



Technical Data Sheet for AvK-Alternators

FM 7.3-5

| | | | |
|--------------|----------|----------------|-----------------------------|
| Date: | 09/01/14 | Customer: | GENERIC DATASHEET only |
| Project No.: | | AvK Reference: | dig130I_4_50_10500_A048N005 |

Object data:

| | | | |
|--------------|------------------------|---------------|--|
| Site: | | Prime Mover: | |
| Application: | Stationary Power Plant | Manufacturer: | |

Generator data:

| | | | | | |
|------------------------|----------------------------------|-------------------|----------|-------------------------------------------------------|----------------------|
| Generator: | DIG 130 i/4 | Poles: | 4 | Standards: | IEC 60034 |
| Rated power: | 2500 kVA | 2000 kWe | 2079 kWm | | |
| Power factor: | 0.80 | | | | |
| Power at pf 1,0 | 2019 kVA | 2019 kWe | 2079 kWm | | |
| Rated voltage: | 10.5 kV | | | | |
| Speed: | 1500 1/min | | | | |
| Frequency: | 50 Hz | | | Voltage range / frequency range: | |
| Rated current: | 137.5 A | | | Zone A according IEC 60034-1 (dU = +/-5%, df = +/-2%) | |
| Winding pitch: | ca. 5/6 | | | | |
| Insulation class: | Stator: Class F | Rotor: Class F | | Temperature rise: | F |
| Ambient temperature: | 40 ° C | | | Environment: | Standard environment |
| Site altitude: | 1000 m | | | | |
| Enclosure: | IP23 | | | Filter: | |
| Cooling: | IC 01 - Open-circuit ventilation | | | | |
| Coolant: | Ambient Air | Temperature | 40 ° C | Temperature Air inlet | 40 ° C |
| | | Coolant: | | generator: | |
| | | Cooling air vol.: | 3.0 m³/s | Cooling water quantity: | n/a |
| Moment of inertia (I): | 97 kgm² | Weight: | 6900 Kg | Losses (environment): | 79 KW |
| | | | | Losses (cooling): | n/a |

| | |
|--------------------|--------------------------------------------------|
| Wires: | 4 terminals, starpoint connected in terminal box |
| Operation mode: | Single mode |
| Regulators: | |
| Voltage regulator: | DECS 100 |

Electrical data: (acc. IEC)

| | | | | | |
|------------------|-------|-------|------|-------|-------|
| Efficiencies: | 110% | 100% | 75% | 50% | 25% |
| Power factor 0.8 | 96,01 | 96,2 | 96,2 | 95,8 | 93,7 |
| Power factor 0.9 | 96,49 | 96,65 | 96,6 | 96,05 | 93,95 |
| Power factor 1.0 | 96,96 | 97,1 | 97 | 96,3 | 94,2 |

Reactances and time constants

| | unsaturated | saturated | | unsaturated | saturated | | | | |
|----------|-------------|------------|---------|-------------|------------|-----------|--------|------------|-----------|
| X_d | 2.40 | 2.16 p.u. | X_q | 1.20 | 1.18 p.u. | $T_{d0'}$ | 3 s | $T_{d0''}$ | 0.03217 s |
| X_d' | 0.304 | 0.304 p.u. | X_q' | 1.20 | 1.18 p.u. | $T_{d'}$ | 0.40 s | $T_{q0'}$ | 0.4 s |
| X_d'' | 0.208 | 0.189 p.u. | X_q'' | 0.208 | 0.208 p.u. | $T_{d''}$ | 0.02 s | $T_{q0''}$ | 0.23077 s |
| X_2 | 0.218 | 0.198 p.u. | X_0 | 0.063 | 0.057 p.u. | T_a | 0.07 s | $T_{q'}$ | 0.4 s |
| X_{1s} | n.a. | 0.113 p.u. | | | | | | $T_{q''}$ | 0.04 s |

| | |
|-------------------------------------|------------------|
| Short circuit ratio saturated: 0.46 | Z_n 44.100 Ohm |
|-------------------------------------|------------------|

Short circuit data:

| | | | |
|------------------------------------------|----------|-----------|----------------------------------------|
| Initial short circuit current (3-phase): | I_k'' | 727 A | |
| Max. peak current (3-phase): | I_s | 1851 A | |
| Sustained short circuit current: | I_k | 412 A | Minimum 3 x rated current for max.10 s |
| Initial short circuit torque: | M_{k2} | 109.5 kNm | |
| | M_{k3} | 65.7 kNm | |
| Max. faulty synchron moment: | M_f | 235.4 kNm | |
| Rated kVA torque: | M_{SN} | 15.92 kNm | |
| Rated torque | M_N | 12.74 kNm | |
| Shaft torque | M_{Sh} | 13.24 kNm | |

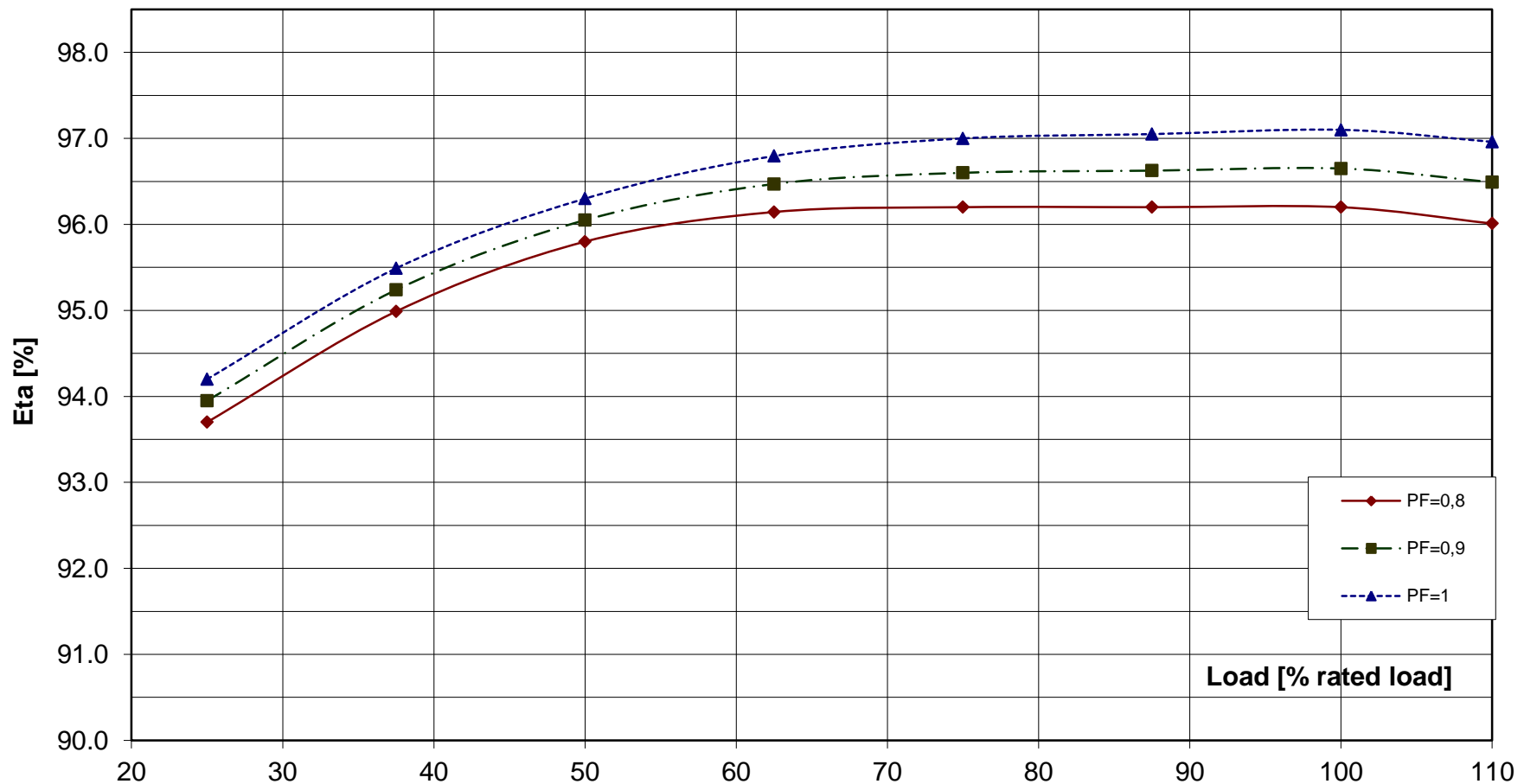
Load application:

| | |
|---------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| max. load application: 1234 kVA (corresponds to 49,34 % from 2500 kVA) for Power factor 0.4 15% transient voltage drop | Power: 2500 kVA Power factor: 0.8 transient voltage drop: -23.3 % |
|---------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|

Remarks:

| | | | | |
|----------------------|--------------------|---------------------|------|--------------------------|
| Alternator : | DIG 130 i/4 | | | |
| Rated output [kVA] | 2500 | Rated power factor: | 0.8 | Rated voltage [kV]: 10.5 |
| Rated frequency [Hz] | 50 | Rated speed [rpm] | 1500 | |

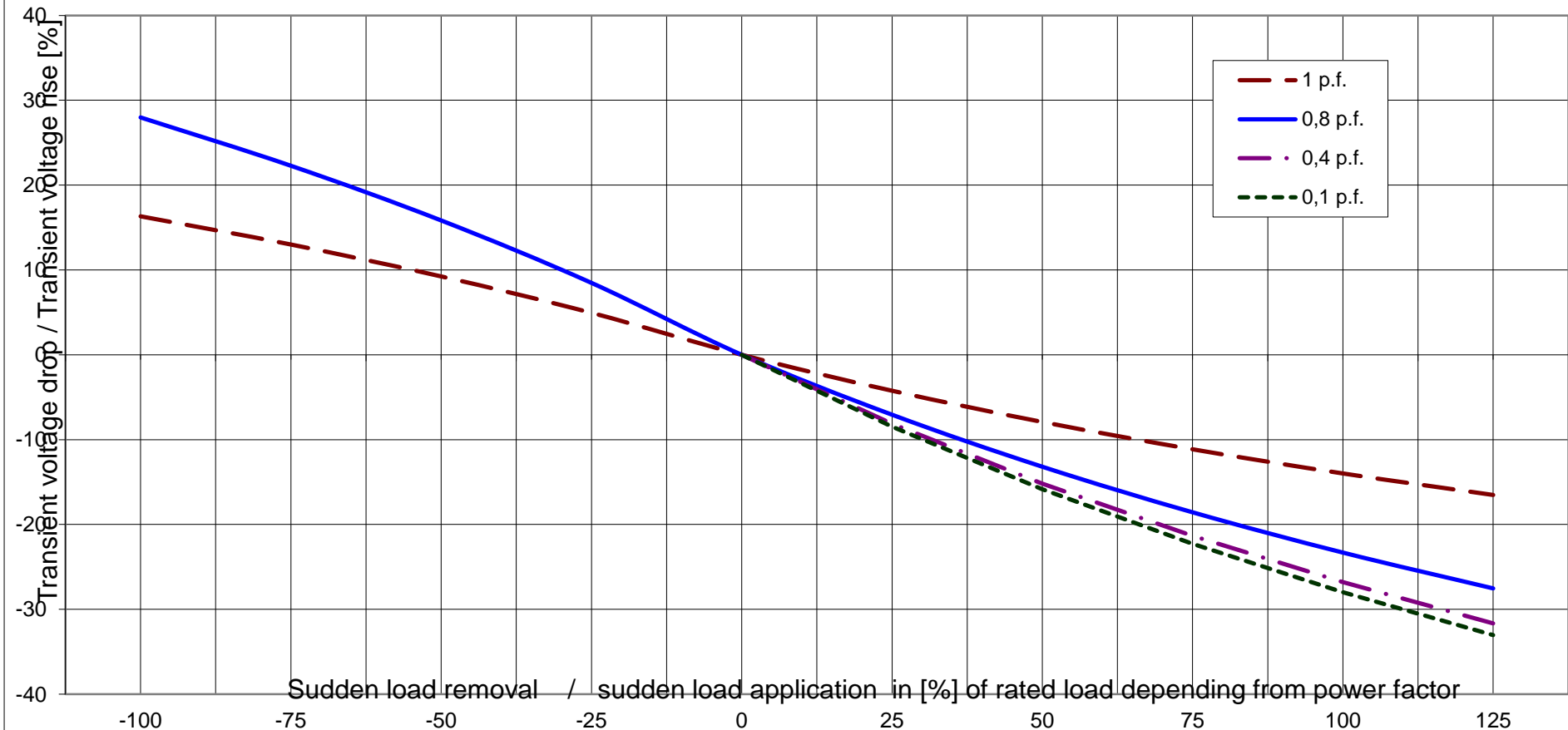
Wirkungsgrad-Kennlinie - Efficiency Curve



Alternator : DIG 130 i/4

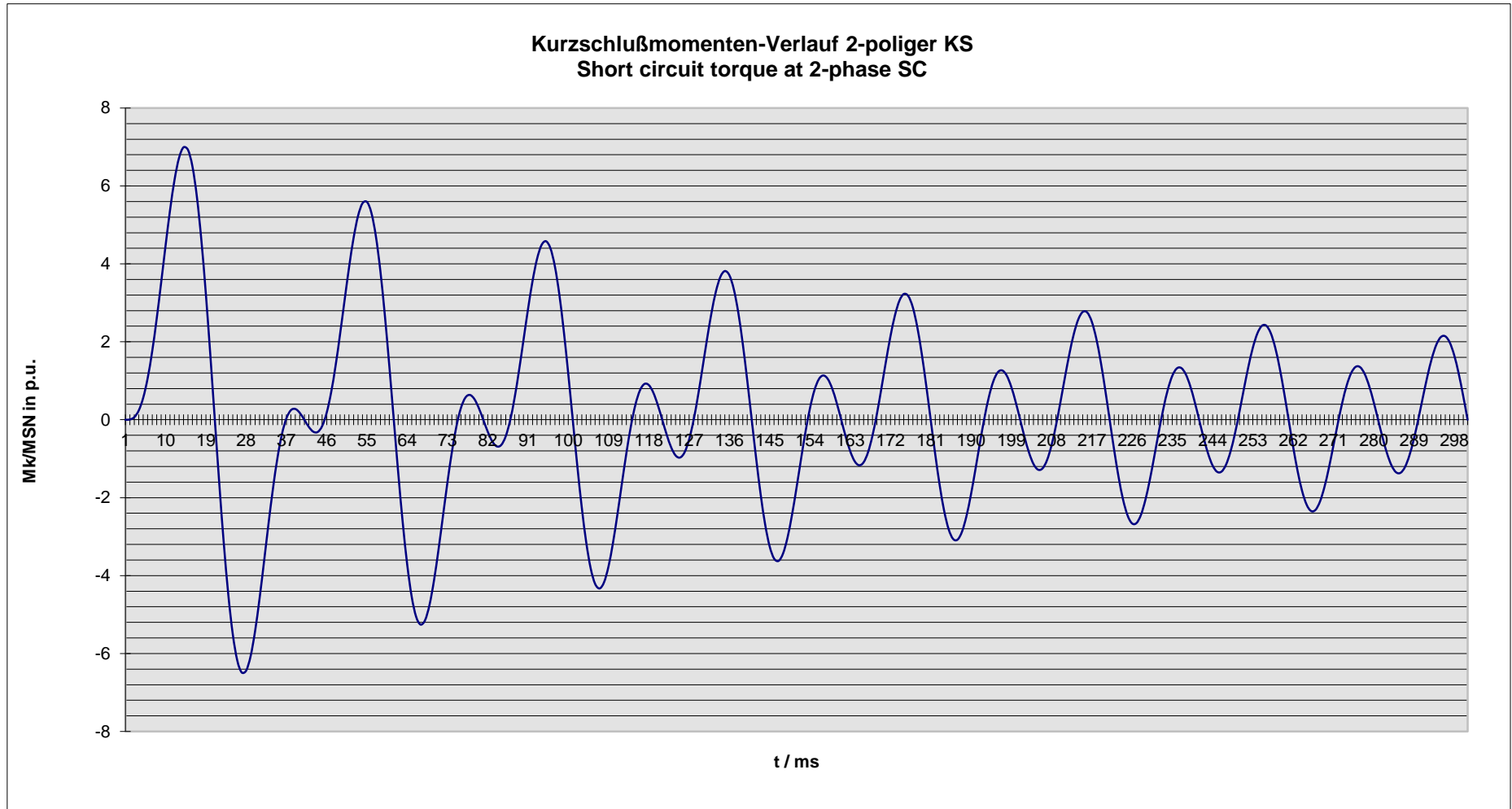
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| Rated output [kVA] | 2500 | Rated power factor: | 0.8 | Rated voltage [kV]: | 10.5 |
| Rated frequency [Hz] | 50 | Rated speed [rpm] | 1500 | | |

Transient Voltage rise or drop for sudden load removal or application



| | | | | |
|----------------------|--------------------|---------------------|------|-------------------------------|
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| Rated frequency [Hz] | 50 | Rated speed [rpm] | 1500 | MSN related to kVA: 15.92 KNm |

Kurzschlußmomenten-Verlauf 2-poliger KS
Short circuit torque at 2-phase SC



Nenndaten / nominal data

DIG 130 i/4

Leistung S_N : **2500 kVA**

$\cos \varphi$: **0.80**

Rating

p.f.

Spannung U_N : **10.50 kV**

Strom I_N : **137 A**

Voltage

Current

Frequenz f : **50 Hz**

Drehzahl n : **1,500 min⁻¹**

Frequency

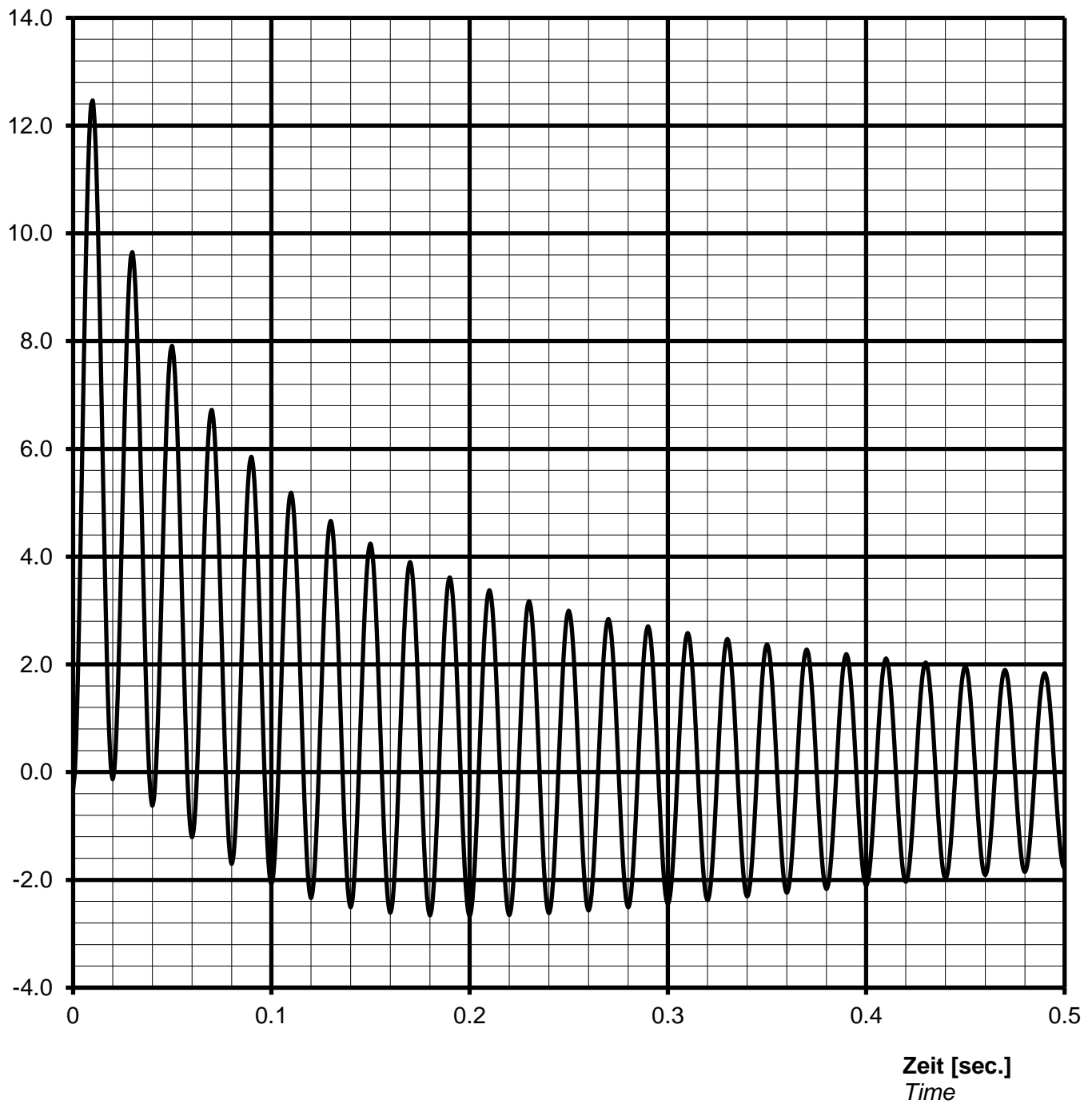
Speed

Schutzart **IP23**

Protection

Kurzschlussstrom $I_{k3\text{phasig}} / I_N$ [p.u.]
Short-circuit current $I_{k3\text{phase}} / I_N$ [p.u.]

Stosskurzschluss-Strom, 3-phasig, asymmetrisch /
Sudden short circuit current, 3-phase, asymmetrical



Notizen / remarks:

Maximum asymmetric peak value $I_{\text{peak}} =$ **1713 A** or **12.46 p.u.**

Nennwerten / nominal data

DIG 130 i/4

Leistung S_N : **2500** kVA

$\cos \varphi$: **0.80**

Rating

p.f.

Spannung U_N : **10.50** kV

Strom I_N : **137** A

Voltage

Current

Frequenz f: **50** Hz

Drehzahl n: **1500** min⁻¹

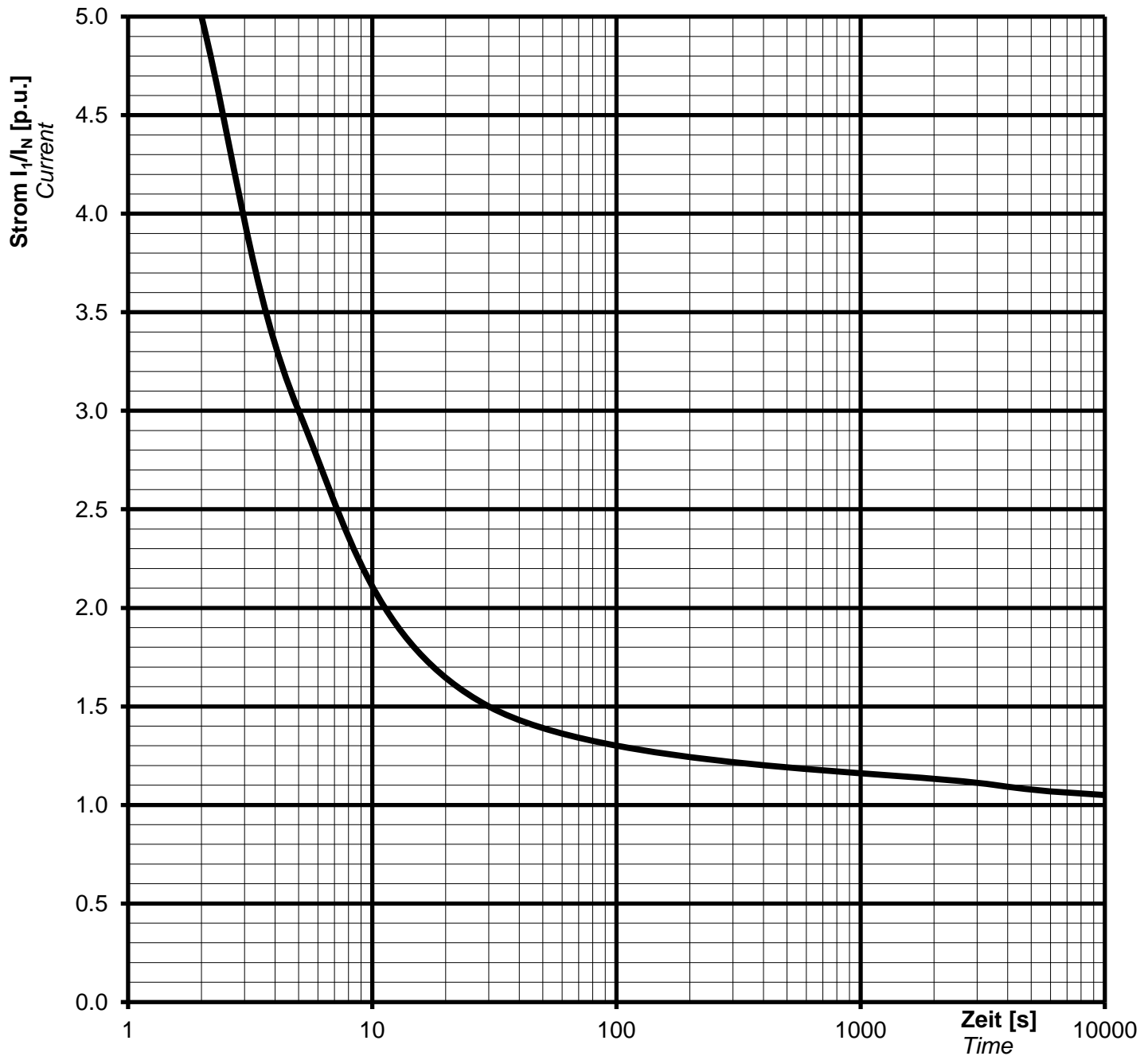
Frequency

Speed

Schutzart **IP23**

Protection

Überlast Kennlinie Overload capability



Notizen / remarks:

Strom / Zeit Kriterien:

$$(I / I_N)^2 \cdot t = 45s$$

Current/time characteristics:

1,5 * I_N for 30 s

1,1 * I_N for 1 h in 6h

Nennwerten / nominal data

DIG 130 i/4

Rating S_N : **2500 kVA**

p.f. **0.80**

Bemessungsleistung

Leistungsfaktor $\cos \varphi$:

Nominal voltage U_N : **10.50 kV**

Nominal current I_N : **137 A**

Bemessungsspannung

Bemessungsstrom

Frequency f_N : **50 Hz**

Speed n : **1500 min⁻¹**

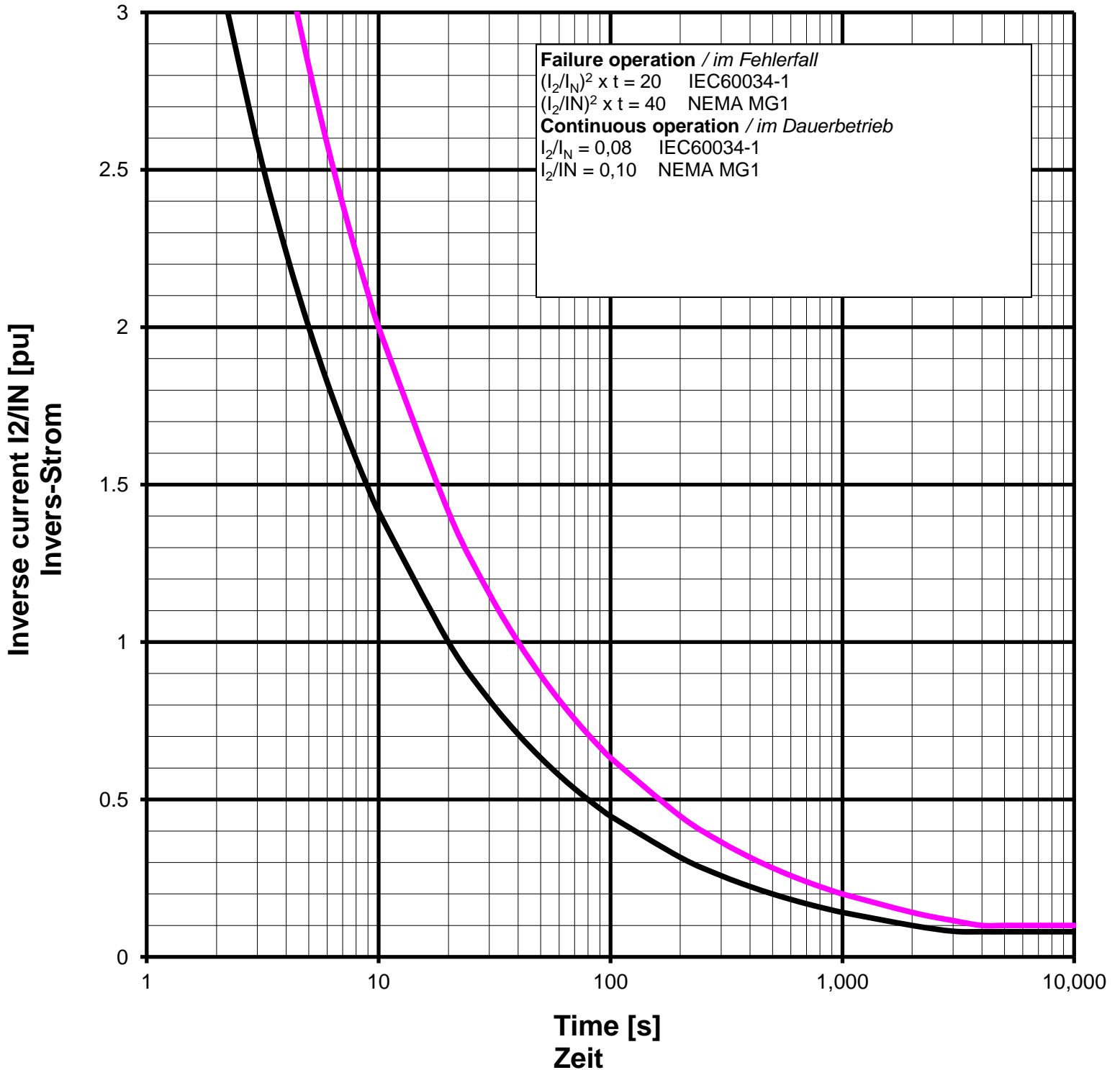
Frequenz

Drehzahl

Protection: **IP23**

Schutzart

Inverse current or unbalanced negative sequence current



Remarks / Notizen:



Technische Daten selbstregelnden Drehstrom-Synchrongenerator
technical data for self regulating three phase alternator

ING-FCD-0112

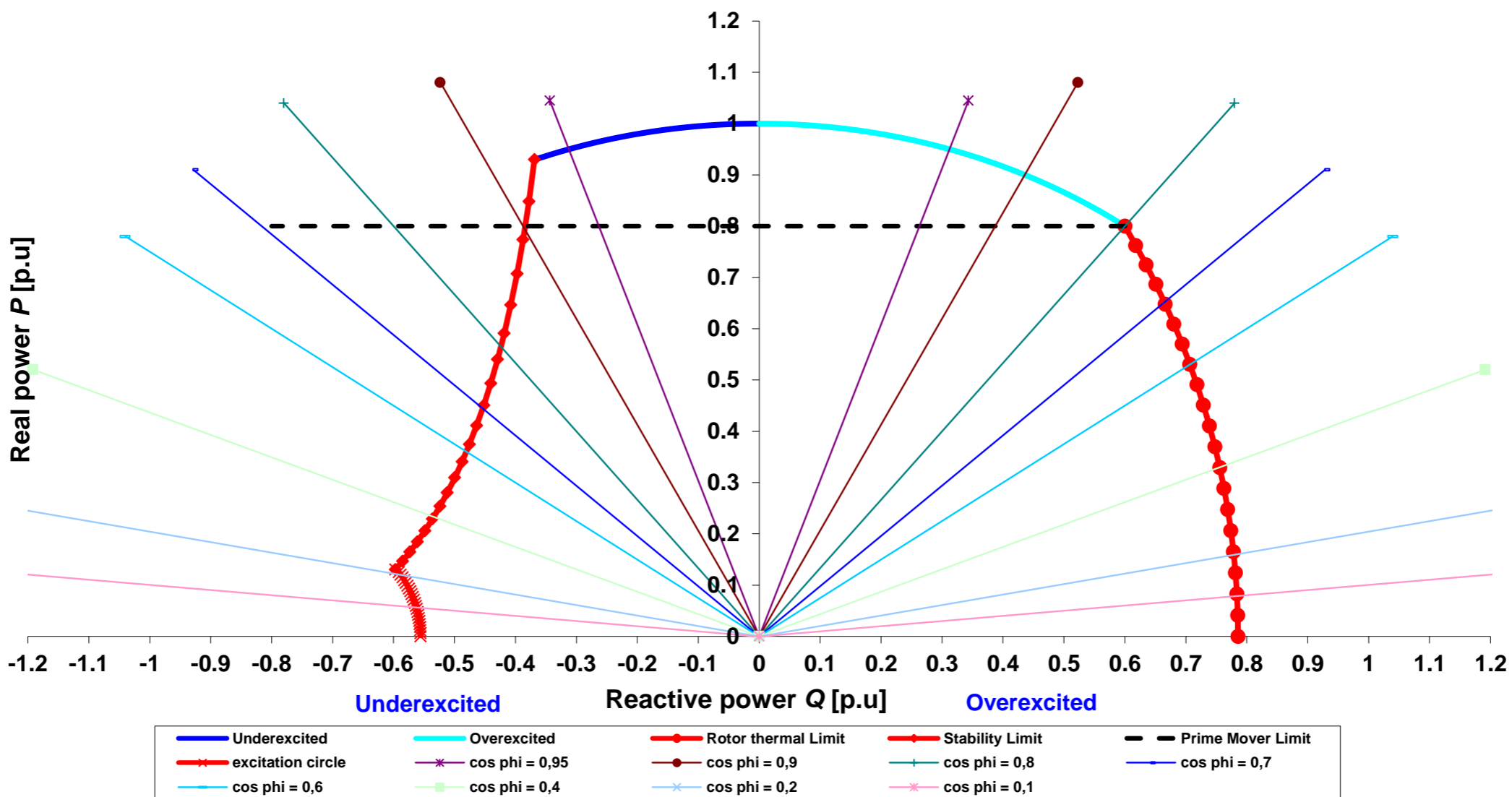
TYPE

DIG 130 i/4

Projekt:

Order Nr.:

Capability (P-Q) Diagram



Cummins Generator Technologies

Datum / date:

21/01/2014

TYPE

DIG 130 i/4

Projekt:

Order Nr.:

