This manual must be given to the end user

FMC brake motor
Installation and maintenance
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). The coil is supplied by D.C. or rectified current (dual half-wave).

The brake motor operating conditions:
- Explosive, harsh or damp atmospheres should be avoided.
- Protection IP 40.
- Ambient operating temperature 0-40°C.

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.

<table>
<thead>
<tr>
<th>A.C. motor voltage</th>
<th>D.C. brake voltage</th>
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</thead>
<tbody>
<tr>
<td>Standard case: 230/400 3 ph or 220V singlephd</td>
<td>196V</td>
</tr>
<tr>
<td>Other cases: 254/440 3 ph or 254V singlephd</td>
<td>225V</td>
</tr>
<tr>
<td>125V single phase</td>
<td>112V</td>
</tr>
<tr>
<td>110V single phase</td>
<td>97V</td>
</tr>
<tr>
<td>48V single phase</td>
<td>41V</td>
</tr>
<tr>
<td>24V single phase</td>
<td>19V</td>
</tr>
</tbody>
</table>

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 - 112 V.

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 - 112 V.

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)
3.1 - 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 re-adjusted 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

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 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. To return the brake to the "on" position, completely unscrew the control knob.

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

5 - REPLACING THE BRAKE DISC OR THE ELECTRO-MAGNET YOKE
- Remove the cover and the fan (for motors with ventilation).
- Unlock and remove the 3 screws.
- Remove the brake block, pulling it towards the rear.
- Unlock and pull out the 3 columns which hold the fixed plate.
- Remove the fixed plate taking note of its position in relation to the electro-magnet support.
- Take out the brake disc.
- Replace the brake disc if this is the part to be replaced.
- If the electro-magnet yoke is to be replaced:
  - Remove the 3 screws which fix the yoke
  - Remove the yoke from the support.
  - Replace the yoke
  - Mount the yoke on the support, and replace the 3 screws after loosening the 3 adjustment screws by several turns.
  - Replace the fixed plate observing its correct position.
- Replace and lock the 3 columns.
- Replace the brake block, taking care to fit the brake disc correctly on the hexagonal hub.
- Replace and lock the 3 screws.
- Adjust the air gap as described in the section entitled "Adjusting the air gap".
- Replace the fan and the cover.
- Remove the cover and the fan (for motors with ventilation).
- Remove the 3 screws.
- Remove the brake block, pulling it towards the rear.
- Remove the sealing ring (if there is one) from the hub.
- Pull out the pin and remove the hub.
- Push the new pin into the motor shaft ensuring that it does not protrude on the other side.
- Mount a grooved hub on the shaft ensuring that the open notch on the hub is on the side towards the pin. The pin should be firmly embedded 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 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.