

ALTERNATOR TECHNICAL DESCRIPTION

LSA 52.3 XL10 / 4p

LS Reference: OF241039_3.3KV_1955KVA 1

Date: 10-28-2024 V6.10 - 12/2023 1
Project Manager : Aviva 1
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Electric Power Generation - Fuzhou +86 (591)88373034
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Main data C 1

Generator type: LSA 52.3 XL10 / 4p 1
Power: 1 955 kVA 1 564 kW_e 1 627 kW_m 1
Voltage: 3 300 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: 342 A 1
Winding type: p5/6 1
Classes (Insulation / Temperature Rise): H / F 1
Ambient temperature: 40 °C 1
Altitude: 1 000 m 1

Installation IEC Quantity 1 1

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

Mechanical construction IM1201 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: SAE 21 1
Balancing - Class (ISO 21940-11): Without key - G2,5 (std) 1
Flange: SAE 00 1
Shaft height: 500 mm 1
Width: 750 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:	Between alternators (1F) - 1 x 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

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

Protection and measurement accessories

Temperature detection

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

Anti-condensation heating

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

Various items

Paint:	PE - Primary - ---	1
Documentation:	PDF manual	1
Documentation Language:	English	1
Nameplate	Sticker	1

Controls

Standards:	IEC	1
QUAL/INES/006 001 => 101	Measurement of winding resistance	1
QUAL/INES/006 021 => 128	Insulation check on sensors (when fitted)	1
QUAL/INES/006 002 => 102&103	Voltage balance and phase order check	1
QUAL/INES/006 007 => 109	Overspeed test (according to test bench limitation)	1
QUAL/INES/006 009 => 111	High potential test	1
QUAL/INES/006 010 => 112	Insulation resistance measurement	1

ALTERNATOR ELECTRICAL DATA

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Main data:						C	
Power:	1 955	kVA	1 564	kWe	1 627	kWm	1
Voltage:	3300	V	Frequency:	50	Hz		1
Rated voltage range:	+5% / -5%		Speed:	1500	rpm		1
Power factor - Lagging:	0.8						1
Nominal current:	342	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 1564 kWe)						IEC
	25%	50%	75%	100%	110%	
Power factor - Lagging: 0.8	93.18	95.62	96.13	96.16	96.11	1
Power factor - Lagging: 1	93.71	96.31	96.99	97.18	97.19	1

Reactances (%) - (Base 1955 kVA)									
Unitary impedance (1 per unit) = 5.570332 ohms									
		Unsaturated		Saturated		Unsaturated		Saturated	
		Direct axis		Quadrature axis					
Synchronous reactance	Xd	202	180	Xq	103	92			1
Transient reactance	X'd	22.9	19.5	X'q	103	92			1
Subtransient reactance	X''d	11.4	9.6	X''q	11.7	10.0			1
Negative sequence reactance	X2	11.5	9.8						
X0	7.0	Zero sequence reactance							1
Xl	5.7	Stator leakage reactance							
Xr	18.9	Rotor leakage reactance							
Kc	0.56	Short-circuit ratio							1

Time constants (s)						
		Direct axis		Quadrature axis		
Open circuit transient time constant	T'do	1.68		T'qo	NA	1
Short-circuit transient time constant	T'd	0.190		T'q	NA	1
Open circuit subtransient time constant	T''do	0.024		T''qo	0.095	1
Subtransient time constant	T''d	0.012		T''q	0.011	1
Ta	0.030	Armature winding short circuit time constant				1

Resistances (%)						
Ra	1.2	Armature resistance	R0	2.3	Zero sequence resistance	1
X/R	7.9	X/R ratio (without unit)	R2	2.3	Negative sequence resistance	

Voltage accuracy: 0.25%

Maximum inrush current for a voltage dip of 15%: 1674 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.

#REF!

ALTERNATOR MAIN CURVES
LSA 52.3 XL10 / 4P

LS Reference: OF241039_3.3KV_1955KVA

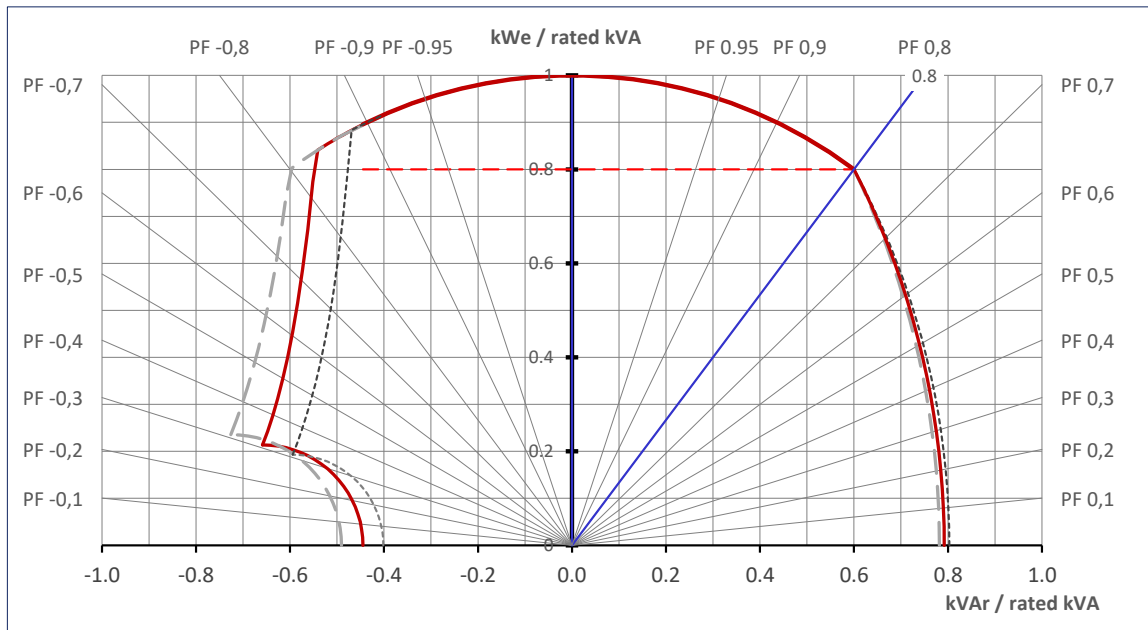
Date: 10-28-2024

1955kVA - 3300V - 50 Hz

V6.10 - 12/2023

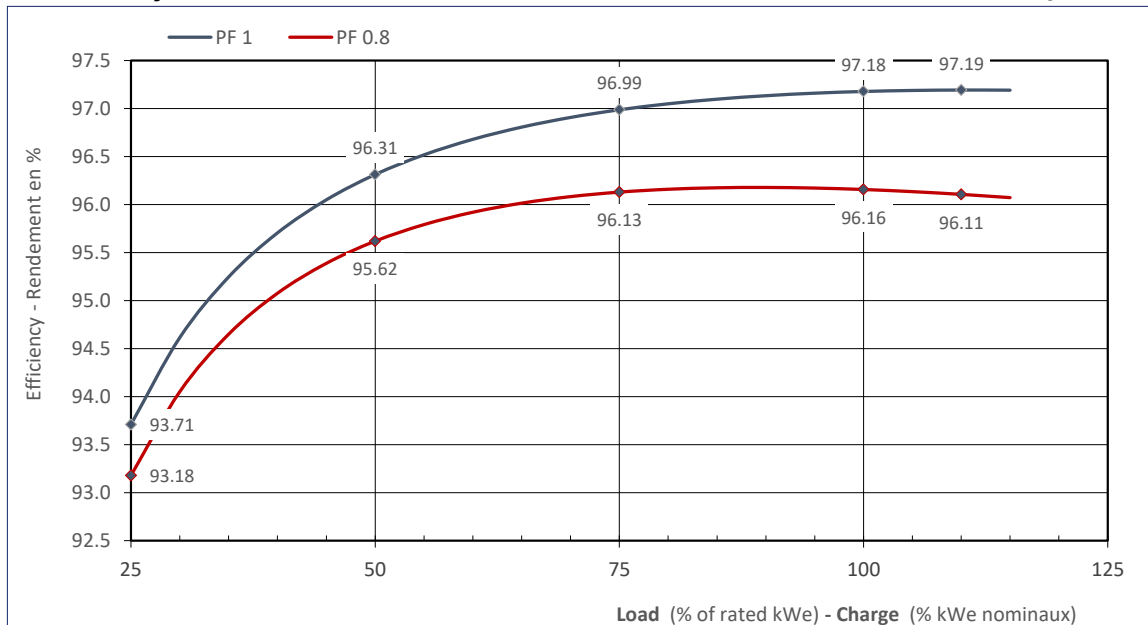
Capability Curve

---	Umax	+ 5%	3 465	V
---	Un		3 300	V
---	Umin	- 5%	3 135	V



Efficiency Curves

According to: IEC



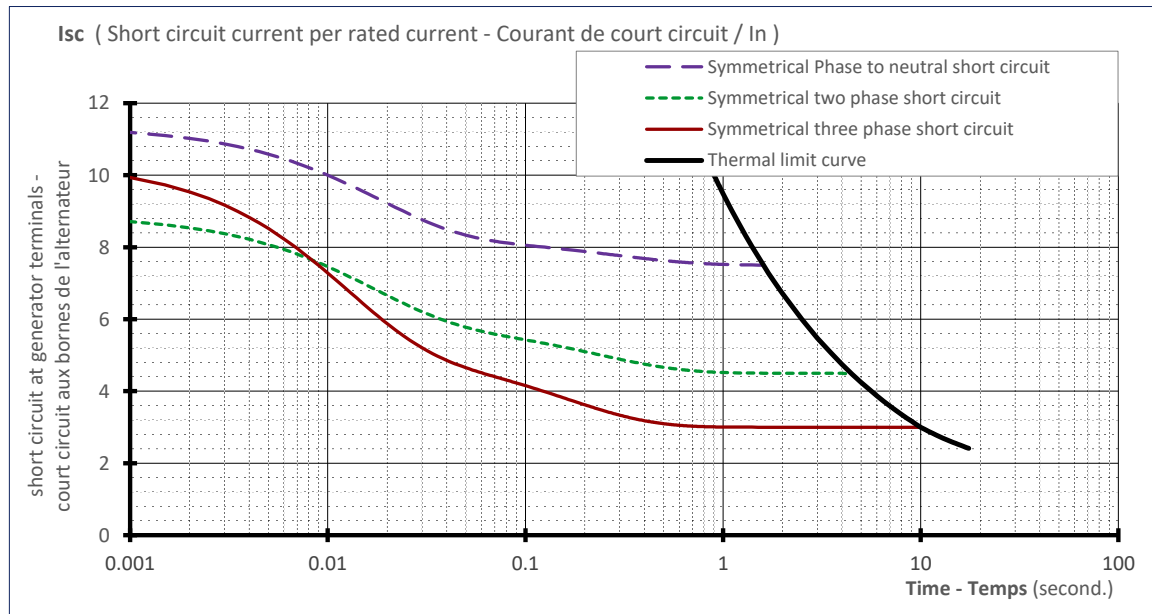
ALTERNATOR MAIN CURVES

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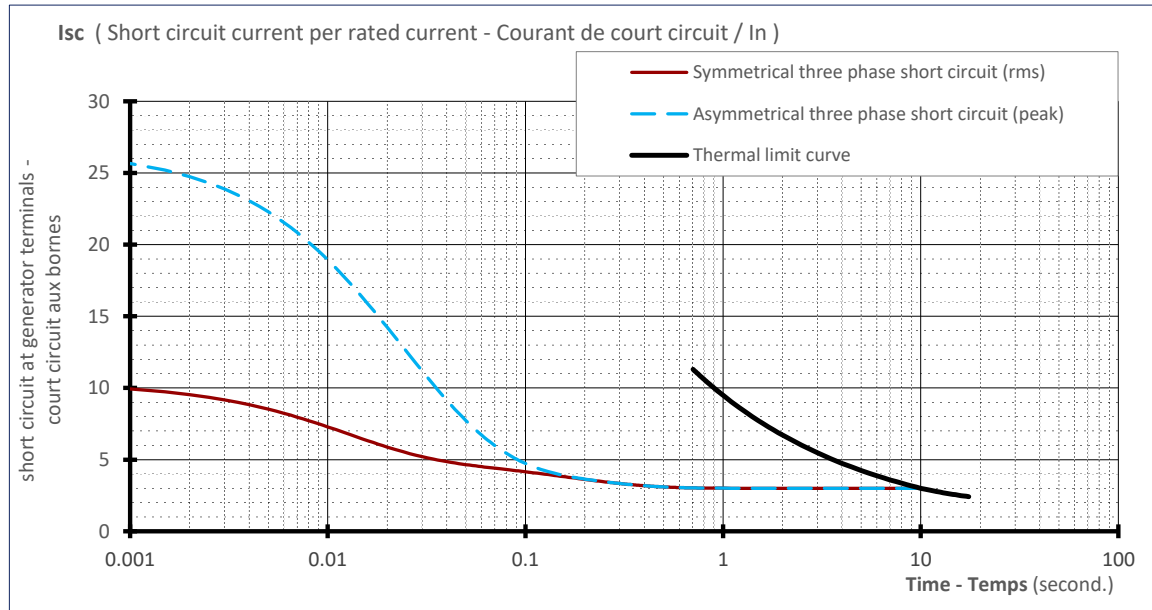
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Stator Current decrement curves

Symmetrical phase to neutral short-circuit	—	initial	3 826	A	11.2 x In	
Symmetrical two phase short-circuit	- - -	max	2 980	A	8.7 x In	In = 342 A
Symmetrical three phase short-circuit	—	value	3 397	A	9.9 x In	
Thermal Limit	—					



Asymmetrical three phase short-circuit — IP 8 713 A 25.5 x In

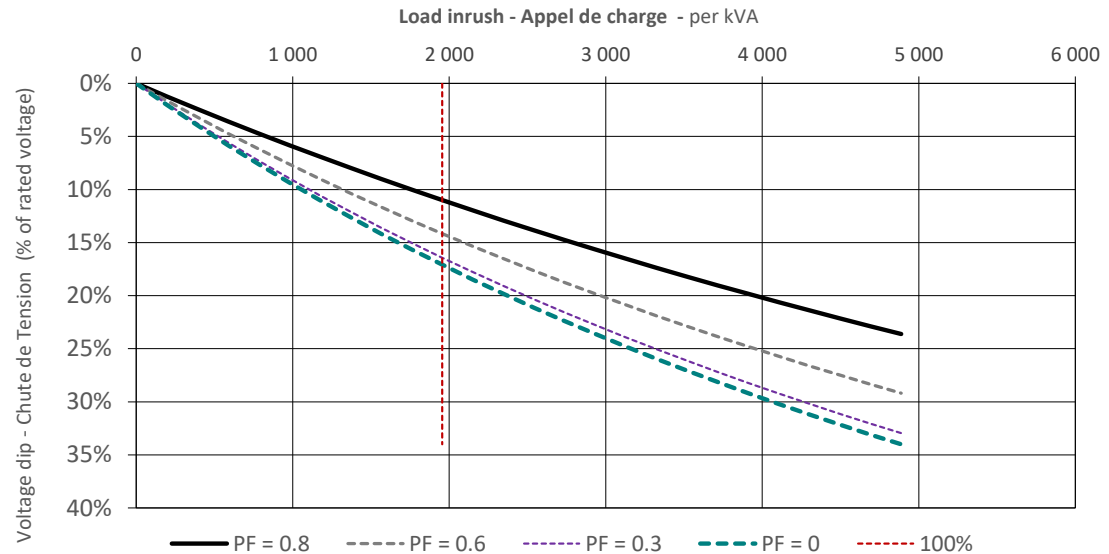


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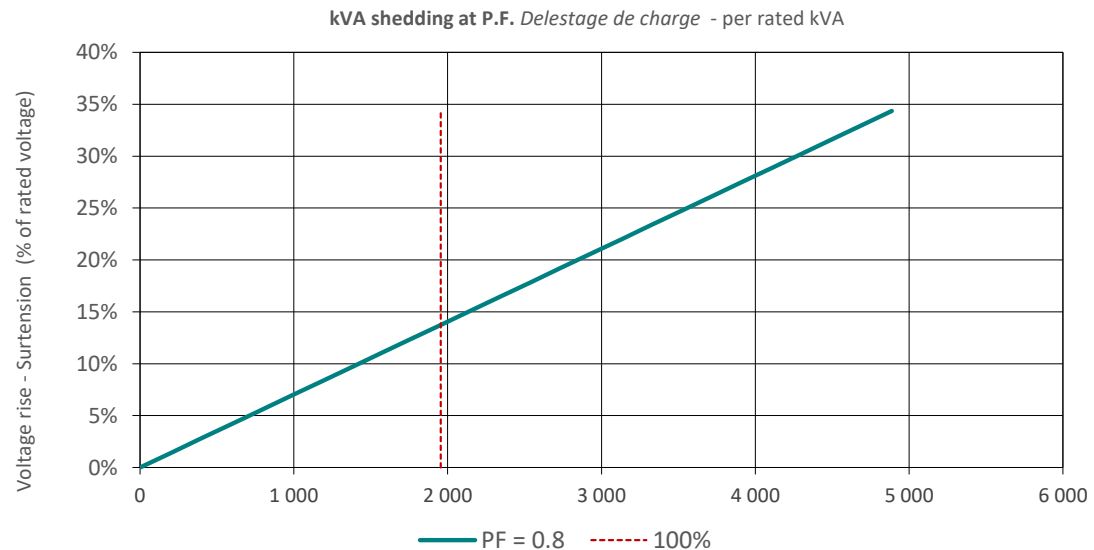
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Transient Voltage Variation

Transient voltage dip curve versus load impact



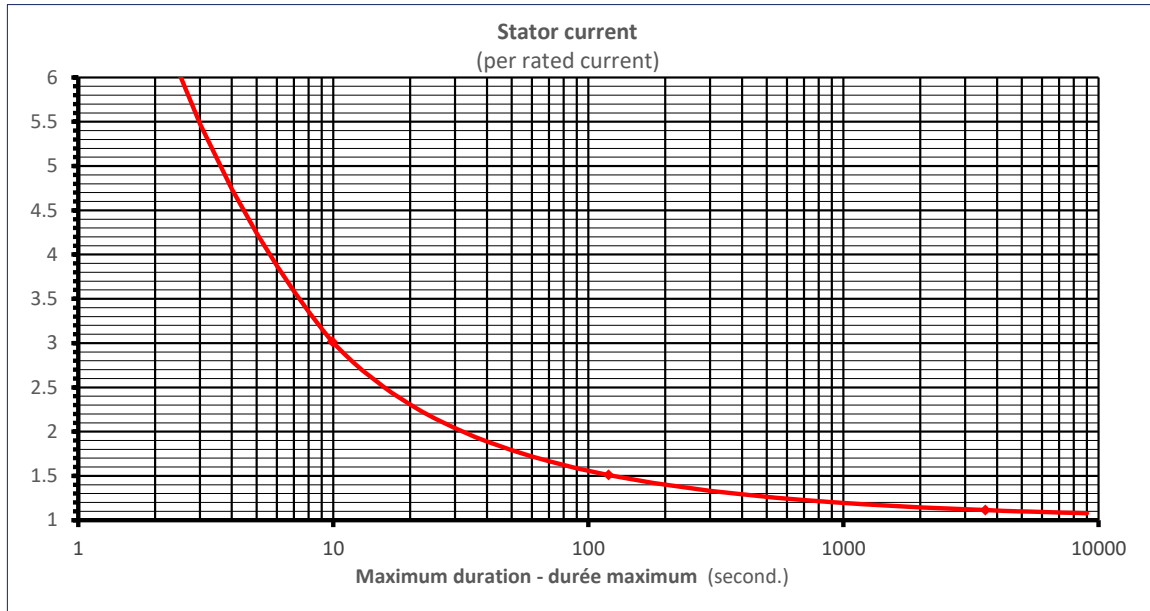
Transient voltage rise curve versus load rejection



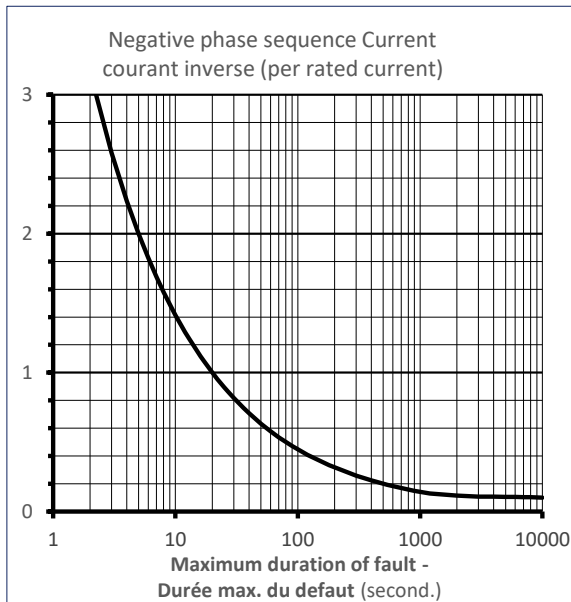
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Thermal Damage Curve



Unbalance Load Curve



Stator Earth Fault Current

