ALTERNATOR TECHNICAL DESCRIPTION
LSA 52.3 XL5 / 4p

LS Reference: OF241039_1110KVA

Date: 10-28-2024

V6.10 - 12/2023

Project Manager : Aviva
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Main data					C
Generator type:	**LSA 52.3 XL5 / 4p**				
Power:	1 110	kVA	888 kWe	935 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:	58	A			
Winding type:	p5/6				
Classes (Insulation / Temperature Rise):	H / F				
Ambient temperature:	40	°C			
Altitude:	1 000	m			

Installation	IEC	Quantity	1
Client:	Vertgroup		
Prime mover:	Reciprocating engine		
Manufacturer:	-		
Type:	-		
Duty:	Base Rating		

Mechanical construction	IM1201
Type of construction:	Single bearing
Mounting arrangement:	Horizontal Axis
Direction of rotation:	Clockwise (seen when facing the drive end - DE)
Bearing type:	Anti-friction
Bearing Lubrication:	Regreasable
Bearing insulation:	Not insulated
Flector type:	SAE 21
Balancing - Class (ISO 21940-11):	Without key - G2,5 (std)
Flange:	SAE 00
Shaft height:	500 mm
Width:	750 mm

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

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Connection, Excitation & Regulation

Parallel operation:	Between alternators (1F) - 1 x Droop CT
Excitation:	Self-excited - Brushless - Type: 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)
Gland plate:	Non magnetic, Undrilled
Auxiliaries	In main terminal box
	-

Protection and measurement accessories

Temperature detection

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

Anti-condensation heating

Voltage: 230 V - 1Ph / Power: 500 W

Various items

Paint:	PE - Primary - ---
Documentation:	PDF manual
Documentation Language:	English
Nameplate	Sticker

Controls

Standards:	IEC
QUAL/INES/006 001 => 101	Measurement of winding resistance
QUAL/INES/006 021 => 128	Insulation check on sensors (when fitted)
QUAL/INES/006 002 => 102&103	Voltage balance and phase order check
QUAL/INES/006 007 => 109	Overspeed test (according to test bench limitation)
QUAL/INES/006 009 => 111	High potential test
QUAL/INES/006 010 => 112	Insulation resistance measurement

ALTERNATOR ELECTRICAL DATA
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Main data:							C
Power:	**1 110**	kVA	**888**	kWe	**935**	kWm	1
Voltage:	**11000**	V	Frequency:		**50**	Hz	1
Rated voltage range:	+5% / -5%		Speed:		1500	rpm	1
Power factor - Lagging:	0.8						1
Nominal current:	58	A	Phases		3		
Insulation / Temperature rise:	H / F		Connexion		Star serial		1
Cooling:	**IC01**		Winding type:		p5/6		1
			Winding:		- 6 Wires		1
Ambient temperature:	40	°C					1
Altitude:	1000	m	Overspeed (rpm)		1800		1
Duty: Base Rating			Total Harmonic Distortion (THD) < 1.5%				1

Efficiency (Base 888 kWe) IEC

	25%	50%	75%	**100%**	110%	
Power factor - Lagging: 0.8	92.75	94.94	95.20	**94.97**	94.81	1
Power factor - Lagging: 1	93.43	95.89	96.40	**96.43**	96.38	1

Reactances (%) - (Base 1110 kVA)

Unitary impedance (1 per unit) = 109.009009 ohms

		Unsaturated	*Saturated*		*Unsaturated*	*Saturated*	
	Direct axis			Quadrature axis			
Synchronous reactance	Xd	218	198	Xq	111	101	1
Transient reactance	X'd	28.3	24.0	X'q	111	101	1
Subtransient reactance	X"d	16.1	13.7	X"q	16.5	14.0	1
Negative sequence reactance	X2	16.3	13.8				

X0	6.9	Zero sequence reactance	1
Xl	8.0	Stator leakage reactance	
Xr	22.4	Rotor leakage reactance	
Kc	**0.51**	Short-circuit ratio	1

Time constants (s)

	Direct axis		Quadrature axis		
Open circuit transient time constant	T'do	1.39	T'qo	NA	1
Short-circuit transient time constant	T'd	0.181	T'q	NA	1
Open circuit subtransient time constant	T"do	0.023	T"qo	0.079	1
Subtransient time constant	T"d	0.013	T"q	0.012	1

Ta	0.028	Armature winding short circuit time constant	1

Resistances (%)

Ra	1.8	Armature resistance	R0	2.3	Zero sequence resistance	1
X/R	7.4	X/R ratio (without unit)	R2	3.3	Negative sequence resistance	

Voltage accuracy: 0.25%
Maximum inrush current for a voltage dip of 15%: 770 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

#REF!

ALTERNATOR MAIN CURVES
LSA 52.3 XL5 / 4P

LS Reference: OF241039_1110KVA

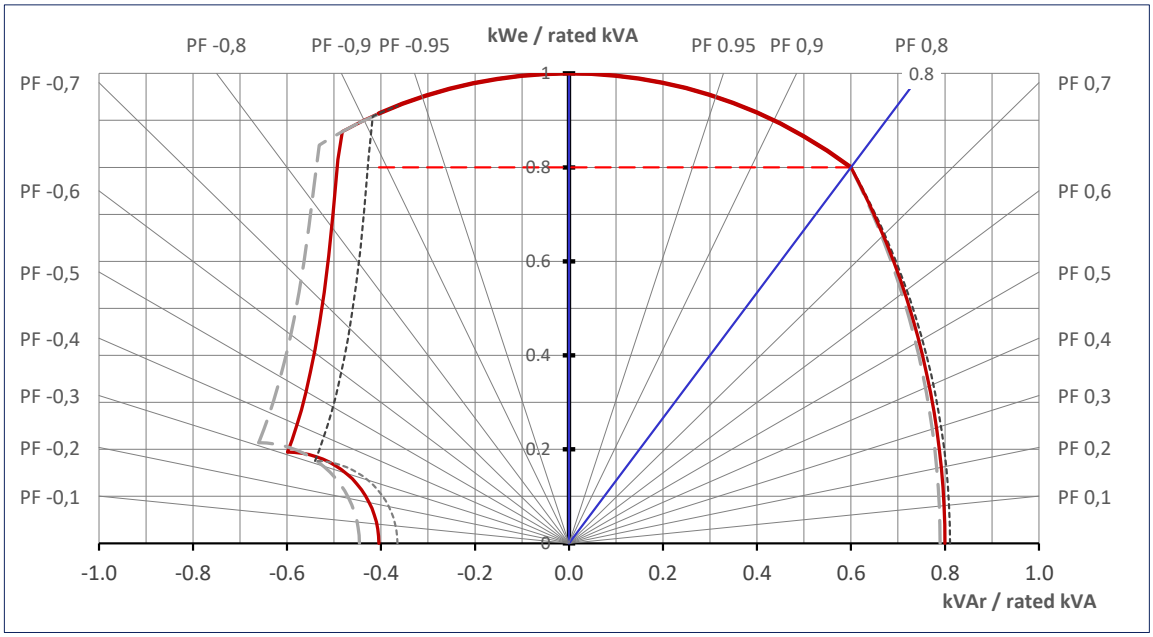
Date: 10-28-2024

1110kVA - 11000V - 50 Hz

V6.10 - 12/2023

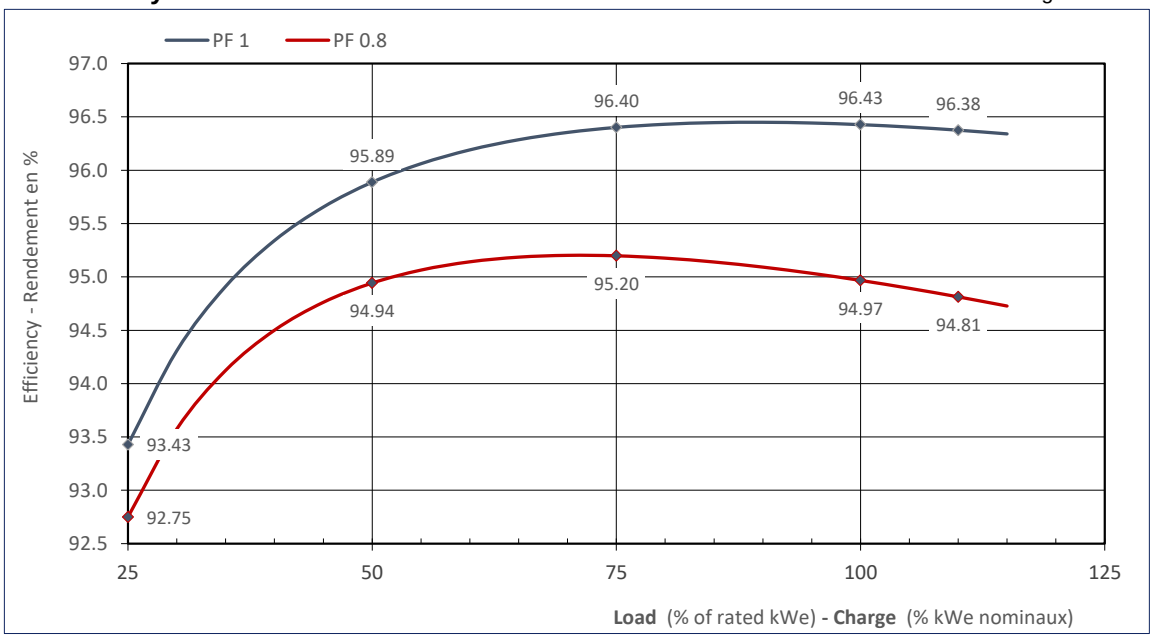
Capability Curve

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



Efficiency Curves

According to: IEC



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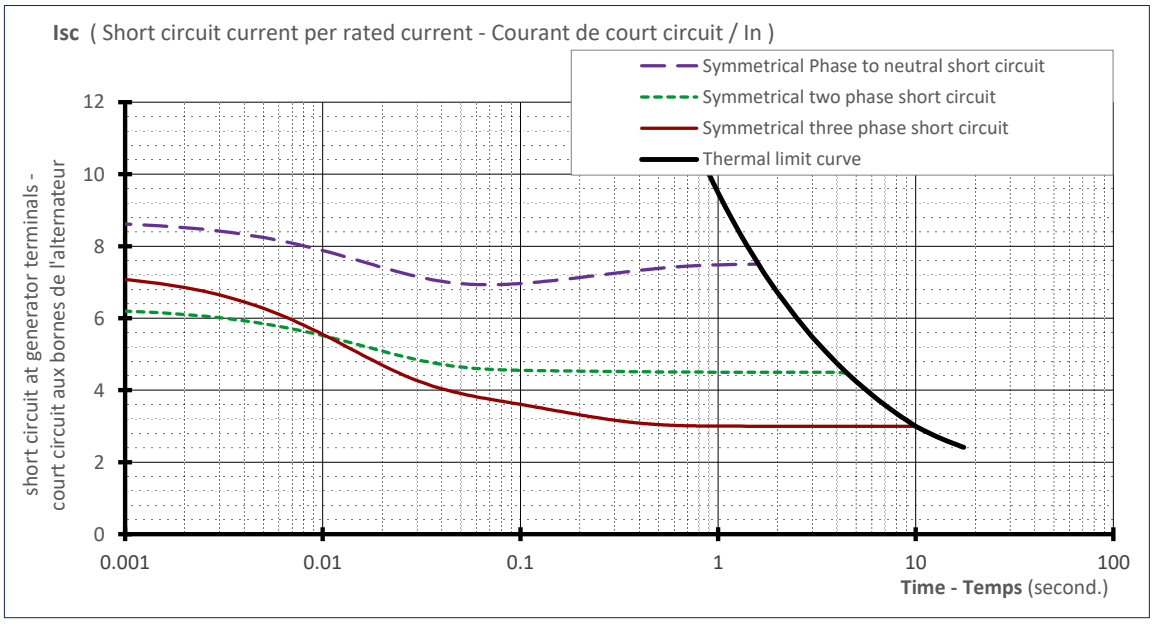
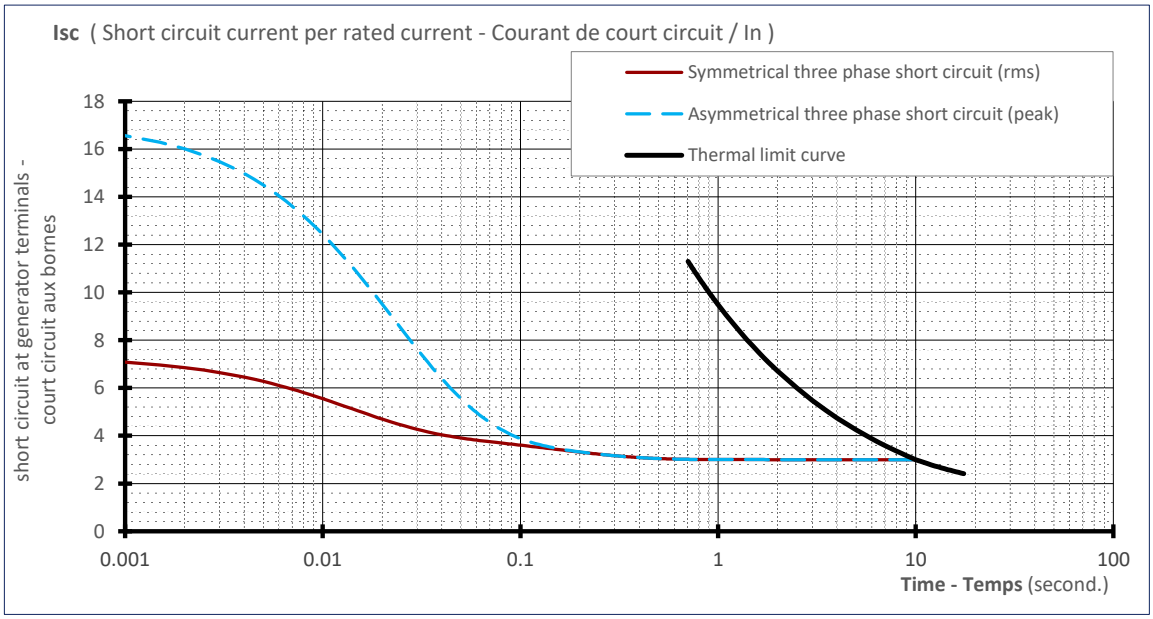
Stator Current decrement curves

Symmetrical phase to neutral short-circ	initial	500	A	8.6 x In			
Symmetrical two phase short-circuit	max	360	A	6.2 x In	In =	**58**	A
Symmetrical three phase short-circuit	value	411	A	7.1 x In			
Thermal Limit							



Asymmetrical three phase short-circuit	IP	951	A	16.4 x In			



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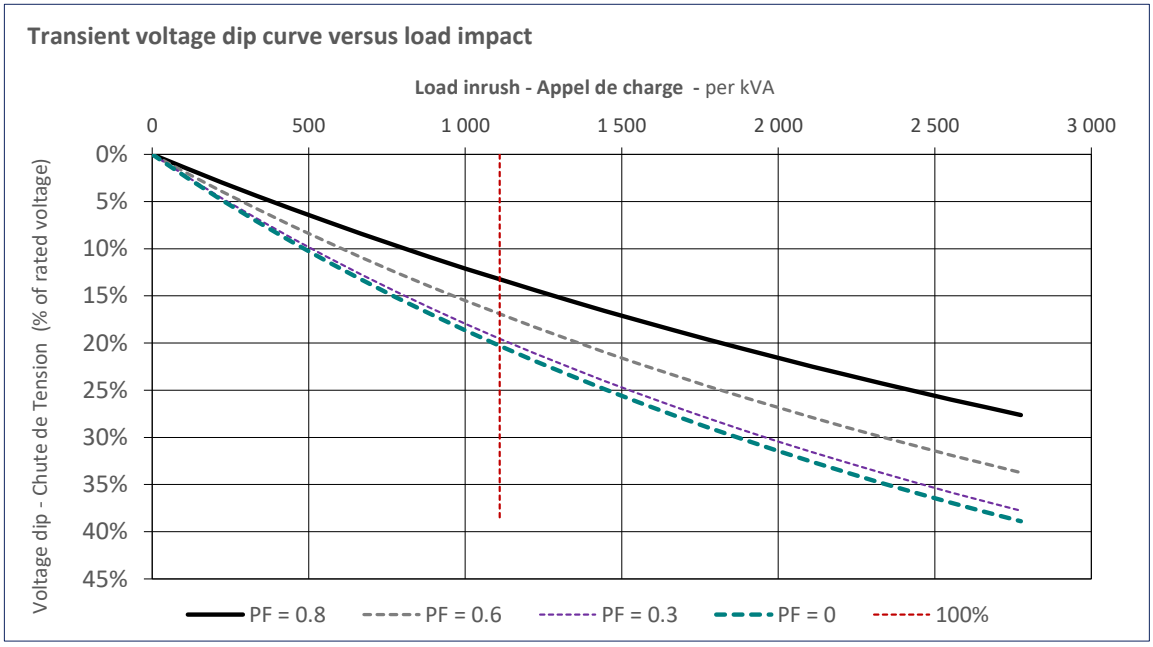
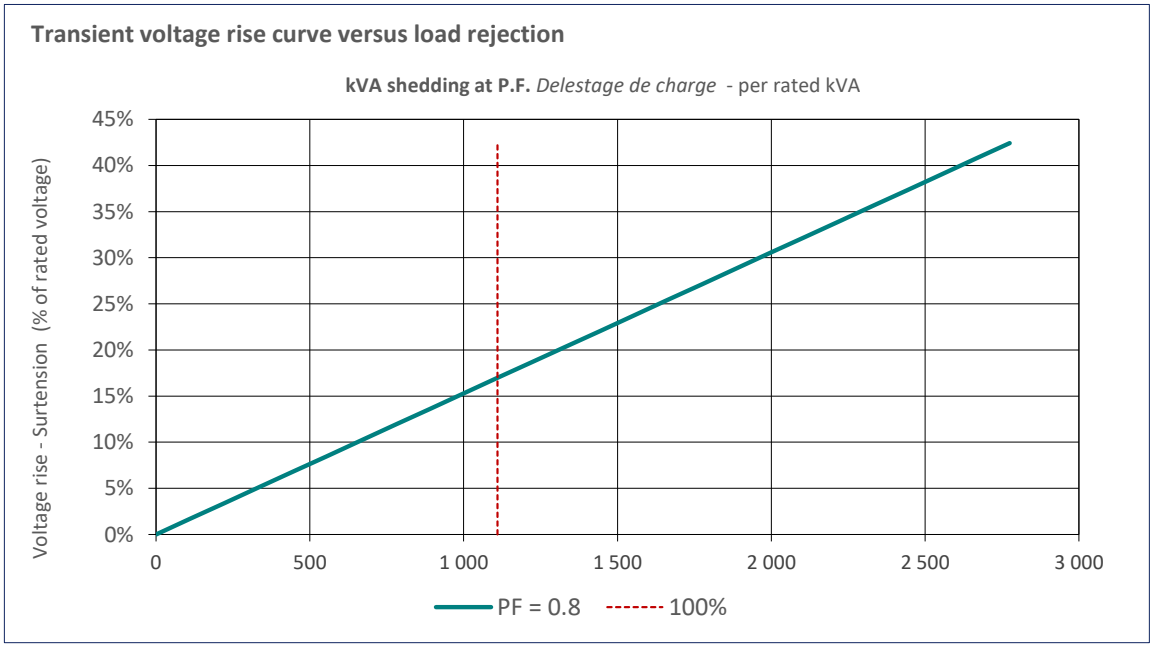
Transient Voltage Variation





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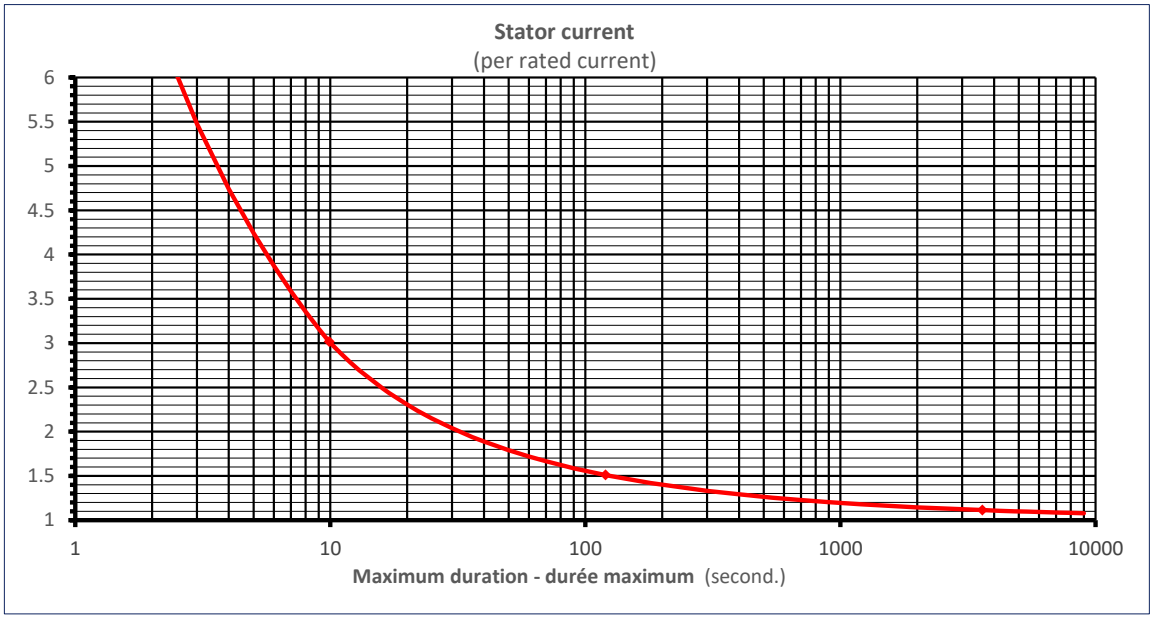
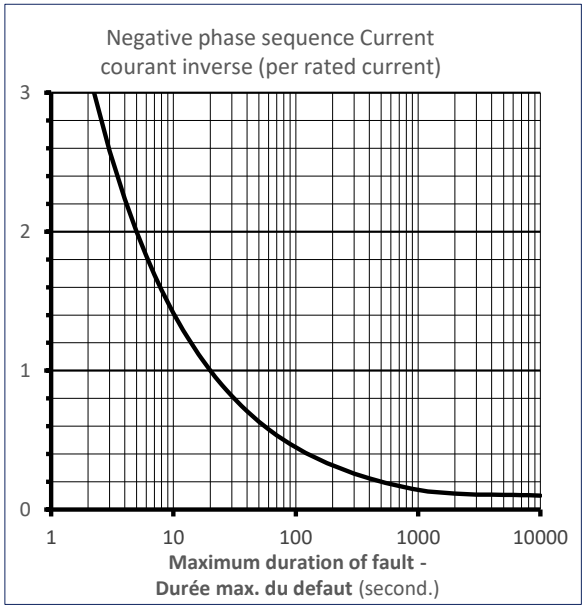
Thermal Damage Curve



Unbalance Load Curve



Stator Earth Fault Current