ALTERNATOR TECHNICAL DESCRIPTION
LSA 53.2 XL11 / 4p

LS Reference: TDS-MVH-1244

Date: 14-04-2025 V6.10d - 07/2024

Leroy-Somer
Electric Power Generation
Bangalore

Main data

Generator type:	**LSA 53.2 XL11 / 4p**			
Power:	2 600	kVA	2 080 kWe	2 163 kWm
Voltage:	11 000	V	Star serial	
Rated voltage range:	+5/-5%			
Power factor - Lagging:	0.8			
Frequency:	50	Hz		
Speed:	1 500	RPM		
Nominal current:	136	A		
Winding type:	p5/6			
Classes (Insulation / Temperature Rise):	H / F			
Ambient temperature:	40	°C		
Altitude:	1 000	m		

Installation

Prime mover:	Reciprocating engine
Manufacturer:	-
Type:	-
Duty:	Base Rating

Mechanical construction

Type of construction:	Single bearing
Mounting arrangement:	Horizontal Axis
Direction of rotation:	Clockwise (when facing the drive end - DE)
Bearing type:	Anti-friction
Bearing Lubrication:	Regreasable
Bearing insulation:	Not insulated
Shaft end type:	Cylindrical with keyway
Balancing - Class:	G2,5 (std)
Flange:	SAE 00
Shaft height:	Refer dimension drawing
Width:	Refer dimension drawing

Additional specificities

Stabilized Runaway speed:	1 800	rpm - 2 min.

Cooling Method IC01

Degree of protection:	IP23
Coolant:	Air / Temperature: 40 °C
Air quality:	Clean
Ventilation (internal):	Self-ventilated
Filters:	Without
Ducting for air inlet:	No
Ducting for air outlet:	No

Connection, Excitation & Regulation

Parallel operation:	Between alternators (1F) - 1 x Droop CT
Excitation:	Self-excited - Brushless: AREP + PMI
Sustained 3-phase Isc:	> 3 x FLC for 10s.
AVR type:	Leroy Somer - D550 - Digital
AVR location:	In terminal box
Alternator Voltage sensing:	Terminal box mounted voltage sensing VTs

Terminal box

Power connection:	4 connectors (brought out neutral)
Main terminal box location:	1 terminal box on the top
Line side outlet:	Left hand side (seen when facing the drive end - D)
Auxiliaries	In main terminal box

Protection and measurement accessories

Temperature detection

Stator windings:	6 x PT100 (3 wires)
NDE bearing:	1 x PT100 per bearing (3 wires)

Anti-condensation heating

Alternator:	Voltage: 230 V - 1Ph / Power: 2x250 W

Various items

Paint:	Customer to confirm
Documentation:	PDF maintennance manual
Documentation Language:	English

ALTERNATOR ELECTRICAL DATA
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Main data:

Power:	**2 600**	kVA	**2 080** kWe	**2 163**	kWm
Voltage:	**11000**	V	Frequency:	**50**	Hz
Rated voltage range:	+5% / -5%		Speed:	1500	rpm
Power factor - Lagging:	0.8				
Nominal current:	136	A	Phases	3	
Insulation / Temperature rise:	H / F		Connexion	Star serial	
Cooling:	**IC01**		Winding type:	p5/6	
			Winding:	- 6 Wires	
Ambient temperature:	40	°C			
Altitude:	1000	m	Overspeed (rpm)	1800	
Duty: Base Rating			Total Harmonic Distortion (THD) < 1.5%		

Efficiency (Base 2080 kWe)

	25%	50%	75%	**100%**	110%
Power factor - Lagging: 0.8	93.97	95.98	96.29	**96.17**	96.08
Power factor - Lagging: 1	94.35	96.58	97.08	**97.16**	97.14

Reactances (%) - (Base 2600 kVA)

Unitary impedance (1 per unit) = 46.538462 ohms

		Direct axis *Unsaturated*	Direct axis *Saturated*	Quadrature axis	Quadrature axis *Unsaturated*	Quadrature axis *Saturated*
Synchronous reactance	Xd	271	246	Xq	138	125
Transient reactance	X'd	27.7	23.5	X'q	138	125
Subtransient reactance	X"d	14.9	12.7	X"q	15.8	13.4
Negative sequence reactance	X2	15.4	13.1			

X0	11.0	Zero sequence reactance
Xl	7.5	Stator leakage reactance
Xr	21.9	Rotor leakage reactance
Kc	**0.41**	Short-circuit ratio

Time constants (s)

		Direct axis	Quadrature axis	
Open circuit transient time constant	T'do	3.04	T'qo	NA
Short-circuit transient time constant	T'd	0.311	T'q	NA
Open circuit subtransient time constant	T"do	0.035	T"qo	0.150
Subtransient time constant	T"d	0.019	T"q	0.017

Ta	0.034	Armature winding short circuit time constant

Resistances (%)

Ra	1.4	Armature resistance	R0	3.7	Zero sequence resistance
X/R	8.8	X/R ratio (without unit)	R2	3.1	Negative sequence resistance

Voltage accuracy:0.25%
Maximum inrush current for a voltage dip of 15%: 1841 kVA
when starting an AC motor having a starting power factor between 0 and 0.4

Rating is provided for the specified temperature rise, by resistance measurement according to IEC60034-1

According to: I.E.C. 60034.1 - 60034.2 - NEMA MG 1-32

ALTERNATOR MAIN CURVES
LSA 53.2 XL11 / 4P

LS Reference: TDS-MVH-1244

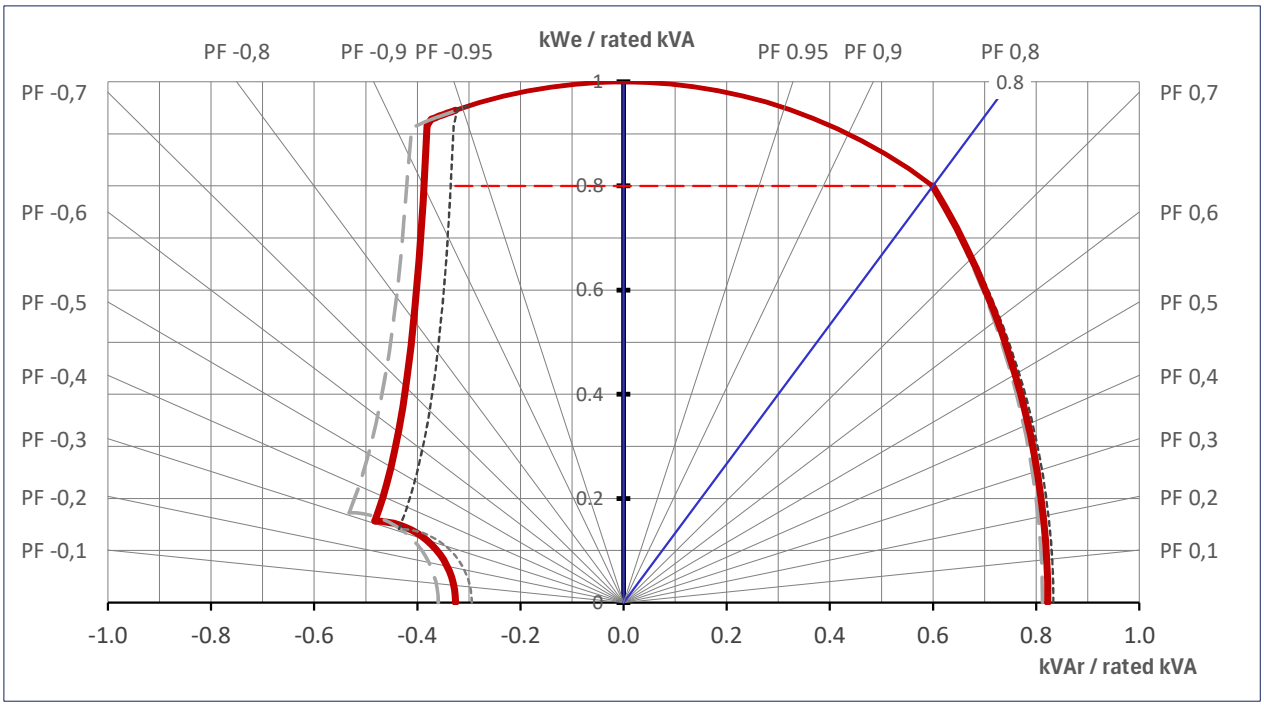
Date: 14-04-2025

2600kVA - 11000V - 50 Hz

V6.10d - 07/2024

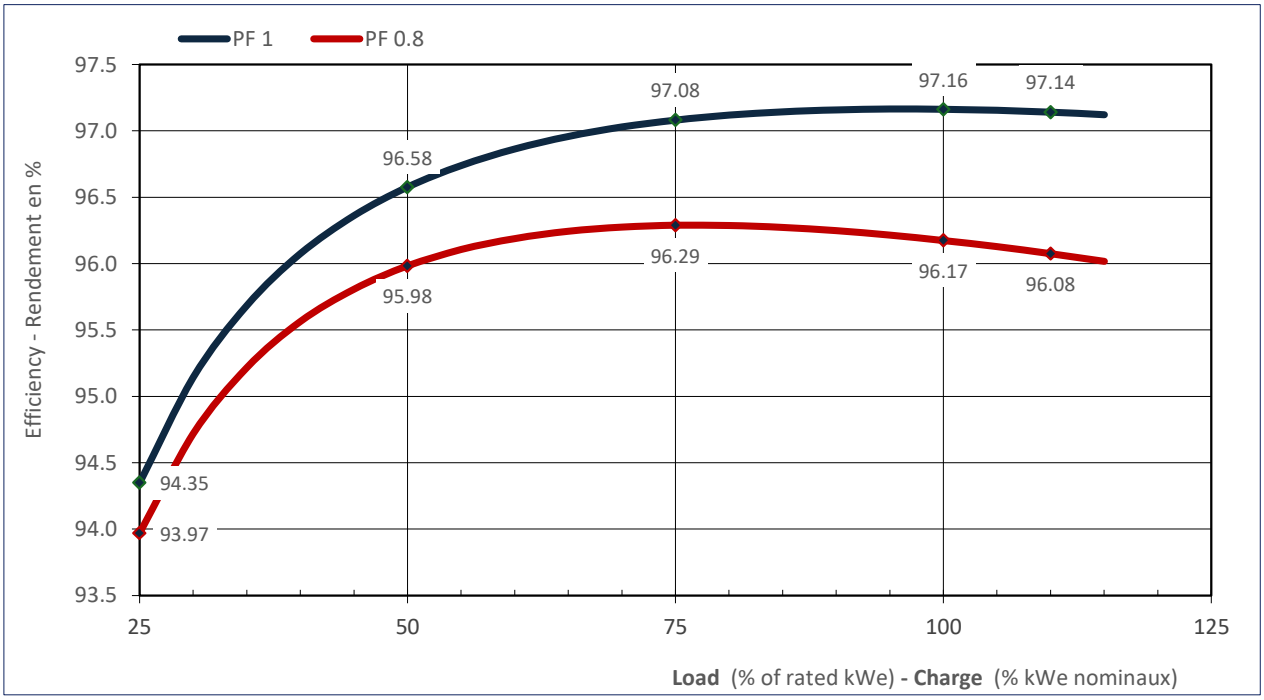
Capability Curve

Umax	+ 5%	11 550	V
Un		**11 000**	V
Umin	- 5%	10 450	V



Efficiency Curves

According to: IEC



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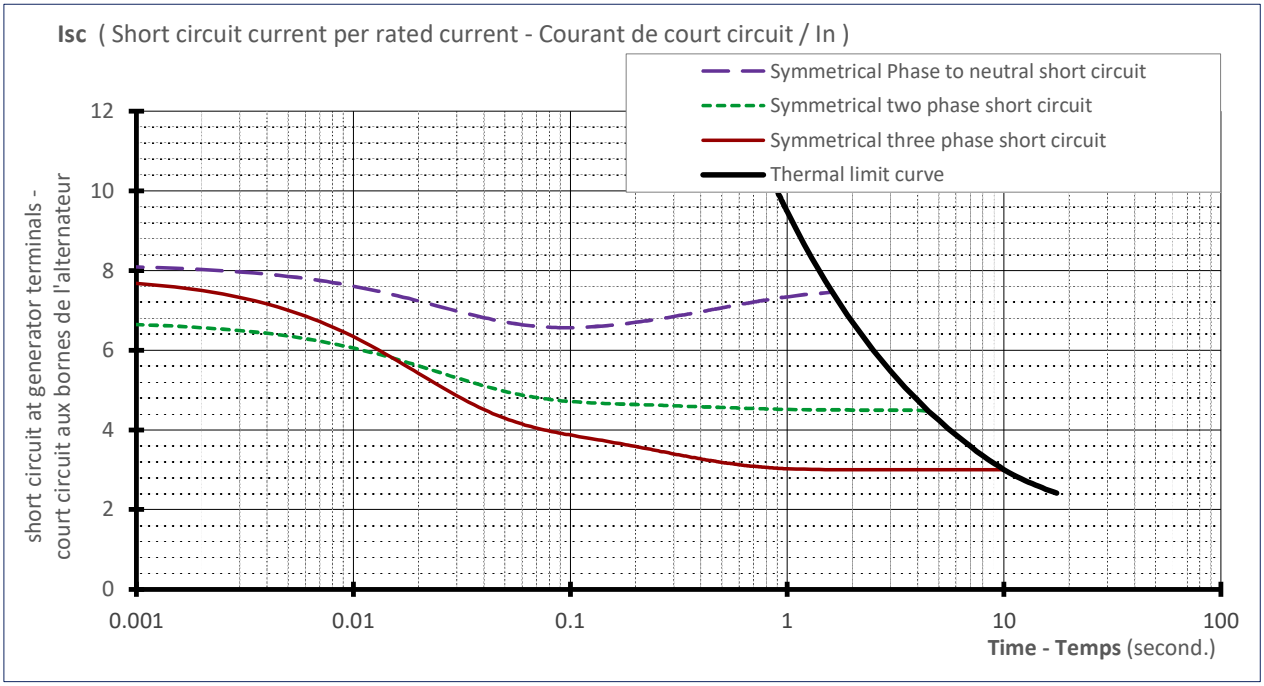
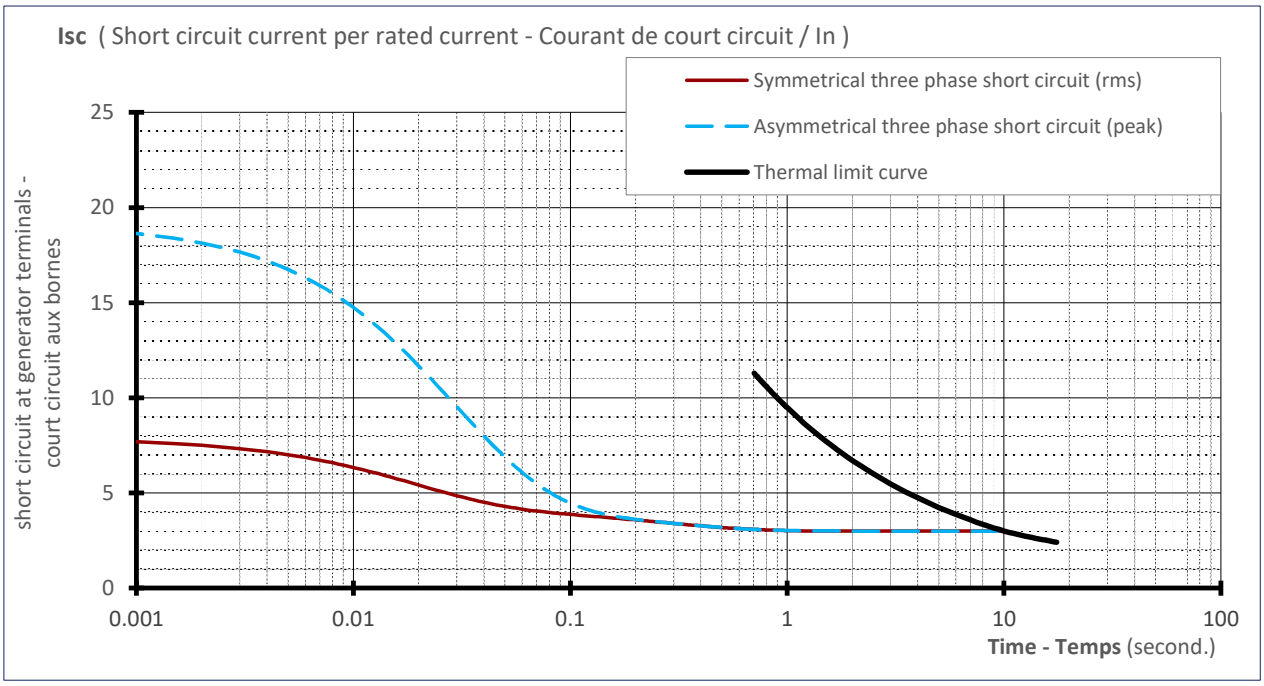
Stator Current decrement curves

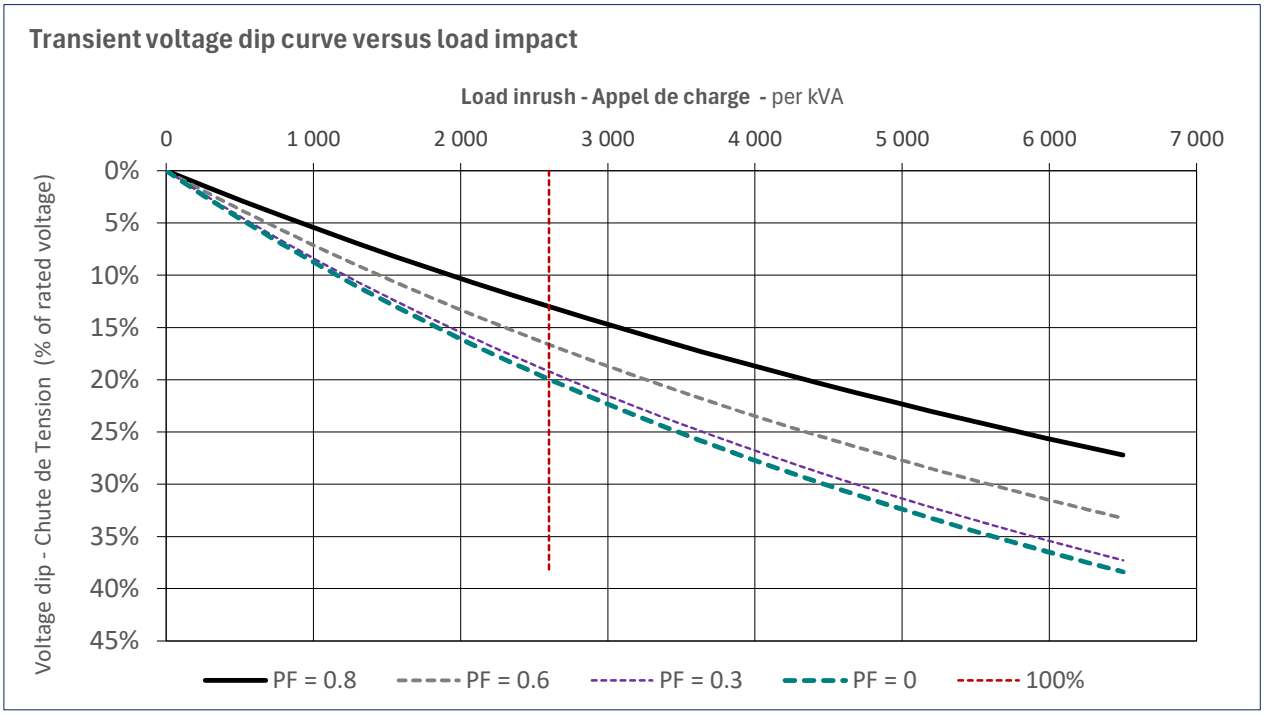
Symmetrical phase to neutral short-circ	initial	1 101	A	8.1 x In		
Symmetrical two phase short-circuit	max	904	A	6.6 x In	In =	**136** A
Symmetrical three phase short-circuit	value	1 045	A	7.7 x In		
Thermal Limit						

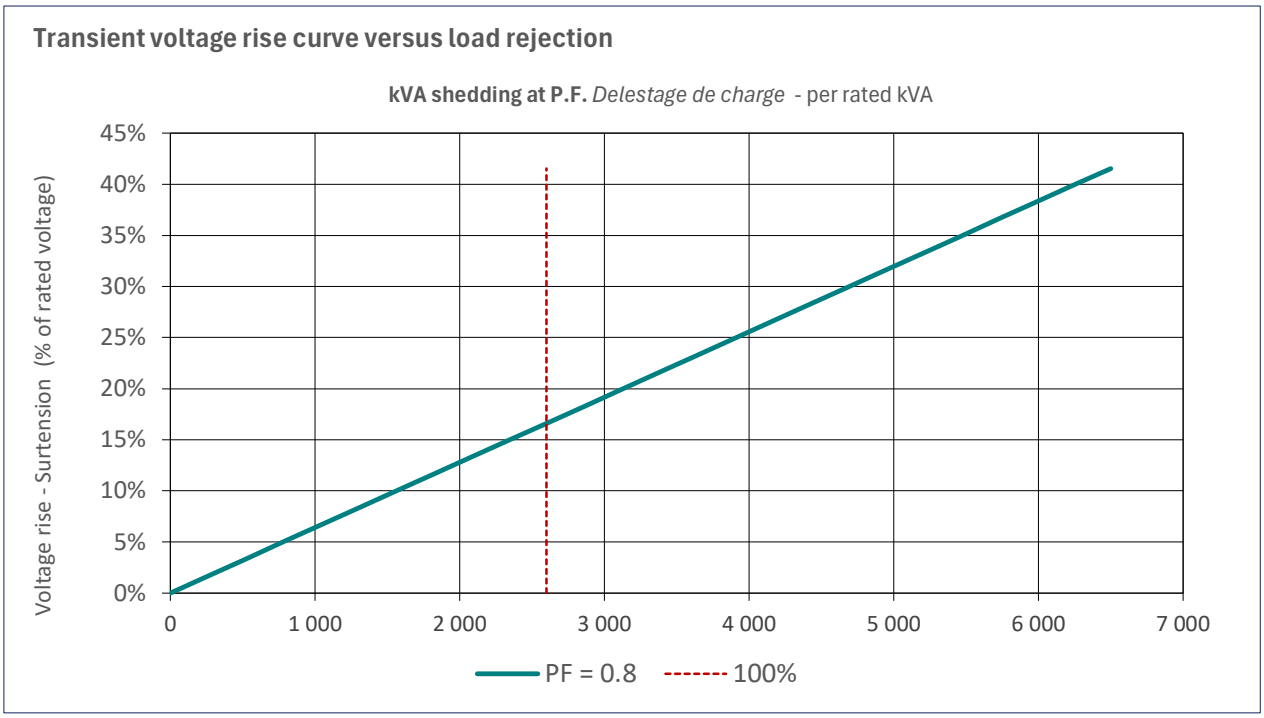


Asymmetrical three phase short-circuit	IP	2 510	A	18.5 x In



Transient Voltage Variation





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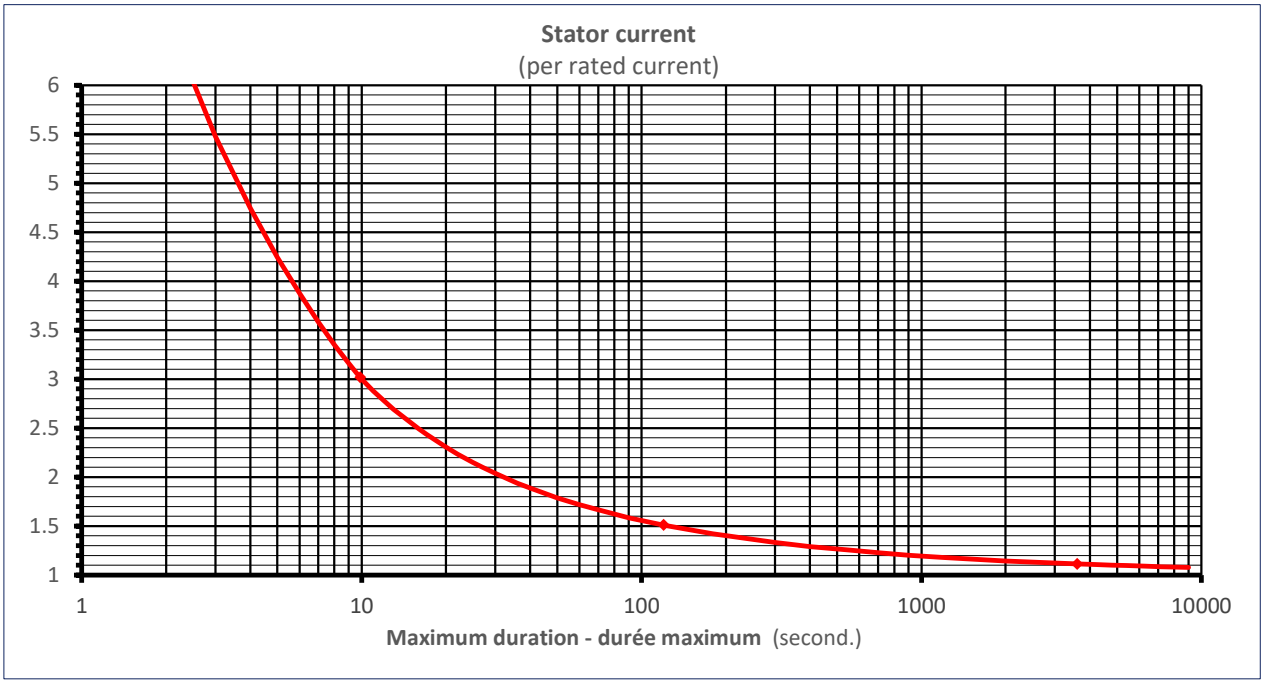
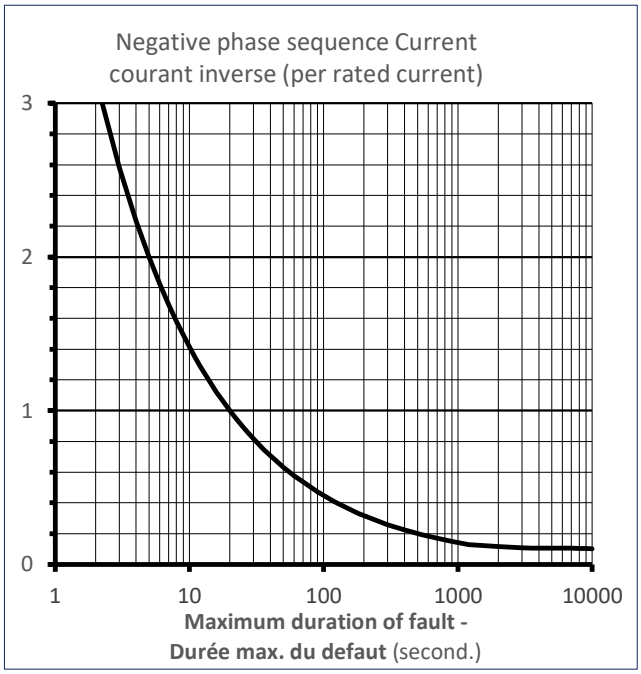
Thermal Damage Curve



Unbalance Load Curve



Stator Earth Fault Current