

**Technical Data Sheet for AvK-Alternators**

FM 7.3-5

Date:	30/09/13	Customer:	GENERIC DATASHEET only
Project No.:		AvK Reference:	DSG086M1_8_50_400

<b>Object data:</b>	
Site:	Prime Mover:
Application: Stationary Power Plant	Manufacturer:

<b>Generator data:</b>					
Generator:	DSG 86 M1/8	Poles:	8	Standards: IEC 60034	
Rated power:	1210 kVA	968 kWe	1019 kWm		
Power factor:	0.80				
Power at pf 1,0	982 kVA	982 kWe	1019 kWm		
Rated voltage:	0.4 kV				
Speed:	750 1/min				
Frequency:	50 Hz	Voltage range / frequency range:			
Rated current:	1746.5 A	Zone A according IEC 60034-1 (dU = +/-5%, df = +/-2%)			
Winding pitch:	ca. 5/6				
Insulation class:	Stator: Class H	Rotor: Class H	Temperature rise:	H	
Ambient temperature:	40 ° C	Environment:	Standard environment		
Site altitude:	1000 m	Filter:			
Enclosure:	IP23				
Cooling:	IC 01 - Open-circuit ventilation				
Coolant:	Ambient Air	Temperature	40 ° C	Temperature Air inlet	40 ° C
		Coolant:		generator:	
		Cooling air vol.:	1.7 m³/s	Cooling water quantity:	n/a
Moment of inertia (I):	96 kgm²	Weight:	4400 Kg	Losses (environment):	51 KW
				Losses (cooling):	n/a

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

<b>Electrical data: (acc. IEC)</b>					
Efficiencies:	110%	100%	75%	50%	25%
Power factor 0.8	94,75	95	95,2	95	93,3
Power factor 0.9	95,49	95,7	95,8	95,5	93,6
Power factor 1.0	96,22	96,4	96,4	96	93,9

<b>Reactances and time constants</b>										
	unsaturated		saturated			unsaturated		saturated		
X <sub>d</sub>	1.85	1.67	p.u.	X <sub>q</sub>	0.93	0.91	p.u.	T <sub>d0'</sub>	1.85	s
X <sub>d'</sub>	0.273	0.273	p.u.	X <sub>q'</sub>	0.93	0.91	p.u.	T <sub>d'</sub>	0.27	s
X <sub>d''</sub>	0.166	0.151	p.u.	X <sub>q''</sub>	0.166	0.166	p.u.	T <sub>d''</sub>	0.013	s
X <sub>2</sub>	0.175	0.159	p.u.	X <sub>0</sub>	0.050	0.045	p.u.	T <sub>a</sub>	0.036	s
X <sub>1s</sub>	n.a.	0.091	p.u.					T <sub>q'</sub>	0.26	s
								T <sub>q''</sub>	0.026	s
Short circuit ratio saturated:	0.6		Z <sub>n</sub>	0.132		Ohm				

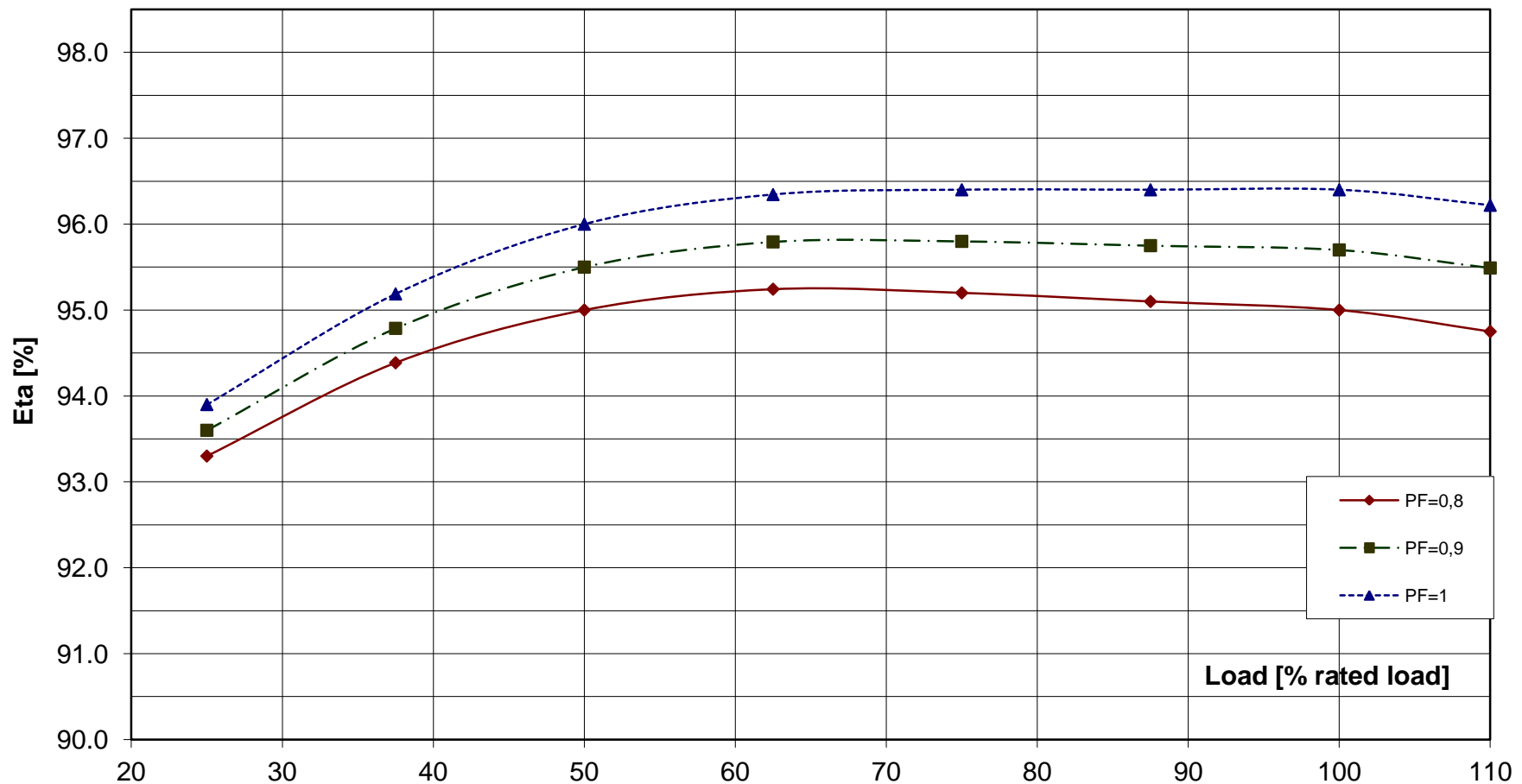
<b>Short circuit data:</b>		
Initial short circuit current (3-phase):	I <sub>k''</sub>	11566 A
Max. peak current (3-phase):	I <sub>s</sub>	29442 A
Sustained short circuit current:	I <sub>k</sub>	5239 A
		Minimum 3 x rated current for max.10 s
Initial short circuit torque:	M <sub>k2</sub>	132.6 kNm
	M <sub>k3</sub>	79.6 kNm
Max. faulty synchron moment:	M <sub>f</sub>	285.1 kNm
Rated kVA torque:	M <sub>SN</sub>	15.41 kNm
Rated torque	M <sub>N</sub>	12.33 kNm
Shaft torque	M <sub>Sh</sub>	12.98 kNm

<b>Load application:</b>	
max. load application: 665 kVA (corresponds to 54,94 % from 1210 kVA) for Power factor 0.4 15% transient voltage drop	Power: 1210 kVA Power factor: 0.8 transient voltage drop: -21.4 %

**Remarks:**

<b>Alternator :</b>	<b>DSG 86 M1/8</b>			
Rated output [kVA]	1210	Rated power factor:	0.8	Rated voltage [kV]: 0.4
Rated frequency [Hz]	50	Rated speed [rpm]	750	

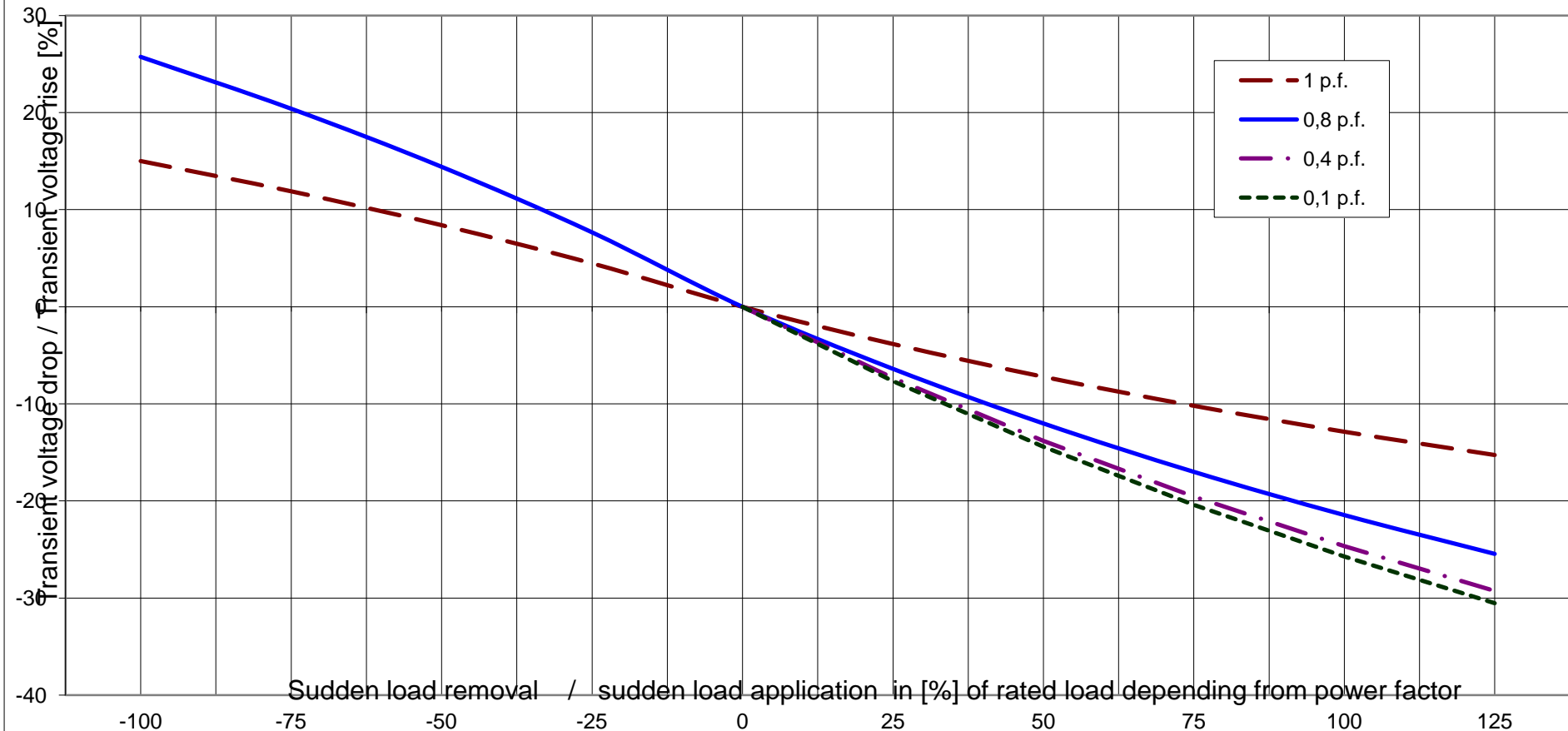
### Wirkungsgrad-Kennlinie - Efficiency Curve



**Alternator : DSG 86 M1/8**

Rated output [kVA]	1210	Rated power factor:	0.8	Rated voltage [kV]:	0.4
Rated frequency [Hz]	50	Rated speed [rpm]	750		

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



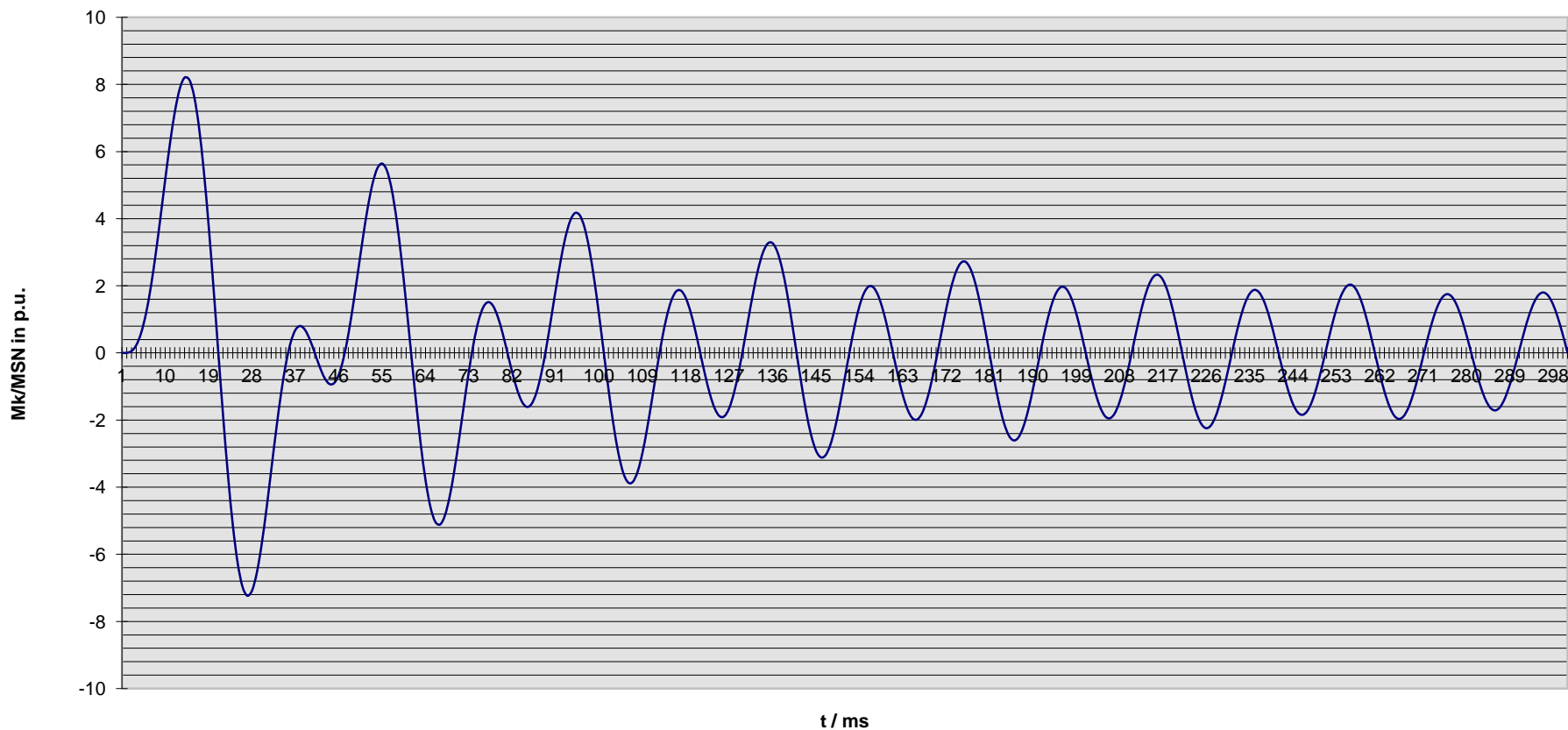


Technisches Datenblatt - Diagramme  
Technical data sheet - Diagrams

ING-FCD-0112

<b>Alternator :</b>	<b>DSG 86 M1/8</b>			
Rated output [kVA]	1210	Rated power factor:	0.8	Rated voltage [kV]: 0.4
Rated frequency [Hz]	50	Rated speed [rpm]	750	MSN related to kVA: 15.41 KNm

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



#### Nenn Daten / nominal data

DSG 86 M1/8

Leistung  $S_N$ : **1210 kVA**

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

Rating

p.f.

Spannung  $U_N$ : **0.40 kV**

Strom  $I_N$ : **1746 A**

Voltage

Current

Frequenz  $f$ : **50 Hz**

Drehzahl  $n$ : **750 min<sup>-1</sup>**

Frequency

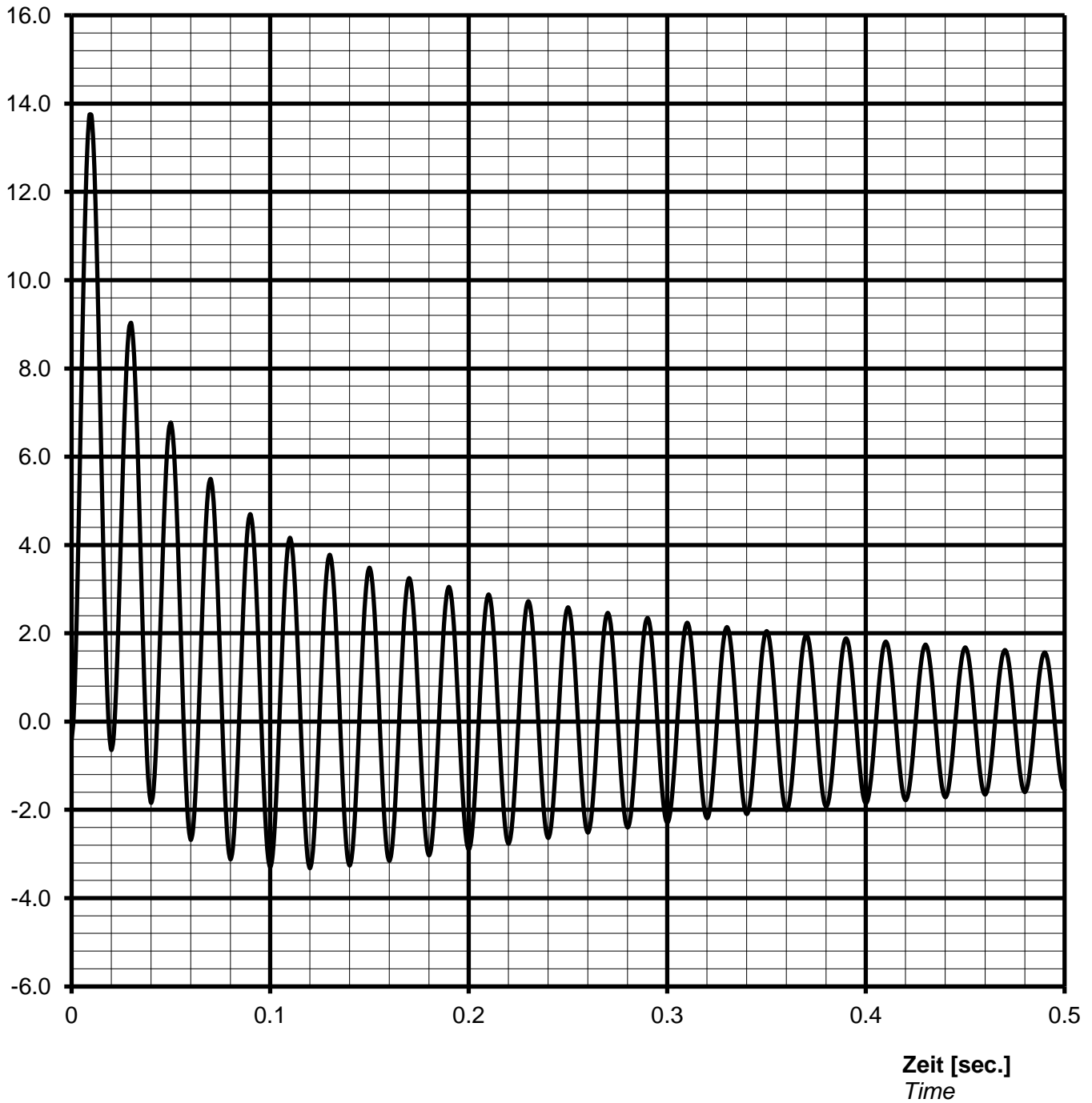
Speed

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

$I_{\text{peak}} =$  **24013 A** or **13.75 p.u.**

#### Nennwerten / nominal data

DSG 86 M1/8

Leistung  $S_N$ : **1210 kVA**

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

Rating

p.f.

Spannung  $U_N$ : **0.40 kV**

Strom  $I_N$ : **1746 A**

Voltage

Current

Frequenz f: **50 Hz**

Drehzahl n: **750 min<sup>-1</sup>**

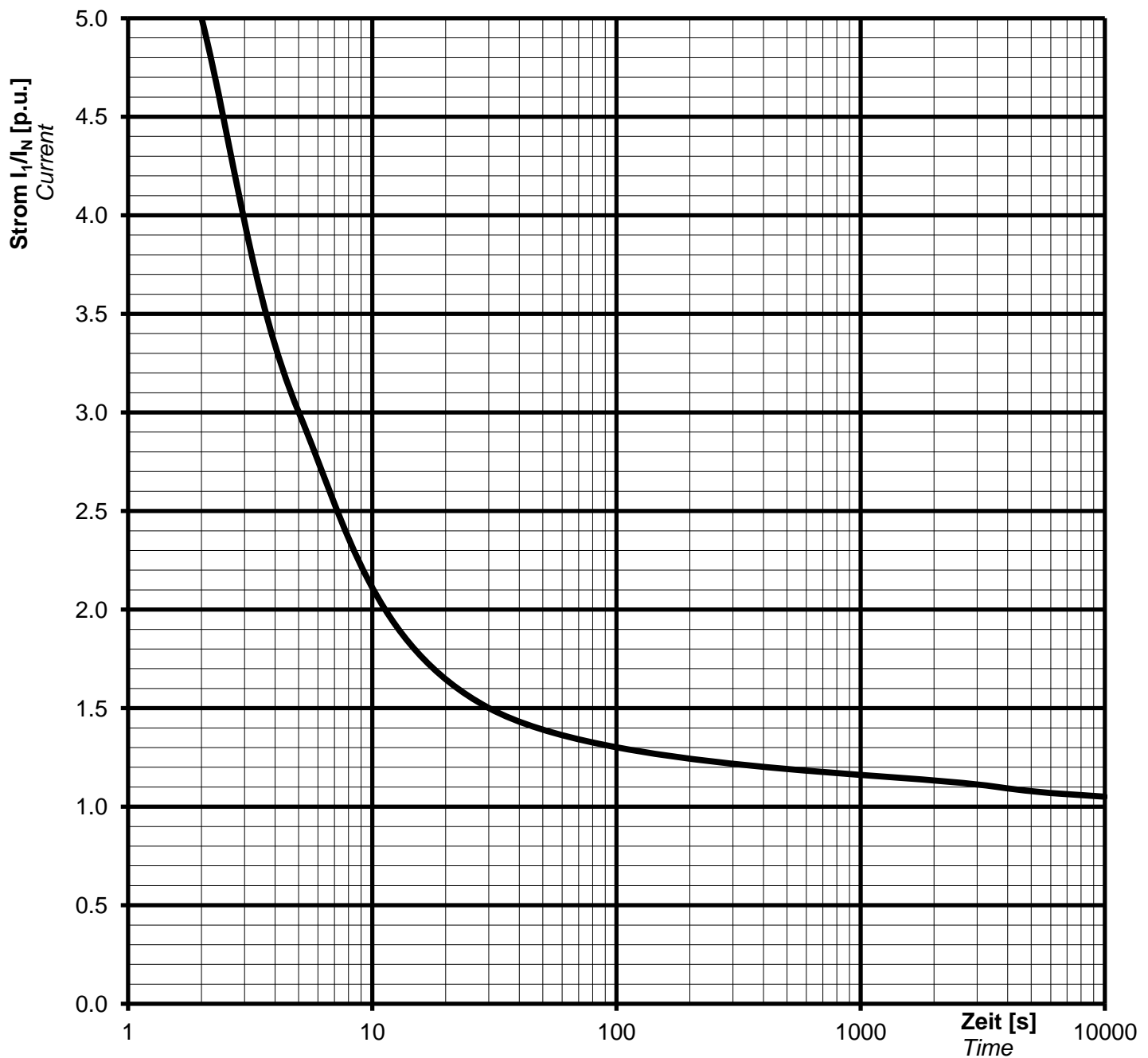
Frequency

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 M1/8**

Rating  $S_N$ : **1210 kVA**

*p.f.* **0.80**

*Bemessungsleistung*

Leistungsfaktor  $\cos \varphi$ :

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

Nominal current  $I_N$ : **1746 A**

*Bemessungsspannung*

*Bemessungsstrom*

Frequency  $f_N$ : **50 Hz**

Speed  $n$ : **750 min<sup>-1</sup>**

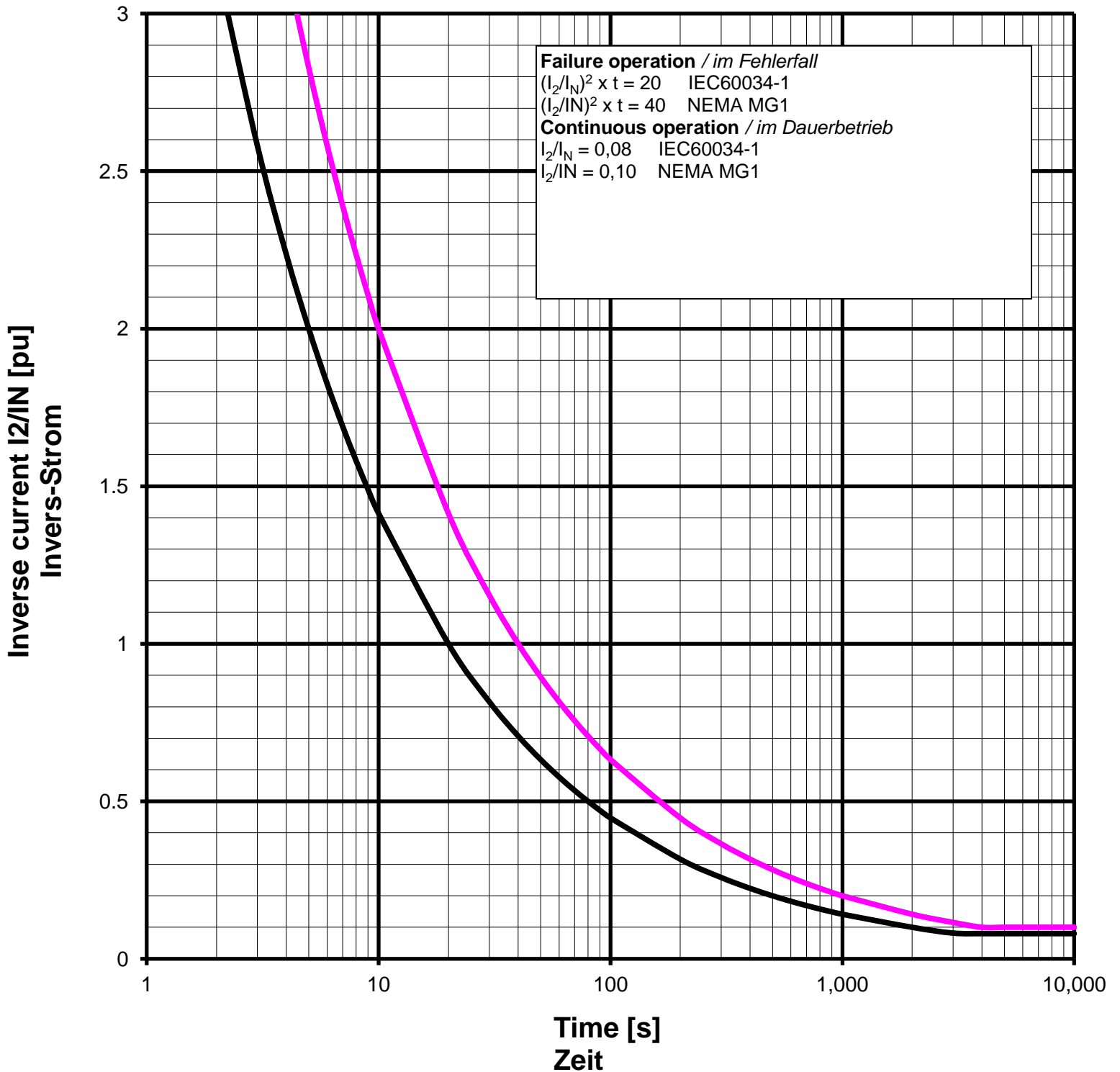
*Frequenz*

*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

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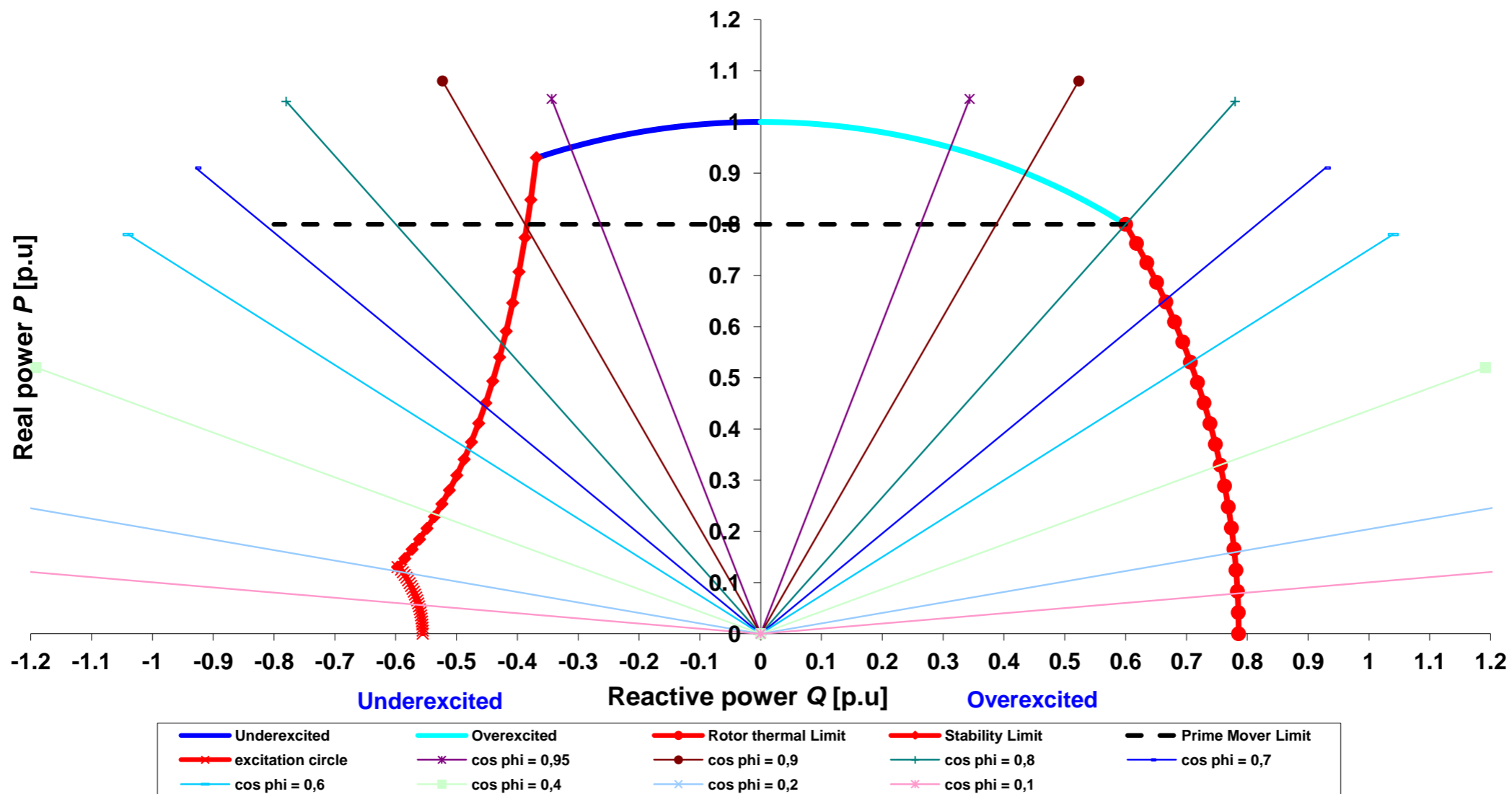
TYPE

DSG 86 M1/8

Projekt:

Order Nr.:

### Capability (P-Q) Diagram



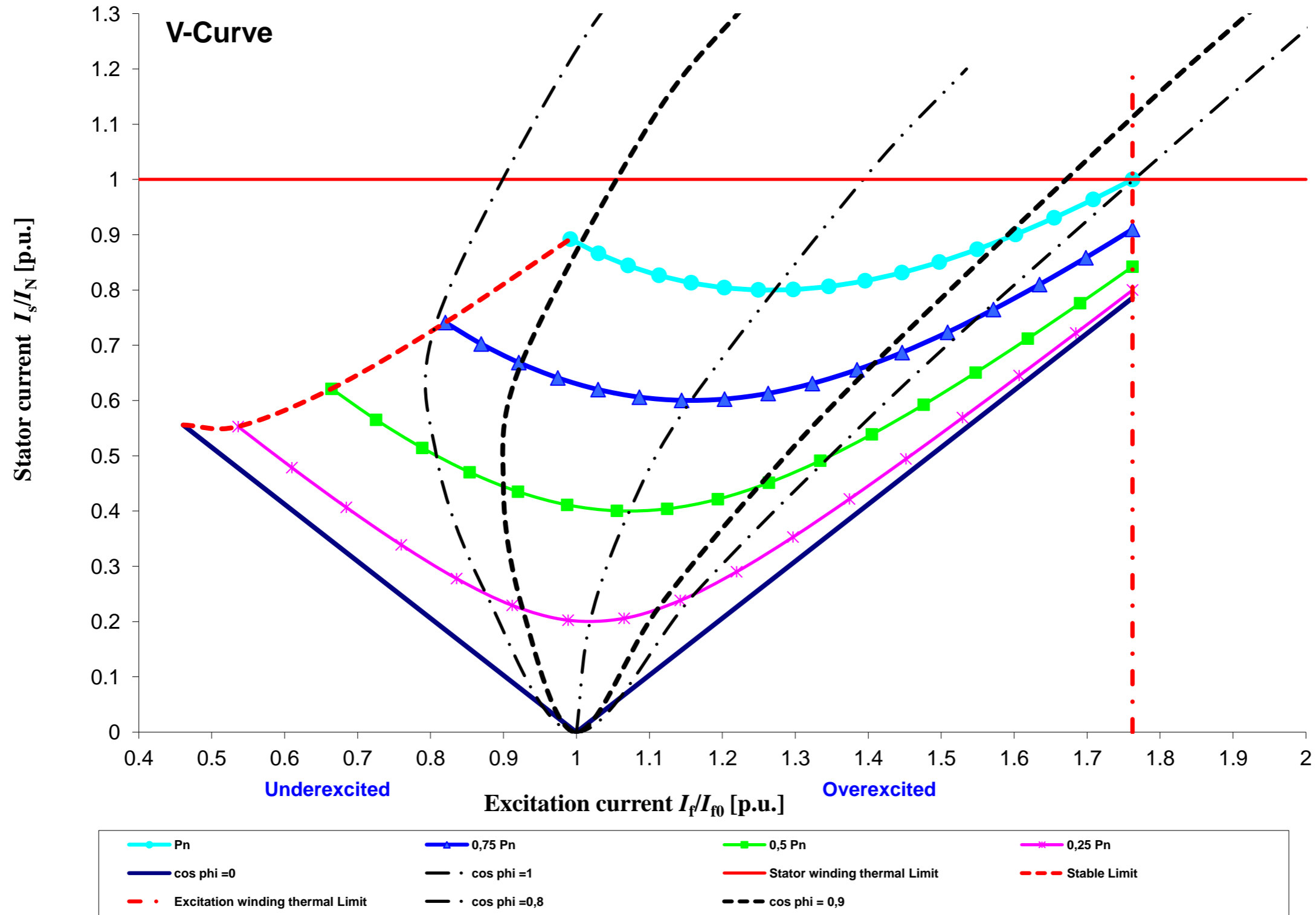
Cummins Generator Technologies

Datum / date:

30/09/2013



TYPE	DSG 86 M1/8	Projekt:		Order Nr.:	
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