

ALTERNATOR TECHNICAL DESCRIPTION
LSA 52.3 ZL8 / 4p

LS Reference: **OF241039_1545KVA** 1

Date: 10-28-2024 V6.10 - 12/2023 1
Project Manager : Aviva 1
Leroy-Somer Paul.HU@mail.nidec.com
Electric Power Generation - Fuzhou +86 (591)88373034
No.1 Aimosheng Road, Gaishan Town, Cangshan District - Fuzhou, Fujian | 350026 | P.R. China PH

Main data C 1

Generator type: **LSA 52.3 ZL8 / 4p** 1
Power: 1 545 kVA 1 236 kWe 1 292 kWm 1
Voltage: 11 000 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: 81 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

ALTERNATOR TECHNICAL DESCRIPTION
LSA 52.3 ZL8 / 4p

LS Reference: OF241039_1545KVA 1

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

Various items

| | | |
|-------------------------|-------------------------|---|
| Paint: | PE - Primary - RAL 7032 | 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
LSA 52.3 ZL8 / 4P

LS Reference: **OF241039_1545KVA**

Date: 10-28-2024

V6.10 - 12/2023

Main data: **C**

| | | | | |
|--------------------------------|------------------|---------------------------------|------------------------------|---|
| Power: | 1 545 kVA | 1 236 kW _e | 1 292 kW _m | 1 |
| Voltage: | 11000 V | Frequency: | 50 Hz | 1 |
| Rated voltage range: | +5% / -5% | Speed: | 1500 rpm | 1 |
| Power factor - Lagging: | 0.8 | Phases | 3 | 1 |
| Nominal current: | 81 A | Connexion | Star serial | 1 |
| Insulation / Temperature rise: | H / F | 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 1236 kW_e) **IEC**

| | | | | | | |
|------------------------------------|-------|-------|-------|--------------|-------|---|
| | 25% | 50% | 75% | 100% | 110% | |
| Power factor - Lagging: 0.8 | 92.80 | 95.26 | 95.71 | 95.67 | 95.58 | 1 |
| Power factor - Lagging: 1 | 93.34 | 96.01 | 96.67 | 96.83 | 96.82 | 1 |

Reactances (%) - (Base 1545 kVA)

Unitary impedance (1 per unit) = 78.317152 ohms

| | | Unsaturated | | Saturated | | |
|-----------------------------|------------------|--------------------------|------|------------------|------|-----------------|
| | Direct axis | | | | | Quadrature axis |
| Synchronous reactance | X _d | 198 | 180 | X _q | 101 | 92 |
| Transient reactance | X' _d | 23.5 | 20.0 | X' _q | 101 | 92 |
| Subtransient reactance | X'' _d | 12.2 | 10.4 | X'' _q | 12.6 | 10.7 |
| Negative sequence reactance | X ₂ | 12.4 | 10.6 | | | |
| X ₀ | 6.9 | Zero sequence reactance | | | | |
| X _l | 6.1 | Stator leakage reactance | | | | |
| X _r | 19.1 | Rotor leakage reactance | | | | |
| K_c | 0.56 | Short-circuit ratio | | | | |

Time constants (s)

| | Direct axis | Quadrature axis |
|---|-------------------------|--|
| Open circuit transient time constant | T' _{do} 1.56 | T' _{qo} NA |
| Short-circuit transient time constant | T' _d 0.185 | T' _q NA |
| Open circuit subtransient time constant | T'' _{do} 0.023 | T'' _{qo} 0.087 |
| Subtransient time constant | T'' _d 0.012 | T'' _q 0.011 |
| T _a | 0.028 | Armature winding short circuit time constant |

Resistances (%)

| | | | | | |
|----------------|-----|--------------------------|----------------|-----|------------------------------|
| R _a | 1.4 | Armature resistance | R ₀ | 2.3 | Zero sequence resistance |
| X/R | 7.4 | X/R ratio (without unit) | R ₂ | 2.5 | Negative sequence resistance |

Voltage accuracy: 0.25%

Maximum inrush current for a voltage dip of 15%: 1289 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 ZL8 / 4P

LS Reference: OF241039_1545KVA

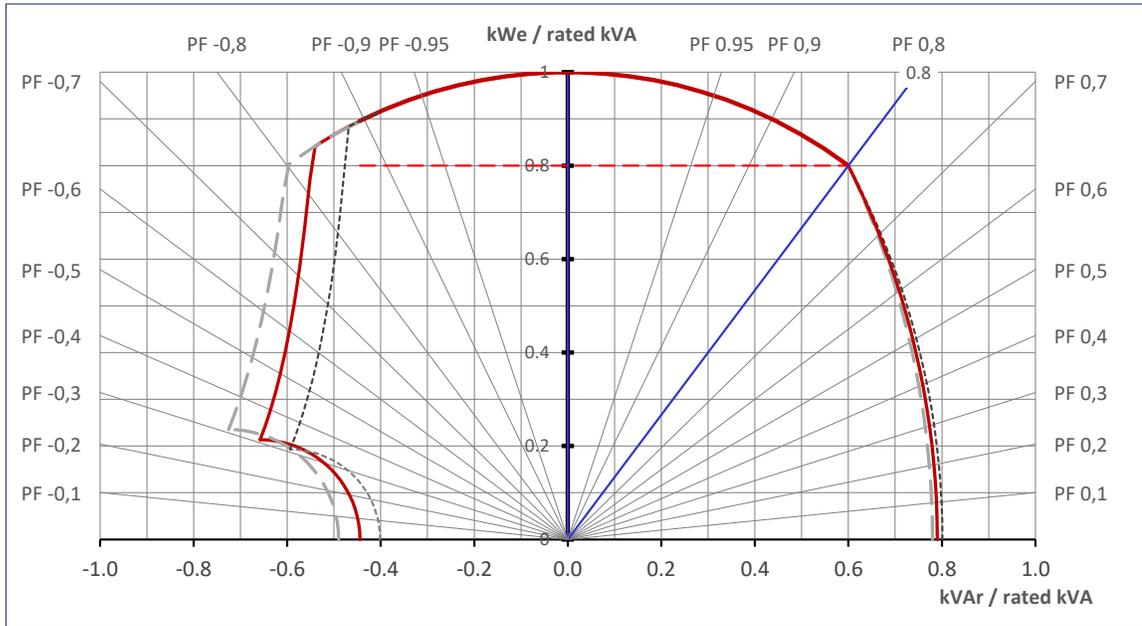
Date: 10-28-2024

1545kVA - 11000V - 50 Hz

V6.10 - 12/2023

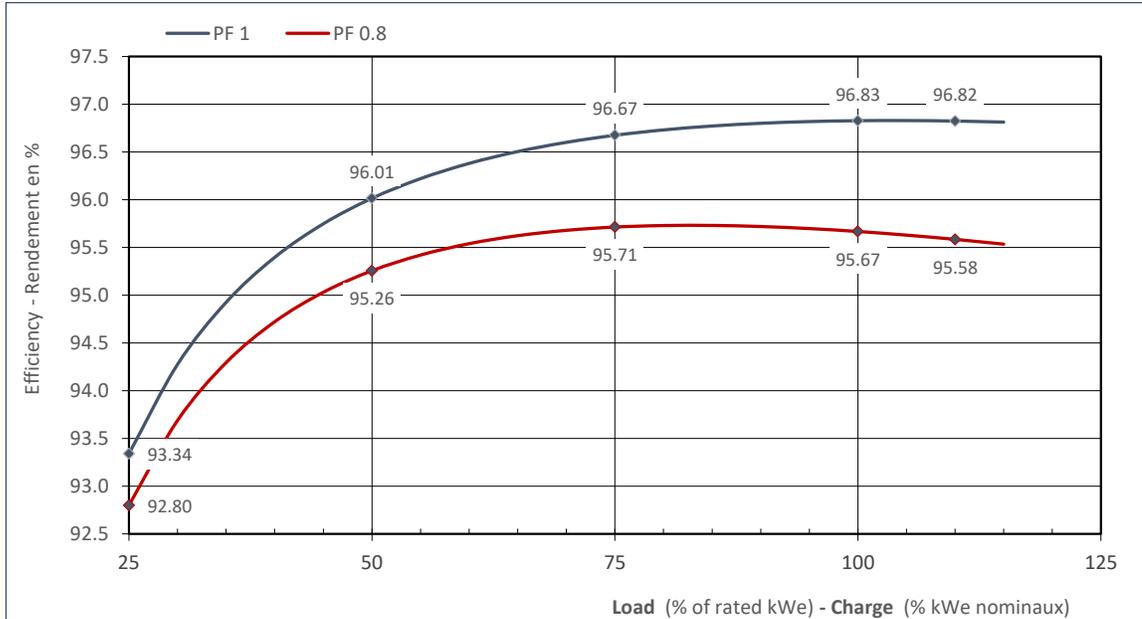
Capability Curve

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



Efficiency Curves

According to: IEC

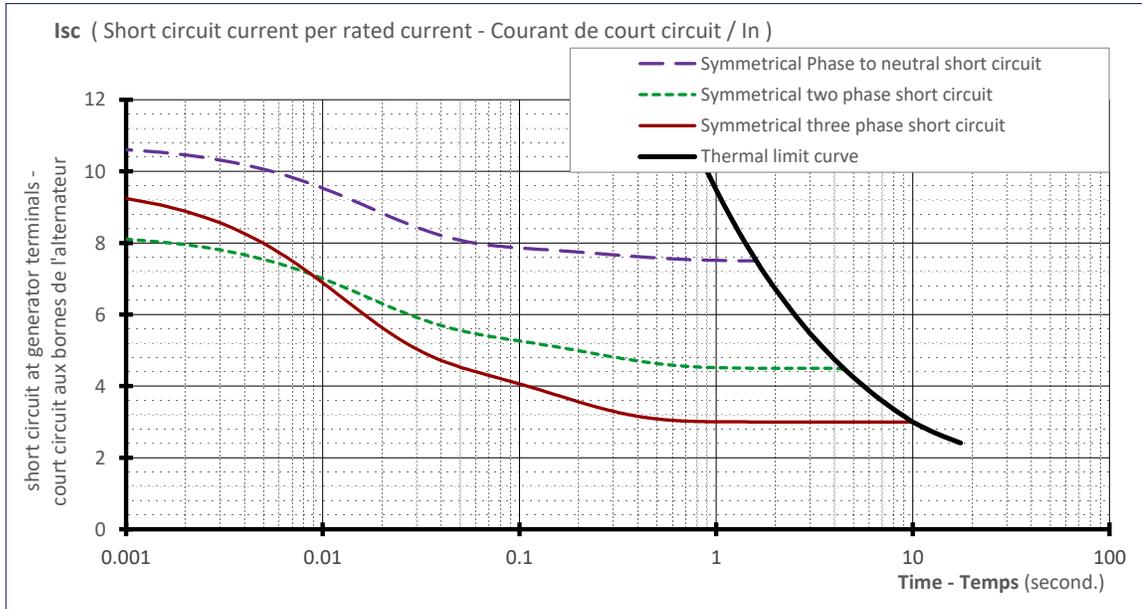


ALTERNATOR MAIN CURVES
LSA 52.3 ZL8 / 4P

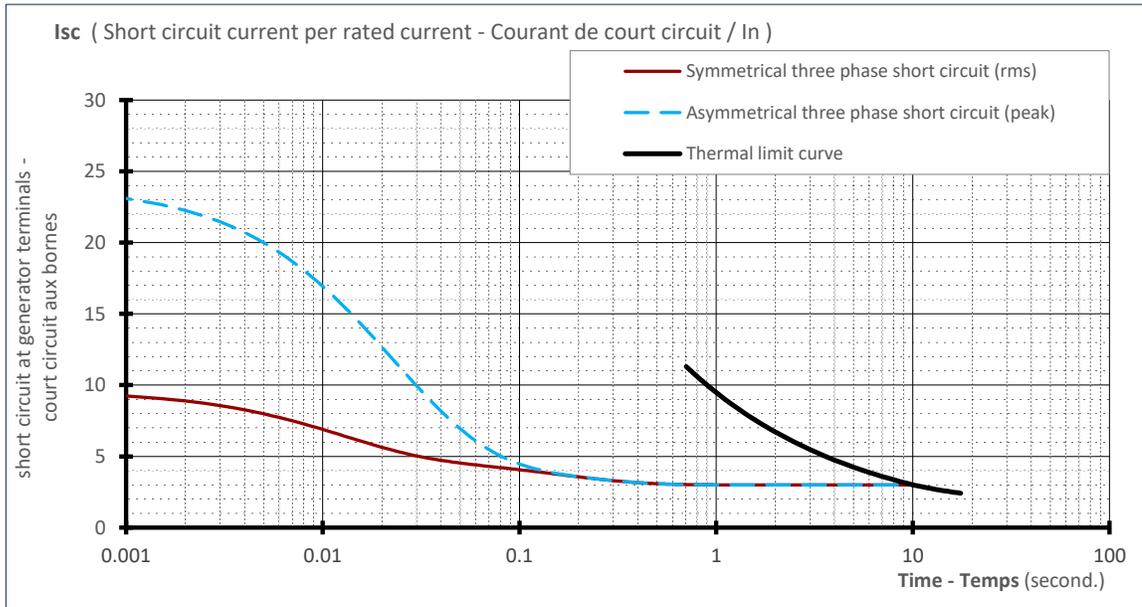
LS Reference: OF241039_1545KVA

Stator Current decrement curves

| | | | | | | |
|--|--|---------|-----|---|-----------|-----------|
| Symmetrical phase to neutral short-circuit | | initial | 859 | A | 10.6 x In | |
| Symmetrical two phase short-circuit | | max | 657 | A | 8.1 x In | In = 81 A |
| Symmetrical three phase short-circuit | | value | 748 | A | 9.2 x In | |
| Thermal Limit | | | | | | |



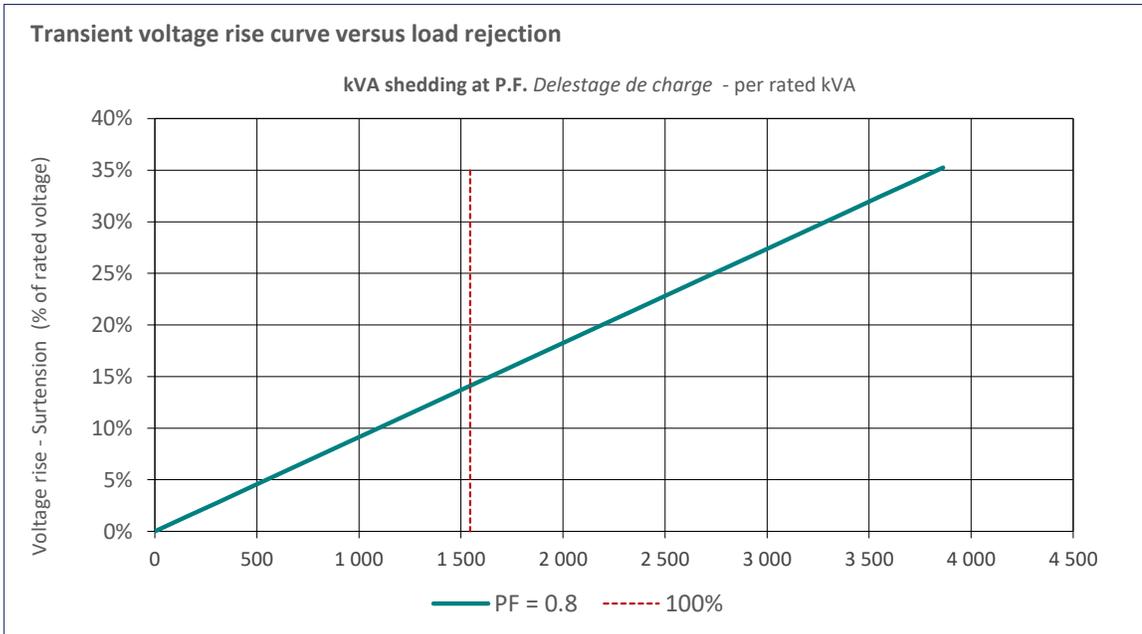
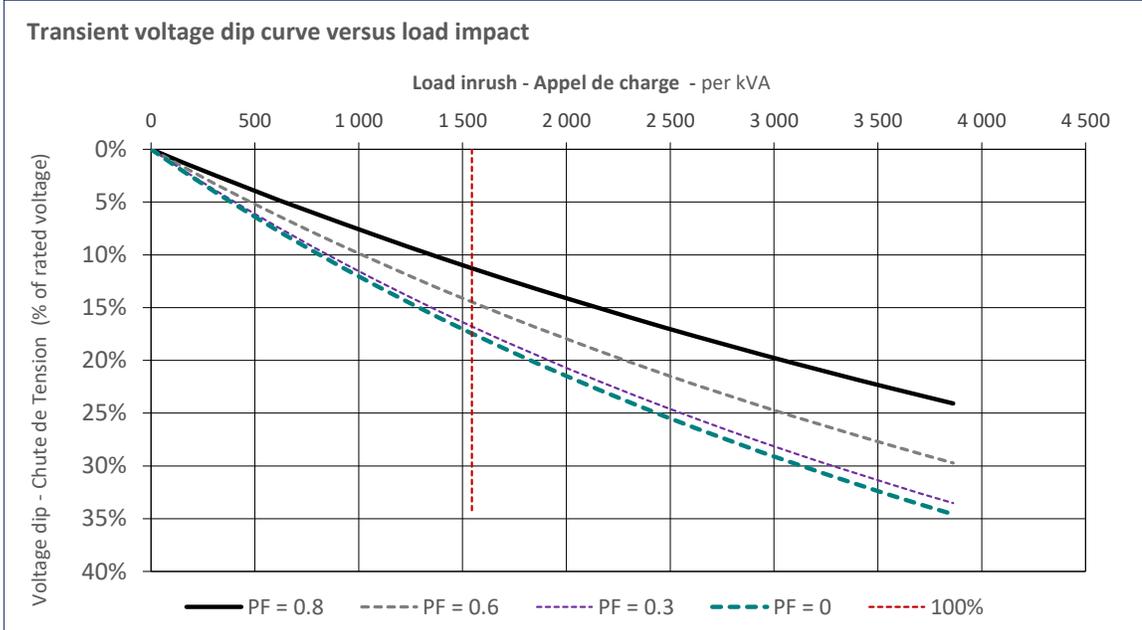
Asymmetrical three phase short-circuit IP 1 856 A 22.9 x In



ALTERNATOR MAIN CURVES
LSA 52.3 ZL8 / 4P

LS Reference: OF241039_1545KVA

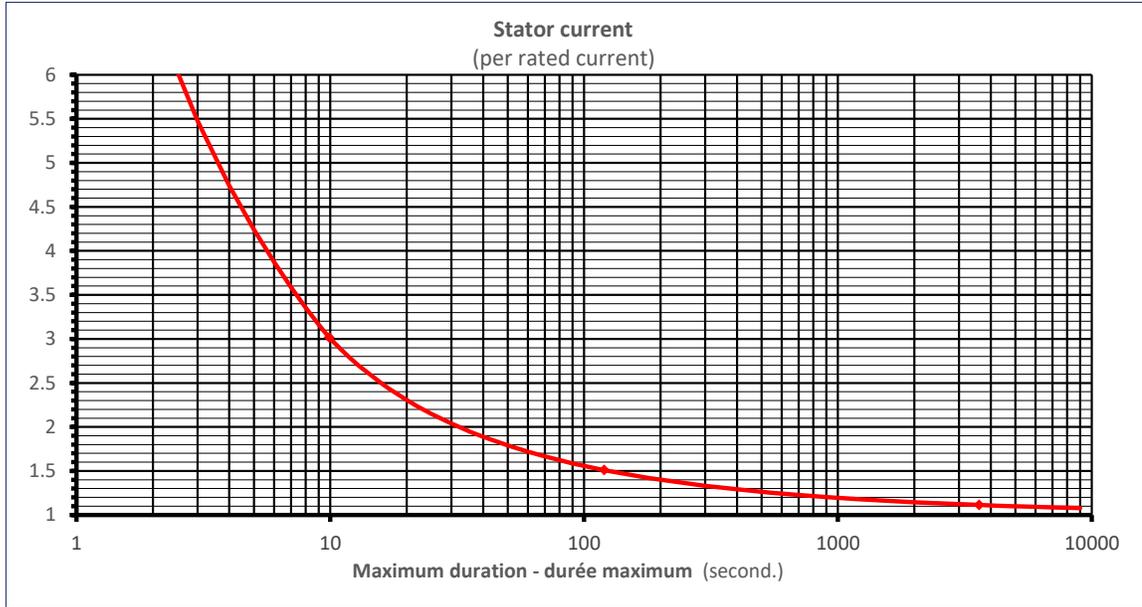
Transient Voltage Variation



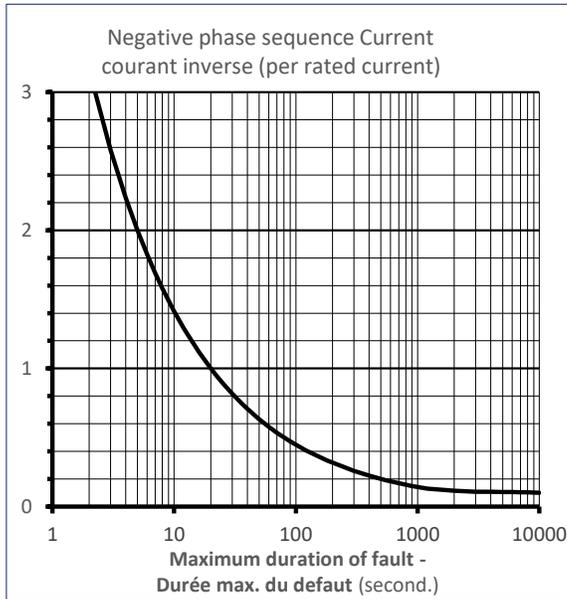
ALTERNATOR MAIN CURVES
LSA 52.3 ZL8 / 4P

LS Reference: OF241039_1545KVA

Thermal Damage Curve



Unbalance Load Curve



Stator Earth Fault Current

