ALTERNATOR TECHNICAL DESCRIPTION
LSA 52.3 XL7 / 4p

LS Reference: OF241039_1380KVA

Date: 10-28-2024

V6.10 - 12/2023

Project Manager : Aviva
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PH

Main data					C
Generator type:	**LSA 52.3 XL7 / 4p**				
Power:	1 380	kVA	1 104 kWe	1 156 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:	72	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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Date: 10-28-2024 V6.10 - 12/2023

Main data: C

Power:	**1 380**	kVA	**1 104**	kWe	**1 156**	kWm
Voltage:	**11000**	V	Frequency:		**50**	Hz
Rated voltage range:	+5% / -5%		Speed:		1500	rpm
Power factor - Lagging:	0.8					
Nominal current:	72	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 1104 kWe) IEC

	25%	50%	75%	**100%**	110%
Power factor - Lagging: 0.8	92.75	95.18	95.60	**95.53**	95.43
Power factor - Lagging: 1	93.32	95.97	96.61	**96.74**	96.73

Reactances (%) - (Base 1380 kVA)

Unitary impedance (1 per unit) = 87.681159 ohms

		Direct axis *Unsaturated*	Direct axis *Saturated*		Quadrature axis *Unsaturated*	Quadrature axis *Saturated*
Synchronous reactance	Xd	200	182	Xq	102	93
Transient reactance	X'd	24.0	20.4	X'q	102	93
Subtransient reactance	X"d	12.7	10.8	X"q	13.1	11.1
Negative sequence reactance	X2	12.9	11.0			

X0	7.0	Zero sequence reactance
Xl	6.4	Stator leakage reactance
Xr	19.5	Rotor leakage reactance
Kc	**0.55**	Short-circuit ratio

Time constants (s)

	Direct axis		Quadrature axis	
Open circuit transient time constant	T'do	1.51	T'qo	NA
Short-circuit transient time constant	T'd	0.182	T'q	NA
Open circuit subtransient time constant	T"do	0.023	T"qo	0.084
Subtransient time constant	T"d	0.012	T"q	0.011

Ta	0.028	Armature winding short circuit time constant

Resistances (%)

Ra	1.5	Armature resistance	R0	2.3	Zero sequence resistance
X/R	7.4	X/R ratio (without unit)	R2	2.6	Negative sequence resistance

Voltage accuracy: 0.25%
Maximum inrush current for a voltage dip of 15%: 1125 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 52.3 XL7 / 4P

LS Reference: OF241039_1380KVA

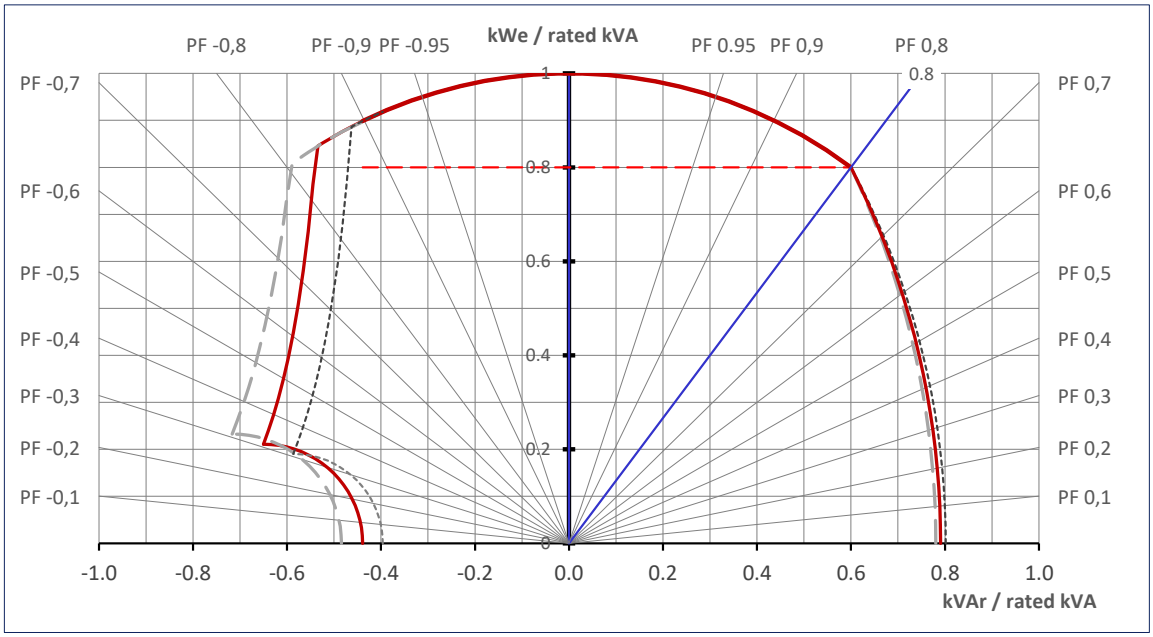
Date: 10-28-2024

1380kVA - 11000V - 50 Hz

V6.10 - 12/2023

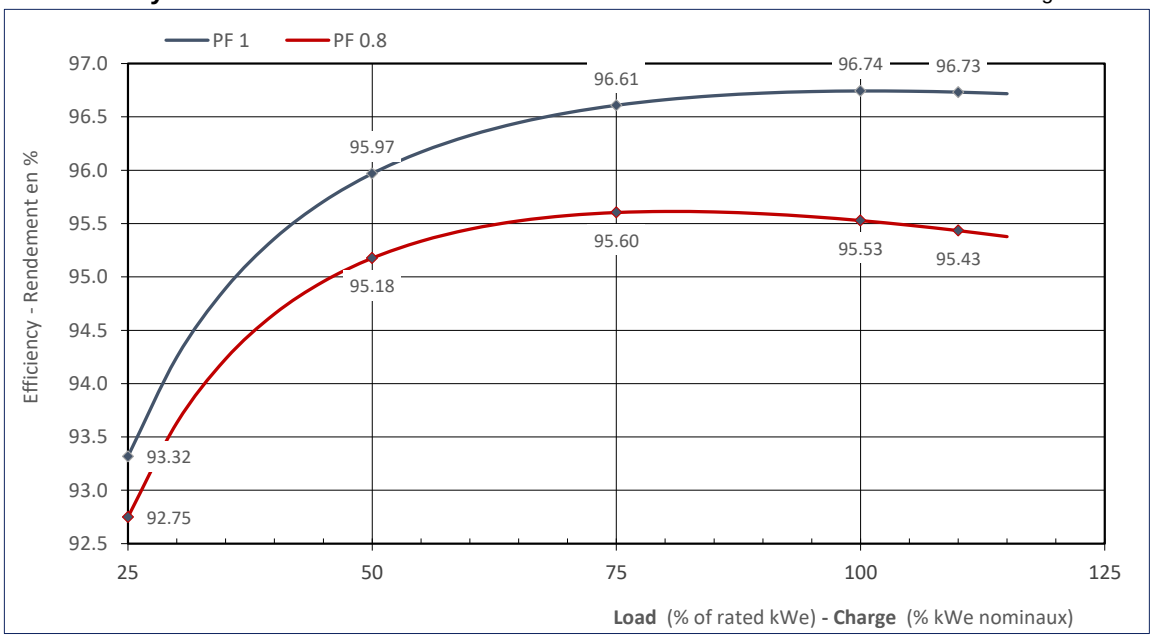
Capability Curve

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



Efficiency Curves

According to: IEC



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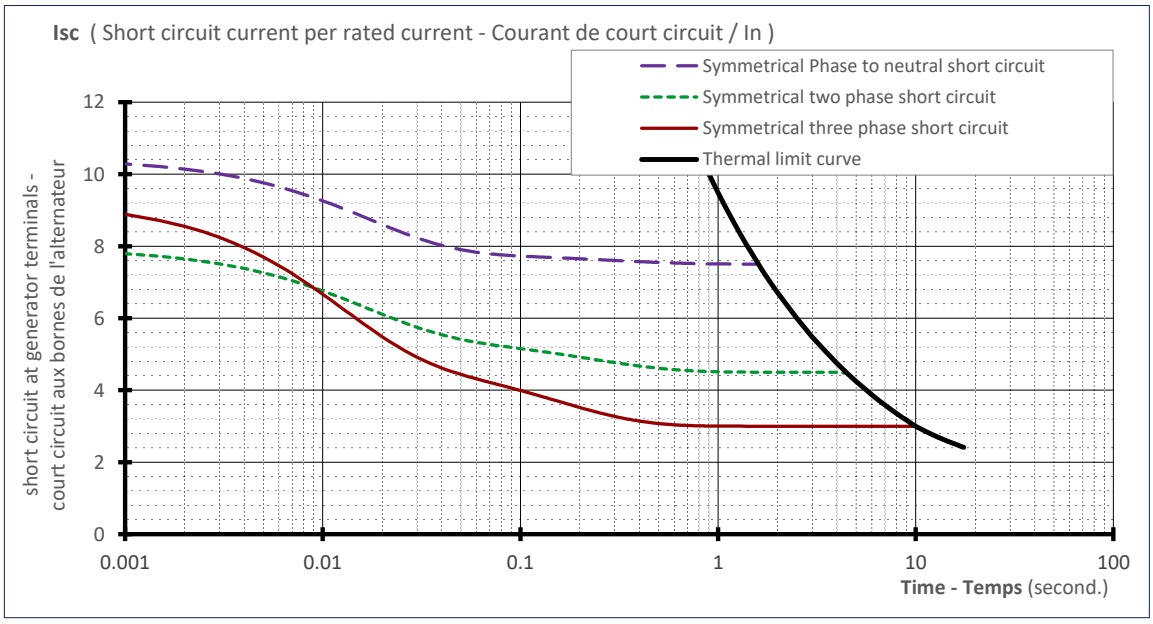
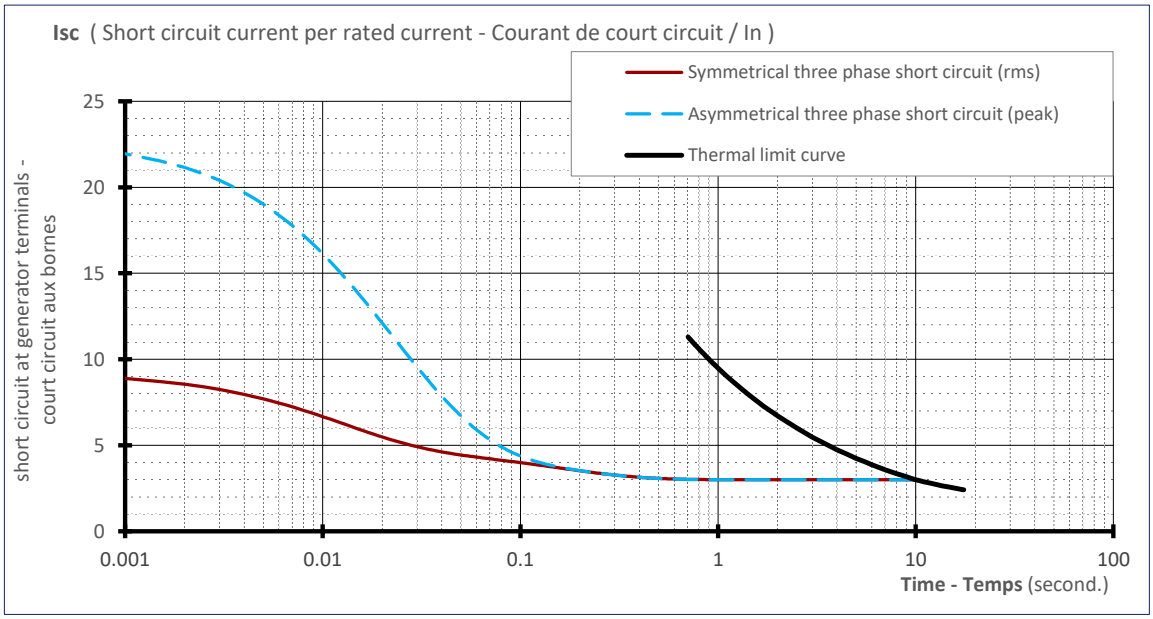
Stator Current decrement curves

Symmetrical phase to neutral short-circ	initial	740	A	10.3 x In			
Symmetrical two phase short-circuit	max	561	A	7.8 x In	In =	**72**	A
Symmetrical three phase short-circuit	value	640	A	8.9 x In			
Thermal Limit							



Asymmetrical three phase short-circuit	IP	1 567	A	21.8 x In			



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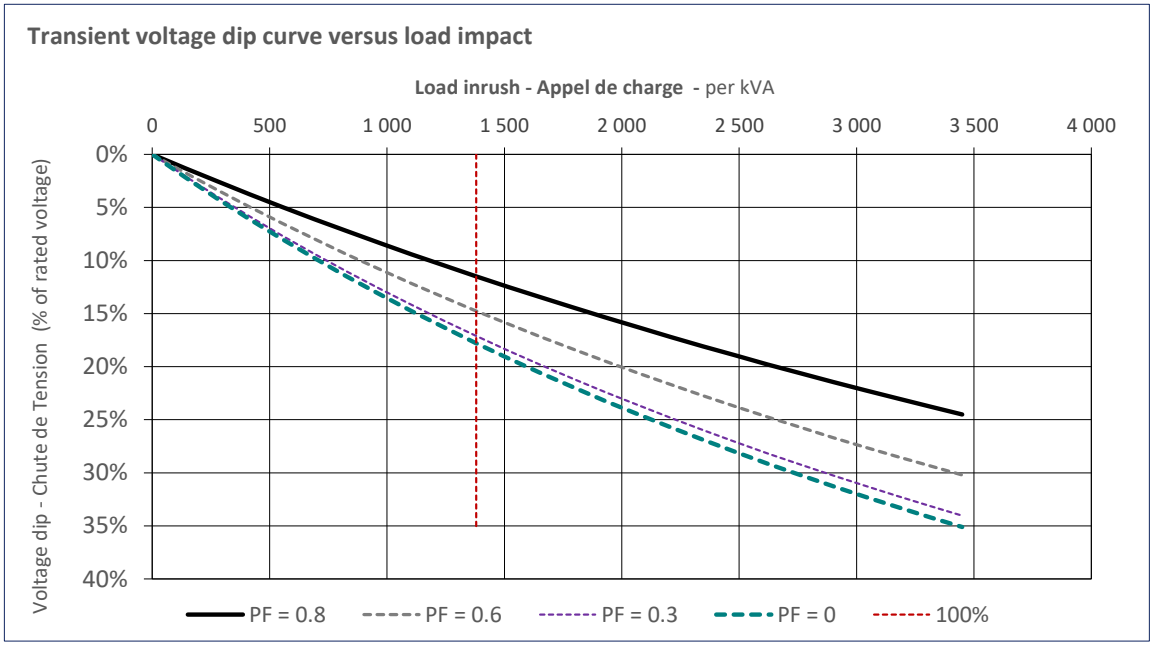
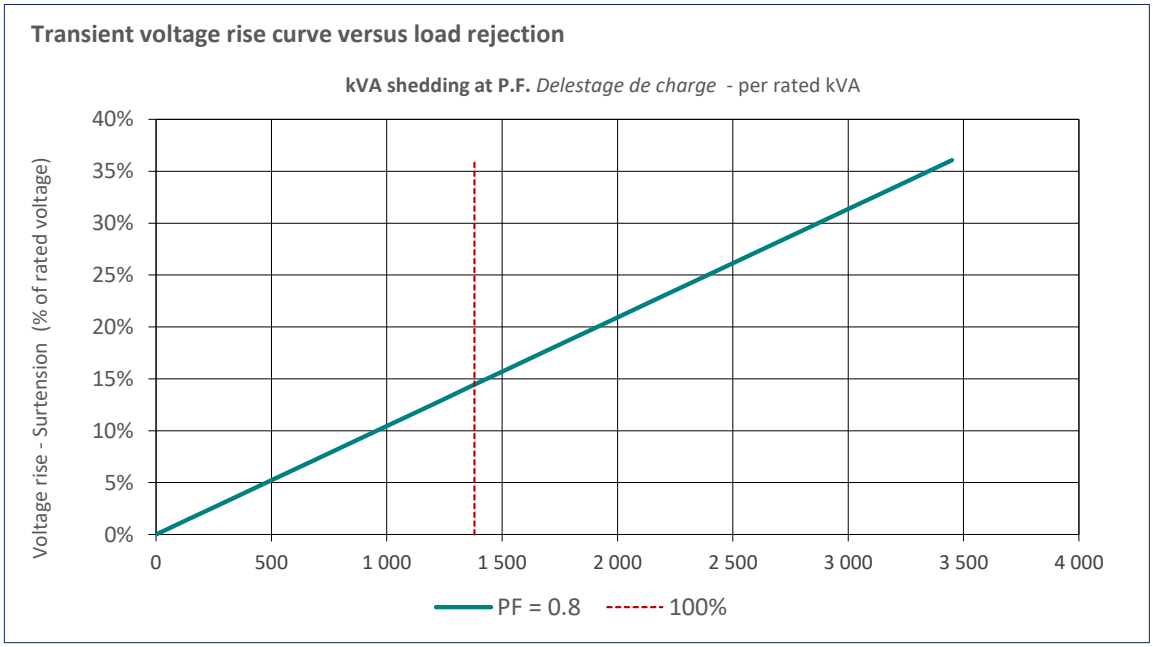
Transient Voltage Variation





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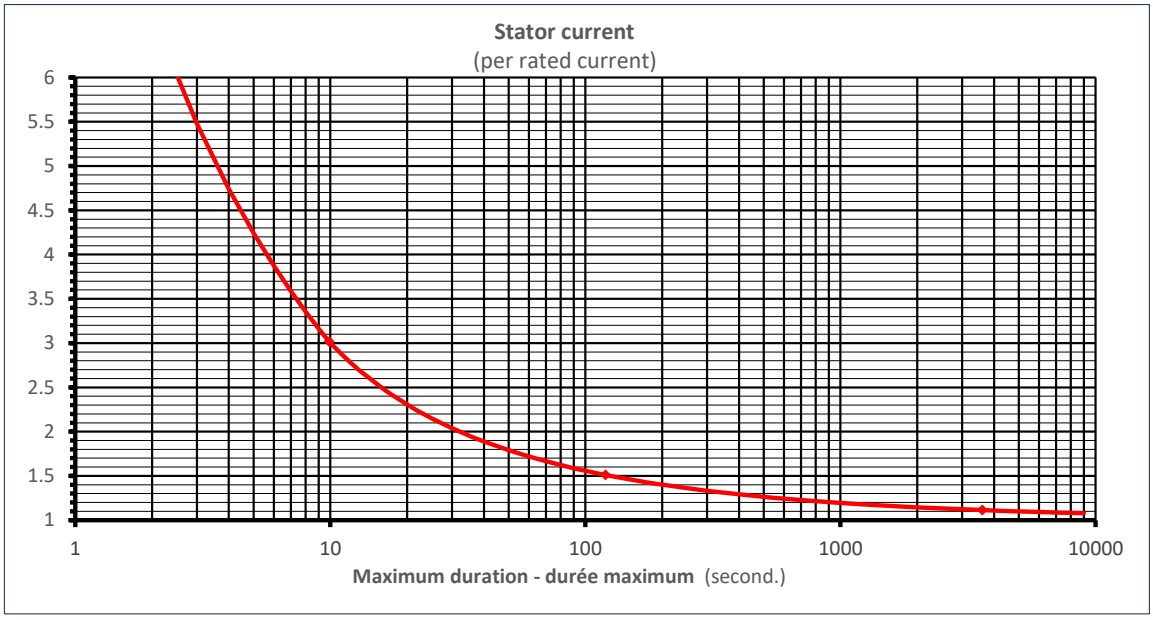
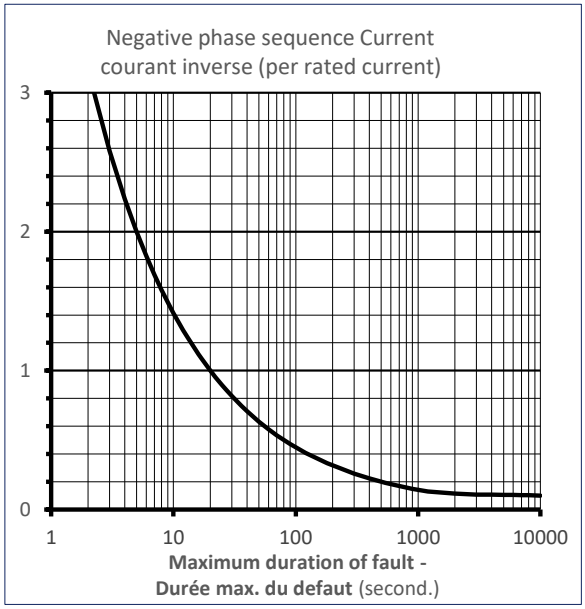
Thermal Damage Curve



Unbalance Load Curve



Stator Earth Fault Current