



Technical Data Sheet for AvK-Alternators

FM 7.3-5

| | | | |
|--------------|----------|----------------|------------------------|
| Date: | 09/10/13 | Customer: | GENERIC DATASHEET only |
| Project No.: | | AvK Reference: | dig130k_4_50_3300 |

Object data:

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

Generator data:

| | | | | | |
|-----------------|-------------|----------|----------|---|-----------|
| Generator: | DIG 130 k/4 | Poles: | 4 | Standards: | IEC 60034 |
| Rated power: | 3000 kVA | 2400 kWe | 2484 kWm | | |
| Power factor: | 0.80 | | | | |
| Power at pf 1,0 | 2422 kVA | 2422 kWe | 2484 kWm | | |
| Rated voltage: | 3.3 kV | | | | |
| Speed: | 1500 1/min | | | | |
| Frequency: | 50 Hz | | | Voltage range / frequency range: | |
| Rated current: | 524.9 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): | 110 kgm² | Weight: | 7500 Kg | Losses (environment): | 84 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 | 96,43 | 96,6 | 96,6 | 96,3 | 94,6 |
| Power factor 0.9 | 96,91 | 97,05 | 97 | 96,55 | 94,8 |
| Power factor 1.0 | 97,38 | 97,5 | 97,4 | 96,8 | 95 |

Reactances and time constants

| | unsaturated | saturated | | unsaturated | saturated | | | | |
|----------|-------------|------------|---------|-------------|------------|-----------|---------|------------|-----------|
| X_d | 2.70 | 2.43 p.u. | X_q | 1.35 | 1.32 p.u. | $T_{d0'}$ | 3.1 s | $T_{d0''}$ | 0.024 s |
| X_d' | 0.320 | 0.320 p.u. | X_q' | 1.35 | 1.32 p.u. | $T_{d'}$ | 0.37 s | $T_{q0'}$ | 0.3 s |
| X_d'' | 0.220 | 0.200 p.u. | X_q'' | 0.220 | 0.220 p.u. | $T_{d''}$ | 0.015 s | $T_{q0''}$ | 0.18409 s |
| X_2 | 0.231 | 0.210 p.u. | X_0 | 0.066 | 0.060 p.u. | T_a | 0.09 s | $T_{q'}$ | 0.3 s |
| X_{1s} | n.a. | 0.120 p.u. | | | | | | $T_{q''}$ | 0.03 s |

| | | | |
|--------------------------------|------|-------|-----------|
| Short circuit ratio saturated: | 0.41 | Z_n | 3.630 Ohm |
|--------------------------------|------|-------|-----------|

Short circuit data:

| | | | |
|--|----------|-----------|--|
| Initial short circuit current (3-phase): | I_k'' | 2624 A | |
| Max. peak current (3-phase): | I_s | 6680 A | |
| Sustained short circuit current: | I_k | 1575 A | Minimum 3 x rated current for max.10 s |
| Initial short circuit torque: | M_{k2} | 124.1 kNm | |
| | M_{k3} | 74.5 kNm | |
| Max. faulty synchron moment: | M_f | 266.8 kNm | |
| Rated kVA torque: | M_{SN} | 19.10 kNm | |
| Rated torque | M_N | 15.28 kNm | |
| Shaft torque | M_{Sh} | 15.82 kNm | |

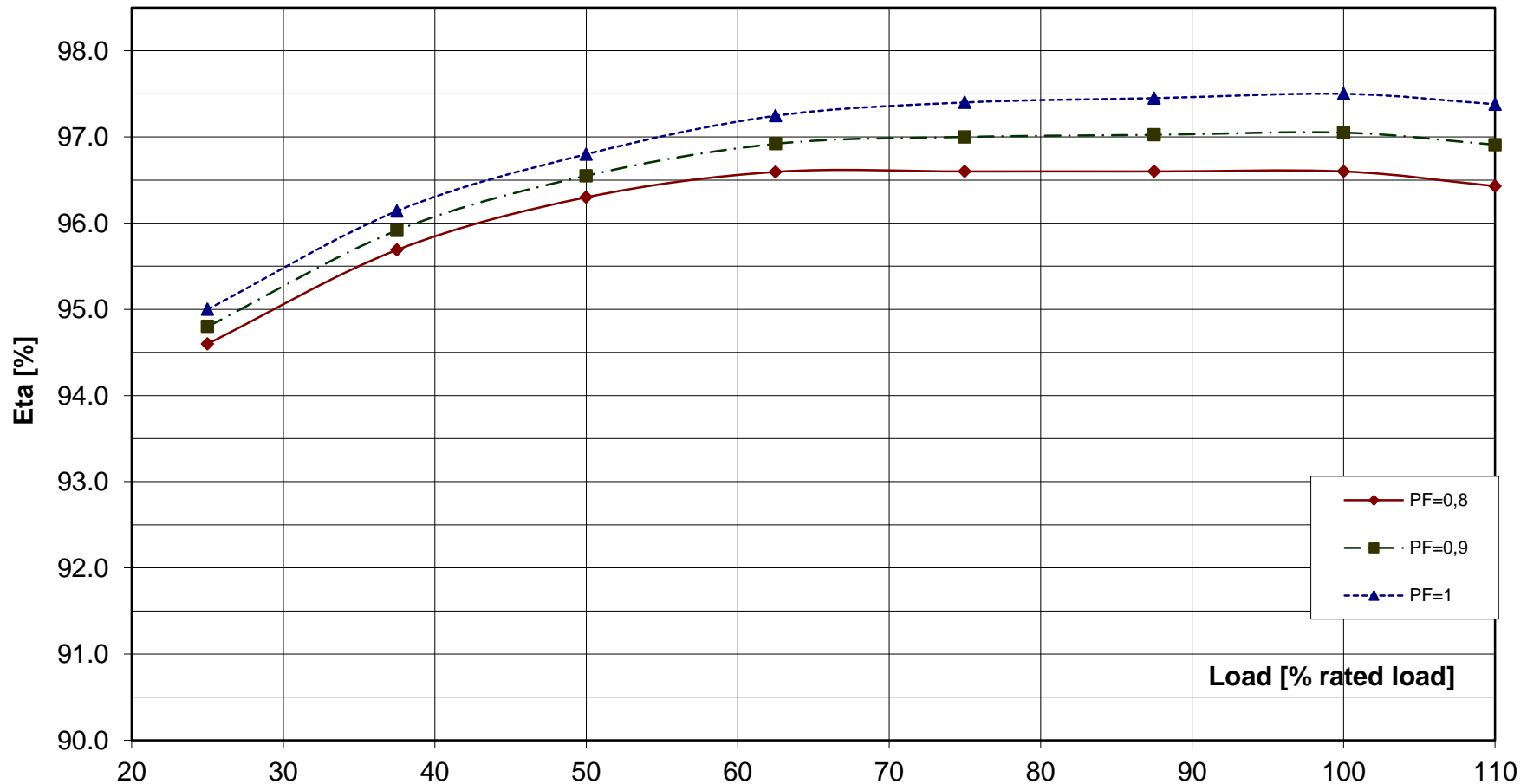
Load application:

| | |
|---|---|
| max. load application: 1406 kVA (corresponds to 46,88 % from 3000 kVA) for Power factor 0.4 15% transient voltage drop | Power: 3000 kVA Power factor: 0.8 transient voltage drop: -24.2 % |
|---|---|

Remarks:

| | | | | |
|----------------------|--------------------|---------------------|------|-------------------------|
| Alternator : | DIG 130 k/4 | | | |
| Rated output [kVA] | 3000 | Rated power factor: | 0.8 | Rated voltage [kV]: 3.3 |
| Rated frequency [Hz] | 50 | Rated speed [rpm] | 1500 | |

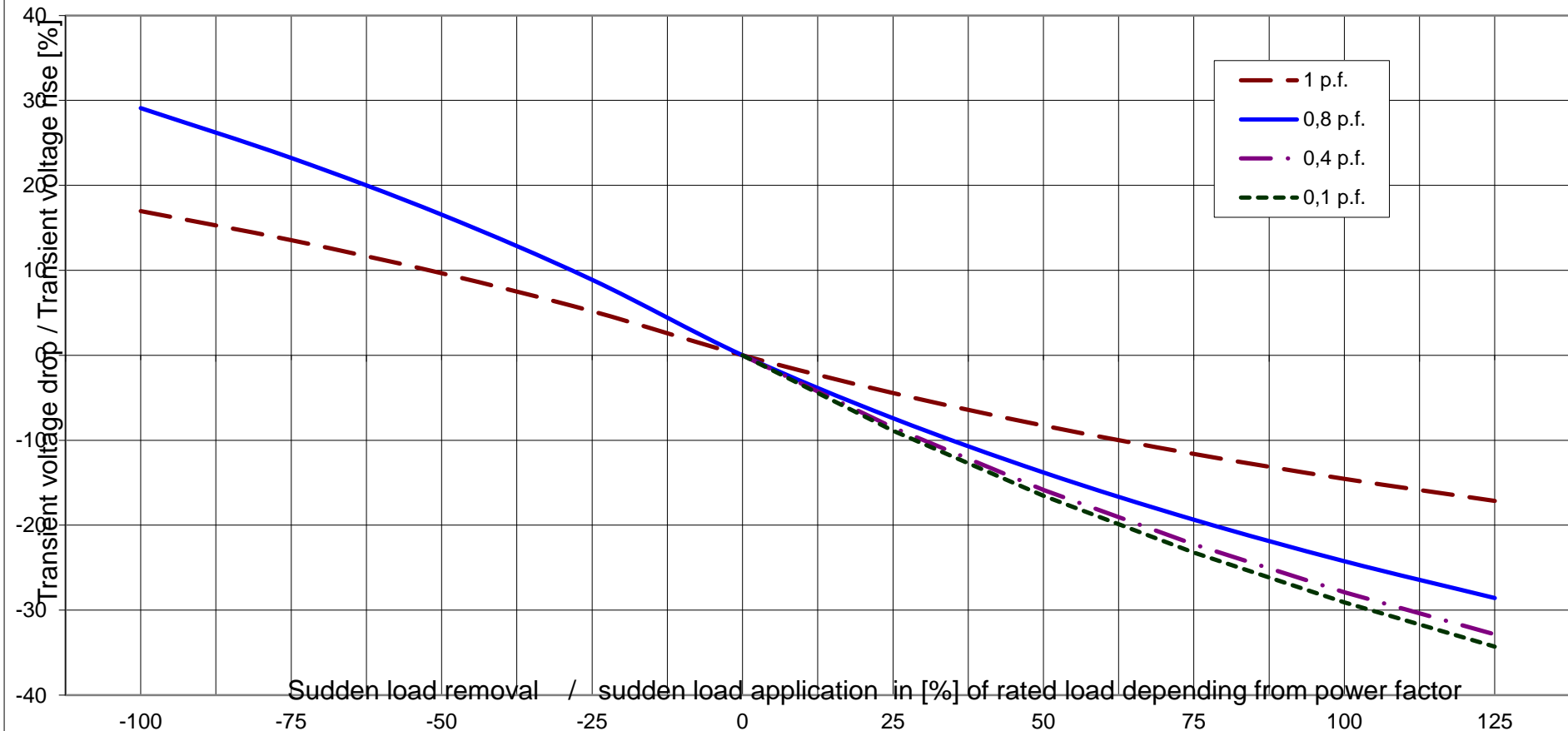
Wirkungsgrad-Kennlinie - Efficiency Curve



Alternator : DIG 130 k/4

| | | | | | |
|----------------------|------|---------------------|------|---------------------|-----|
| Rated output [kVA] | 3000 | Rated power factor: | 0.8 | Rated voltage [kV]: | 3.3 |
| Rated frequency [Hz] | 50 | Rated speed [rpm] | 1500 | | |

Transient Voltage rise or drop for sudden load removal or application





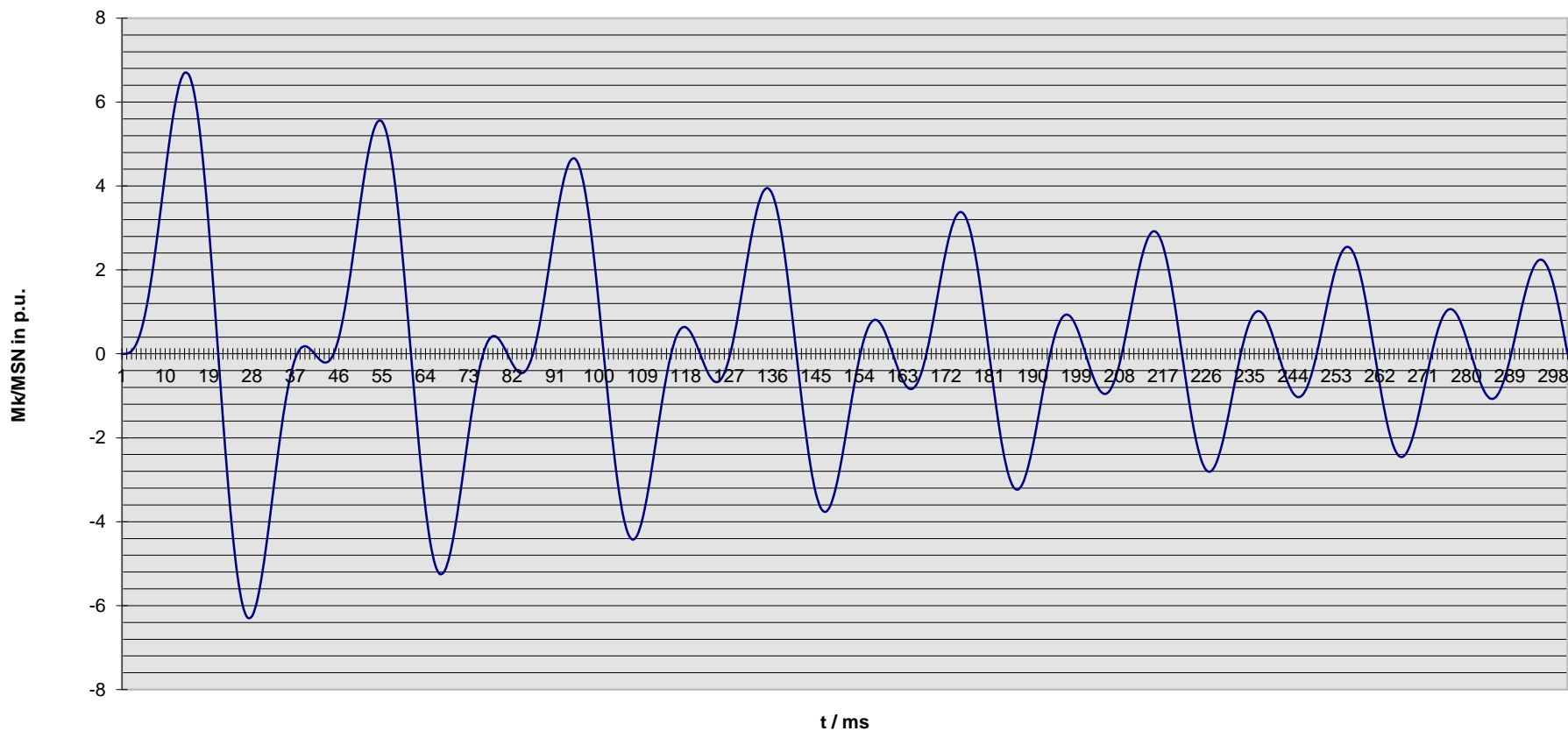
Technisches Datenblatt - Diagramme
Technical data sheet - Diagrams

ING-FCD-0112

Alternator : **DIG 130 k/4**

| | | | | | |
|----------------------|------|---------------------|------|---------------------|----------|
| Rated output [kVA] | 3000 | Rated power factor: | 0.8 | Rated voltage [kV]: | 3.3 |
| Rated frequency [Hz] | 50 | Rated speed [rpm] | 1500 | MSN related to kVA: | 19.1 KNm |

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



Nenndaten / nominal data

DIG 130 k/4

Leistung S_N : **3000 kVA**

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

Rating

p.f.

Spannung U_N : **3.30 kV**

Strom I_N : **525 A**

Voltage

Current

Frequenz f : **50 Hz**

Drehzahl n : **1,500 min⁻¹**

Frequency

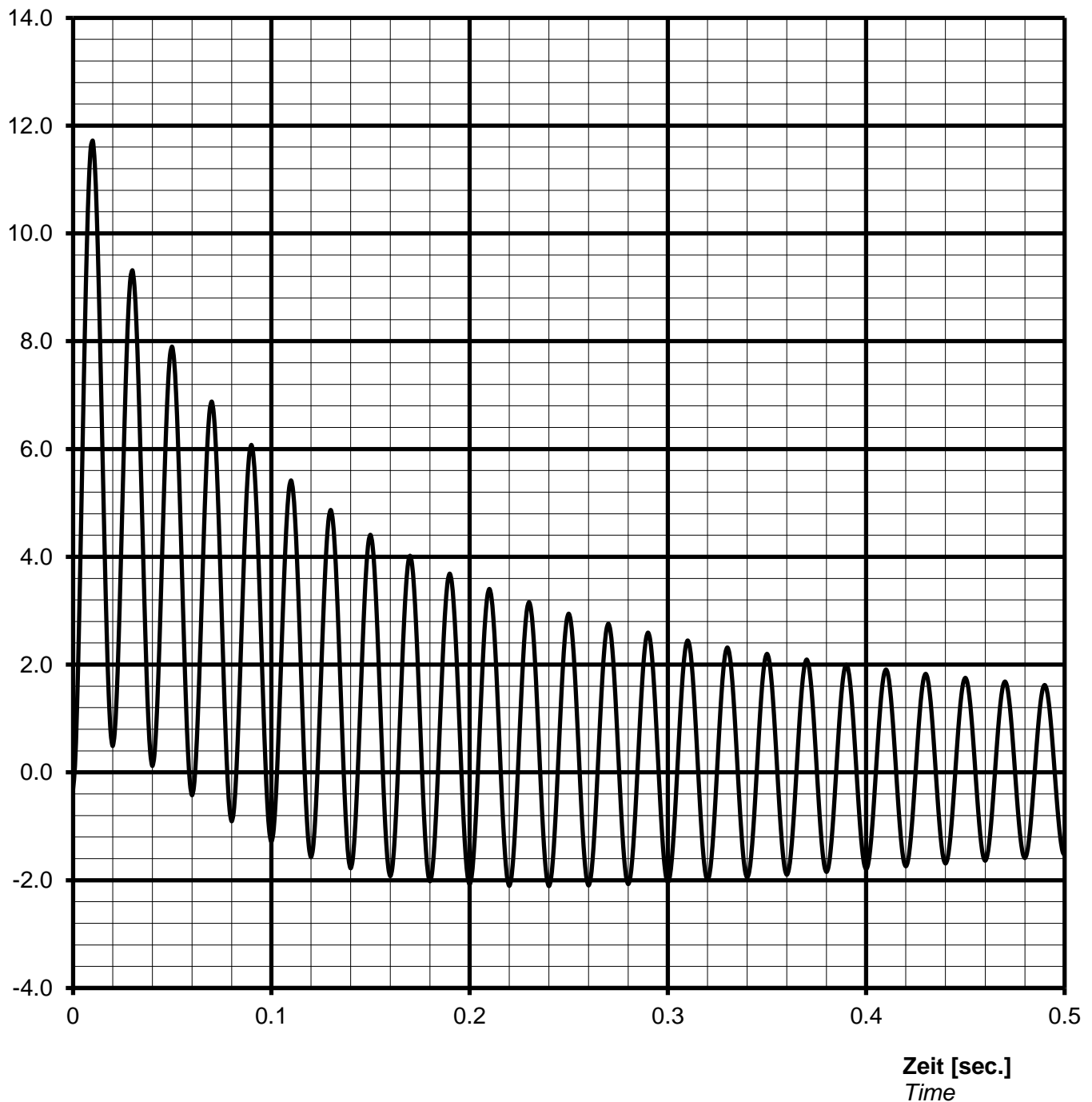
Speed

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 $I_{\text{peak}} = 6150 \text{ A}$ or 11.72 p.u.

Nennwerten / nominal data

DIG 130 k/4

Leistung S_N : **3000** kVA

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

Rating

p.f.

Spannung U_N : **3.30** kV

Strom I_N : **525** A

Voltage

Current

Frequenz f: **50** Hz

Drehzahl n: **1500** min⁻¹

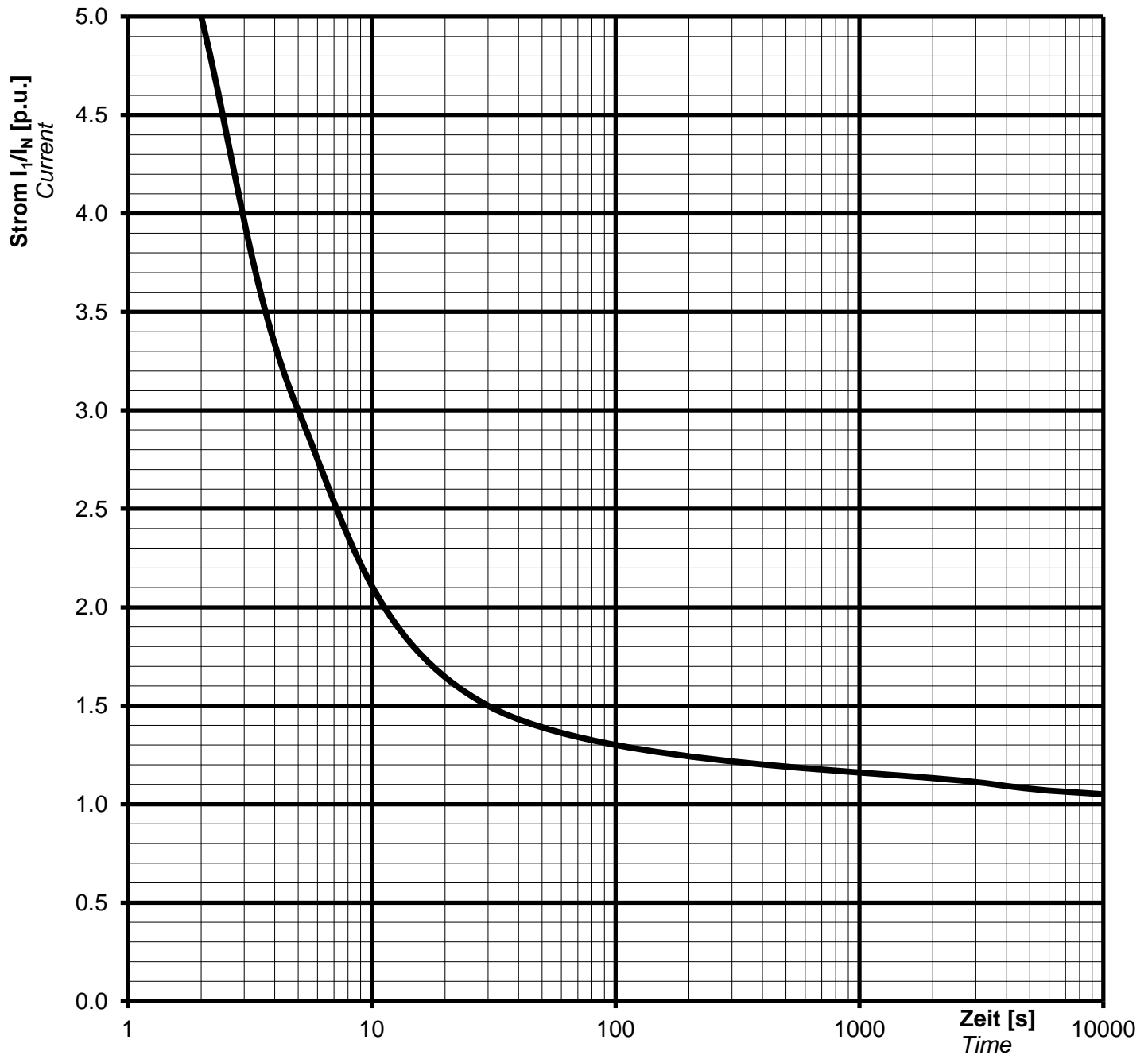
Frequency

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

Nenn Daten / nominal data

DIG 130 k/4

Rating S_N : **3000 kVA**

p.f. **0.80**

Bemessungsleistung

Leistungsfaktor $\cos \varphi$:

Nominal voltage U_N : **3.30 kV**

Nominal current I_N : **525 A**

Bemessungsspannung

Bemessungsstrom

Frequency f_N : **50 Hz**

Speed n : **1500 min⁻¹**

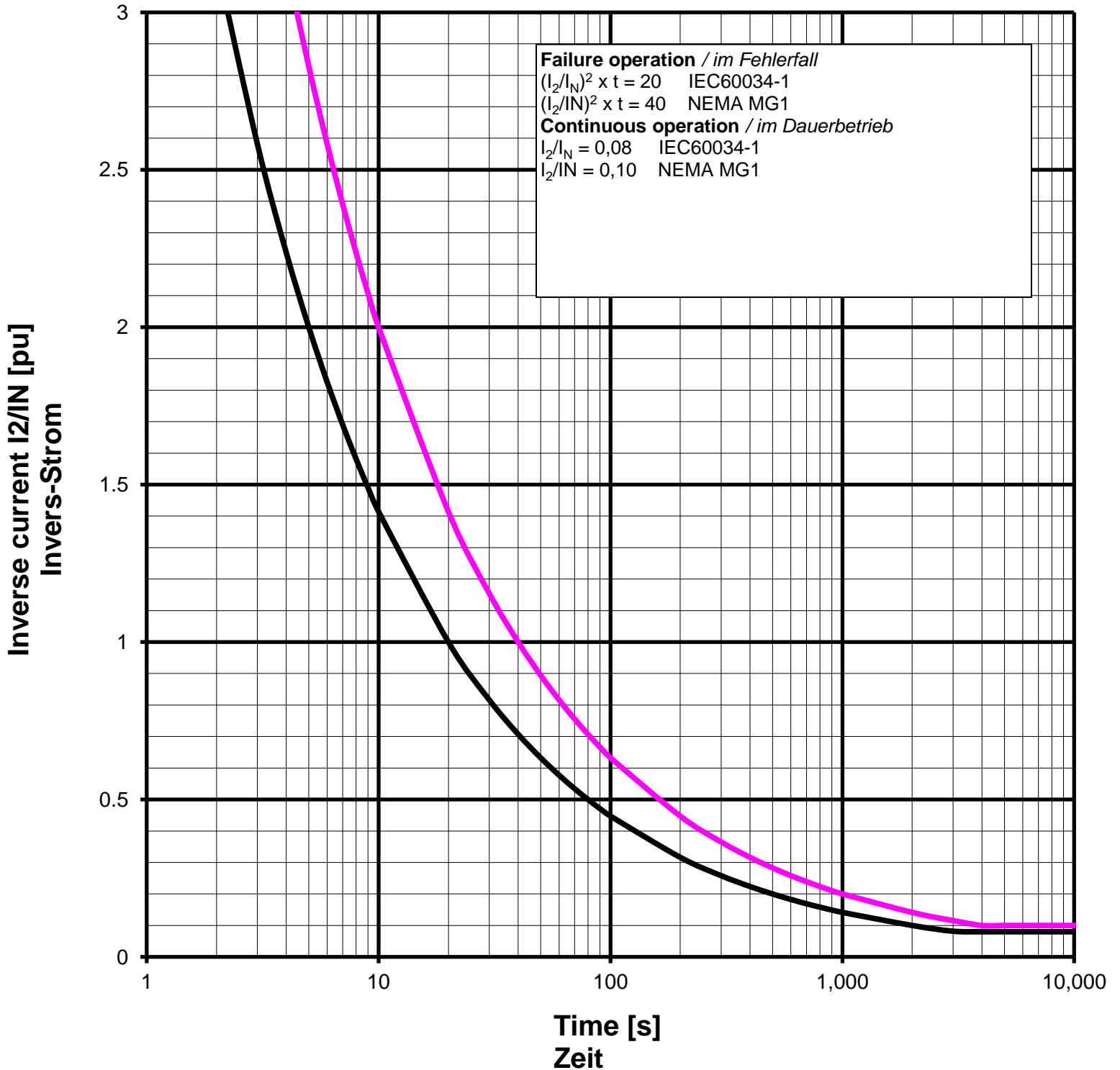
Frequenz

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

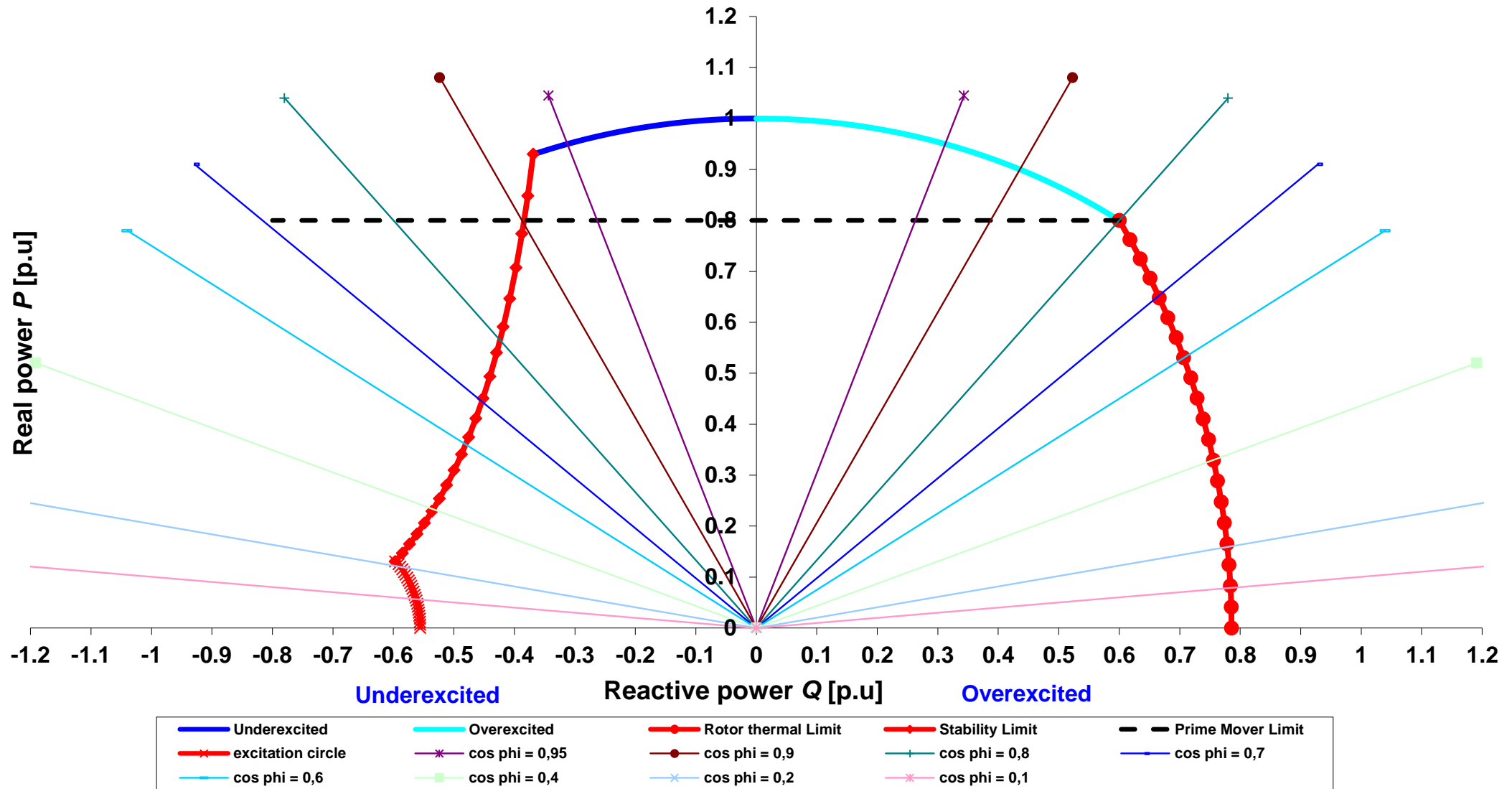
TYPE

DIG 130 k/4

Projekt:

Order Nr.:

Capability (P-Q) Diagram



Cummins Generator Technologies

Datum / date:

11/10/2013

TYPE

DIG 130 k/4

Projekt:

Order Nr.:

