

ALTERNATOR TECHNICAL DESCRIPTION
LSA 53.2 VL8 / 4p

LS Reference: NS873-10-2022-1 1

Date: 07/10/2022 V6.09b - 01/2022 1
Project Manager : NHS 1
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Electric Power Generation - Orleans +33 (0) 6 07 10 88 49
1 Rue de la Burelle - 45800 - Saint Jean de Braye - France NS

Main data M 1

Generator type: **LSA 53.2 VL8 / 4p** 1
Power: 2 500 kVA 2 000 kWe 2 083 kWm 1
Voltage: 6 600 V Star serial 1
Rated voltage range: +5/-5% 1
Power factor - Lagging: 0,8 1
Frequency: 50 Hz 1
Speed: 1 500 rpm 1
Nominal current: 219 A 1
Winding type: p5/6 1
Classes (Insulation / Temperature Rise): H / H 1
Ambient temperature: 40 °C 1
Altitude: 1 000 m 1

Installation IEC Quantity 1 1

Prime mover: Reciprocating engine 1
Manufacturer: - 1
Type: - 1
Duty: Base Rating 1
Industry: Industrial Applications 1

Mechanical construction IM1301 1

Type of construction: Single bearing 1
Mounting arrangement: Horizontal Axis 1
Direction of rotation: Clockwise (seen when facing the drive end - DE) 1
Bearing type: Anti-friction 1
Bearing Lubrication: Regreasable 1
Bearing insulation: Not insulated 1
Flector type: Cylindrical with keyway 1
Balancing - Class (ISO 1940/1): Half key - G2,5 (std) 1
Flange: To defined later 1
Shaft height: 500 mm 1
Width: 1 150 mm 1

Additional specificities 1

Stabilized Runaway speed: 1 800 rpm - 2 min. 1

Cooling Method IC01 1

Degree of protection: IP23 1
Coolant: Air / Temperature: 40 °C 1
Air quality: Clean 1
Ventilation (internal): Self-ventilated 1
Filters: Without 1
Ducting for air inlet: No 1
Ducting for air outlet: No 1

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Connection, Excitation & Regulation

Parallel operation:	Island mode (0F) - no droop CT	1
Excitation:	Self-excited - Brushless - Type: AREP + PMI	1
Sustained 3-phase Isc:	> 3 x FLC for 10s.	1
AVR type:	Leroy Somer - D550 - Digital	1
AVR location:	In terminal box	1
Alternator Voltage sensing:	Terminal box mounted voltage sensing VTs	1
Additional features:	Three-phase sensing	1

Terminal box

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

Protection and measurement accessories

Temperature detection

Stator windings:	6 x 3-wire PT100 RTDs	1
Guide bearing - NDE:	1 x 3-wire PT100 RTD	1

Anti-condensation heating

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

Various items

221006YV03_A

Paint:	C3M-P - Polyurethane - TBC	1
Documentation:	PDF manual	1
Documentation Language:	English	1

Controls

QUAL/INES/006 001	Measurement of winding resistance	1
QUAL/INES/006 021	Insulation check on sensors (when fitted)	1
QUAL/INES/006 002	Voltage balance and phase order check	1
QUAL/INES/006 007	Overspeed test (according to test bench limitation)	1
QUAL/INES/006 009	High potential test	1
QUAL/INES/006 010	Insulation resistance measurement	1

ALTERNATOR ELECTRICAL DATA
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V6.09b - 01/2022

Main data: M

Power:	2 500 kVA	2 000 kWe	2 083 kWm	1
Voltage:	6600 V	Frequency:	50 Hz	1
Rated voltage range:	+5% / -5%	Speed:	1500 rpm	1
Power factor - Lagging:	0,8	Phases	3	1
Nominal current:	219 A	Connexion	Star serial	1
Insulation / Temperature rise:	H / H	Winding type:	p5/6	1
Cooling:	IC01	Winding:	- 6 Wires	1
Ambient temperature:	40 °C	Overspeed (rpm)	1800	1
Altitude:	1000 m	Total Harmonic Distortion (THD) <	1,5%	1
Duty: Base Rating				

Efficiency (Base 2000 kWe) IEC

	25%	50%	75%	100%	110%	
Power factor - Lagging: 0,8	93,89	95,88	96,17	96,03	95,93	1
Power factor - Lagging: 1	94,39	96,58	97,06	97,11	97,08	1

Reactances (%) - (Base 2500 kVA)

Unitary impedance (1 per unit) = 17,424 ohms

		Unsaturated	Saturated	Unsaturated	Saturated	
	Direct axis			Quadrature axis		
Synchronous reactance	Xd	280	236	Xq	143	120
Transient reactance	X'd	30,2	25,7	X'q	143	120
Subtransient reactance	X''d	17,1	14,5	X''q	17,9	15,2
Negative sequence reactance	X2	17,5	14,9			

X0	11,3	Zero sequence reactance	1
Xl	8,5	Stator leakage reactance	
Xr	23,5	Rotor leakage reactance	
Kc	0,42	Short-circuit ratio	1

Time constants (s)

	Direct axis	Quadrature axis		
Open circuit transient time constant	T'do	2,75	T'qo	NA
Short-circuit transient time constant	T'd	0,296	T'q	NA
Open circuit subtransient time constant	T''do	0,035	T''qo	0,143
Subtransient time constant	T''d	0,020	T''q	0,018
Ta	0,039	Armature time constant		1

Resistances (%)

Ra	1,4	Armature resistance	R0	3,8	Zero sequence resistance	1
X/R	10,2	X/R ratio (without unit)	R2	3,5	Negative sequence resistance	

Voltage accuracy: 0,25%

Maximum inrush current for a voltage dip of 15%: 1624 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

Products and materials shown in this catalogue may, at any time, be modified in order to follow the latest technological developments,

ALTERNATOR MAIN CURVES
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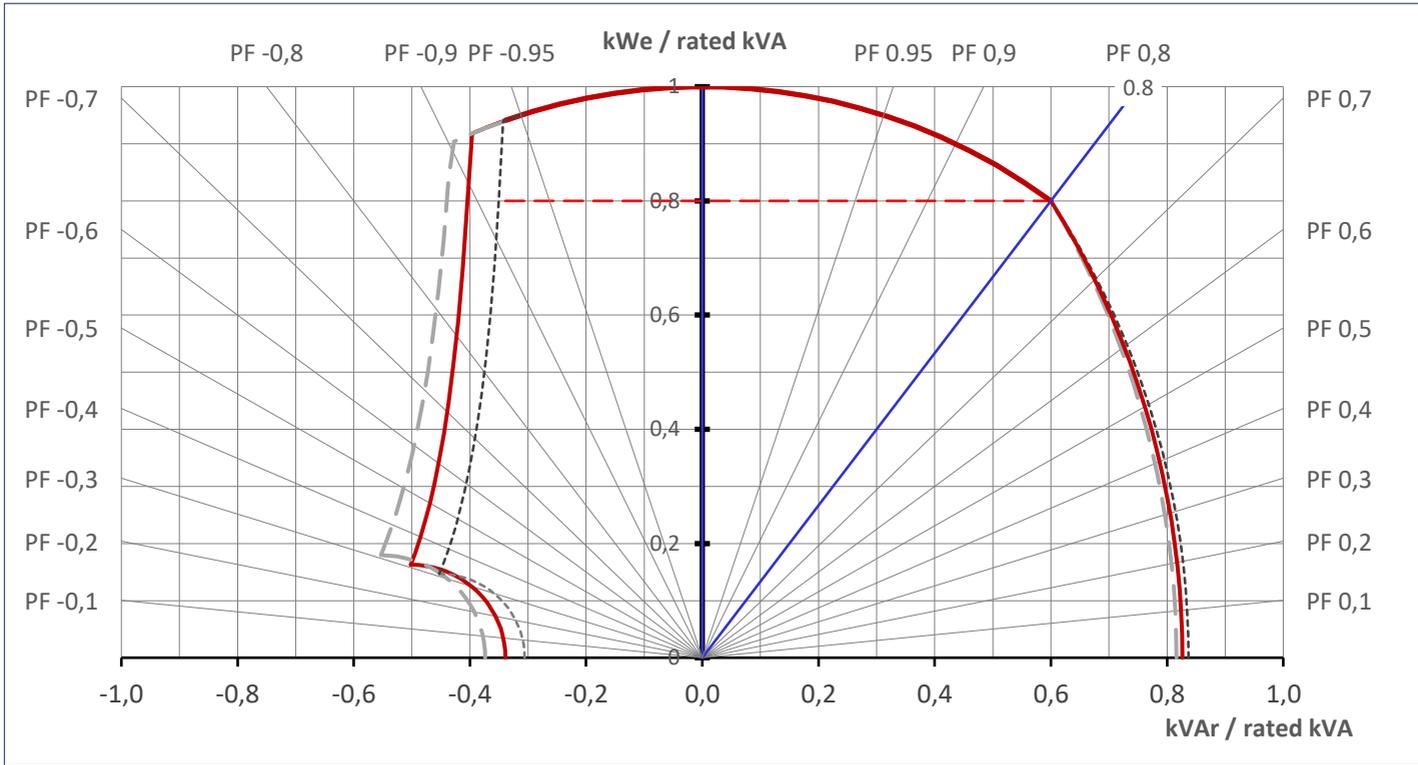
Date: 07/10/2022

2500kVA - 6600V - 50 Hz

V6.09b - 01/2022

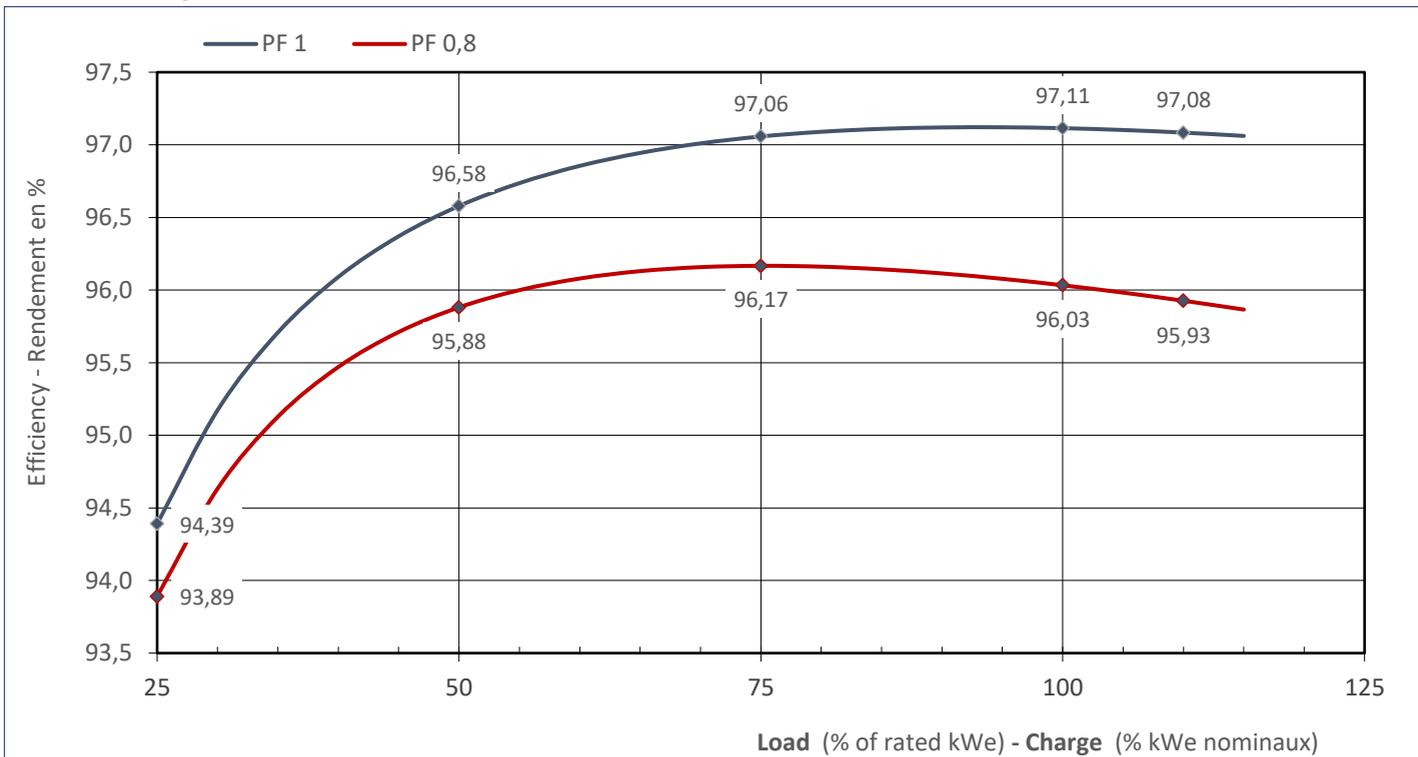
Capability Curve

---	Umax	+ 5%	6 930	V
—	Un		6 600	V
- - -	Umin	- 5%	6 270	V



Efficiency Curves

According to: IEC

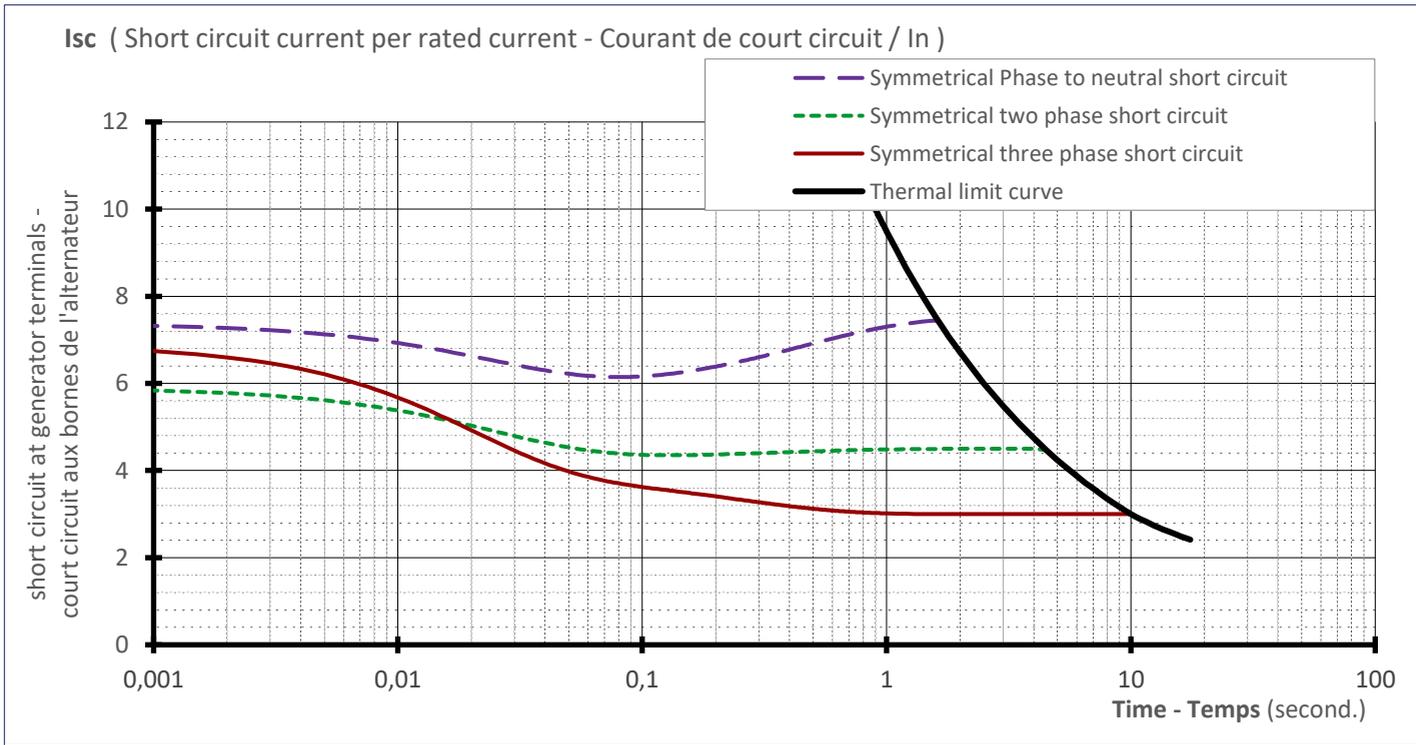


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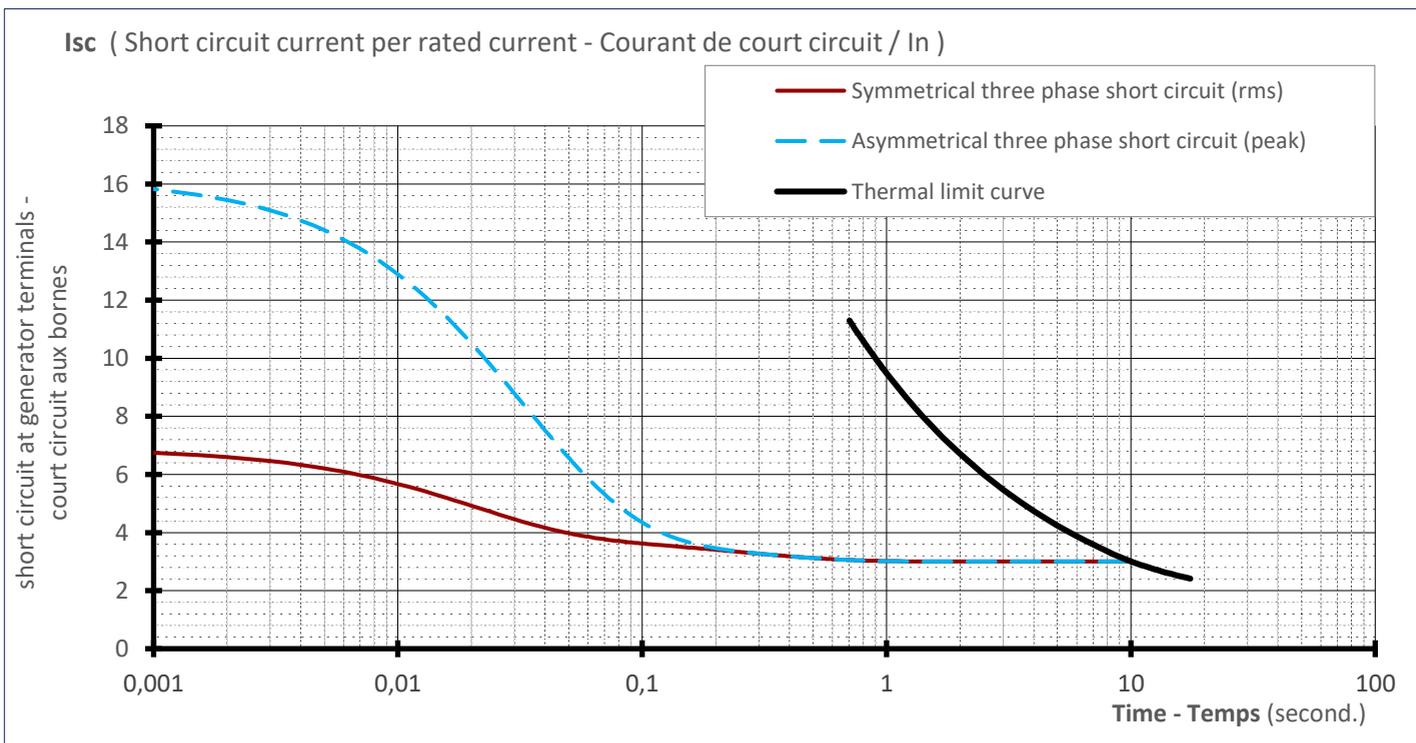
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Stator Current decrement curves

Symmetrical phase to neutral short-circuit		initial	1 603	A	7,3 x In	
Symmetrical two phase short-circuit		max	1 278	A	5,8 x In	In = 219 A
Symmetrical three phase short-circuit		value	1 477	A	6,7 x In	
Thermal Limit						



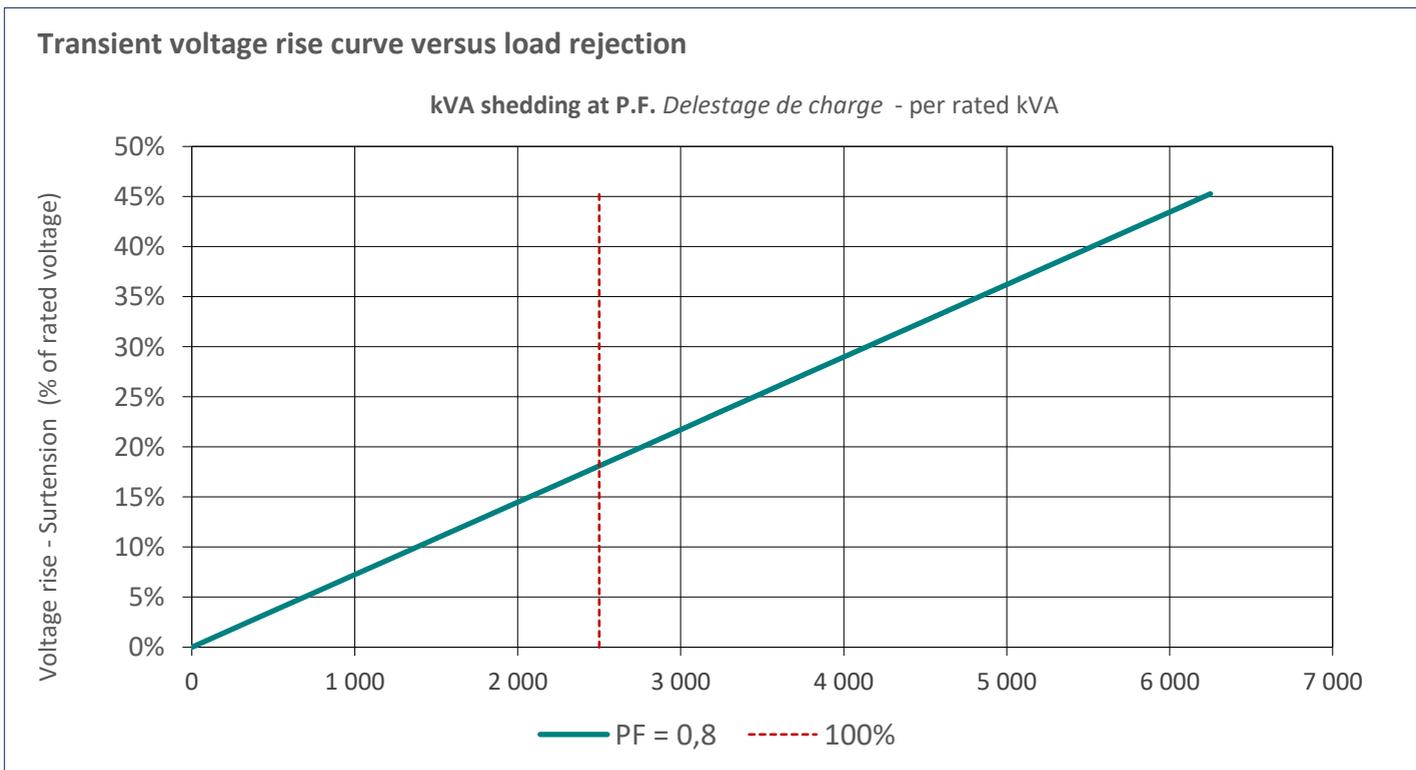
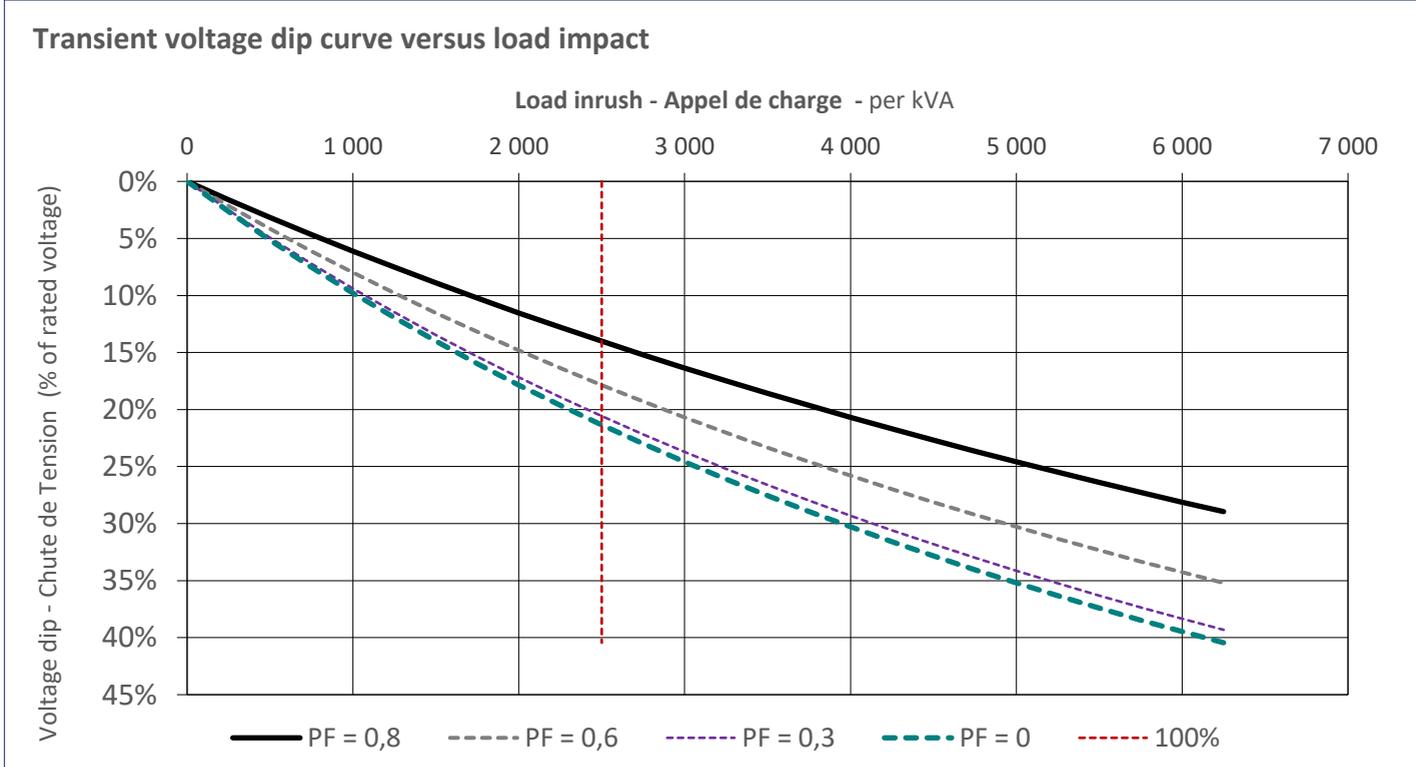
Asymmetrical three phase short-circuit IP 3 431 A 15,7 x In



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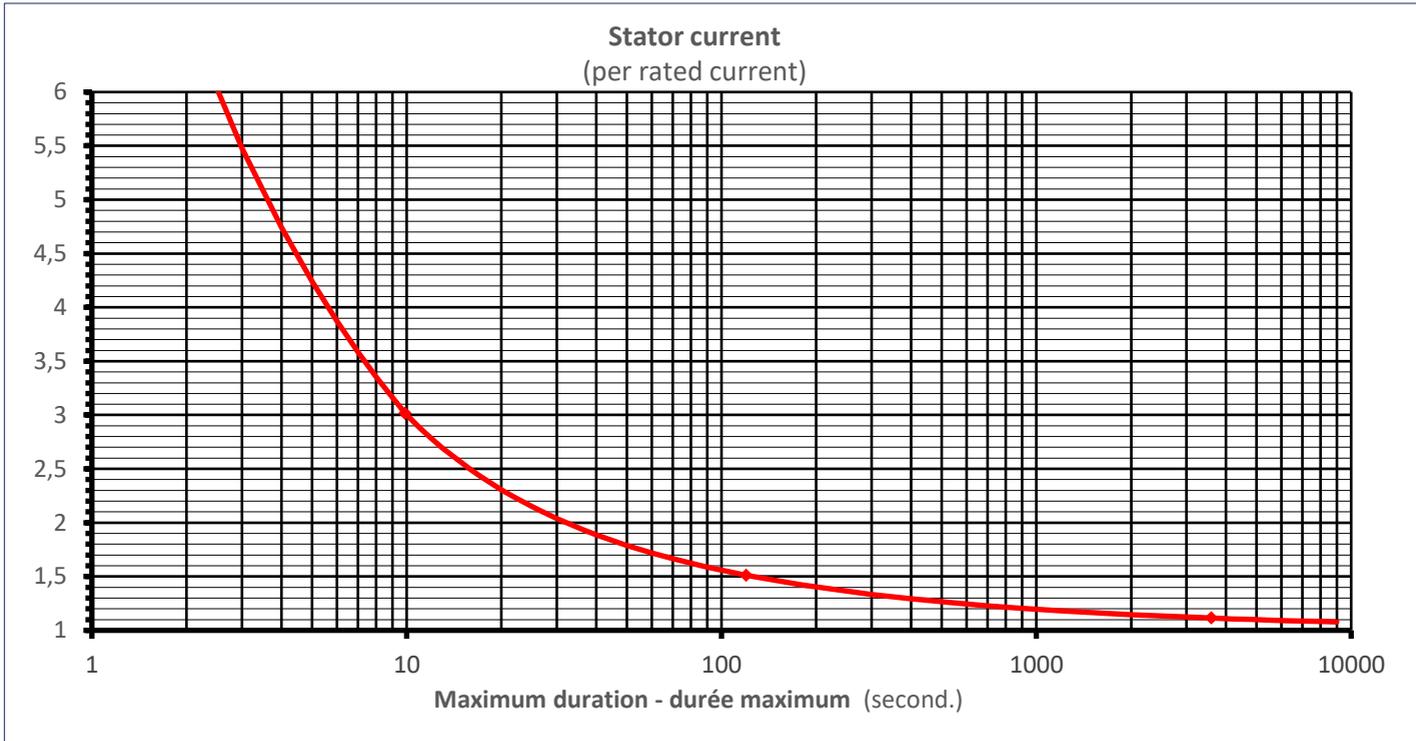
Transient Voltage Variation



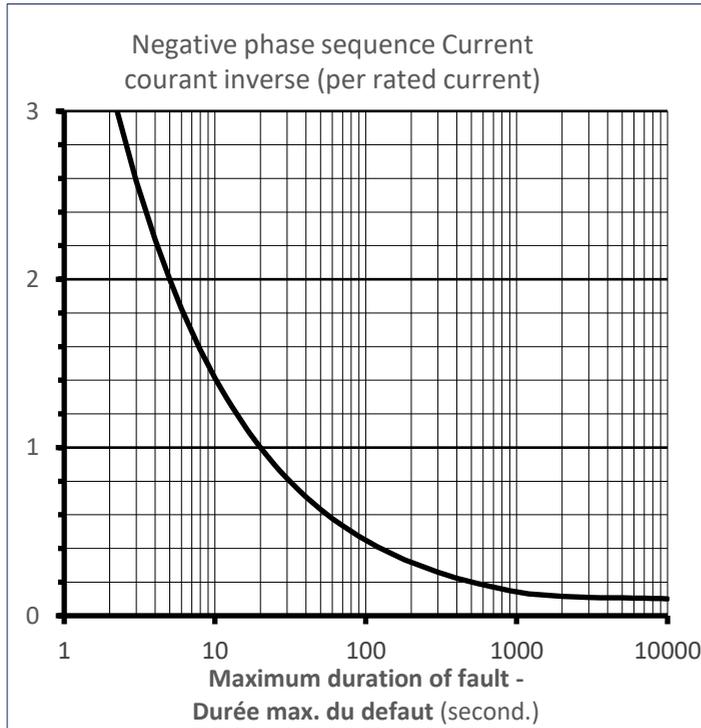
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Thermal Damage Curve



Unbalance Load Curve



Stator Earth Fault Current

