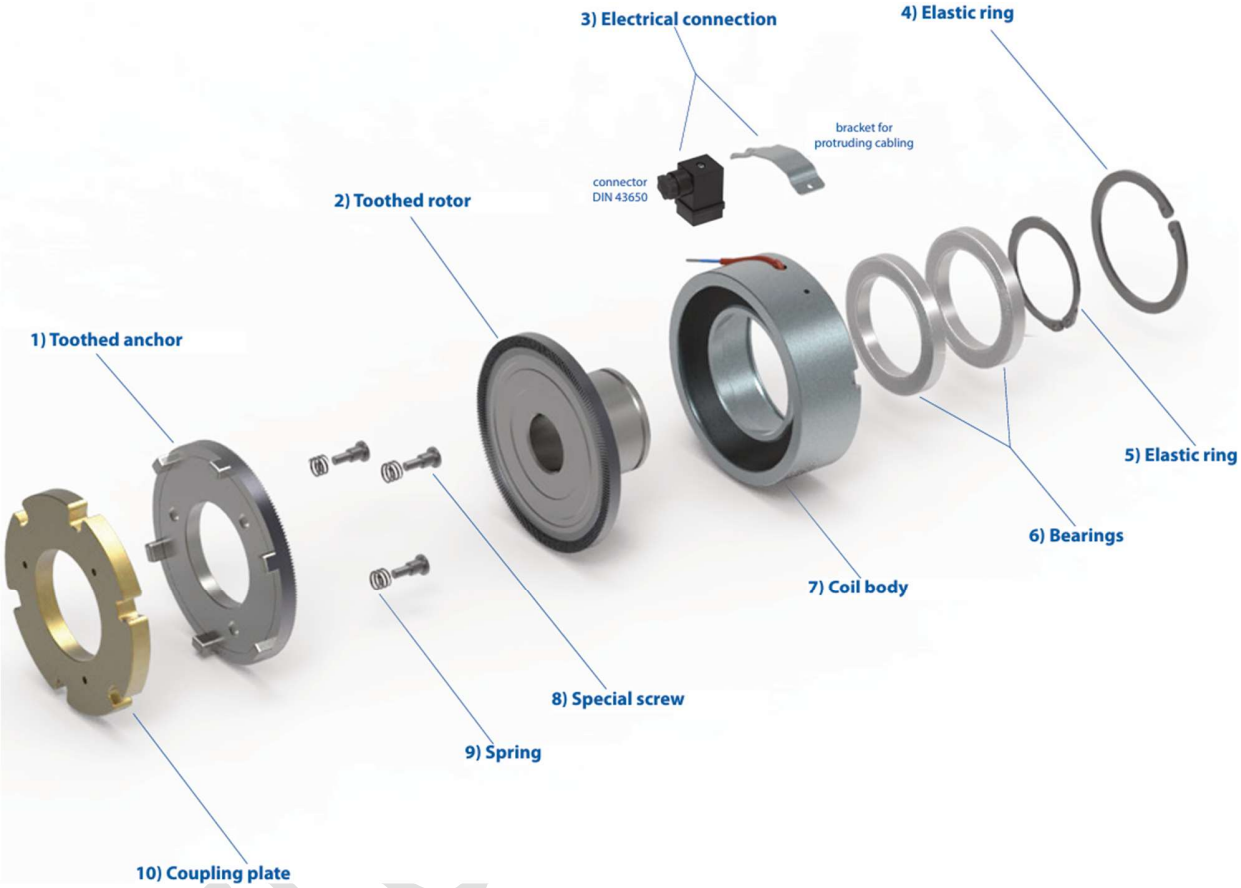
2.2. Main components

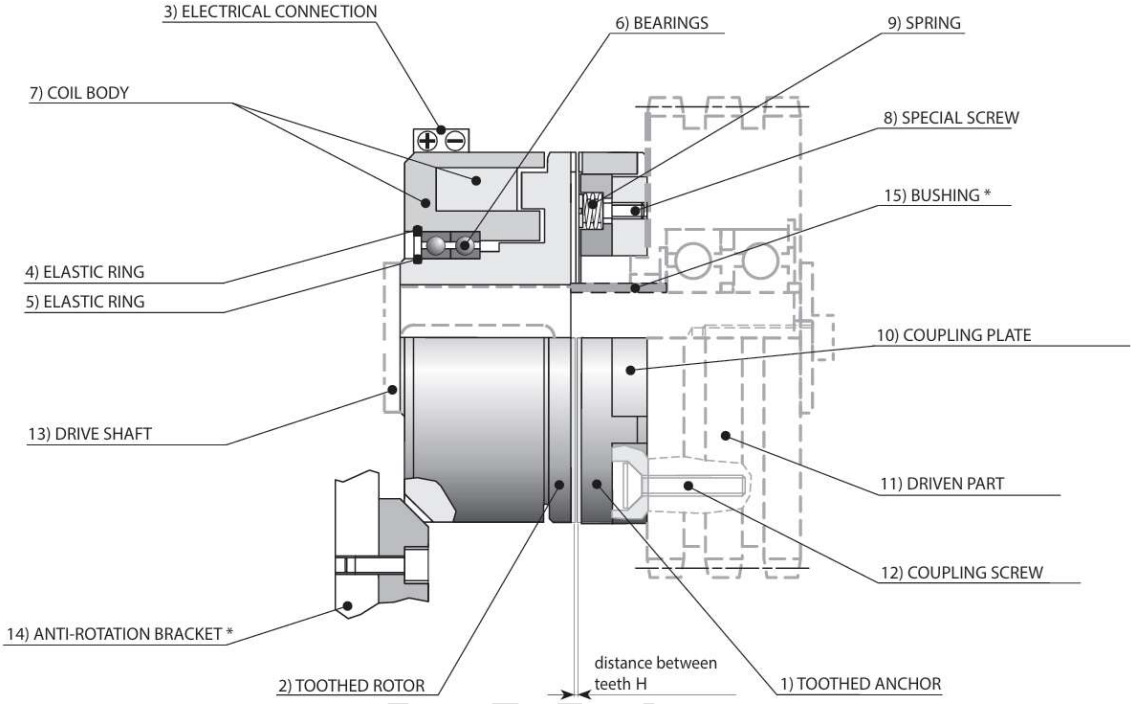
Positive toothed electromagnetic clutches with fixed body are composed of a coil body, a toothed rotor, a coupling plate, a toothed anchor, springs, screws, roller bearings and elastic rings:



2.3. Maintenance

Maintenance status of positive electromagnetic friction clutches with fixed body:

Toothed anchor – toothed rotor distance adjustment, dimension "H"



Verify that the distance H between the toothed anchor (1) and the toothed rotor (2) is as shown in the following table:

Size	Distance H [mm]
70 ÷ 82	0.3
95 ÷ 258	0.4
320	0.5

If this distance is less than the value indicated in the table, increase the length of the bushing (15) by the difference found.

If this distance is more than the value indicated in the table, decrease the length of the bushing (15) by the difference found.

Check the distance at each maintenance operation.

Troubleshooting

Issue	Cause	Solution
Clutch not engaging when powered	Coil not receiving power	Check the power supply connection
	Distance “H” too wide	Adjust distance “H” again
	Damaged coil	Replace the coil body (7)
Clutch not disengaging when unpowered	Springs not returning the anchor	Check the state of the springs (9)
	Anchor not sliding	Check that the toothed anchor (1) slides freely along the coupling plate (10)

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3. Negative electromagnetic friction clutches with rotating body

3.1. Operating principle

The negative electromagnetic friction clutch with rotating body is a partly completed machinery designed for the controlled transmission and/or interruption of motion between two rotating components, by utilizing an electromagnetic field generated by an electrically powered winding.

In rest conditions (absence of electrical supply), the friction elements of the clutch are coupled or engaged, allowing the transmission of torque between the drive shaft and the driven shaft, depending on the construction configuration (dry or oil bath, tension or compression).

Upon activation of the electrical circuit, the coil generates a magnetic field that disengages the moving element (armature or anchor disc), terminating the contact between the friction surfaces. The loss of contact cancels the torque, thus releasing the transmission.

Torque transmission therefore occurs through frictional adhesion between the contact surfaces, proportional to the compression force in the absence of current.

When the electrical supply ceases, the magnetic field is canceled, and, due to return springs or equivalent elastic forces, the friction elements separate, restoring the decoupled condition and interrupting the transmission of motion.

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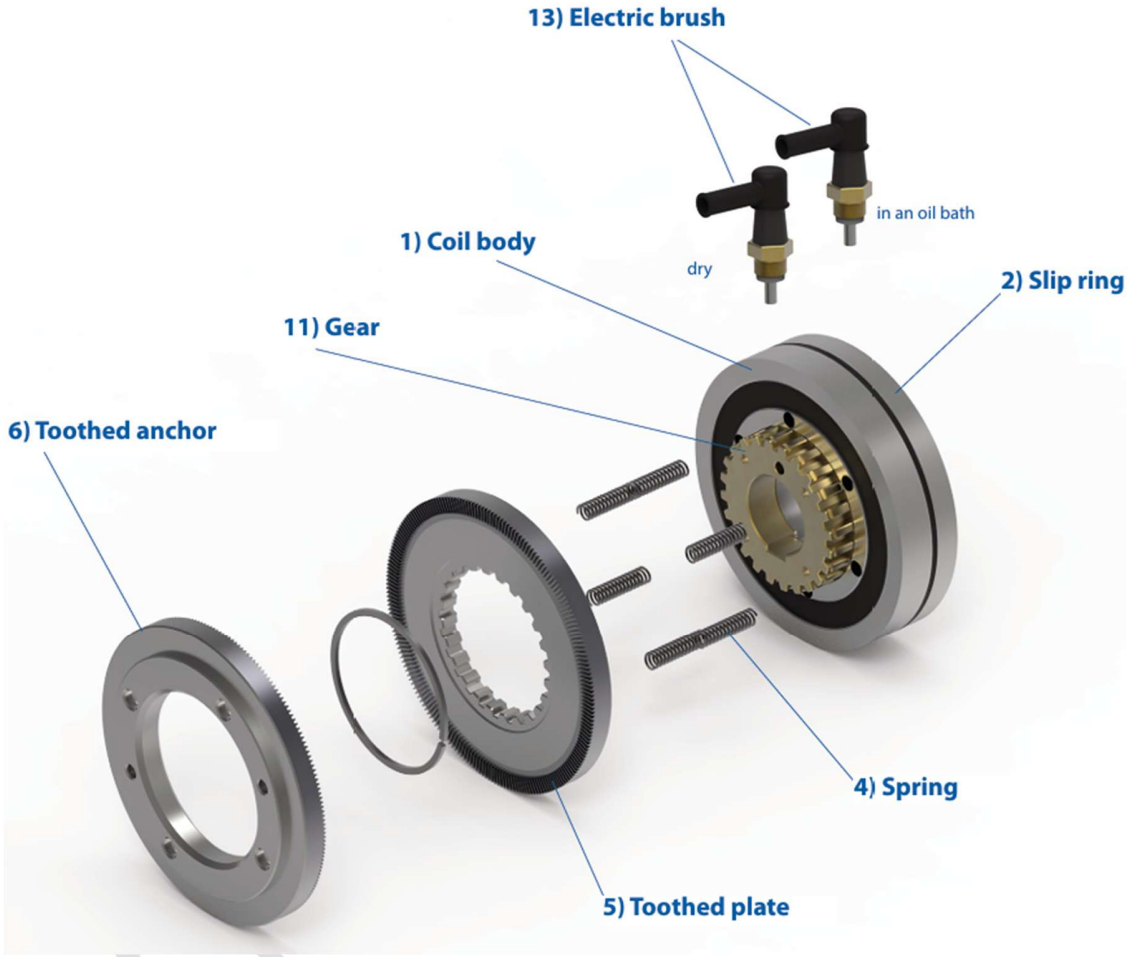
3.2. Main components

Negative electromagnetic friction clutches with rotating body are composed of a coil body, a slip ring, a toothed plate, a toothed anchor, a gear, springs and an electric brush:



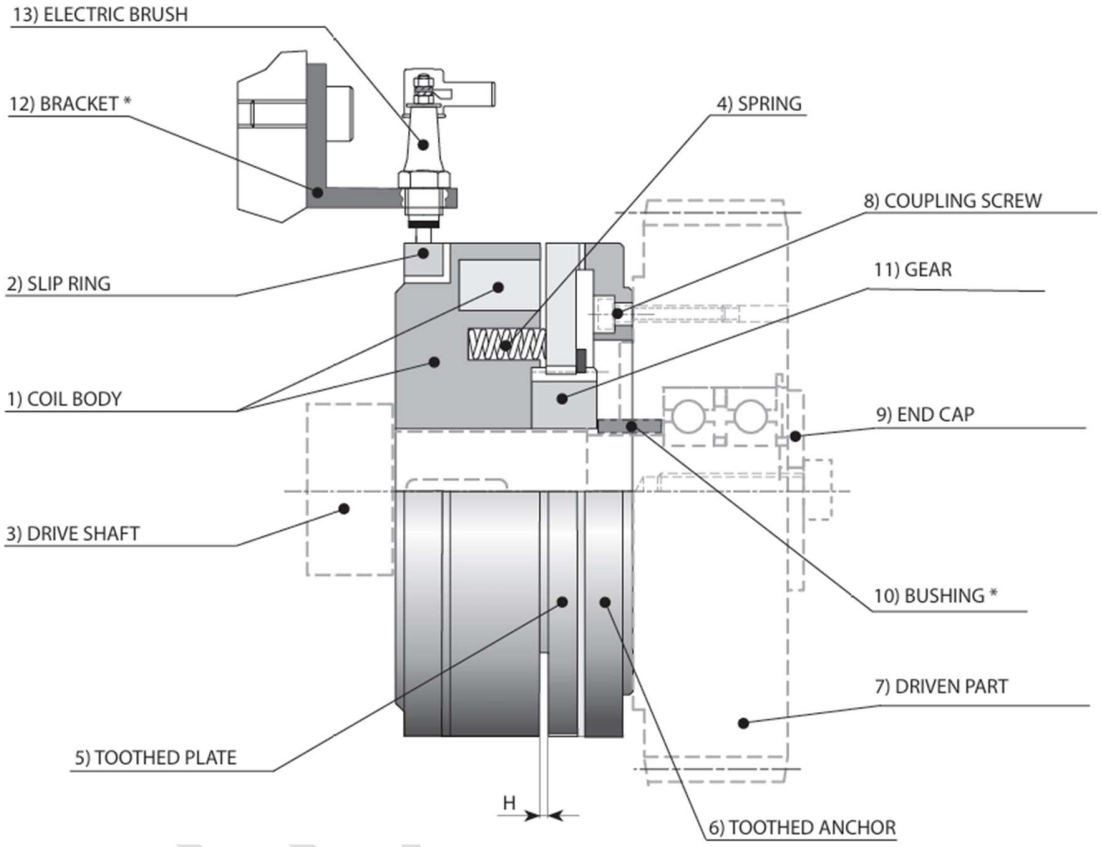
3.3. Environmental conditions

Negative electromagnetic friction clutches with rotating body contain rubber seals in the brush holder, which may generate toxic gases in the event of a fire. For firefighting personnel in small environments, the use of gas masks is recommended.

3.4. Maintenance

Maintenance status of negative electromagnetic friction clutches with rotating body:

Toothed plate – coil body distance adjustment, dimension "H"



Verify that the distance H between the toothed plate (5) and the coil body (1) is as shown in the following table:

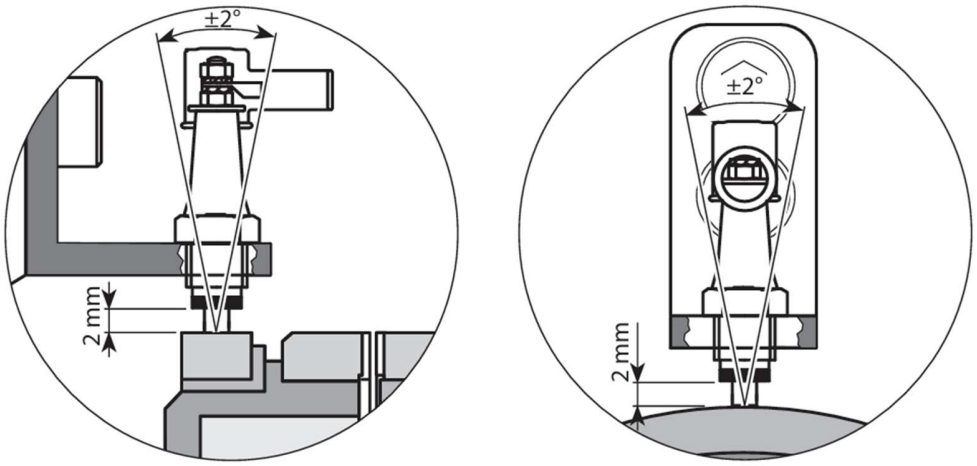
Size	Distance H [mm]
95 ÷ 114	1.3
126 ÷ 140	1.5
166 ÷ 215	1.8

If this distance is less than the value indicated in the table, increase the length of the bushing (10) by the difference found.

If this distance is more than the value indicated in the table, decrease the length of the bushing (10) by the difference found.

Check the distance at each maintenance operation.

Brush adjustment



Verify that the positioning of the support bracket places the brush within 2° of perpendicularity from the slip ring in all directions.

Position the brush and screw it in fully so that, in the working position, there is a distance of 2mm between the brush body and the slip ring.

Troubleshooting

Issue	**Cause**	**Solution**
Clutch not disengaging when powered	Coil not receiving power	Check the power supply connection
	Distance “H” too wide	Adjust distance “H” again
	Damaged coil	Replace the coil body (1)
	Damaged brush	Replace the brush
Clutch not engaging when unpowered	Springs not returning the anchor	Check the state of the springs (4)
	Anchor not sliding	Check that the toothed plate (5) slides freely along the gear (11)

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4. Negative electromagnetic friction clutches with fixed body

4.1 Working principle

The negative electromagnetic friction clutch with fixed body is a partly completed machinery intended for the controlled transmission and/or interruption of motion between two rotating components, by utilizing an electromagnetic field generated by an electrically powered winding.

In rest conditions (absence of electrical supply), the friction elements of the clutch are coupled or engaged, allowing the transmission of torque between the drive shaft and the driven shaft, depending on the construction configuration (dry or oil bath, tension or compression).

Upon activation of the electrical circuit, the coil generates a magnetic field that disengages the moving element (armature or anchor disc), terminating the contact between the friction surfaces. The lack of contact cancels the torque, thereby releasing the transmission.

Torque transmission thus occurs through frictional adhesion between the contact surfaces, proportional to the compression force in the absence of current.

When the electrical supply ceases, the magnetic field is canceled, and, due to return springs or equivalent elastic forces, the friction elements separate, restoring the decoupled condition and interrupting the transmission of motion.

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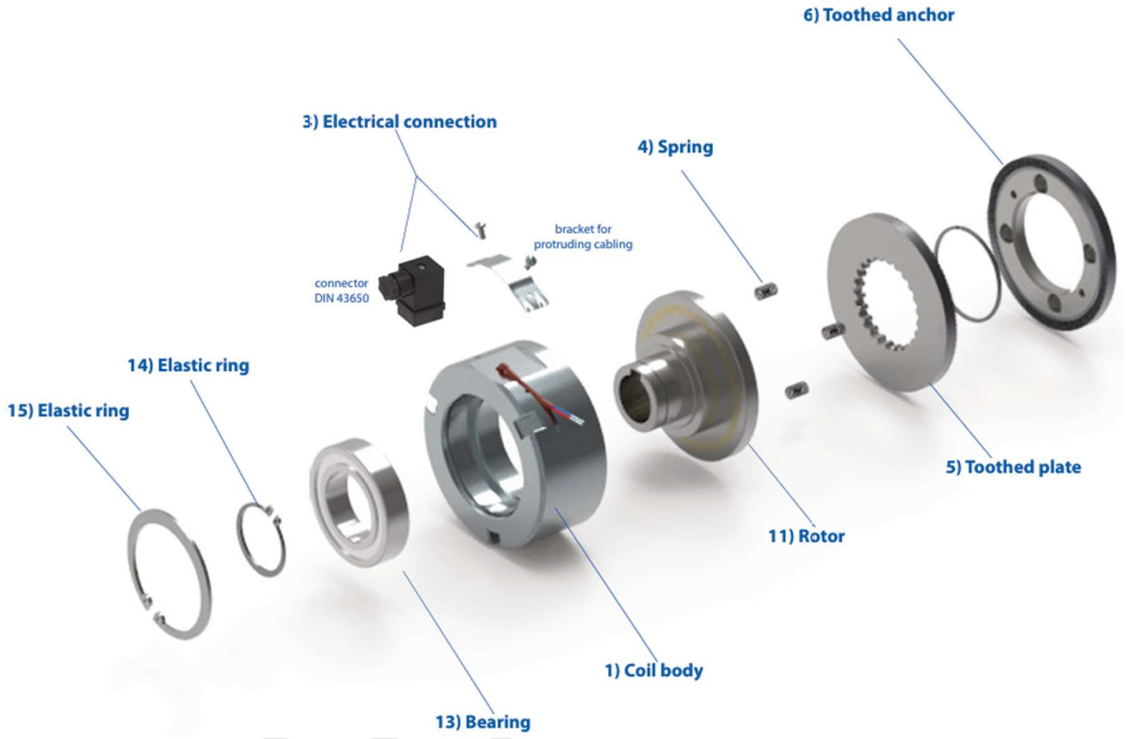
4.2. Main components

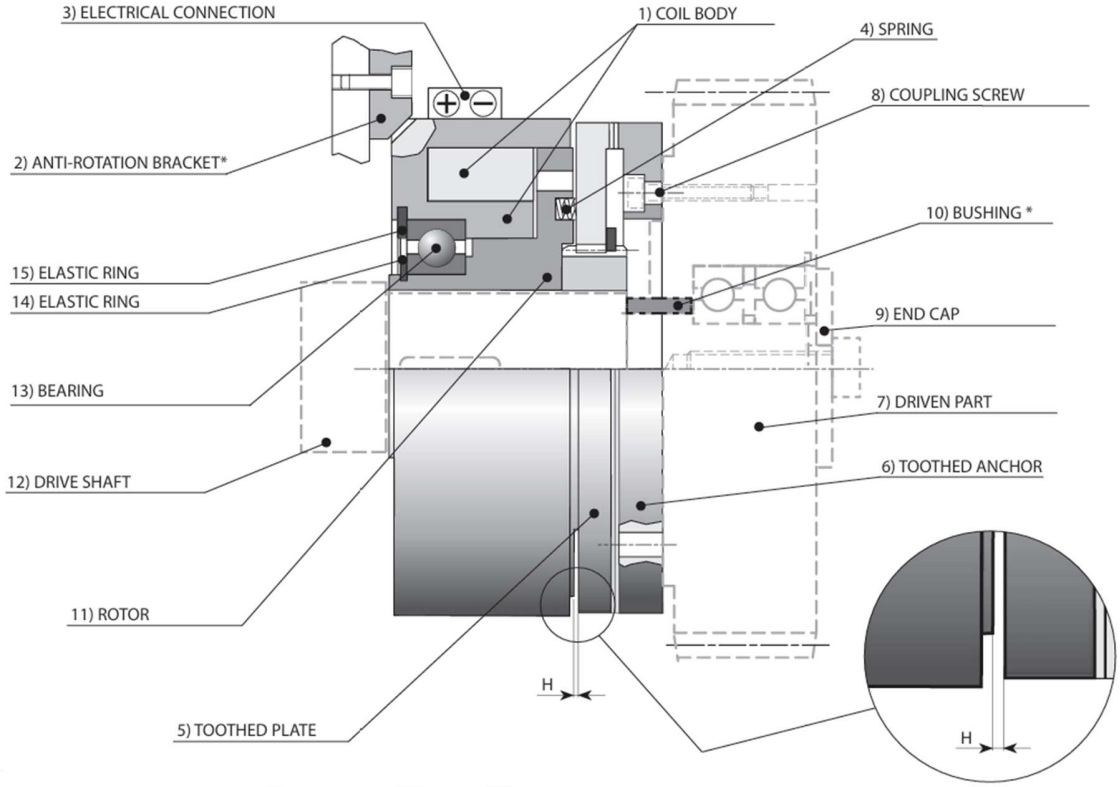
Negative electromagnetic friction clutches with fixed body are composed of a coil body, a rotor, a toothed plate, a toothed anchor, springs, bearings and elastic rings:



4.3. Maintenance

Maintenance status of negative electromagnetic friction clutches with fixed body:

Toothed plate – coil body distance adjustment, dimension "H"



Verify that the distance H between the toothed plate (5) and the coil body (1) is as shown in the following table:

Size	Distance H [mm]
70	0.8
95 ÷ 114	1.2
126 ÷ 155	1.5

If this distance is less than the value indicated in the table, increase the length of the bushing (10) by the difference found.

If this distance is more than the value indicated in the table, decrease the length of the bushing (10) by the difference found.

Check the distance at each maintenance operation.

Troubleshooting

Issue	Cause	Solution
Clutch not disengaging when powered	Coil not receiving power	Check the power supply connection
	Distance “H” too wide	Adjust distance “H” again
	Damaged coil	Replace the coil body (1)
Clutch not engaging when unpowered	Springs not returning the anchor	Check the state of the springs (4)
	Anchor not sliding	Check that the toothed plate (5) slides freely along the rotor (11)

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5. Negative electromagnetic safety brake

5.1. Working principle

The negative electromagnetic safety brake, qualified as partly completed machinery, is a device intended for the stopping and holding in position of a rotating component through the combined action of an electromagnetic system and return elastic elements, ensuring engagement in the absence of electrical power.

In rest conditions (absence of power), the brake is in the normally engaged state: the action of springs or elastic elements generates an axial force that keeps the friction surfaces in contact, thus locking the shaft or rotating component and preventing its rotation.

When the electromagnetic coil is powered, a magnetic field is generated that attracts the moving element (anchor or armature plate), counteracting the force exerted by the elastic elements. This action causes the controlled disengagement of the friction surfaces and the subsequent release of the shaft, allowing it to rotate.

During power-off, the magnetic field decays, and the return elastic forces restore the system to the safety configuration, re-establishing contact between the friction surfaces and the resulting braking effect.

The system thus allows for the controlled management of the engagement and disengagement phases of the brake, ensuring intrinsic safety via the fail-safe stopping condition in the absence of electrical energy—a characteristic typical of safety braking devices.

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5.2. Main components

Negative electromagnetic safety brakes are composed of a coil body, spings, a brake disc, an anchor and a rotor.

1. Mozzo/Hub/Nabe
2. Ferodo/Brake disc/Rotor
3. Piattello/Brake plate/ Ankerscheibe
4. Vite di regolazione/Adjustment screw/Einstellschrauben
5. Molla esterna/External spring/ Außenfeder
6. Bobina/Coil/Spule
7. Molla interna/Internal spring/ Innenfeder
8. Spingi molla/Spring pusher/ Federreiber
9. Corpo/Body/Magnetteil
10. Ghiera/Ring/Ring

5.3. Environmental conditions

Brakes and clutches contain rubber seals and a friction material that may generate toxic gases in the event of a fire. For firefighting personnel in small environments, the use of gas masks is recommended.

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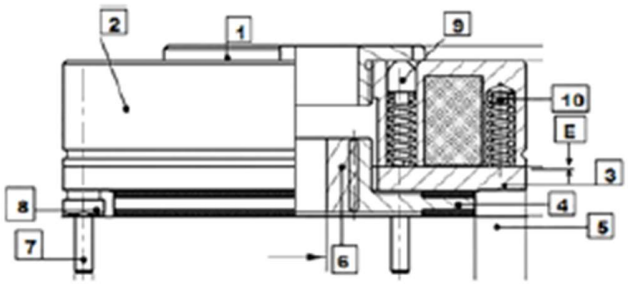
5.4. Maintenance

Maintenance status of negative electromagnetic safety brakes:

Adjustment of clearance – dimension "E"



1	Ghiera	6	Mozzo
2	Corpo	7	Vite di bloccaggio
3	Piattello	8	Vite di regolazione
4	Ferodo	9	Spingi molla
5	Flangia (opzionale)	10	Molla

Loosen the locking screws (part 7) by one turn and intervene on the adjustment screw (part 8): turning it in one direction increases dimension "E," and in the other direction decreases it.

Tighten the locking screw and check dimension "E" with a thickness gauge.

Repeat the operation for all adjustment screws.

Check the clearance during every maintenance intervention.

Operating torque adjustment (for ECOR/FMPR series only)

Secure the brake onto the motor or flange (part 5) using the locking screws (part 7), adjusting the tightening torque (... Nm see catalog) with a torque wrench.

Insert the hub (part 6) and verify the drag resistance with a torque wrench.

To adjust the necessary torque, use the collar (part 1).

Troubleshooting

Issue	Cause	Solution
Brake not disengaging	Coil not receiving power	Check the power supply connection
	Clearance “E” too wide/narrow	Adjust clearance “E” again
	Worn out braking disc	Replace disc and adjust clearance “E”
	Damaged coil	Replace the entire unit
Brake not engaging	Coil still powered on	Check the power supply
	Grease onto braking disc	Replace disc and adjust clearance “E”

TELCOMEC SRL

6. Disc electromagnetic clutches with rotating body

6.1. Working principle

The disc electromagnetic clutch with rotating body is a partly completed machinery designed for the controlled transmission and/or interruption of motion between two rotating components, by utilizing an electromagnetic field generated by an electrically powered winding.

In rest conditions (absence of electrical supply), the friction elements of the clutch are decoupled or not engaged, preventing the transmission of torque between the drive shaft and the driven shaft.

Upon activation of the electrical circuit, the coil generates a magnetic field that attracts the moving element (platter), compressing the discs and establishing contact between the friction surfaces. This contact generates a controlled friction force that allows for the progressive transmission of the driving torque from the input shaft to the output shaft.

Torque transmission thus occurs through frictional adhesion between the contact surfaces, proportional to the compression force induced by the electromagnetic field.

When the electrical supply ceases, the magnetic field is canceled, and, due to return springs, the friction elements separate, restoring the decoupled condition and interrupting the transmission of motion.

The operation of disc clutches must strictly take place in an oil bath.

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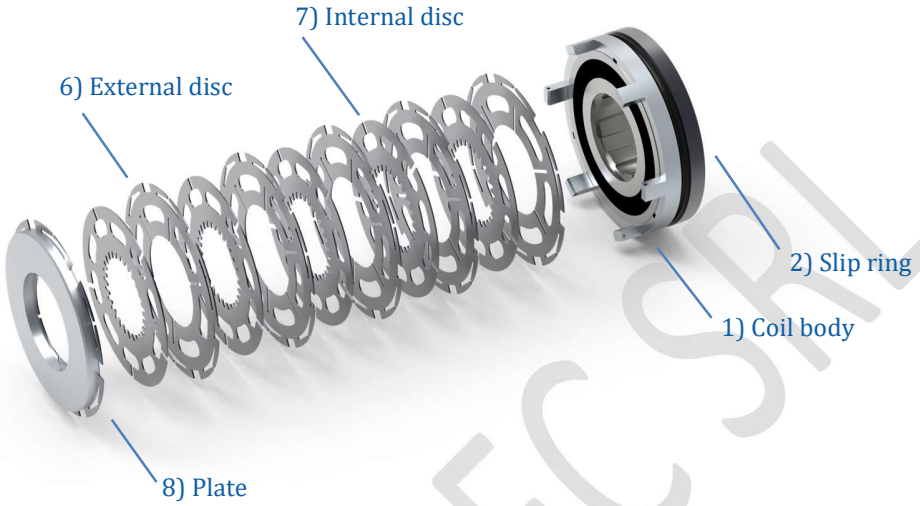
6.2. Main components

Disc electromagnetic clutches with rotating body are composed of a coil body, a slip ring, a stack of discs, a plate and an electric brush:



6.3. Environmental conditions

Disc electromagnetic clutches with rotating body contain rubber seals in the brush holder, which may generate toxic gases in the event of a fire. For firefighting personnel in small environments, the use of gas masks is recommended.

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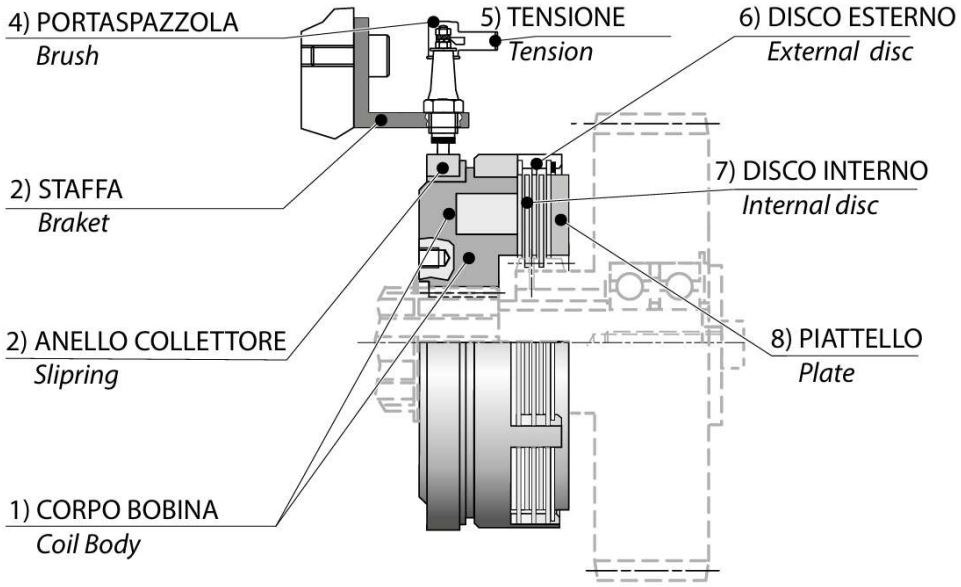
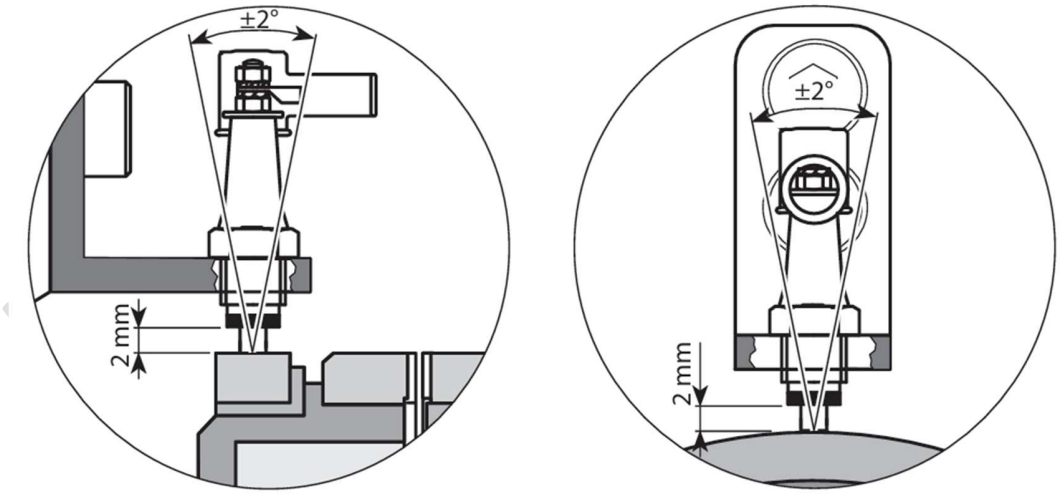
6.4. Maintenance

Maintenance status of disc electromagnetic clutches with rotating body:



Brush adjustment



Verify that the positioning of the support bracket places the brush within 2° of perpendicularity from the slip ring in all directions.

Position the brush and screw it in fully so that, in the working position, there is a distance of 2mm between the brush body and the slip ring.

Troubleshooting

Issue	Cause	Solution
Clutch not engaging when powered	Coil not receiving power	Check the power supply connection
	Misshapen discs	Replace the discs (6) and (7)
	Damaged coil	Replace the coil body (1)
	Damaged slip ring	Replace the entire unit
Clutch not disengaging when unpowered	Damaged brush	Replace the brush
	Anchor not sliding	Verify that the external discs (6) slide freely along the teeth of the coil body (1)

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7. Disc electromagnetic clutches with rotating body and pinion

7.1. Working principle

The disc electromagnetic clutch with rotating body and pinion is a partly completed machinery intended for the controlled transmission and/or interruption of motion between two rotating components, by utilizing an electromagnetic field generated by an electrically powered winding.

In rest conditions (absence of electrical supply), the friction elements of the clutch are decoupled or not engaged, preventing the transmission of torque between the drive shaft and the driven shaft.

Upon activation of the electrical circuit, the coil generates a magnetic field that attracts the moving element (platter), compressing the discs and establishing contact between the friction surfaces. This contact generates a controlled friction force that allows for the progressive transmission of the driving torque from the input shaft to the output shaft.

Torque transmission thus occurs through frictional adhesion between the contact surfaces, proportional to the compression force induced by the electromagnetic field.

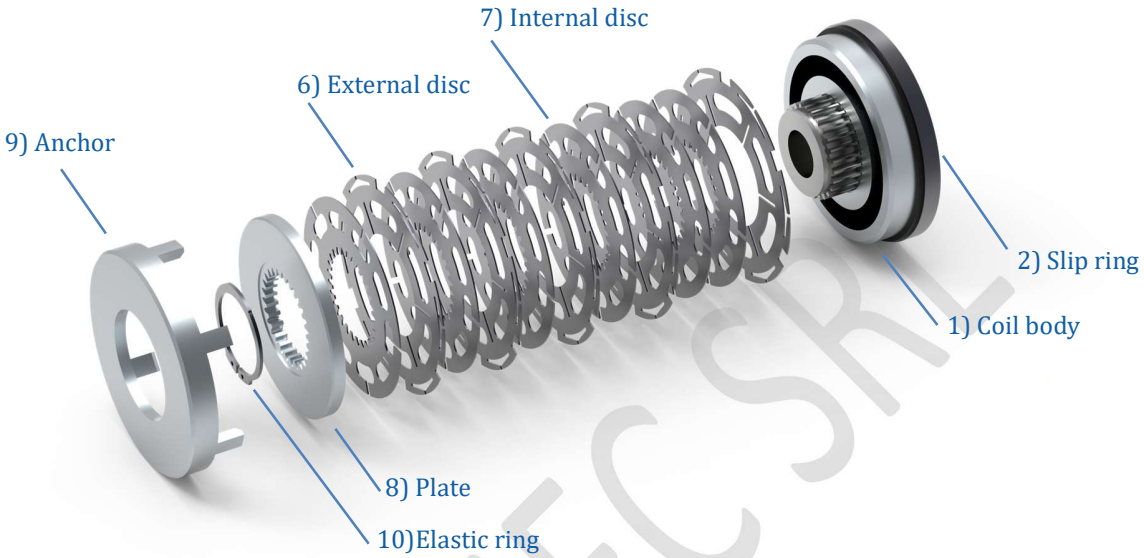
When the electrical supply ceases, the magnetic field is canceled, and, due to return springs, the friction elements separate, restoring the decoupled condition and interrupting the transmission of motion.

The operation of disc clutches must strictly take place in an oil bath.

TELCOMEC SRL

7.2. Main components

Disc electromagnetic clutches with rotating body and pinion are composed of a coild body, a slip ring, a discs stack, a plate, an anchor, a pinion, elastic rings and an electrical brush:



7.3. Environmental conditions

Disc electromagnetic clutches with rotating body and pinion contain rubber seals in the brush holder, which may generate toxic gases in the event of a fire. For firefighting personnel in small environments, the use of gas masks is recommended.

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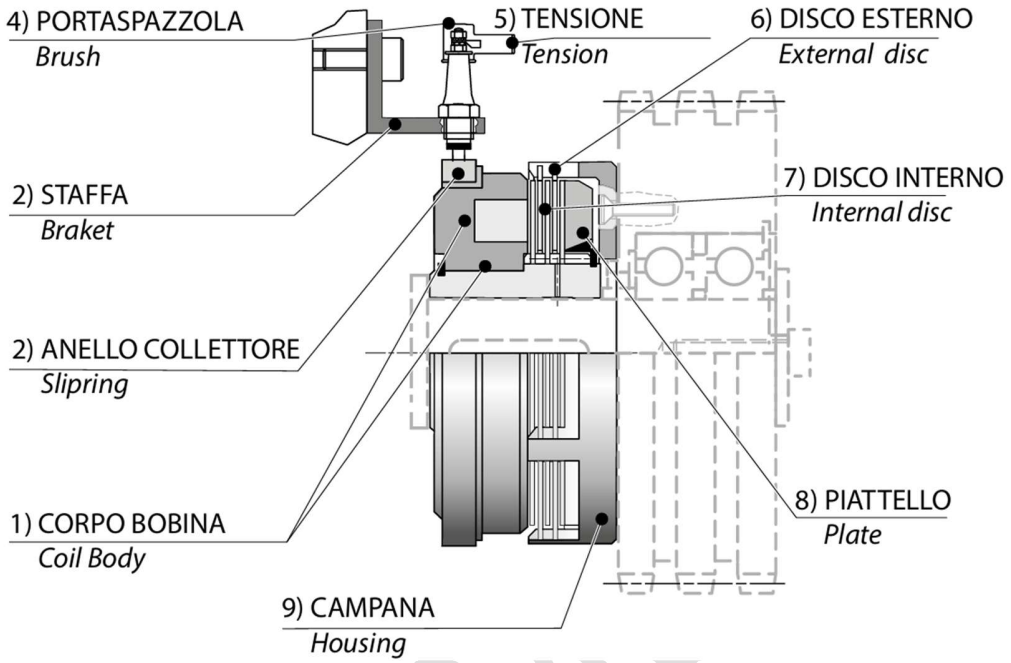
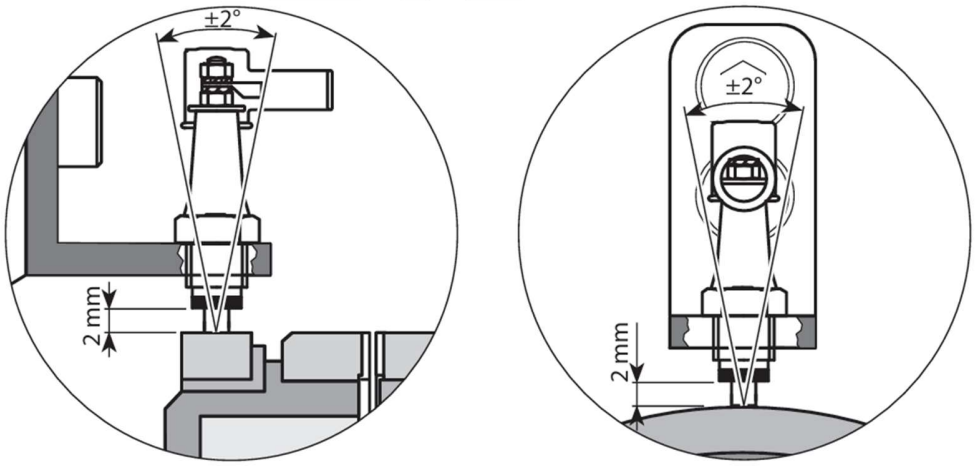
7.4. Maintenance

Maintenance status of disc electromagnetic clutches with rotating body and pinion:



Brush adjustment



Verify that the positioning of the support bracket places the brush within 2° of perpendicularity from the slip ring in all directions.

Position the brush and screw it in fully so that, in the working position, there is a distance of 2mm between the brush body and the slip ring.

Troubleshooting

Issue	Cause	Solution
Clutch not engaging when powered	Coil not receiving power	Check the power supply connection
	Dischi deformati	Sostituire i dischi (6) e (7)
	Damaged coil	Replace the coil body (1)
	Anello collettore danneggiato	Sostituire l'intero innesto
Clutch not disengaging when unpowered	Damaged brush	Replace brush
	Anchor not sliding	Verify that the external discs (6) slide freely along the teeth of the anchor (9) and thte plate (8) slides freely along the coil body (1)

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8. Disc electromagnetic clutches with fixed body

8.1. Working principle

The disc electromagnetic clutch with fixed body is a partly completed machinery intended for the controlled transmission and/or interruption of motion between two rotating components, by utilizing an electromagnetic field generated by an electrically powered winding.

In rest conditions (absence of electrical supply), the friction elements of the clutch are decoupled or not engaged, preventing the transmission of torque between the drive shaft and the driven shaft.

Upon activation of the electrical circuit, the coil generates a magnetic field that attracts the moving element (platter), compressing the discs and establishing contact between the friction surfaces. This contact generates a controlled friction force that allows for the progressive transmission of the driving torque from the input shaft to the output shaft.

Torque transmission thus occurs through frictional adhesion between the contact surfaces, proportional to the compression force induced by the electromagnetic field.

When the electrical supply ceases, the magnetic field is canceled, and, due to return springs, the friction elements separate, restoring the decoupled condition and interrupting the transmission of motion.

The operation of disc clutches must strictly take place in an oil bath.

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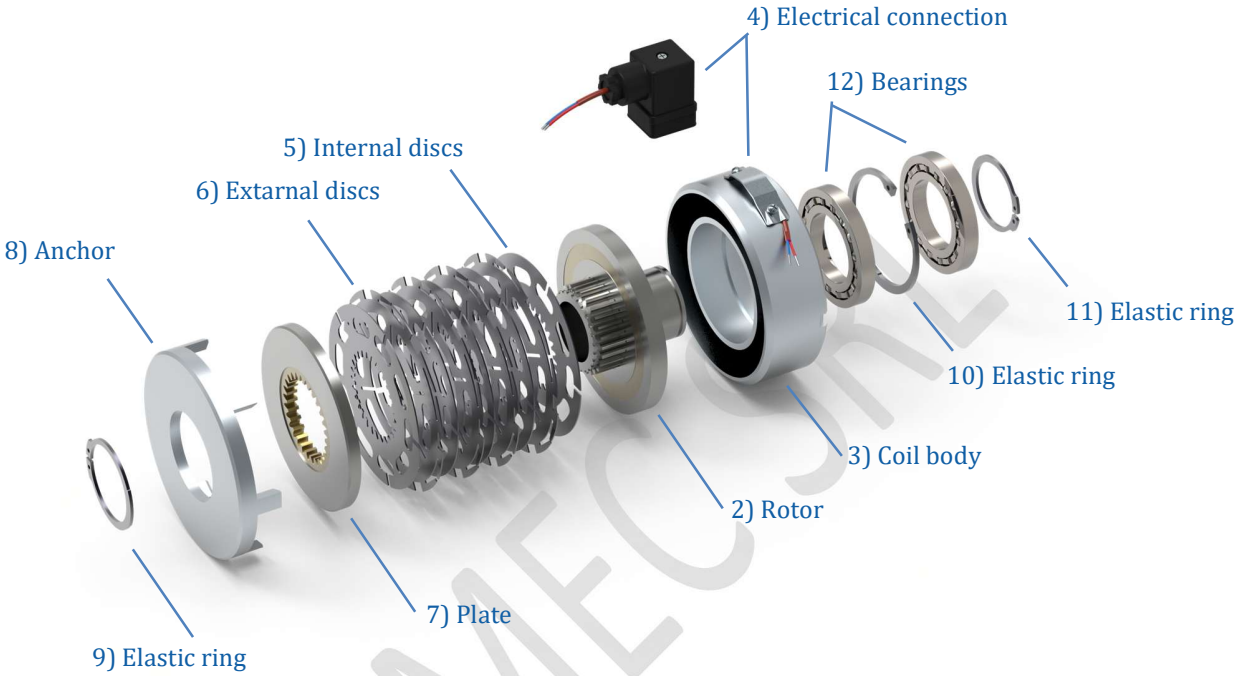
8.2. Main components

Disc electromagnetic clutches with fixed body are composed of a coil body, a rotor, a discs stack, a plate, an anchor, bearings and elastic rings:



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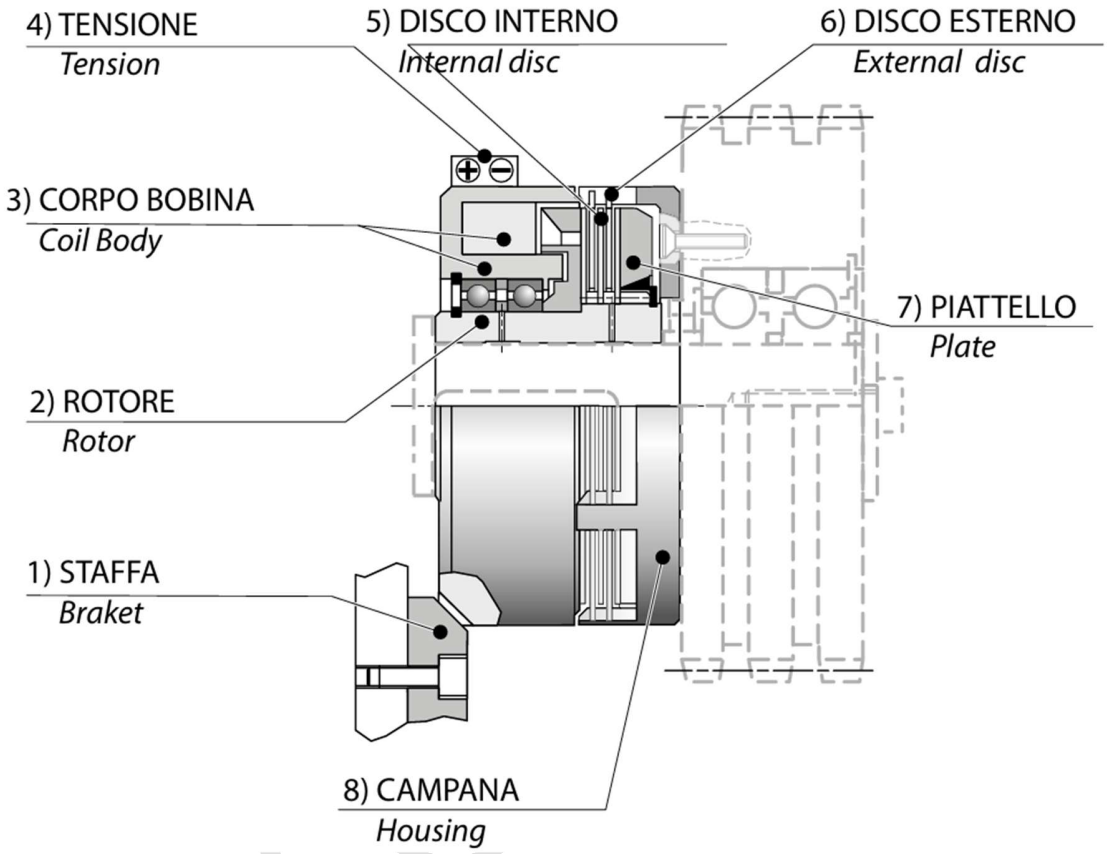
8.3. Maintenance

Maintenance status of disc electromagnetic clutches with fixed body:



Troubleshooting

Issue	Cause	Solution
Clutch not engaging when powered	Coil not receiving power	Check the power supply connection
	Misshapen discs	Replace the discs (5) and (6)
	Damaged coil	Replace the coil body (1)
	Anchor not sliding	Verify that the external discs (6) slide freely along the teeth of the anchor (8) and along the rotor (2)

9. Electrical brushes

9.1. Working principle

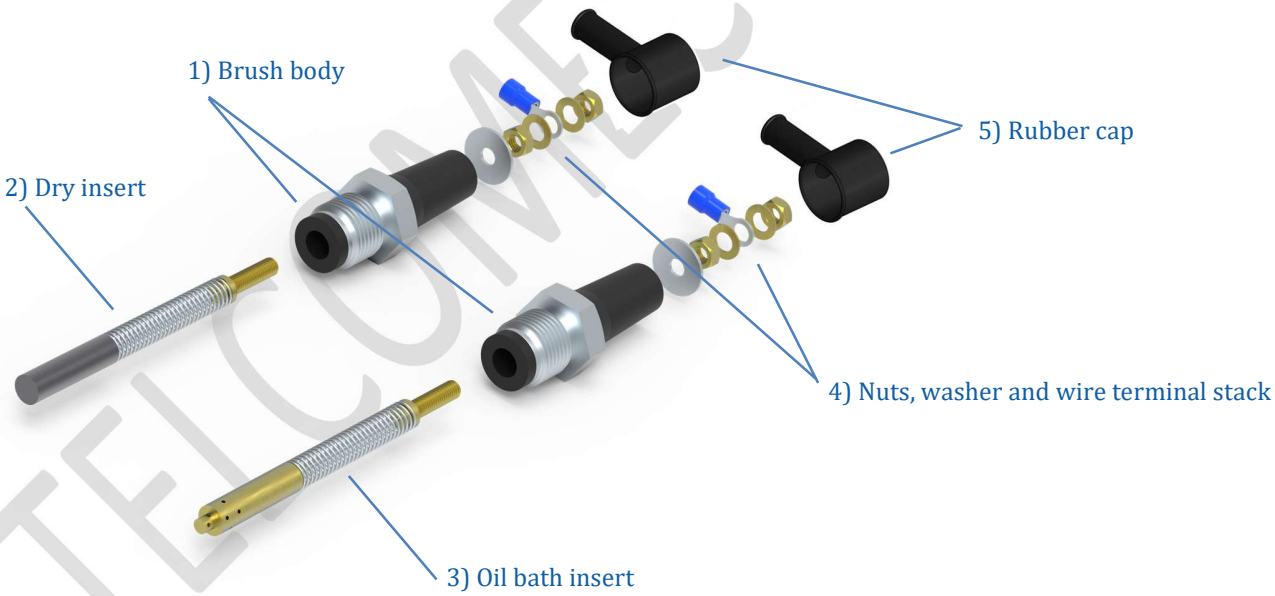
The electric brush is a partly completed machinery intended for transmitting power to the rotating body of the couplings that include it.

Under working conditions, the brush electrode is maintained in contact with the coupling's collector ring via a spring.

The operation of the brush is designed for both dry working conditions (graphite electrode) and oil bath conditions (brass electrode).

9.2. Main components

Eklectrical brushes are composed of a brush body, an insert, and rubber caps:



9.3. Environmental conditions

Electrical brushes contain rubber seals, which may generate toxic gases in the event of a fire. For firefighting personnel in small environments, the use of gas masks is recommended.

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Troubleshooting

Issue	Cause	Solution
The brush does not transmit power	Interrupted electrical contact	Replace insert

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10. Pneumatic toothed clutches

10.1. Working principle

The pneumatic toothed clutch is a partly completed machinery designed for the controlled transmission and/or interruption of motion between two rotating components, by utilizing compressed air.

In rest conditions (absence of pressure in the pneumatic circuit), the friction elements of the clutch are decoupled or not engaged, preventing the transmission of torque between the drive shaft and the driven shaft, depending on the construction configuration (dry or oil bath, tension or compression).

Upon activation of the pneumatic circuit using compressed air, the internal expansion chamber of the clutch generates a push that engages the moving element (armature or anchor disc), establishing contact between the friction surfaces. This contact generates a controlled friction force that allows for the progressive transmission of the driving torque from the input shaft to the output shaft.

Torque transmission thus occurs through frictional adhesion between the contact surfaces, proportional to the compression force induced by the air pressure.

When the supply of compressed air ceases, the expansion chamber empties, and, due to springs, the friction elements separate, restoring the decoupled condition and interrupting the transmission of motion.

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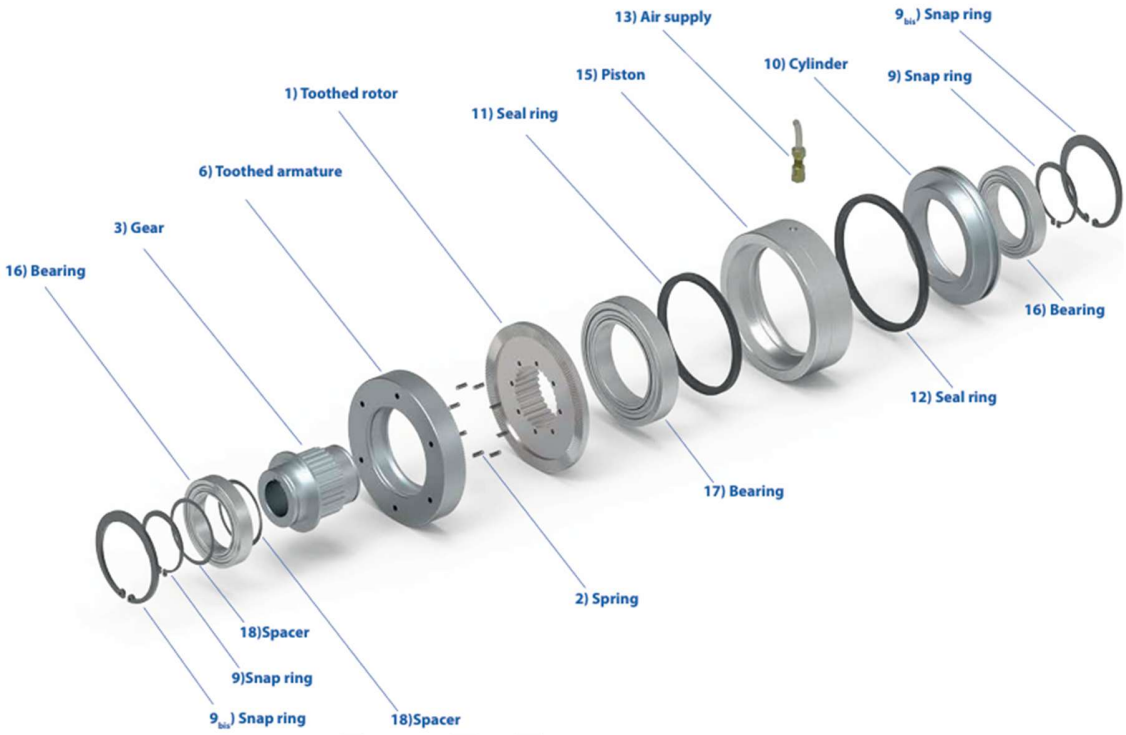
10.2. Main components

Pneumatic toothed clutches are composed of a piston and cylinder, a toothed rotor, a gear, a toothed armature, bearings, elastic rings,and seal rings:



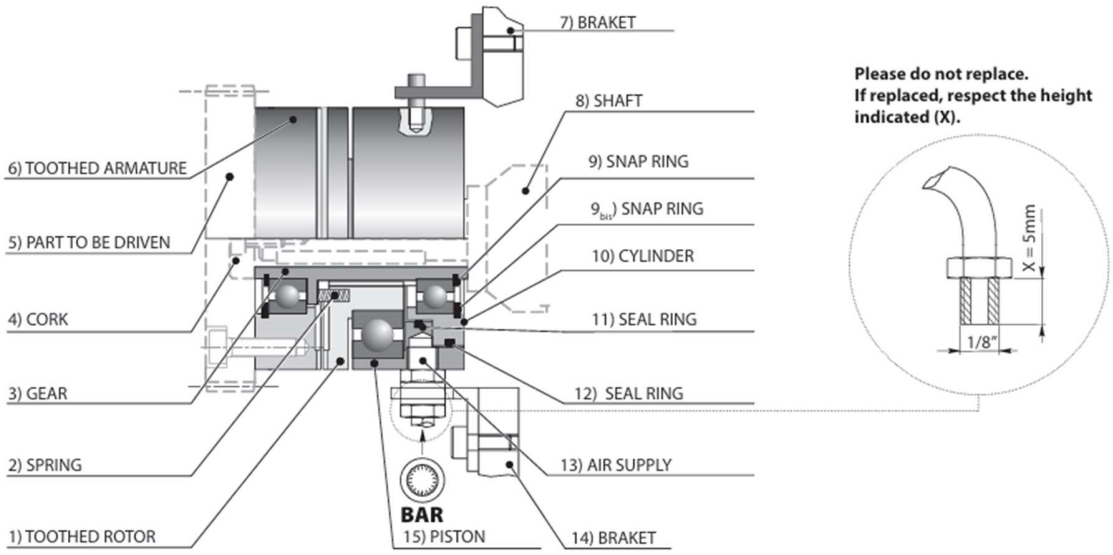
10.3. Environmental conditions

Pneumatic toothed clutches contain rubber seal rings, which may generate toxic gases in the event of a fire. For firefighting personnel in small environments, the use of gas masks is recommended.

10.4. Maintenance

Maintenance status of pneumatic toothed clutches:

Adjustment of dimension "H"



Verify that the mounting of the bracket (7) does not impede the movement of the anti-rotation pin (16) along the piston axis.

Verify that the distance H between the toothed anchor (6) and the toothed rotor (1) is as shown in the following table.

Size	Distance H [mm]
72 ÷ 166	0.5
195 ÷ 280	0.8

If this distance is less than that indicated in the table, increase the number of spacers between the gear (3) and the toothed anchor (6).

If this distance is greater than that indicated in the table, reduce the number of spacers between the gear (3) and the toothed anchor (6).

Check the distance during every maintenance intervention.

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Troubleshooting

Issue	Cause	Solution
Clutch not engaging when powered	No pressure from air supply	Check the air supply connection
	Distance “H” too wide	Adjust distance “H” again
	Damaged seal rings	Replace seal rings (11) and (12)
Clutch not disengaging when unpowered	Springs not returning the anchor	Check the state of the springs (2)
	Anchor not sliding	Verify that the toothed rotor (1) slides freely along the gear (3)

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11. Pneumatic friction clutches with friction material

11.1. Working principle

The pneumatic friction clutch with friction material is a partly completed machinery designed for the controlled transmission and/or interruption of motion between two rotating components, by utilizing compressed air.

In rest conditions (absence of pressure in the pneumatic circuit), the friction elements of the clutch are decoupled or not engaged, preventing the transmission of torque between the drive shaft and the driven shaft, depending on the construction configuration (dry or oil bath, tension or compression).

Upon activation of the pneumatic circuit using compressed air, the internal expansion chamber of the clutch generates a push that engages the moving element (armature or anchor disc), establishing contact between the friction surfaces. This contact generates a controlled friction force that allows for the progressive transmission of the driving torque from the input shaft to the output shaft.

Torque transmission thus occurs through frictional adhesion between the contact surfaces, proportional to the compression force induced by the air pressure.

When the supply of compressed air ceases, the expansion chamber empties, and, due to springs, the friction elements separate, restoring the decoupled condition and interrupting the transmission of motion.

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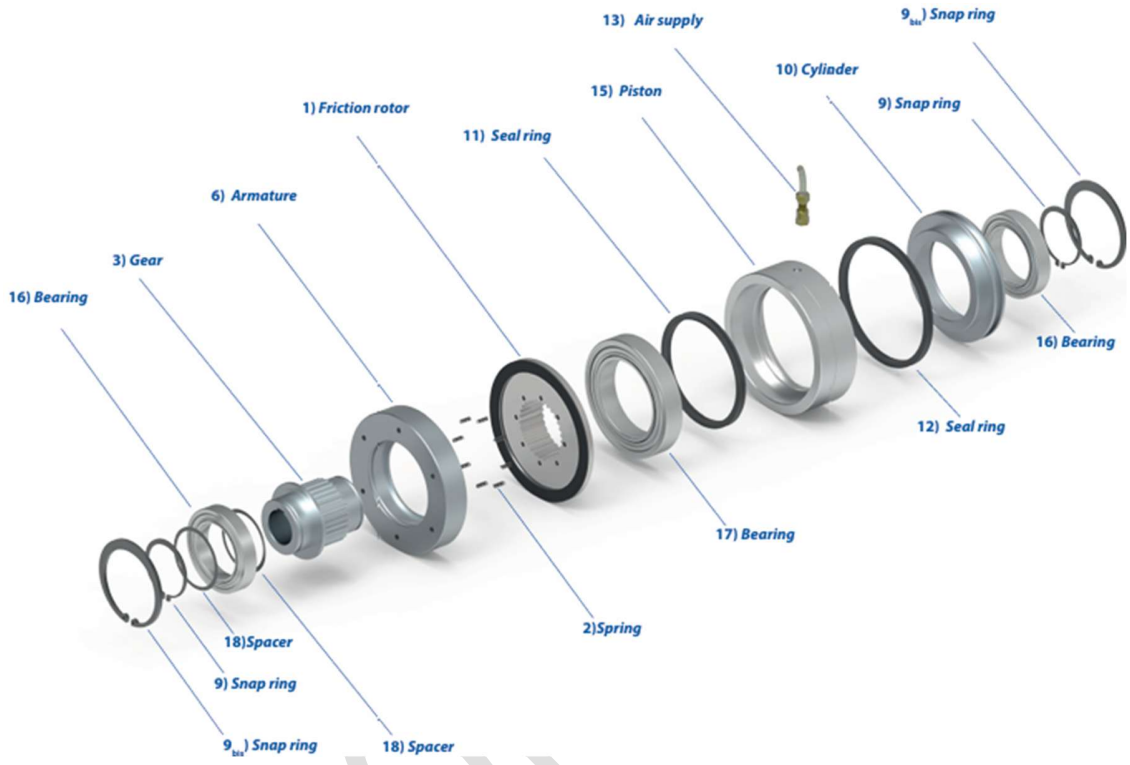
11.2. Main components

Pneumatic friction clutches with friction material are composed of a piston and cylinder, a plate with friction material, an anchor, a gear, bearing, elastic rings and seal rings:



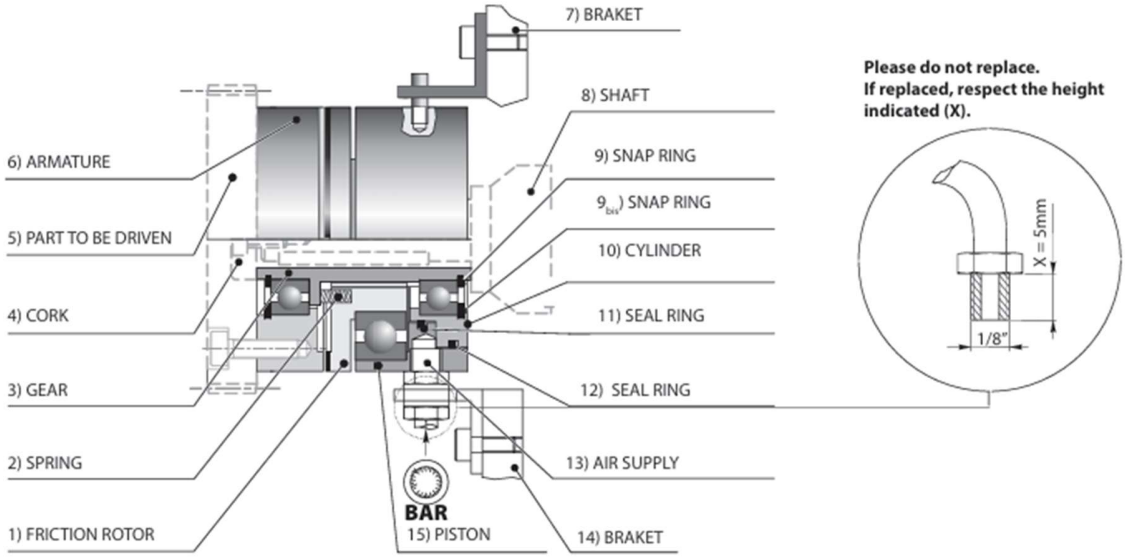
11.3. Environmental conditions

Pneumatic friction clutches with friction material contain rubber seal rings, which may generate toxic gases in the event of a fire. For firefighting personnel in small environments, the use of gas masks is recommended.

11.4. Maintenance

Maintenance state of pneumatic friction clutches with friction material:

Adjustment of dimension "H"



Check the distance during every maintenance intervention.

Verify that the mounting of the bracket (7) does not impede the movement of the anti-rotation pin (16) along the piston axis.

Verify that the distance H between the anchor (6) and the rotor (1) is as shown in the following table.

Size	Distance H [mm]
72 ÷ 166	0.5
195 ÷ 280	0.8

If this distance is less than that indicated in the table, increase the number of spacers between the gear (3) and the anchor (6).

If this distance is greater than that indicated in the table, reduce the number of spacers between the gear (3) and the anchor (6).

Troubleshooting

Issue	Cause	Solution
Clutch not engaging when powered	No pressure from air supply	Check the air supply connection
	Distance “H” too wide	Adjust distance “H” again
	Damaged seal rings	Replace seal rings (11) and (12)
Clutch not disengaging when unpowered	Springs not returning the anchor	Check the state of the springs (2)
	Anchor not sliding	Verify that the toothed rotor (1) slides freely along the gear (3)

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GENERAL INFORMATIONS

1. Declarations

- The partly completed machinery is designed and manufactured in compliance with the applicable Community Directives valid at the time of its placing on the market.

- Pursuant to EU Regulation 2023/1230 of the European Parliament and of the Council of 14 June 2023, which repeals Directive 2006/42/EC (Machinery Directive) and Council Directive 73/361/EEC, "partly completed machinery" refers to systems that constitute a partly completed machinery, which, taken individually, are unable to ensure a specific and determined application. This definition also includes a drive system. The partly completed machinery is intended exclusively to be integrated or assembled with other machines, partly completed machinery, or equipment, in order to constitute a complete machine falling within the scope of the said directive.

- The partly completed machinery, defined as an electromagnetic or pneumatic clutch, constitutes a service component intended for integration into machines, systems, or other mechanical components. It is designed for a wide spectrum of applications to meet the differing operational needs of the end-user. The choice of the most suitable model must be made based on the reference parameters and technical specifications.

- The partly completed machinery, defined as an electromagnetic brake, constitutes a service component intended for integration into machines, systems, or other mechanical components. It is designed to block a rotating shaft as needed; consequently, its fields of application are diverse. The choice of the most suitable model must be made based on the reference parameters and technical specifications.

- The materials used in the construction ensure high resistance to mechanical stresses as well as adequate durability for wear parts.

- For electromechanical products, brakes, and clutches, it is essential to determine the length of a working cycle to avoid overheating. In case of continuous service and/or harsh environments such as temperature, forced ventilation or reduced holding tension compared to the nominal tension must be provided.

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- The friction material used is asbestos-free. If disposal is prescribed, it must be done at the of the useful life, in compliance with the current regulations in the country of use.

- The relevant technical documentation has been drawn up in accordance with EU Regulation 2023/1230 of the European Parliament and of the Council of 14 June 2023. The manufacturer undertakes to provide, upon a duly motivated request from the competent national authorities, relevant information regarding the partly completed machinery.

2. Commissioning prohibition

The partly completed machinery must not be put into service if it has undergone construction modifications or components integrations that do not fall under routine or extraordinary maintenance, unless it is subsequently subjected to a procedure of assessment and declaration of conformity to the requirements of EU Regulation 2023/1230 of the European Parliament and of the Council of 14 June 2023.

3. Safety regulations

The partly completed machinery has been designed and manufactured in compliance with the applicable technical standards listed below.

4. Applicable and respected EHSR

Essential Safety and Health Requirements (EHSR) pursuant to points 1.1 to 1.7.

5. Technical support information

The manufacturer can provide the customer with technical guidance and support regarding the assembly and use of the partly completed machinery, provided that it is used in accordance with its technical characteristics and the functions for which it was designed.

6. Customer responsibilities

The customer declares that they have selected the partly completed machinery from among various available types, deeming it suitable for their operational needs after careful evaluation of the technical characteristics and operating conditions.

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ASSEMBLY

1. Transportation and handling

The product can be moved and transported by taking the usual precautions prescribed for products of the same nature.

2. Storage

During the product storage, account must be taken of the high mass concentration in a reduced volume. Therefore, the use of suitable personal protective equipment by the attending personnel (such as, for example, safety shoes, helmets, and gloves) is recommended in order to prevent the risk of accidents.

3. Provisions, incorporation, and connections

The necessary provisions for the integration of the partly completed machinery with other partly completed machinery or with further components are the responsibility of the customer. The manufacturer disclaims any responsibility regarding any connection and/or integration difficulties or impossibilities, as the manufacturer is unaware of the specific intended use of the partly completed machinery.

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WARNINGS

Personnel responsible for assembly and maintenance functions are recommended to use suitable equipment (gloves, goggles, or other protective gear) to safeguard against loads and/or weights.

Machine isolation

Moving parts must be protected in accordance with Directives 89/893/EEC, 91/386/EEC, 93/44/EEC, 93/68/EEC, 2006/42/EC, or equivalent standards valid in the countries where they are used.

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