

# EU-TYPE EXAMINATION CERTIFICATE

Issued by Liftinstituut B.V.  
identification number Notified Body 0400,  
commissioned by Decree no. 2016-0000038870

Certificate no. : NL04-400-1002-051-01 Revision no.: 11

Description of the product : Double Disk Brake to be used as part of the Ascending Car Overspeed Protection means and stopping element of the Unintended Car Movement Protection.

Trademark, type : FCRD90 type 60 Nm  
FCRD90 type 70 Nm (Schindler reference torque 65 Nm)  
FCRD90 type 80 Nm  
FCRD90 type 90 Nm (Schindler reference torque 80/88 Nm)  
FCRD90 type 100 Nm  
FCRD112 type 110 Nm  
FCRD112 type 125 Nm (Schindler reference torque 105 Nm)  
FCRD112 type 140 Nm  
FCRD112 type 155 Nm  
FCRD112 type 170 Nm  
FCRD112 type 185 Nm (Schindler reference torque 150/165 Nm)  
FCRD112 type 200 Nm (Schindler reference torque 180 Nm)  
FCRD112 type 220 Nm (Schindler reference torque 200 Nm)

Name and address of the manufacturer : MOTEURS LEROY SOMER  
Usine de Rabion, rue de la Brigade RAC, 16005 Angouleme France.  
Usine des Agriers-DMT, ZI. des Agriers, 16015 Angouleme France.  
Leroy Somer Electro-Technique (Fuzhou) Co., Ltd., No.1 Emerson Road, Gaishan, Cangshan District, Fuzhou, Fujian, P.R. China.  
Leroy Somer Motors, A Division of Emerson Electronic Co (I) Pvt Ltd A 221, Sector 83 Noida 201 305 Gautam Budha Nagar U.P India.

Name and address of the certificate holder : MOTEURS LEROY SOMER  
Boulevard Marcellin Leroy  
16005 Angouleme Cedex - France

Certificate issued on the following requirements : Lifts Directive 2014/33/EU

Certificate based on the following standard : EN 81-20:2014, EN 81-50:2014, EN 81-1:1998+A3:2009  
Parts of:-

Test laboratory : None

Date and number of the laboratory report : None

Date of EU-type examination : July 2017

Additional document with this certificate : Report belonging to the EU-type examination certificate no.: NL04-400-1002-051-01 Rev.11

Additional remarks : None

Conclusion : The safety component meets the requirements of the Lifts Directive 2014/33/EU taking into account any additional remarks mentioned above.

Amsterdam

Date : 18-07-2017  
Valid until : 18-07-2022

  
ing. J.L. van Vliet  
Managing Director

  
Certification decision by

## Report EU-type examination

Report belonging to EU-type examination certificate no. : NL04-400-1002-051-01  
Date of issue of original certificate : 23-11-2004  
Concerns : Safety component  
No. and date of revision : 11. 18-07-2017  
Requirements : Lifts Directive 2014/33/EU  
Standard(s):  
EN 81-20:2014, EN 81-50:2014,  
EN 81-1:1998+A3:2009  
under exclusion of articles: -  
Project no. : P170139

### 1. General specifications

Name and address manufacturer : Moteurs Leroy Somer  
Usine de Rabion, rue de la Brigade RAC, 16005  
Angouleme France.

Description of safety component : Double Disk Brake to be used as part of the Ascending Car  
Overspeed Protection means and stopping element of the  
Unintended Car Movement Protection.

Type : FCRD90 type 60 Nm  
FCRD90 type 70 Nm (Schindler reference torque 65 Nm)  
FCRD90 type 80 Nm  
FCRD90 type 90 Nm (Schindler reference torque 80/88 Nm)  
FCRD90 type 100 Nm  
FCRD112 type 110 Nm  
FCRD112 type 125 Nm (Schindler reference torque 105 Nm)  
FCRD112 type 140 Nm  
FCRD112 type 155 Nm  
FCRD112 type 170 Nm  
FCRD112 type 185 Nm (Schindler reference torque 150/165 Nm)  
FCRD112 type 200 Nm (Schindler reference torque 180 Nm)  
FCRD112 type 220 Nm (Schindler reference torque 200 Nm)

Laboratory : None

Address of examined component : Usine de Rabion, rue de la Brigade RAC, 16005  
Angouleme France.

Data of examination : July 15<sup>th</sup>, 2003  
April 26<sup>th</sup>, 2004 and July 9<sup>th</sup>, 2004  
Nov. 30<sup>th</sup> and Dec. 1<sup>st</sup>, 2004  
April 26<sup>th</sup> and 27<sup>th</sup>, 2006  
October 21<sup>th</sup>, 2008 (France)  
September 17 and 18, 2009  
April 2012  
October, 2015  
June - July 2017

Examination performed by : H.B. Kaptein  
A. van den Burg  
R.E. Kaspersma

## 2. Description safety component

### Description of the brakes

The specified disk brakes are intended to be used as holding brakes for the application in lift installations equipped with controlled drive systems.

The brakes each consist of two independent electro-mechanical disk brakes, that have to be mounted to the flange of a lift machine by three stud bolts, M8 for FCRD90 and M10 for FCRD112.

One disk is clamped in between the lift machine flange and the anchor of the first brake. The other disk is clamped between the brake housing of the first brake and the anchor of the second brake.

The brake disks are manufactured of heat treated aluminium. At both sides, an asbestos-free brake lining is bonded to the disks. The connection of the disks with the main shaft of the machine is provided by splines.

The main differences between the types are the dimensions of the electro-magnets, the dimensions of the brake lining, the stiffness and the applied number of the pressure springs and the stud bolts, resulting in different outside dimensions of the housings.

Both anchors are pushed towards the brake disks by means of guided compression springs. The different amount of springs, mainly defining the brake torque, cannot be adjusted in the field.

The main brake pad pressure is exerted by guided compression springs and partly by a sealing and damping element.

The brakes are delivered fully adjusted from the factory. Although the air gap of the FCRD112 brake can be adjusted as well in the factory as also on site, no adjustments are assumed to be required on site. With the introduction of redesigned stud bolts in Generation 5, the air gap of FCRD90 cannot be adjusted in the field.

The wear of the brake lining has such a low degree that re-adjustment of the air gap during life time is not needed. This means that maintenance on the brake is also not needed.

The opening of each brake is monitored by switches that have to be connected to the controller or frequency converter of the lift. If one of the brakes fails to open, the lift shall be stopped. The contacts (micro-switches) are insulated and installed on the outside at the bottom of the brake housings.

More details concerning the dimensions of the main parts and mechanical data of these parts can be found in the tables on the next pages.

In accordance with EN 81-1 art. 12.4.2.3.3 and EN 81-20 art. 5.9.2.2.2.3 c), it is allowed to delay the closing of one of the brakes by applying a diode directly to the terminals. The additional delay that results has to be taken into account in case the brake is used as an ascending car over speed protection or protection against unintended car movement.

### **Technical details and limits of use**

Type indication	FCRD 90	FCRD 90	FCRD 90	FCRD 90
Nominal braking torque [Nm]	2 x 60	2 x 70	2 x 80	2 x 90
Maximum theoretic torque [Nm]	2x 101	2 x 117	2 x 132	2 x 148
Average theoretic torque [Nm]	2 x 84	2 x 96	2 x 109	2 x 121
Minimum theoretic torque [Nm]	2 x 69	2 x 78	2 x 87	2 x 96
Maximum allowed speed RPM	1000	1000	1000	1000
Brake lining diameters outside / inside [mm]	ø152 x ø132	ø152 x ø132	ø152 x ø132	ø152 x ø132
Brake lining material	Bremskerl 9013	Bremskerl 9013	Bremskerl 9013	Bremskerl 9013
Indication of pressure springs	RST010 RC011 (654181)	RST010 RC011 (654181)	RST010 RC011 (654181)	RST010 RC011 (654181)
Number of pressure springs	5	6	7	8
Installation diameter of the pressure springs [mm]	ø 136	ø 136	ø 136	ø 136
Overall dimensions [mm]	ø 204 x 151.5			

Type indication	FCRD 90
Nominal braking torque [Nm]	2 x 100
Maximum theoretic torque [Nm]	2 x 163
Average theoretic torque [Nm]	2 x 133
Minimum theoretic torque [Nm]	2 x 105
Maximum allowed speed RPM	1000
Brake lining diameters outside / inside [mm]	ø152 x ø132
Brake lining material	Bremskerl 9013
Indication of pressure springs	RST010 RC011 (654181)
Number of pressure springs	9
Installation diameter of the pressure springs [mm]	ø 136
Overall dimensions [mm]	ø 204 x 151.5

Type indication	FCRD 112	FCRD 112	FCRD 112	FCRD 112
Nominal braking torque [Nm]	2 x 110	2 x 125	2 x 140	2 x 155
Maximum theoretic torque [Nm]	2 x 165	2 x 184	2 x 204	2 x 224
Average theoretic torque [Nm]	2 x 137	2 x 153	2 x 169	2 x 185
Minimum theoretic torque [Nm]	2 x 109	2 x 121	2 x 132	2 x 144
Maximum allowed speed RPM	1400	1400	1400	1400
Brake lining diameters outside / inside [mm]	ø180 x ø150	ø180 x ø150	ø180 x ø150	ø180 x ø150
Brake lining material	Bremskerl 9013	Bremskerl 9013	Bremskerl 9013	Bremskerl 9013
Indication of pressure springs	RST012 RC004 (674036)	RST012 RC004 (674036)	RST012 RC004 (674036)	RST012 RC004 (674036)
Number of pressure springs	7	8	9	10
Installation diameter of the pressure springs [mm]	ø 174	ø 174	ø 174	ø 174
Overall dimensions [mm]	ø 235 x 163.5			

Type indication	FCRD 112	FCRD 112	FCRD 112	FCRD 112
Nominal braking torque [Nm]	2 x 170	2 x 185	2 x 200	2 x 220
Maximum theoretic torque [Nm]	2x 243	2 x 263	2 x 302	2 x 343
Average theoretic torque [Nm]	2 x 200	2 x 216	2 x 248	2 x 281
Minimum theoretic torque [Nm]	2 x 155	2 x 167	2 x 191	2 x 216
Maximum allowed speed RPM	1400	1400	1400	1400
Brake lining diameters outside / inside [mm]	ø180 x ø150	ø180 x ø150	ø180 x ø150	ø180 x ø150
Brake lining material	Bremskerl 9013	Bremskerl 9013	Bremskerl 9013	Bremskerl 9013
Indication of pressure springs	RST012 RC004 (674036)	RST012 RC004 (674036)	RST012 RC004 (674036)	RST010 RC011 (654181)
Number of pressure springs	11	12	14	16
Installation diameter of the pressure springs [mm]	ø 174	ø 174	ø 174	ø 174
Overall dimensions [mm]	ø 235 x 163.5			

### Delay times to be taken into account for UCMP applications

Series or parallel connection <u>without</u> diode							
Power supply interruption on DC side on both brakes							
FCRD size		90			112		
Brake type	[Nm]	60	70/80	90/100	125/140/155/170	185	200/220
t <sub>10</sub>	ms	50	40	30	80	60	90
t <sub>50</sub>	ms	70	60	40	100	80	100
t <sub>90</sub>	ms	90	80	50	120	100	110

Series or parallel connection <u>with</u> diode on one brake							
Power supply interruption on DC side on both brakes							
FCRD size		90			112		
Brake type	[Nm]	60	70/80	90/100	125/140/155/170	185	200/220
t <sub>10</sub>	ms	50	40	30	80	60	90
t <sub>50</sub>	ms	270	220	175	390	330	345
t <sub>90</sub>	ms	490	400	320	700	600	600

Principal drawings of the brakes are shown in the annexes of this report.

### 3. Examinations and tests

The examination covered a check whether compliance with the Lift Directive 2014/33/EU is met, based on the harmonized product standards EN 81-20:2014 and EN 81-50:2014.

The examination included:

- Examination of the technical file (See annex 2):
- Check of performed calculations
- Examination of the representative model in order to establish conformity with the technical file.
- Inspections and tests to check compliance with the requirements.

The brakes, are initially examined and tested in full accommodated lifts both as a lift brake as well as part of the ascending car overspeed protection means. This means that the tests were performed for the purpose of being applied in certain defined lifts. After the modifications of the brakes described in revision 6.0 of this report, it is decided to change the method of testing.

The brakes are now tested on a test bench that consisted of an electro motor with additional inertias coupled to a lift machine to which the two brakes are mounted. Only the brake types FCRD90 for 90 Nm and the FCRD112 for 220 Nm are actually tested in order to prove that the brakes are capable to neutralise the maximum specified amount of energy of 46881 J for FCRD90 and 108566 J for FCRD112. The other types are assumed to function properly as well by comparison on theoretical grounds.

The tests are described in "Test report of EC Type-examination NL04-400-1002-051-01 Rev. 6.0".

The modifications described in Rev. 7.0 up to 10 of this report are judged by comparison on theoretical grounds and calculations where necessary and did not require an update of the test report that was made for Rev. 6.0 dated October 20, 2009.

For revision 11 of the certificate additional tests are witnessed to verify the delay times until the brakes produce 10%, 50% and 90% of the nominal torque ( $t_{10}$ ,  $t_{50}$  and  $t_{90}$ ).

For stability reasons, the time  $t_{50}$  is calculated as the average from  $t_{10}$  and  $t_{90}$ .

## 4. Results

Within the framework of the certification activities, the following items were checked and found in order:

- The models of the tested brakes
- Relevant layout drawings and cross section drawings of the concerning brakes
- Brake lining material specifications
- The results of the strength calculations
- The test results

The full capacity brake tests passed without remarks and did not lead to permanent deformations notable brake lining wear or loss of stability.

After the final examinations the brakes and the technical file were found in accordance with the requirements.

## 5. Conditions

On the EU-type examination certificate the following conditions apply:

- For application as Ascending Car Overspeed Protection, the requirements of EN 81-1 articles 9.10.1, 9.10.4.d), 9.10.5 and 9.10.10.a) or the requirements of EN 81-20 art. 5.6.6.1, 5.6.6.4 e) and 5.6.6.10 must be fulfilled.
- For application as Unintended Car Movement protection, the relevant requirements of EN 81-1 and/or EN 81-20 for UCMP concerning monitoring and stopping distance shall be checked to be fulfilled.
- The maximum rotational speed of the brakes at the moment of detection of the speed monitoring device according the requirements of art. 9.10.10 of EN 81-1 or art. 5.6.6.10 of EN 81-20 shall not be higher than 1000 rotations/minute for FCRD90 and no higher than 1400 rotations/minute for FCRD112.
- When these brakes are additionally used as the braking system for lifts, compliance of the lift design with the requirements for lift brakes of EN 81-1 articles 12.4.1.1, 12.4.2.1, 12.4.2.2, 12.4.2.3, 12.4.2.4. or EN 81-20 articles 5.9.2.2.1.1, 5.9.2.2.2.1, 5.9.2.2.2.2, 5.9.2.2.2.3 and 5.9.2.2.2.7 shall be checked.
- Installation and maintenance instructions for the brake units shall be provided.

## 6. Conclusions

Based upon the results of the EU-type examination Liftinstituut B.V. issues an EU-type examination certificate.

The EU-type examination certificate is only valid for products which are in conformity with the same specifications as the type certified product. The certificate is issued based on the requirements that are valid at the date of issue. In case of changes of the product specifications, changes in the requirements or changes in the state of the art the certificate holder shall request Liftinstituut B.V. to reconsider the validity of the certificate.

## 7. CE marking and EU Declaration of conformity

Every safety component that is placed on the market in complete conformity with the examined type must be provided with a CE marking according to article 18 of the Lift directive 2014/33/EU under consideration that conformity with eventually other applicable Directives is proven. Also every safety component must be accompanied by an EU declaration of conformity according to annex II of the Directive in which the name, address and Notified Body identification number of Liftinstituut B.V. must be included as well as the number of the EU-type examination certificate.

An EU type-certified safety component shall be random checked e.g. according to annex IX of the Lift directive 2014/33/EU before these safety components may be CE-marked and may be placed on the market. For further information see regulation 2.0.1 'Regulations for product certification' on [www.liftinstituut.com](http://www.liftinstituut.com).

Prepared by:



A. van den Burg  
Product specialist Certification  
Liftinstituut B.V.

Certification decision by:





<b>Annex 2 Documents of the Technical File which were subject of the examination</b>
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title	document number	date
TCF rev.0 – rev.10	NL04-400-1002-051-01	

<b>Annex 3. Reviewed deviations from the standards</b>
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EN xx-x par.	Requirement	Accepted design
None		

<b>Annex 4 Revision overview</b>
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**REVISIONS OF THE CERTIFICATE**

Rev.	Date	Summary of revision
0	23-11-2004	First issue of type-examination certificate
1.0	21-12-2004	New type-examination certificate because of update for new brake
2.0	17-10-2005	New type-examination certificate because of update for details
3.0	12-07-2006	New type-examination certificate because of new brake added
3.1	2-04-2007	New type-examination certificate because of update various data all brakes with exception of 2 x 180 Nm brake
3.2	2-11-2007	New EC-type examination certificate because of changing type examination into EC-type examination, as well various data of the 2 x 180 Nm brake updated
4.0	15-04-2008	New EC-type examination certificate because of implementation two new brakes 2x88 Nm (FCRD90) and 2x80 Nm (FCRD112)
5.0	27-10-2008	New EC-type examination certificate because of implementation two new brakes 2x200 Nm (FCRD112) and 2x280 Nm (FCRD132)
5.1	15-12-2008	New EC-type examination certificate because of corrections in tables on pages 4 and 5
6.0	20-10-2009	New EC-type examination certificate because of modified report and FCRD132 removed from certificate.
7.0	01-07-2010	Manufacturer in Fuzhou China added.
8	10-04-2012	New type-examination certificate because of update of report.
9	06-09-2013	Change of "Schindler reference torque" 150/160 Nm to 150/165 Nm for FCRD 112 brake type 185 Nm.
10	30-10-2015	Update for EN 81-20, addition of Leroy Somer Motors, A Division of Emerson Electronic Co (I) Pvt Ltd A 221, Sector 83 Noida 201 305 Gautam Budha Nagar U.P India.
11	18-07-2017	Update to EU Type-examination certificate and EN 81-20 and EN 81-50 Addition of Unintended Car Movement Protection FCRD132 removed from certificate

**REVISIONS OF THE REPORT, BELONGING TO THE CERTIFICATE**

Rev.	Date	Summary of revision
0	23-11-2004	original report for brakes of 2 x 65 Nm, 2 x 80 Nm and 2 x 150 Nm
1.0	21-12-2004	- brake of 2 x 105 Nm added in report - some values for brake 2 x 150 Nm adapted
2.0	17-10-2005	- limits for adjustment of airgap changed - spline bush data implemented (table at page 3)
3.0	12-07-2006	- new brake added (2 x 180 Nm) - some concerning parts of text adapted - history introduced (Annex 3)
3.1	2-04-2007	- various data updated for all types of brakes, with exception for 2 x 180 Nm (pages 3 and 4) - specification air gap adjustment extended
3.2	2-11-2007	- Type examination changed into EC-type examination - various data of the 2 x 180 Nm updated (page 3)
4.0	15-04-2008	- Two new brake types implemented: 2 x 88 Nm (FCRD90) and 2 x 80 Nm (FCRD112). - Most data of all existing brakes updated, because of new performed calculations
5.0	27-10-2008	- Two new brake models added: 2x200 Nm and 2x280 Nm. - Table split up in 2 sections and data added. - Some existing data accommodated.
5.1	15-12-2008	- Corrections of torque values 44 Nm and 50 Nm in the tables on pages 4 and 5
5.2	04-05-2009	- missing limits of application implemented in the text. - Annex 4 implemented (table and belonging text)
6.0	20-10-2009	New friction material and O-ring for both brakes and modified number of springs in brake FCRD90 only. Complete change of report layout due to changed test method for the brake types FCRD 90 and FCRD112. Type FCRD132 removed.
7.0	-	Not published.
8	10-04-2012	Update of brakes to Gen. 5 with main changes: Alternative friction material Flertex 928 added. Some types of springs and in some cases number of springs in brake FCRD112 and FCRD132 changed. Re introduction of brake type FCRD132 that was removed in Rev. 6.0. New brake type FCRD90 Type 100 Nm introduced. Maximum speed of FCRD112 increased. Sentence added that brake pad pressure comes from guided compression springs and partly from damping element. Remark diode at brake terminals allowed added. Report layout updated.
9	06-09-2013	Change of "Schindler reference torque" 150/160 Nm to 150/165 Nm for FCRD 112 brake type 185 Nm.
10	30-10-2015	Update to EN 81-20 Brake FCRD112 changed back from generation 5 to generation 4. Optional brake lining Flertex 928 removed. Drawings in Annex 1 updated.
11	18-07-2017	Update to EU Type-examination certificate and EN 81-20 and EN 81-50 Addition of Unintended Car Movement Protection and brake delay times FCRD132 removed from certificate Minor textual changes