

**Technical Data Sheet for AvK-Alternators**

FM 7.3-5

Date:	30/09/13	Customer:	GENERIC DATASHEET only
Project No.:		AvK Reference:	DSG086K1_6_50_400

**Object data:**

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

**Generator data:**

Generator:	DSG 86 K1/6	Poles:	6	Standards:	IEC 60034
Rated power:	1500 kVA	1200 kWe	1258 kWm		
Power factor:	0.80				
Power at pf 1,0	1216 kVA	1216 kWe	1258 kWm		
Rated voltage:	0.4 kV				
Speed:	1000 1/min				
Frequency:	50 Hz			Voltage range / frequency range:	
Rated current:	2165.1 A			Zone A according IEC 60034-1 (dU = +/-5%, df = +/-2%)	

Winding pitch:	ca. 5/6
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Insulation class:	Stator: Class H	Rotor: Class H	Temperature rise:	H
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Ambient temperature:	40 ° C	Environment:	Standard environment
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Site altitude:	1000 m		
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Enclosure:	IP23	Filter:	
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Cooling:	IC 01 - Open-circuit ventilation
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Coolant:	Ambient Air	Temperature	40 ° C	Temperature Air inlet	40 ° C
		Coolant:		generator:	

		Cooling air vol.:	2.0 m³/s	Cooling water quantity:	n/a
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Moment of inertia (I):	73 kgm²	Weight:	4900 Kg	Losses (environment):	58 KW
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		Losses (cooling):	n/a
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Wires:	4 terminals, starpoint connected in terminal box
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Operation mode:	Single mode
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Regulators:	
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Voltage regulator:	DECS 100
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**Electrical data: (acc. IEC)**

Efficiencies:	110%	100%	75%	50%	25%
Power factor 0.8	95,17	95,4	95,5	95,4	93,7
Power factor 0.9	95,86	96,05	96,05	95,8	93,95
Power factor 1.0	96,54	96,7	96,6	96,2	94,2

**Reactances and time constants**

	unsaturated	saturated		unsaturated	saturated					
$X_d$	2.35	2.12 p.u.	$X_q$	1.18	1.16 p.u.	$T_{d0'}$	2.25 s	$T_{d0''}$	0.02631 s	
$X_d'$	0.307	0.307 p.u.	$X_q'$	1.18	1.16 p.u.	$T_{d'}$	0.29 s	$T_{q0'}$	0.3 s	
$X_d''$	0.193	0.175 p.u.	$X_q''$	0.193	0.193 p.u.	$T_{d''}$	0.015 s	$T_{q0''}$	0.18342 s	
$X_2$	0.202	0.184 p.u.	$X_0$	0.058	0.053 p.u.	$T_a$	0.045 s	$T_{q'}$	0.3 s	
$X_{1s}$	n.a.	0.105 p.u.						$T_{q''}$	0.03 s	

Short circuit ratio saturated:	0.47	$Z_n$	0.107 Ohm
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**Short circuit data:**

Initial short circuit current (3-phase):	$I_k''$	12372 A	
Max. peak current (3-phase):	$I_s$	31494 A	
Sustained short circuit current:	$I_k$	6495 A	Minimum 3 x rated current for max.10 s
Initial short circuit torque:	$M_{k2}$	106.4 kNm	
	$M_{k3}$	63.8 kNm	
Max. faulty synchron moment:	$M_f$	228.8 kNm	
Rated kVA torque:	$M_{SN}$	14.33 kNm	
Rated torque	$M_N$	11.46 kNm	
Shaft torque	$M_{Sh}$	12.01 kNm	

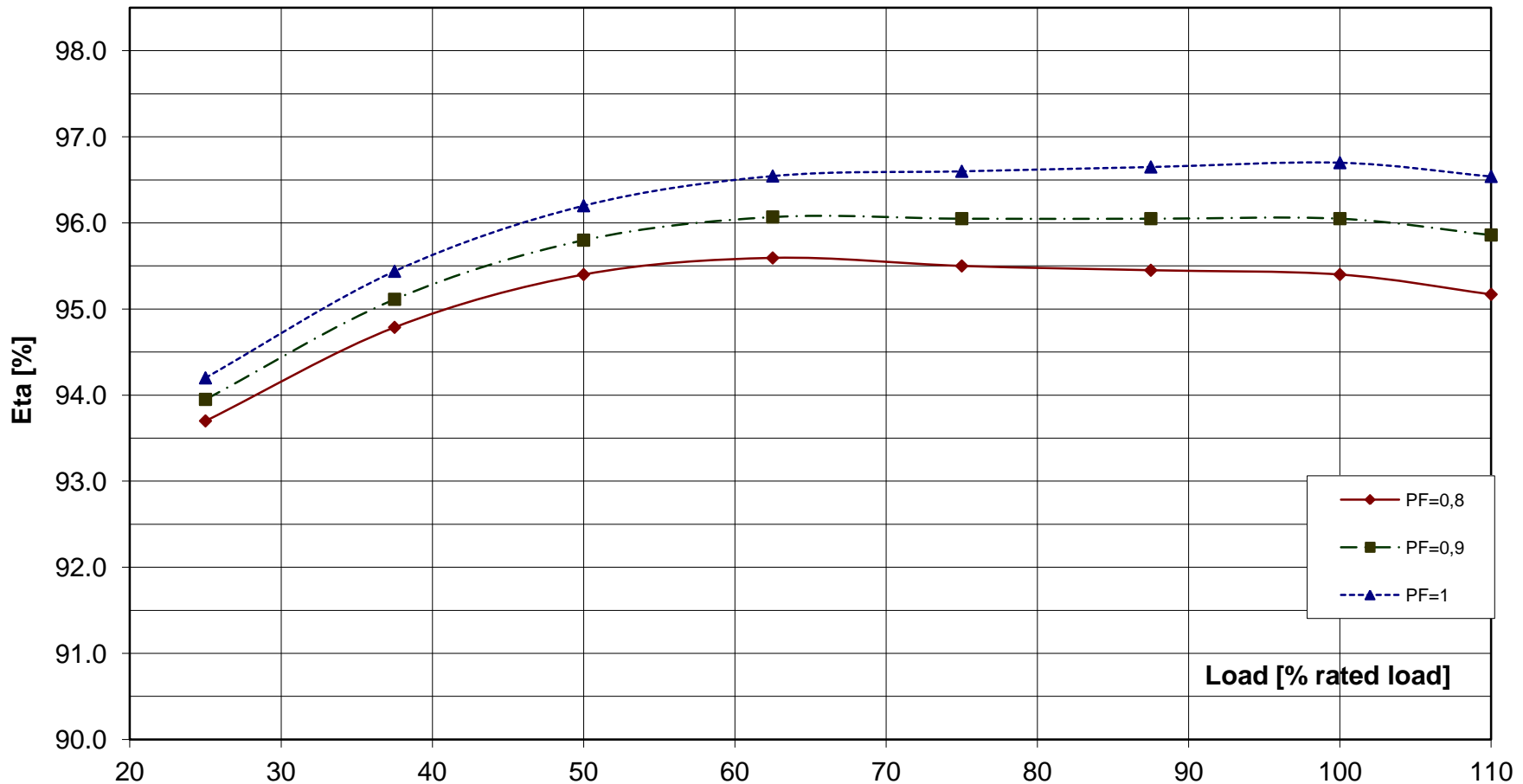
**Load application:**

max. load application: 733 kVA (corresponds to 48,86 % from 1500 kVA) for Power factor 0.4 15% transient voltage drop	Power: 1500 kVA Power factor: 0.8 transient voltage drop: -23.5 %
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**Remarks:**

<b>Alternator :</b>	<b>DSG 86 K1/6</b>			
Rated output [kVA]	1500	Rated power factor:	0.8	Rated voltage [kV]: 0.4
Rated frequency [Hz]	50	Rated speed [rpm]	1000	

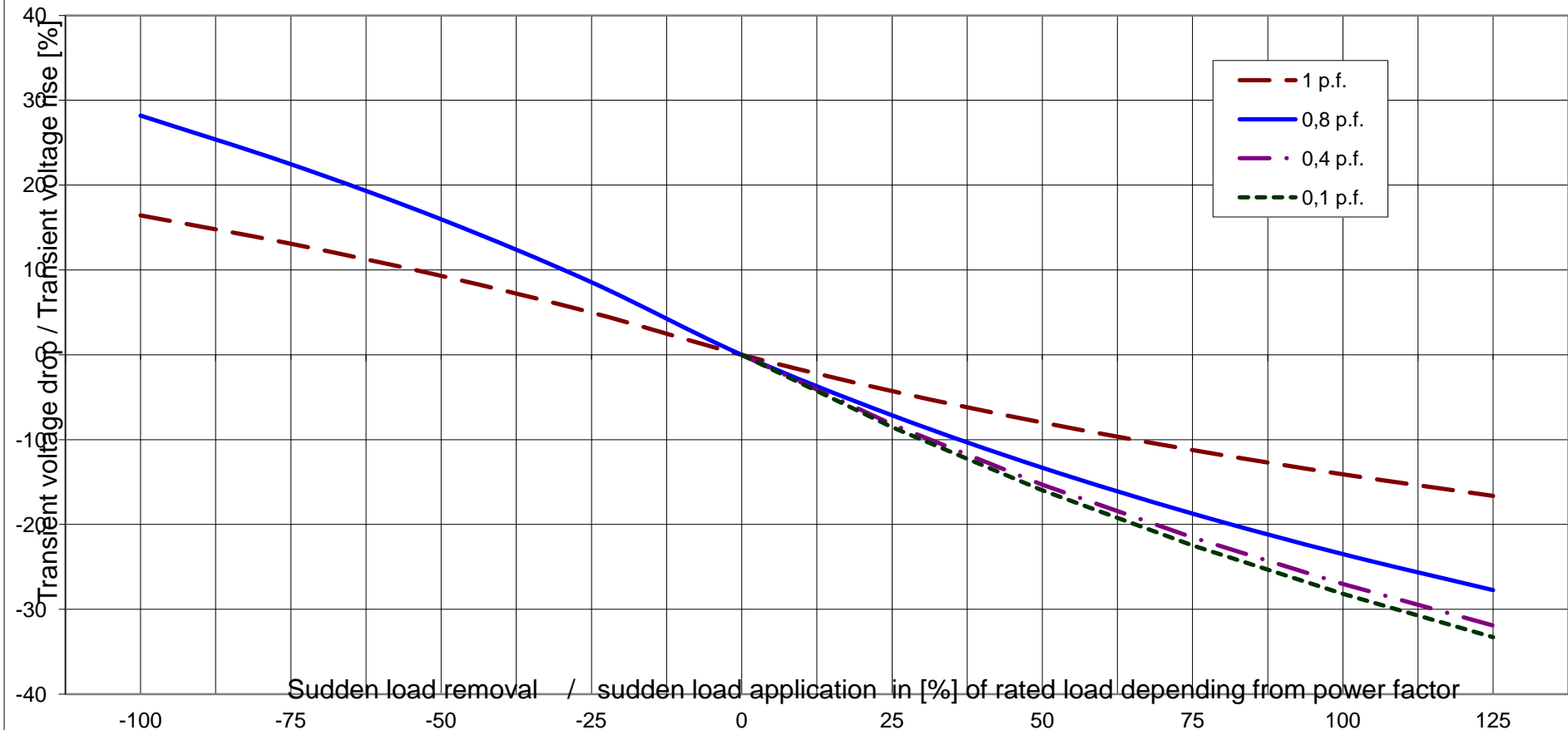
### Wirkungsgrad-Kennlinie - Efficiency Curve



**Alternator : DSG 86 K1/6**

Rated output [kVA]	1500	Rated power factor:	0.8	Rated voltage [kV]:	0.4
Rated frequency [Hz]	50	Rated speed [rpm]	1000		

**Transient Voltage rise or drop for sudden load removal or application**



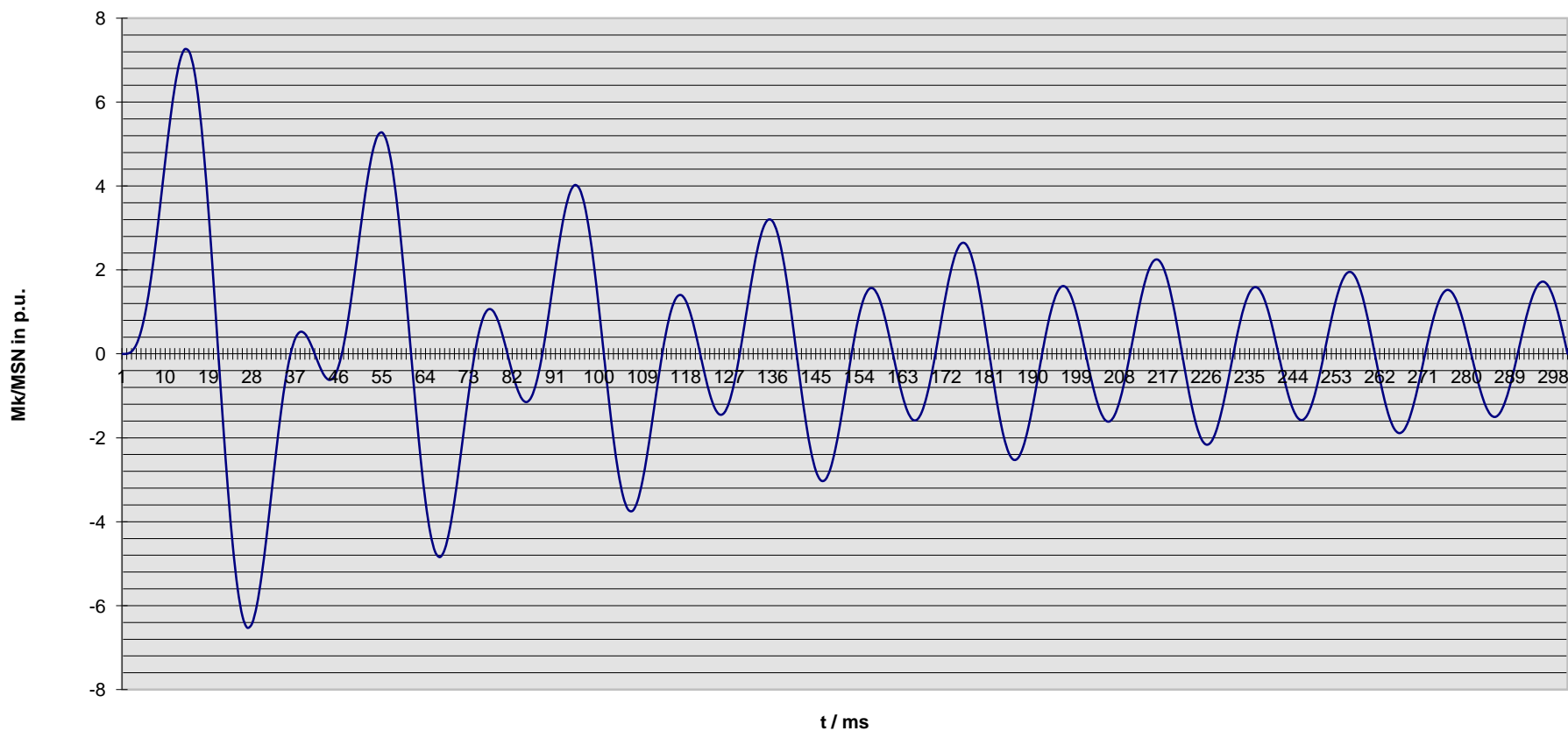


Technisches Datenblatt - Diagramme  
Technical data sheet - Diagrams

ING-FCD-0112

<b>Alternator :</b>	<b>DSG 86 K1/6</b>			
Rated output [kVA]	1500	Rated power factor:	0.8	Rated voltage [kV]: 0.4
Rated frequency [Hz]	50	Rated speed [rpm]	1000	MSN related to kVA: 14.32 KNm

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



#### Nenn Daten / nominal data

DSG 86 K1/6

Leistung  $S_N$ : **1500** kVA

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

*Rating*

*p.f.*

Spannung  $U_N$ : **0.40** kV

Strom  $I_N$ : **2165** A

*Voltage*

*Current*

Frequenz  $f$ : **50** Hz

Drehzahl  $n$ : **1,000** min<sup>-1</sup>

*Frequency*

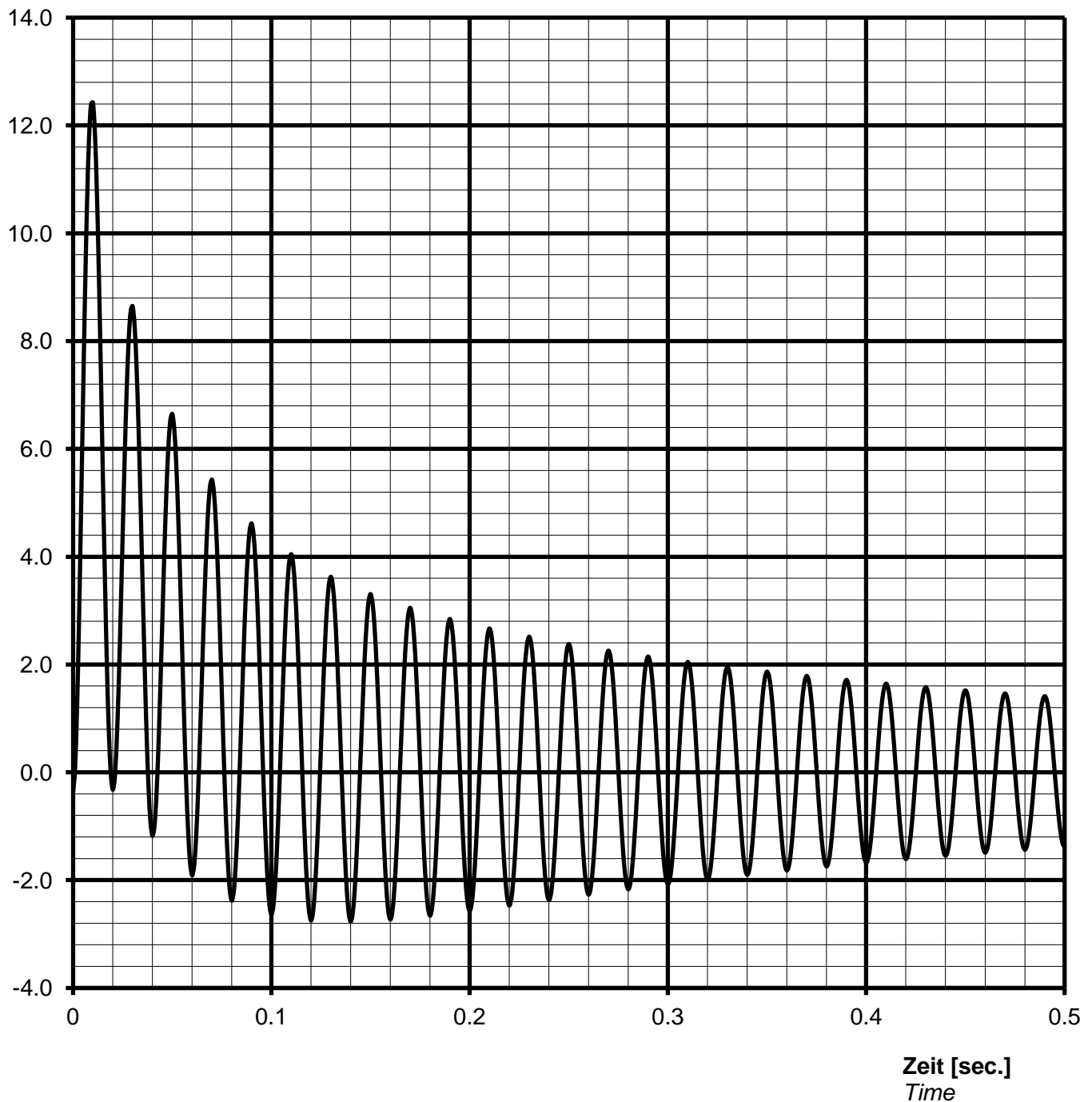
*Speed*

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  $I_{\text{peak}} =$  **26907** A or **12.43** p.u.

#### Nennwerten / nominal data

DSG 86 K1/6

Leistung  $S_N$ : **1500** kVA

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

Rating

p.f.

Spannung  $U_N$ : **0.40** kV

Strom  $I_N$ : **2165** A

Voltage

Current

Frequenz f: **50** Hz

Drehzahl n: **1000** min<sup>-1</sup>

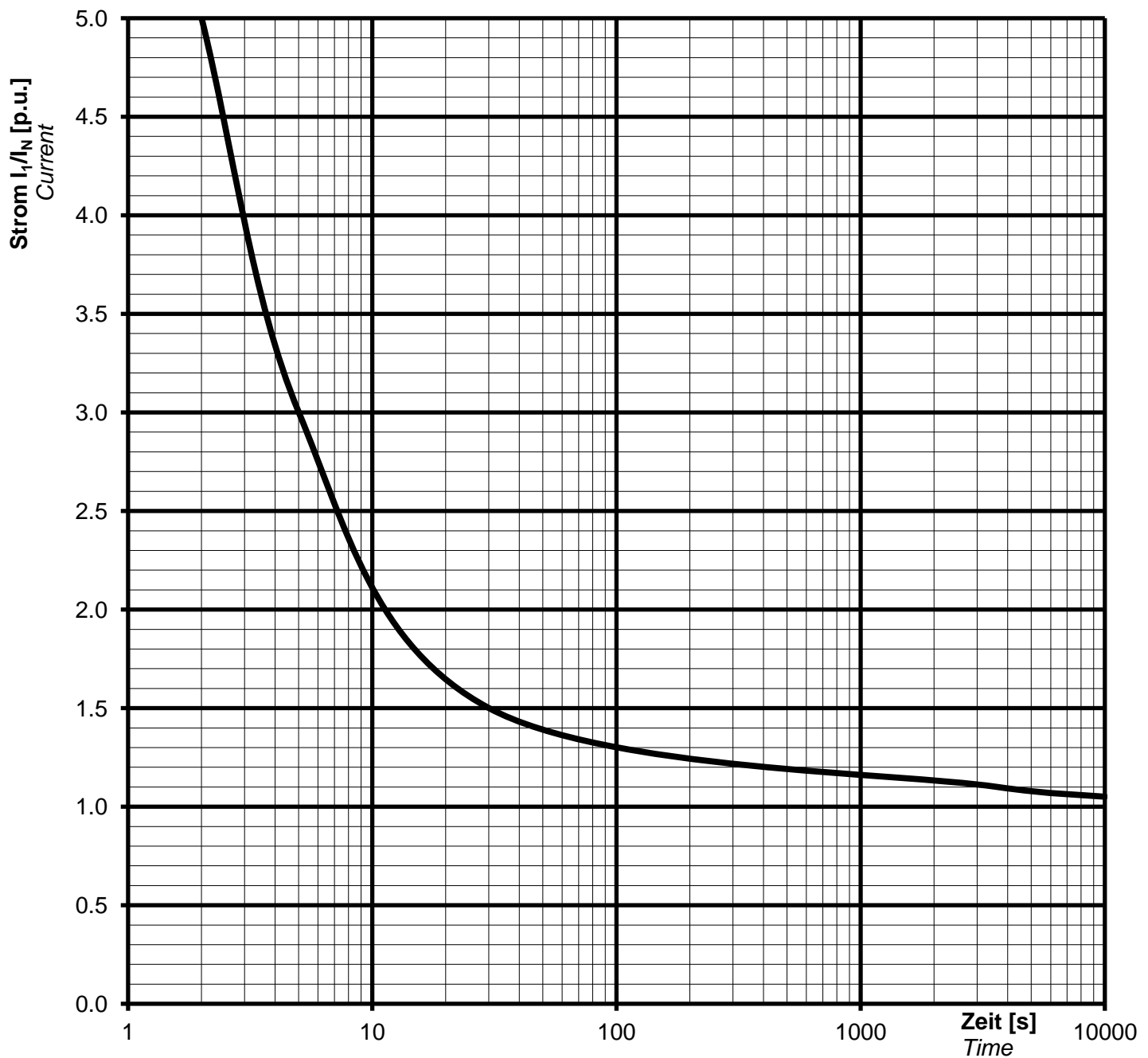
Frequency

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

#### Nennenden / nominal data

DSG 86 K1/6

Rating  $S_N$ : **1500 kVA**

*p.f.* **0.80**

*Bemessungsleistung*

Leistungsfaktor  $\cos \varphi$ :

Nominal voltage  $U_N$ : **0.40 kV**

Nominal current  $I_N$ : **2165 A**

*Bemessungsspannung*

*Bemessungsstrom*

Frequency  $f_N$ : **50 Hz**

Speed  $n$ : **1000 min<sup>-1</sup>**

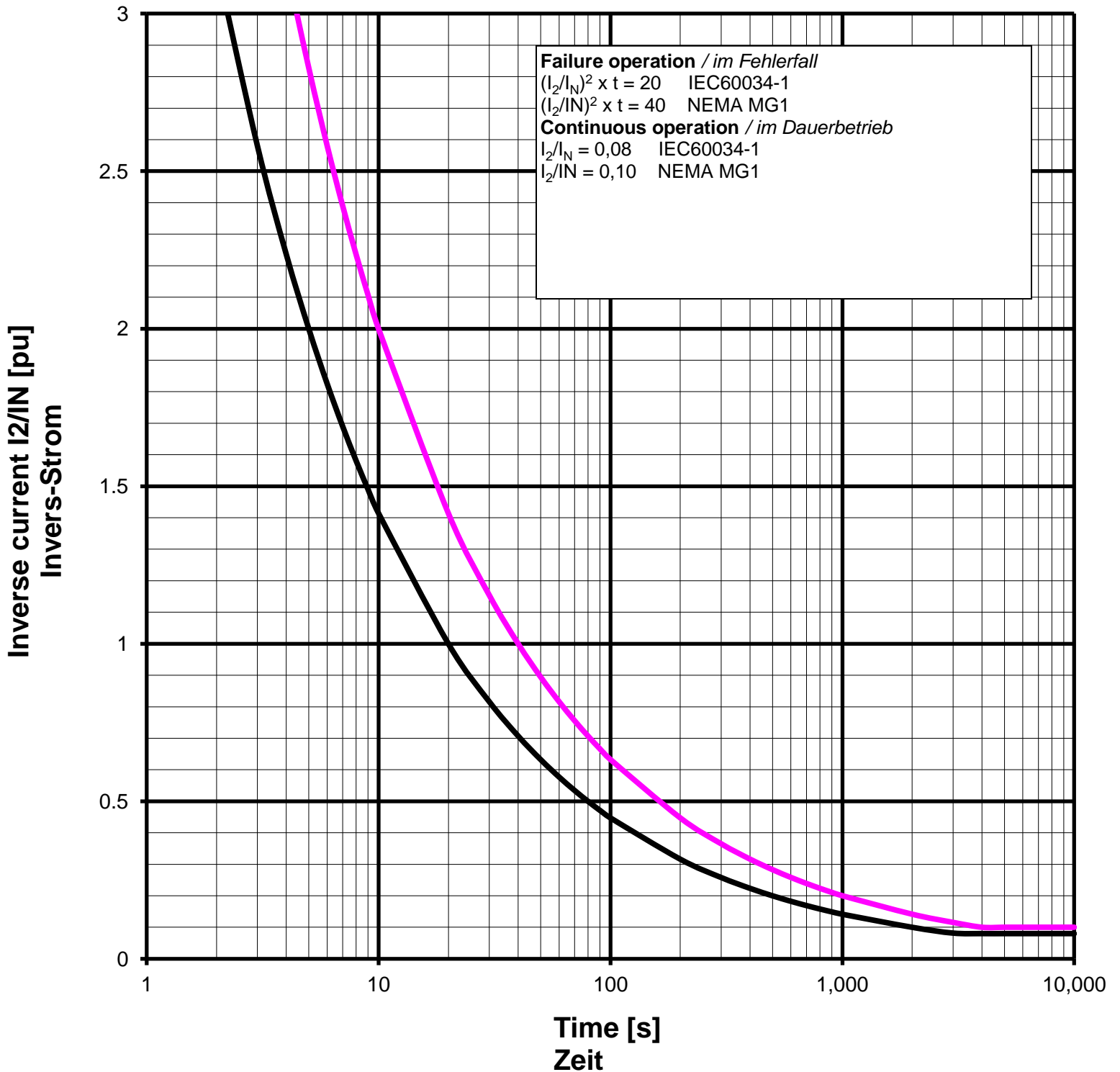
*Frequenz*

*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

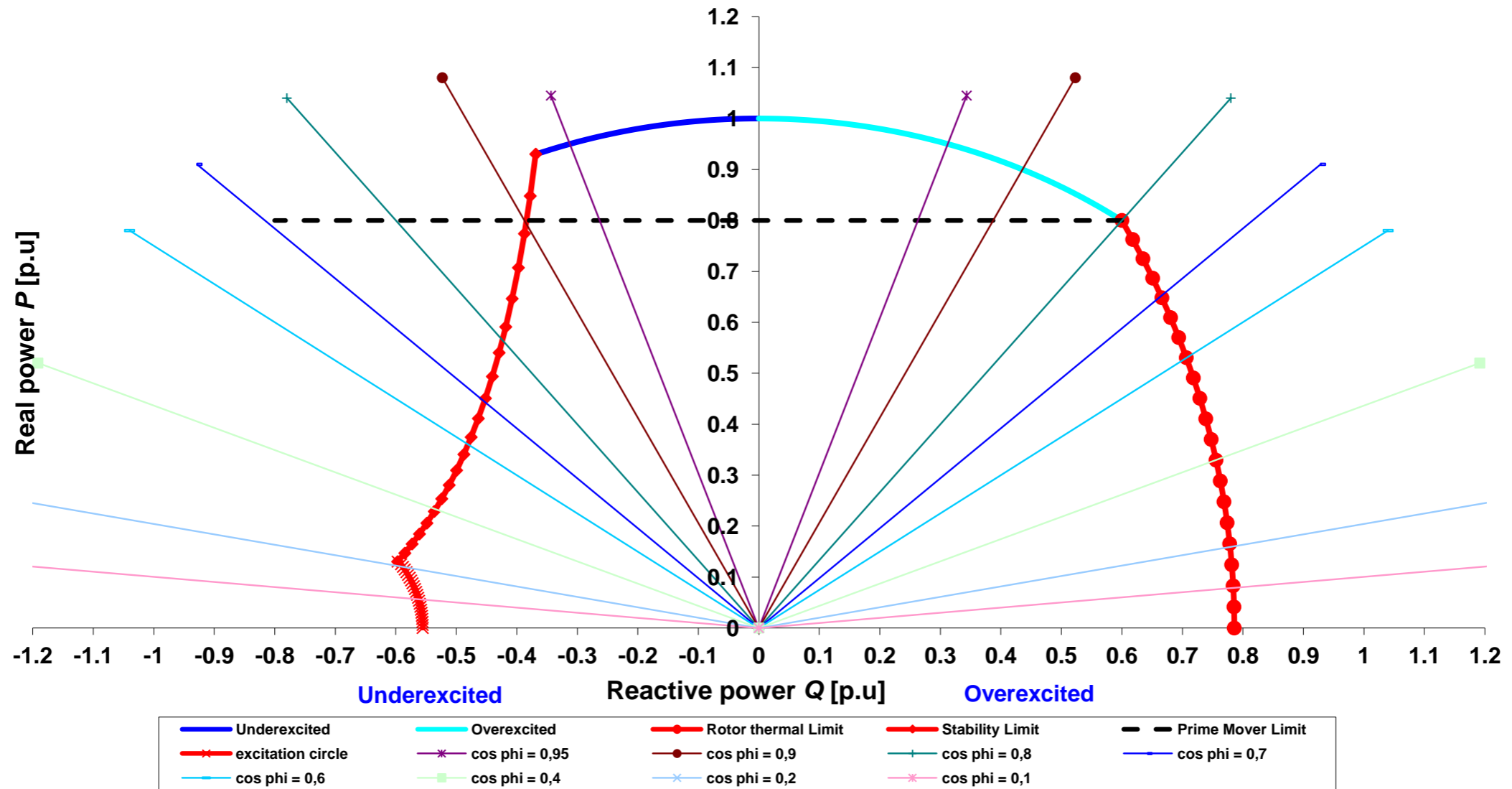
TYPE

DSG 86 K1/6

Projekt:

Order Nr.:

### Capability (P-Q) Diagram



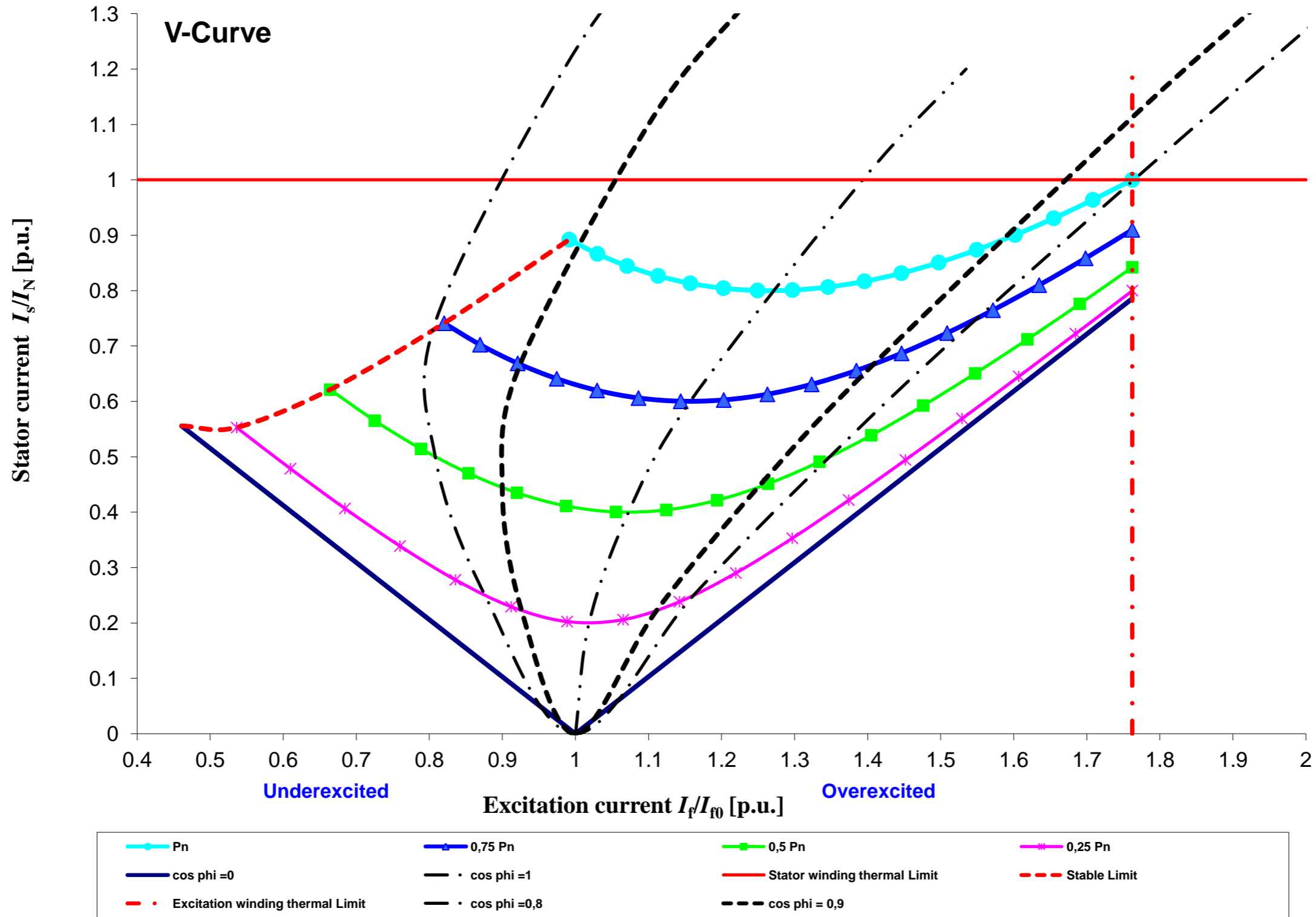
Cummins Generator Technologies

Datum / date:

30/09/2013



TYPE	DSG 86 K1/6	Projekt:		Order Nr.:	
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	30/09/2013	