LEROY SOMER®

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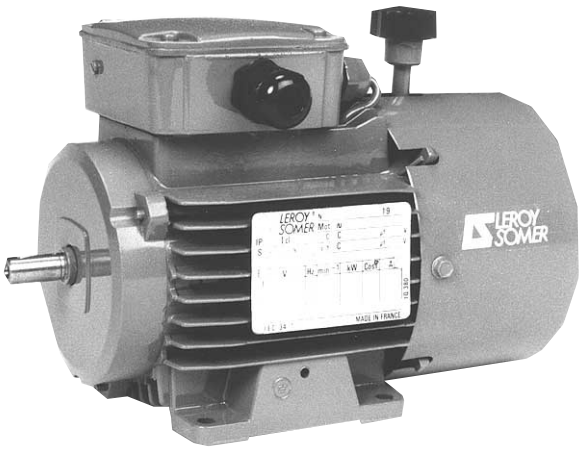
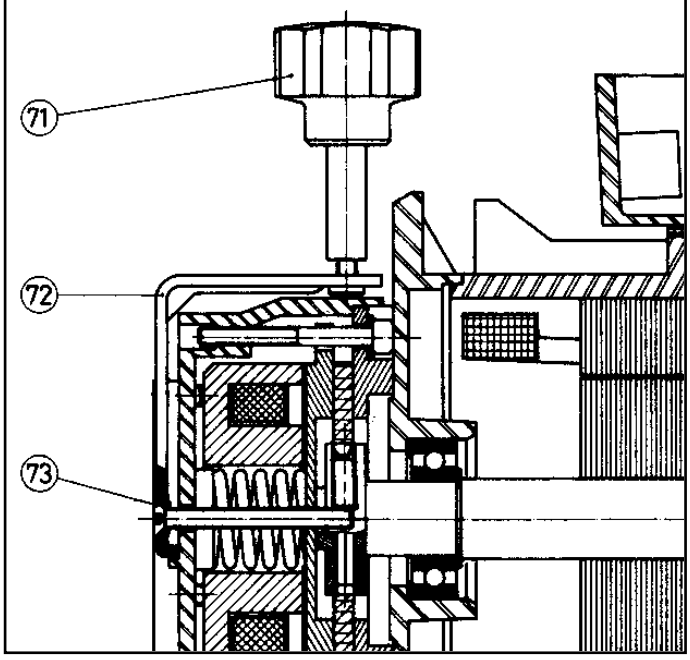


This manual must be given to the end user



FMC brake motor

Installation and maintenance

GN 0030 01 a

FOREWORD

• This brake motor is designed to operate in conjunction with LEROY-SOMER induction or D.C. motors
• LEROY-SOMER reserves the right to change the characteristics of its products at any time, in order to incorporate the latest technological developments. The information contained in this document may therefore be changed without notice.

• This brake motor cannot be used for lifting operations : safety of personnel.
• This brake motor must be installed by qualified personnel and must conform to the instructions set out below.
• The specifications, instructions and descriptions relate to standard use. They do not take account of any variation in construction or special adaptation. Failure to follow these recommendations may lead to premature wear and tear on the motor and to the manufacturer's guarantee no longer applying.

1 - GENERAL

The FMC brake motor is a failsafe brake motor.
This brake motor can be supplied with or without manual release.
The braking torque can be 1.5 mN (blue spring) or 2.5 mN (white galvanised spring).
The coil is supplied by D.C. or rectified current (dual half-wave).
Rectifier integrated in the terminal box : 2 "orange" wires for A.C. supply and 2 "purple" wires for connection to the brake.
Brake disc : in asbestos-free friction linings.
Brake motor operating conditions :
- Explosive, harsh or damp atmospheres should be avoided.
- Protection IP 40.
- Ambient operating temperature 0-40°.

2 - INSTALLATION

Before connection, ensure that the electrical supply to the installation is switched off

2.1 - Single speed induction motors - LS series in finned housing

2.1.1 - Power supply - Connection
2.1.1.1 - Integral power supply
A.C. supply via connection to the terminal plate of a THREE-PHASE OR SINGLE PHASE motor, plus integral rectifier connected on the terminal plate.

	A.C. motor voltage	D.C. brake voltage
Standard case :	230/400 3-ph. or 220V single ph.	196V
Other cases :	254/440 3-ph. or 254V single ph.	225V
	125V single phase	112V
	110V single phase	97V
	48V single phase	41V
	24V single phase	19V

For connection, refer to the motor connection diagram located in the terminal box and the voltage(s) indicated on the motor identification plate.

2.1.1.2 - Separate power supply
Supply the D.C. coil with the following voltages : 12 - 19 - 24 - 41 - 48 - 97 - 112 V.
The cable from the brake is connected in the motor terminal box.
To connect, power the brake cable with the voltage indicated on the brake motor identification plate or on the end of the cable. (To read the brake motor identification plate on ventilated motors, remove the fan cover).

2.1.1.3 - Relative separate power supply
Via the integral rectifier : Single phase A.C. supply from the integral rectifier (double diode bridge).
A.C. input voltage : see table in section entitled "integral power supply" (or indicator plate under the cover in the terminal box).
To connect : Read the brake motor supply voltage on the brake motor identification plate or on the end of the cable. Power the 2 unconnected "orange" A.C. wires on the rectifier with the corresponding A.C. voltage.

Note : For motors with no terminal box, the brake motor always has a separate motor supply.

2.2 - Two-speed induction motors

Please consult LEROY-SOMER.

2.3 - D.C. motors

2.3.1 - Motors with terminal box
2.3.1.1 - Integral power supply
The brake motor is supplied with the same voltage as the motor and the brake cable is connected on the motor terminal plate. Connect the motor according to the connection diagram.
2.3.1.2 - Separate power supply
The brake cable is :
- either connected in the terminal box,
- or left free on the outside.
Power the brake motor with the voltage indicated on the brake motor identification plate or on the end of the cable.
Possible voltages : 12 - 19 - 24 - 41 - 48 - 97 - 112V.
2.3.2 - Motors without terminal boxes
2.3.2.1 - Separate power supply
Power the brake motor with the voltage indicated on the brake motor identification plate or on the end of the cable.
Possible voltages : 12 - 19 - 24 - 41 - 48 - 97 - 112V.

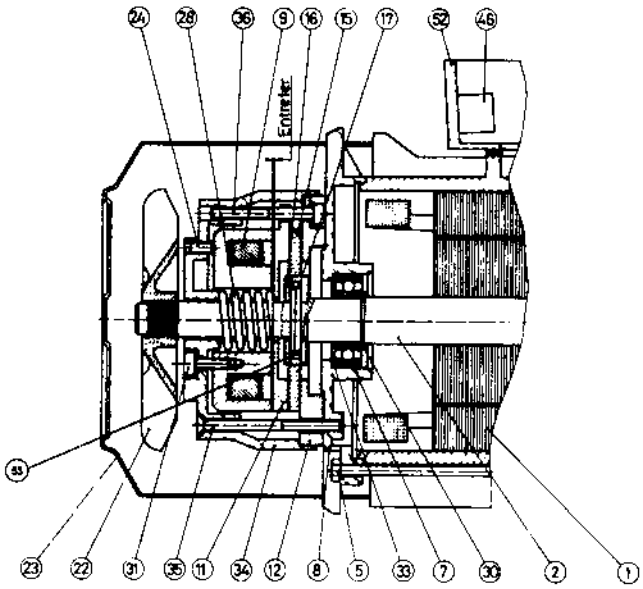
2.4 - Variable speed motors

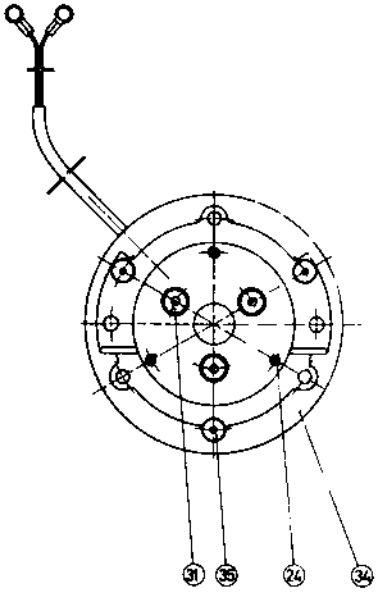
2.4.1 - D.C. motors with variable speed control unit (MVS or MVE)
2.4.1.1 - Integral power supply
Connected to terminals F1 F2 on the motor if these exist (MS motor), otherwise on the unit (MFA motor).
2.4.1.2 - Separate power supply (Same as 2.1.1.2).
2.4.2 - Induction motors with variable frequency control unit (FMV 102)
No integral power supply, only separate power supply is possible (see 2.1.1.2).

3 - STANDARD

Electromagnetic compatibility
For a standard connection (with rectifier) with unfiltered D.C. voltage, the FMC brake motor conforms to the following EMC requirements :
- Conducted emissions 0.15 - 30 MHz acc. to EN 50081-2
- Immunity to electrostatic discharges acc. to EN 50082-2 (level 3)
- Immunity to transient bursts acc. to EN 50082-2 (level 3)

3 - FMC BRAKE MOTOR WITH NO MANUAL RELEASE





NO	QTY	DESCRIPTION
1	1	Housing and wound stator
2	1	Rotor
5	3	Tie rods
7	1	Non-drive end bearing
8	1	Brake shield
9	1	Electro-magnet yoke
11	1	Armature
12	1	Fixed plate
15	1	Brake disc
16	1	Hexagonal hub
17	1	Hub retaining pin
22	1	Fan
23	1	Fan cover

NO	QTY	DESCRIPTION
24	3	Air gap adjustment screw
28	1	Pressure spring
30	1	Circlip E
31	3	Fixing screw for electro-magnet yoke
33	1	Spring washer
34	1	Electro-magnet yoke support
35	3	Brake block fixing screw
36	3	Brake columns
46	1	Rectifier
52	1	Motor terminal box
53	1	Sealing ring

3.1 - Principle

The spring (28) pushes the armature (11) against the brake disc (15) which then pushes against the fixed plate (12).

The brake disc (15) is prevented from rotating. The hub (16) which is attached to and therefore rotates with the disc is prevented from rotating, as is the shaft.

When the electro-magnet (9) is powered up, the armature (11) is pushed against the electro-magnetic yoke, thus reducing the air gap.

The brake disc (15) is thus no longer held tightly between the armature (11) and the fixed plate (12). This allows the hub (16) and the shaft (2) to rotate freely.

3.2 - Adjusting the air gap

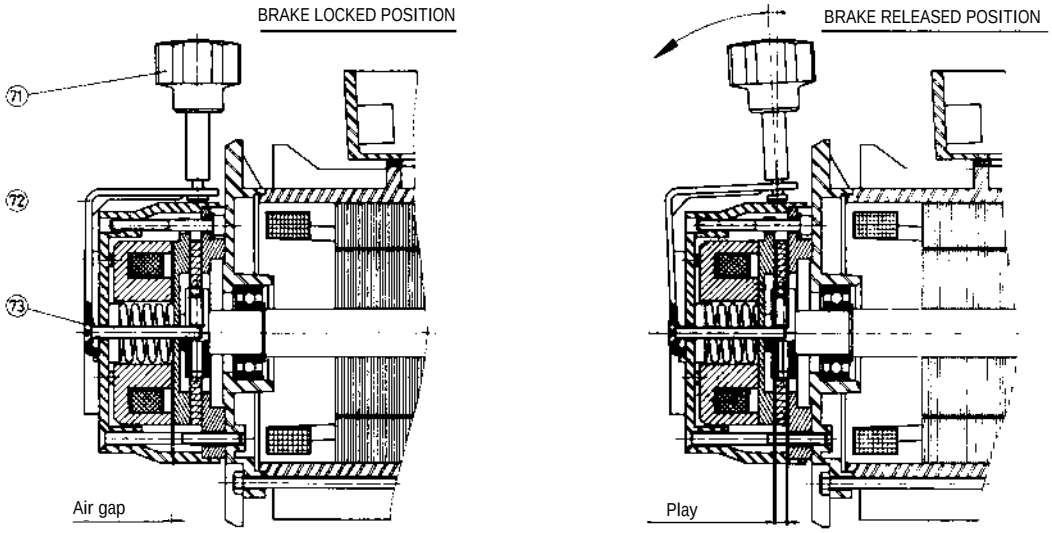
This operation must be carried out with the brakes de-energised and the motor stopped.

- The air gap is factory-set. It may need to be readjusted several hundred operations after the first start-up if the brake disc has become worn.
- Depending on servicing, it may also be necessary to adjust the brake every 50 to 100,000 cycles or more, depending on the braking inertia.

- To adjust the air gap :

- Remove the cover (23) and the fan (22) if the motor is ventilated.
- Loosen the 3 screws (31) by several turns.
- Carefully tighten the 3 screws (24) until they are completely tight.
- Loosen each of these 3 screws (24) a 1/4 turn. The resulting air gap will be 0.17 mm.
- Tighten the 3 screws (31) but do not over-tighten.
- Replace the fan (22), and the cover (23) if the motor is ventilated.

4 - FMC BRAKE MOTOR WITH MANUAL RELEASE



(71) Control knob

(72) Caliper

(73) Countersunk head screw

4.1 - Using manual release

There are two release functions using this mechanism :

Function A : Release with instant return.

The brake is released by slightly twisting the knob (71) in the direction of the arrow. When the knob is released, the brake returns to the "on" position.

Function B : Release with position maintained.

The brake is released and remains in position by screwing the knob (71) . To return the brake to the "on" position, completely unscrew the control knob.

4.2 - Manual release principle

When the control knob (71) is screwed round (Function B) or slightly twisted to the rear, (Function A) the caliper (72) also twists round in the direction of the arrow, pulling on the 2 countersunk head screws (73) which are screwed into the armature (11). The armature is pressed against the electro-magnet (9) , reducing the air gap. The brake disc (15) is thus no longer held tightly between the armature (11) and the fixed plate (12). This allows the hub (16) and the shaft (2) to rotate freely.

5 - REPLACING THE BRAKE DISC OR THE ELECTRO-MAGNET YOKE

- Remove the cover (23) and the fan (22) (for motors with ventilation).
- Unlock and remove the 3 screws (35).
- Remove the brake block, pulling it towards the rear.
- Unlock and pull out the 3 columns (36) which hold the fixed plate (12) .
- Remove the fixed plate (12) taking note of its position in relation to the electro-magnet support (34).
- Take out the brake disc (15).
- Replace the brake disc (15) if this is the part to be replaced.
- If the electro-magnet yoke (9) is to be replaced :

• Remove the 3 screws (31) which fix the yoke

• Remove the yoke (9) from the support (34)

• Replace the yoke (9)

- Mount the yoke (9) in the support (34), and replace the 3 screws (31) after loosening the 3 adjustment screws (24) by several turns.
- Replace the fixed plate (12) observing its correct position.

• Replace and lock the 3 columns (36)

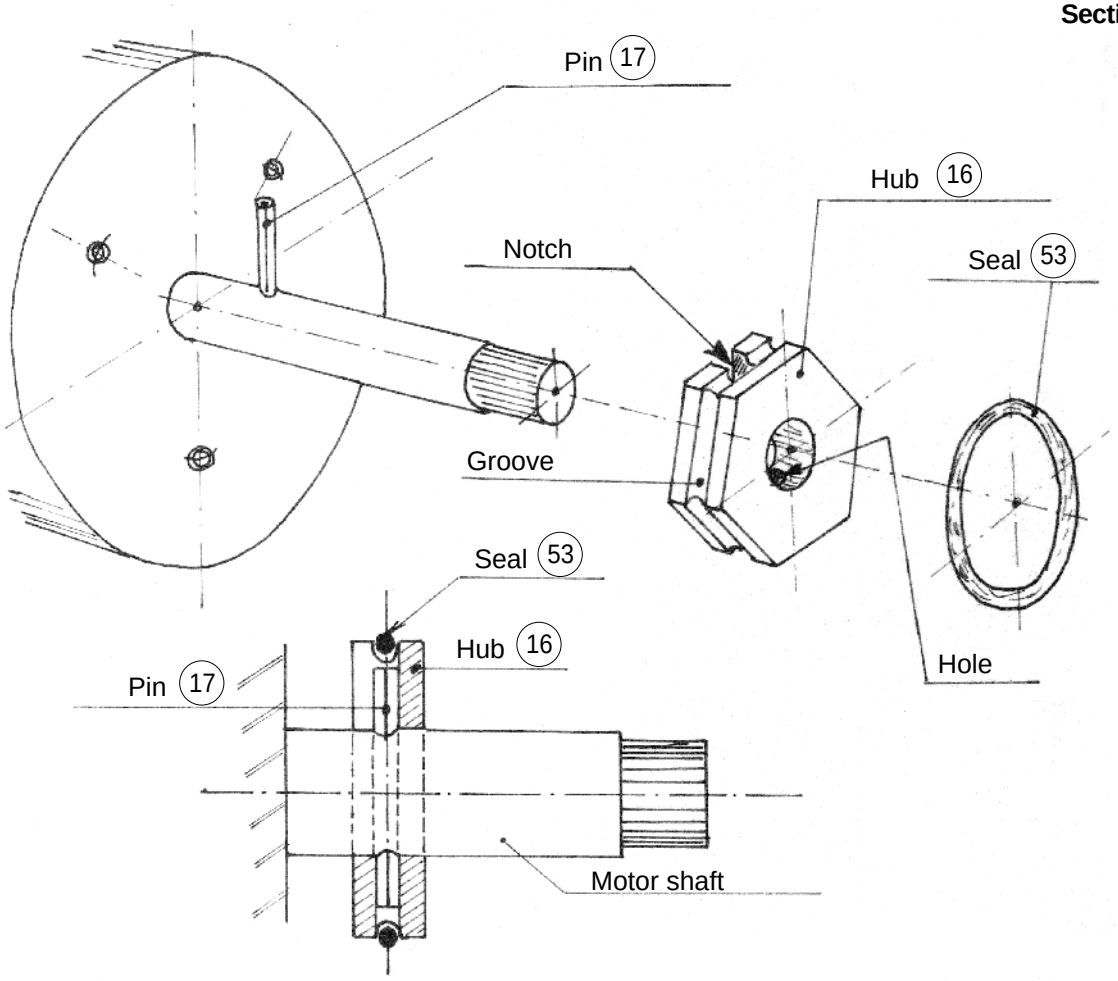
• Replace the brake block, taking care to fit the brake disc (15) correctly on the hexagonal hub (16)

• Replace and lock the 3 screws (35)

- Adjust the air gap as described in the section entitled "Adjusting the air gap".
- Replace the fan (22) and the cover (23) .

6 - DISMANTLING AND REASSEMBLING THE HUB

Sectional view



- Remove the cover (23) and the fan (22) (for motors with ventilation).
- Remove the 3 screws (35) .
- Remove the brake block, pulling it towards the rear.
- Remove the sealing ring (53) (if there is one) from the hub.
- Pull out the pin (17) and remove the hub (16).
- Push the new pin (17) into the motor shaft ensuring that it does not protrude on the other side.
- Mount a grooved hub (16) on the shaft ensuring that the open notch on the hub is on the side towards the pin. The pin should be firmly enbedded in this notch.
- Insert the pin into the hole located on the front of the hub notch using a Ø 2,5 pin punch and push it home, ensuring that it does not protrude on either side, into the groove.
- Insert the sealing ring (53) in the hub groove. Check that it is pushed right into the groove all the way round.
- Spray all 6 sides of the hub with "Molykote 321 R" aerosol slip oil ensuring that the sealing ring and hub are covered (do not use grease). Any surplus oil, sprayed onto the brake housing or shaft, will be polymerised in the air, and will not cause any problem.
- Replace the brake block on the motor. The brake lining should fit onto the hub and the sealing ring without having to exert much pressure, so as not to damage the sealing ring (without slip oil, the brake lining would twist and cut the seal).
- Fix the brake block using the 3 countersunk head screws (35).

Notes

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