FCPL54 and FCPL60 BRAKE

1 INSTALLATION

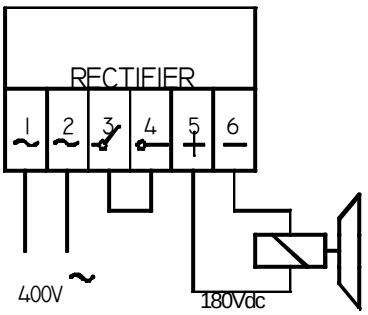
To install the brake motors, follow the recommendations in the A.C. motor installation and maintenance manual.
Ensure that the brake is applied when stopped.

2 SUPPLY

FCPL brakes are fitted with D.C. coils; the separate supply to the brake is via rectifier SO7 mounted in the terminal box as standard.

Voltage Mains ~ (V)	Rectifier	Nominal D.C. brake voltage (V) ± 10%
220 V	SO7	100
230 V	SO7	100
400 V	SO7	180
460 V	SO7	200

For brakes with different voltages, an independent D.C. supply must be provided (brake motor supplied without rectifier).
For motors starting with reduced voltage or operating at a variable voltage or frequency, it is necessary to provide a separate power supply for the brake.
To reduce brake application response time, the D.C. supply between the rectifier and the brake must be cut off (in that case, the “coupure” must not be done above 3 meters from the coil).
This is essential for hoisting applications.
Remove the strap from terminals 3 and 4 on the rectifiers and connect the brake contactor to these terminals.



Duty: Leroy Somer brake coils are defined for a 60 % operating factor with duty cycle (S3) or for continuous duty (S1). They can be distinguished by the colour of the power supply wires when the cover (39) of the brake is removed.
180 V coil : power supply wires are blue for S3 duty, white and blue for S1 duty.
100 V coil : power supply wires are yellow for S3 duty, yellow and white for S1 duty.

Important :
Before any intervention on the brake, the brake motor must be disconnected.
Check that the brake motor is not maintaining a load before performing any work on the brake.

3 SETTING THE AIR GAP

The air-gap is the distance between the armature **11** and the yoke **9** when the coil is not supplied. The air-gap must be re-adjusted when it reaches 1.5 mm or when the brake can no longer be released normally.
To adjust the air-gap, switch off the coil and remove the cover **39**. Then release the three nuts **31** (19mm spanner) to move the armature **11** towards the yoke **9** while turning the nuts **24** (18mm spanner).
Adjustment is performed by inserting an 0.8 mm feeler gauge for 1-disc brakes, and a 1 mm gauge for 2-disc brakes, between the yoke 9 and the armature **11**. It must be possible to slide the gauge into the air-gap without effort and with no play at three points distributed equally around the **edge** of the yoke.
After checking, tighten the three nuts **24** (18 mm spanner).If the air gap is set correctly, the brake should be released sharply when powered up, and the disc should not rub.
Re-assemble cover **39**.

4 DISMANTLING (see dwg 1 & 2)

Suitable tools should be used for dismantling.
For a brake fitted with an encoder, remove the protection cover **105**, then unscrew the 3 columns in order to slide off the set encoder **102** / housing **109a**.
Remove the rear cover **39**, then disconnect the brake power supply wires.
Insert a threaded rod M12 (for FCPL54) ; M16 (for FCPL60 or FCPL54 with encoder), fitted with a washer and locking nut into the yoke (bore **9**), screw it into the armature **11**. Tighten the locking nut to eliminate the air-gap. A complete brake block is thus assembled.
Remove the 3 fixing nuts **24** (18 mm spanner)..
Gradually unscrew the nuts **31** with a 19 spanner and slide off the armature/yoke unit.

4.1 If you only want to change the disc.

The brake disc must be changed when the thickness of one of the two brake lining face is less than 1.5mm (see fig 3).

Pull out the worn disc **15** by sliding it along its spline.
Ensure that the friction surfaces of endshield **8** and armature **11** are clean and dry.
Insert the seal **73** into the brake hub. As for FCPL 60 2-disc brakes, only the disc being in contact with endshield **8** is mounted with a seal **73** (see dwg 3).
Insert the new disc, with the hub side towards the endshield, and with the friction surface of the disc in contact with endshield **8**
Then proceed to the reassembling (look at § 5).

4.2 If you want to alter the braking torque.

It is rarely necessary to alter the braking torque, since it has been defined for the particular application at the time of ordering. Modifying this involves changing certain parameters such as the brake response time.

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Request assembly instructions from the plant.
Unscrew the lock nut of the threaded rod which will gradually slacken the springs **28** then unscrew the threaded rod.
Select the number of springs and spacers needed for the required braking torque (see paragraph 6).
These must be PATAY parts.
Ensure the springs are equi-distant between the yoke and the armature, according to relevant setting sheet.
Screw the threaded rod to the armature to join the yoke and the armature and tighten the nut to compress the springs.
Then proceed to the reassembling (look at § 5).

5 REASSEMBLING

Reassemble the armature/yoke unit by firstly engaging the armature **11** on the (brake) columns, then fit nuts **31** before fitting the yoke lugs.
Bring the friction surface of the armature **11** against the disc by gradually screwing the nuts **31**.
Adjust the nuts **24** to bring them into contact with the yoke lugs **9**.
Remove the locking nut and rem ove the threaded rod.
Adjust the air-gap.
Change gasket **50**.
Reconnect the brake power supply wires before replacing the cover.

6 CHARACTERISTICS

6-1 FCPL54 brake

Electrical characteristics :

Voltage (V)	Duty	R (Ù)	I (A)
20	S3	2,25	8,9
100	S3	61	1,6
180	S3	195	0,9
180	S1	340	0.6

Spare parts :

No.	Description	Part nr
15	Disc	***
21	Spacer	070E 202 054
28	Spring	058E 122 054
50	Cover gasket	965E 000 004
9	Yoke	***
47	Rectifier	069E 807 046

Braking torques

Quantity		Braking	Setting
No 28	No 21	torque (N.m)	sheet ref
2	0	75	314 453
2	2	90	314 575
3	0	110	314 489
3	3	130	314 551
4	0	150	314 412
4	4	180	314 576
6	0	220	314 414

6-2 FCPL60 brake

Electrical characteristics :

Tension (V)	Service	R(Ù)	I(A)
20	S3	1,9	10,5
100	S3	55	1,8
180	S3	160	1.2
180	S1	320	0,6

Pièces d'usure :

No.	Description	Part nr
15	Disc	***
21	Spacer	070E 202 054
28	Spring	058E 122 054
50	Cover gasket	965E 000 006
9	Yoke	***
47	Rectifier	069E 807 046

Braking torques

Quantity		Braking	Setting
No 28	No 21	torque (N.m)	sheet ref.
3	3	150	314 688
4	0	170	315 192
4	4	200	314 689
6	0	260	314 690
6	6	300	314 691

***** When ordering parts, please specify the information contained on the nameplate, in particular the motor serial number.**

NOTE : FCPL 60/2 discs
The braking torque of a 2-disc brake will be twice the braking torque of a 1-disc brake using the same number of springs and spacers.
With this version, an intermediate plate **12** should be inserted between the two discs.

7 OPTIONS

7.1 micro-switch (see dwg4).

This micro switch can be set in different ways, depending what it is used for (brake lining wear, brake release indicator, air gap limits detector).
Theoretically, it is not necessary to adjust the settings, until the brake has been dismantled.
The setting(s) of the micro switch(s) must always be done with the air gap at the minimum value.
Fix on the yoke **9** the micro switch **55** with the two nuts.
Connect, between the black and the blue wires, an ohmmeter or, if you don't have one, an indicator light.

7-1-1 Brake release device.
Slightly relax the nut **61**.
Put on the screw **59** against the micro switch pushrod until the contact switch. The resistance becomes zero, the contact is open.

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Uncrew **59** from ¼turn, the resistance becomes infinite, the contact is open.
Check that when the armature **11** is against with the yoke **9** (brake release), the resistance value is zero.
Lock the nut **61**.

7-1-2 Brake lining wear device.
Slightly relax the nut **61**.

Put on the screw **59** against the micro switch pushrod until the contact switch. The resistance becomes zero, the contact is open.
Unscrew **59** between ¾and 1 turn, this value match to 09mm of brake lining wear. The resistance remain zero.
Lock the nut **61**.

8 TROUBLESHOOTING GUIDE

Fault	Possible cause	Solution
Brake cannot be released	Voltage is present at the coil terminals.	The air-gap is too large for the yoke to attract the armature. *Readjust the air-gap. Check disc wear and change if necessary.*
		The voltage is too low (less than 80% of nominal voltage). *Increase the voltage to the nominal value..*
		The coil is broken, it has infinite resistance. *Change the yoke..*
	There is no voltage at the coil terminals	The rectifier is no longer working. *Test the rectifiier*.
Brake release time is too long.	Check the voltage at the coil terminals.	*It must not be less than 90% of nominal voltage.*
	The air-gap is too large.	*Readjust.*
	The braking torque has been set too high.	*Return to original setting or refer to the factory.*
Brake application time is too long.	Check that the switching is on the D.C. supply between the rectifier and brake (see paragraph II).	*Use terminals 3 and 4 of SO7 rectifier for brake switching..*
Braking torque is insufficient.	Friction surfaces are not clean and dry.	*Ensure friction surfaces are clean and dry.* *Readjust torque setting if necessary.*
	The disc is worn.	*Change the disc..*
Continuous rubbing on the brake lining.	The air-gap is too narrow.	*Readjust the air-gap..*

SO7 rectifiers :

To check that the rectifier is working correctly, use a multimeter in the « diode test » position.

It is also possible to connect a 4.5 V battery and lamp to test the rectifier. Disconnect all wires from the rectifier except the strap between 3 and 4 as shown in the 4 circuit diagrams.
If the lamp does not light as indicated, it should be replaced.

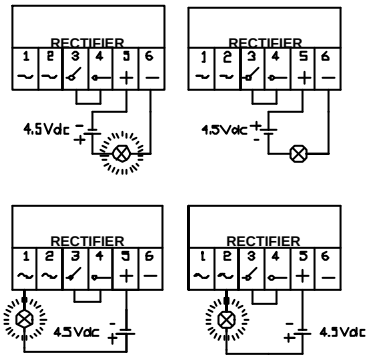

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Fig:1

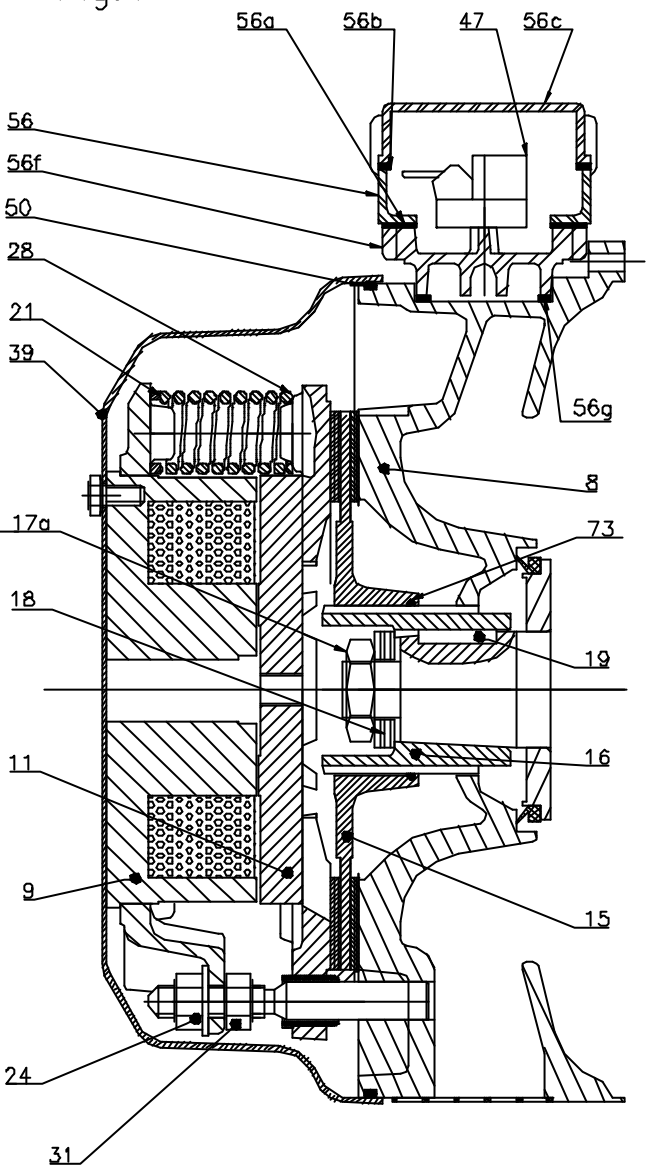

Fig:2

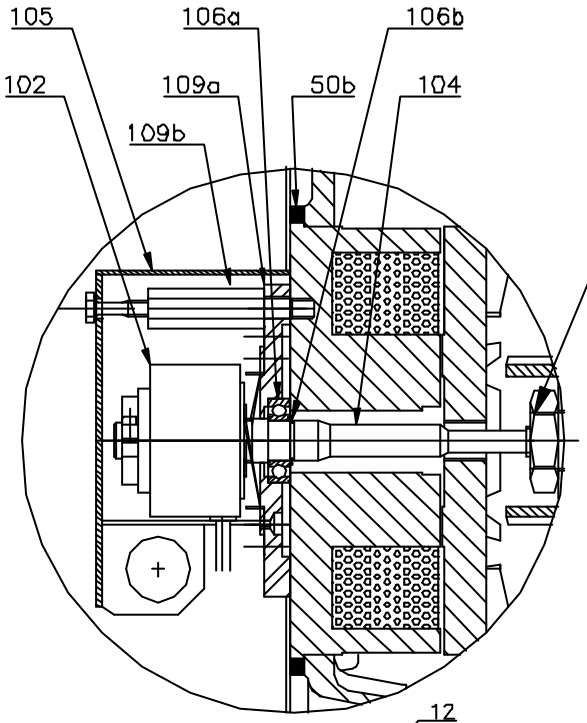

Fig:3

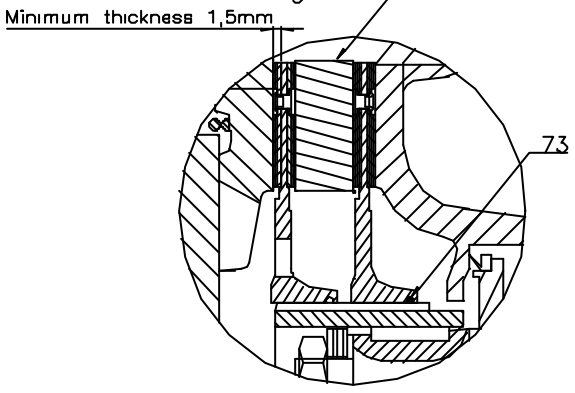

Fig:4