

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Circuit Breaker**with type designation(s)
LF1, LF2 and LF3 Marine VersionIssued to
Schneider Electric Industries SAS
GRENOBLE, Franceis found to comply with
DNV GL rules for classification – Ships, offshore units, and high speed and light craft**Application :****SF6 circuit-breaker for installation in switchboards onboard ships and mobile offshore units****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.****Rated Voltage (V) 7.2 kV, 12 kV or 17.5 kV**
Rated Current (A) up to 3150 A
Frequency (Hz) 50 / 60This Certificate is valid until **2021-12-31**.Issued at **Høvik** on **2017-01-06**DNV GL local station: **Marseille**Approval Engineer: **Nicolay Horn**for **DNV GL**

Andreas Kristoffersen
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

Name and place of manufacturer

Schneider Electric Aubenas – Z.I. de Ripotier
B.P. 133 – 07200 Aubenas, France

Product description

3-pole sulphur hexafluoride (SF6) circuit breakers, type LF for installation in switchboards onboard ships and mobile offshore installations.

The Type Approval is given for the following types of the LF series of circuit breakers with main characteristics as given in the tables below:

	LF1				LF2		
	7.2	12	7.2	12	17,5		
Rated voltage, U_r [kV]	7.2	12	7.2	12	17,5		
Power frequency withstand voltage [kV]	20	28	20	28	38		
Rated lightning impulse voltage, U_w [kV]	60	75	60	75	95		
Rated current, I_n	630 [A]	■	■	■	■	■	■
	1250 [A]	■	■	■	■	■	■
Rated short circuit breaking current, I_{sc} kA	25	31,5	25	31,5	50	40	31,5
Making current capacity [kA] at 50 Hz	63	79	63	79	125	100	79
Making current capacity [kA] at 60 Hz	65	81,9	65	81,9	130	104	81,9
Frequency [Hz]	50 / 60		50 / 60		50 / 60	50 / 60	50 / 60

	LF3											
	7.2				12				17,5			
Rated voltage, U [kV]	7.2				12				17,5			
Power frequency withstand voltage [kV]	20				28				38			
Rated lightning impulse voltage, U_w [kV]	60				75				95			
Rated current, I_n	1250 [A]							■				■
	2500 [A]	■	■	■	■	■	■	■	■	■	■	■
	3150 [A]		■	■	■		■	■	■	■	■	■
Rated short circuit breaking current, I_{sc} kA	25	31,5	40	50	25	31,5	40	50	25	31,5	40	
Making current capacity [kA] at 50 Hz	63	79	100	125	63	79	100	125	63	79	100	
Making current capacity [kA] at 60 Hz	65	81,9	104	130	65	81,9	104	130	65	81,9	104	
Frequency [Hz]	50 / 60				50 / 60				50 / 60			

Application/Limitation

Circuit breakers to be installed in switchboards / enclosures according to the requirements in the Rules, Pt. 4, Ch.8.

Manufacturers "instructions for use" to be followed.

The nominal rated current is given at 40 °C ambient temperature. A derating of 1% per °C is applicable when installed in spaces with ambient temperatures above 40 °C.

Type Approval documentation

MV Distribution Circuit-breakers, LF1 – LF2 – LF3, 1 to 17.5 kV Art. 78654, 08/1997
Instructions for use LF1, LF2, LF3 fixed circuit-breakers, ref. 07896849EN : 01, 03/2008

Drawing no 03406433 – Gen. Arrangement LF1
Drawing no 03406438 – Gen. Arrangement installation cassette LF1
Drawing no 03406434 – Gen. Arrangement LF2
Drawing no 03406451 – Gen. Arrangement installation cassette LF2
Drawing no 03406435 – Gen. Arrangement LF3
Drawing no 03406452 – Gen. Arrangement installation cassette LF3
Drawing no 03407000 – Gen. Arrangement for circuit –breaker cubicle

CESI, GPS-94/030615, 94.10.17
CESI, GPS-95/011947, 95.04.18

CESI, GPS-94/031043, 94.10.18
CESI, GPS-94/007794, 94.03.15

VOLTA, A2007-0782-00, 2007.09.26
VOLTA A2007-1031-00, 2007.12.14
VOLTA, A2008-0031-00, 2008.01.28
VOLTA, A2008-0024-03, 2008.01.08
VOLTA, A20020266c, 2002.12.17
VOLTA, TFR_201306893_001, 2013.09.20

VOLTA, A2007-0789-00, 2007.09.26
VOLTA, 201104719_001, 2011.11.30
VOLTA, 201108173_001, 2011.12.16
VOLTA, 2006-0284-01, 2006.04.18
VOLTA, 2008-0025-04, 2008.01.09
VOLTA, TFR_201306893_002, 2013.09.19

L.E.M.T., TFR_201102531_003, 2011.06.07
L.E.M.T., TFR_201102430_001, 2011.05.23
L.E.M.T, AAA26123EA, 2007.12.06
L.E.M.T., AE892ce, 97.12.19
L.M., TR-LM-0476, 11.97
L.E.M.T, AM59h, 96.02.20
L.E.M.T, 51167364EF, 99.01.13
L.E.M.T., AM911f, 97.07.25
L.E.M.T, 51167364ED, 98.11.23

L.E.M.T., 51253910EA, 2005.12.21
L.E.M.T., TFR_201100205_003, 2011.02.08
L.E.M.T, AAA25115EA, 2006.03.27
L.E.M.T., AE892cb, 97.12.19
L.M, TR-LM-05/1650, 2005.08.10
L.E.M.T., AM615h, 97.06.04
L.E.M.T., AM911h, 97.07.25
L.E.M.T, 51167364EB, 98.11.23

Marina Militare Relazione No. 9576
Marina Militare Relazione No. 9575
Marina Militare Relazione No. 9572

Tests carried out

Type tests in accordance with IEC 62271-100 including short-circuit tests, temperature rise tests, dielectric tests & mechanical tests. Vibration test and humidity tests.

Marking of product

Manufacturer's nameplate with minimum information as stated in IEC 62271-100.

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the Type approval is complied with and that no alterations are made to the product design or choice of materials.

The main elements of the survey are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Routines (RT) checked (if not available tests according to RT to be carried out)
- Review of type approval documentation
- Review of possible change in design, materials and performance
- Ensuring traceability between manufacturer's product type marking and Type Approval Certificate.

Assessment to be performed at 2 and 3,5 year.

END OF CERTIFICATE