

**Technical Data Sheet for AvK-Alternators**

FM 7.3-5

Date:	30/09/13	Customer:	GENERIC DATSHEET only
Project No.:		AvK Reference:	DSG086M1_6_60_480

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

<b>Generator data:</b>					
Generator:	DSG 86 M1/6	Poles:	6	Standards:	IEC 60034
Rated power:	2004 kVA	1603 kWe	1677 kWm		
Power factor:	0.80				
Power at pf 1,0	1623 kVA	1623 kWe	1677 kWm		
Rated voltage:	0.48 kV				
Speed:	1200 1/min				
Frequency:	60 Hz			Voltage range / frequency range:	
Rated current:	2410.4 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				
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.:	2.4 m³/s	Cooling water quantity:	n/a
Moment of inertia (I):	89 kgm²	Weight:	5500 Kg	Losses (environment):	74 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	95,38	95,6	95,7	95,4	93,6
Power factor 0.9	96,01	96,2	96,25	95,85	93,95
Power factor 1.0	96,64	96,8	96,8	96,3	94,3

<b>Reactances and time constants</b>										
	unsaturated		saturated			unsaturated		saturated		
X <sub>d</sub>	2.15	1.94	p.u.	X <sub>q</sub>	1.08	1.06	p.u.	T <sub>d0'</sub>	2.42	s
X <sub>d'</sub>	0.260	0.260	p.u.	X <sub>q'</sub>	1.08	1.06	p.u.	T <sub>d'</sub>	0.29	s
X <sub>d''</sub>	0.165	0.150	p.u.	X <sub>q''</sub>	0.165	0.165	p.u.	T <sub>d''</sub>	0.015	s
X <sub>2</sub>	0.174	0.158	p.u.	X <sub>0</sub>	0.050	0.045	p.u.	T <sub>a</sub>	0.045	s
X <sub>1s</sub>	n.a.	0.090	p.u.					T <sub>q'</sub>	0.3	s
								T <sub>q''</sub>	0.03	s
Short circuit ratio saturated:	0.52				Z <sub>n</sub>	0.115	Ohm			

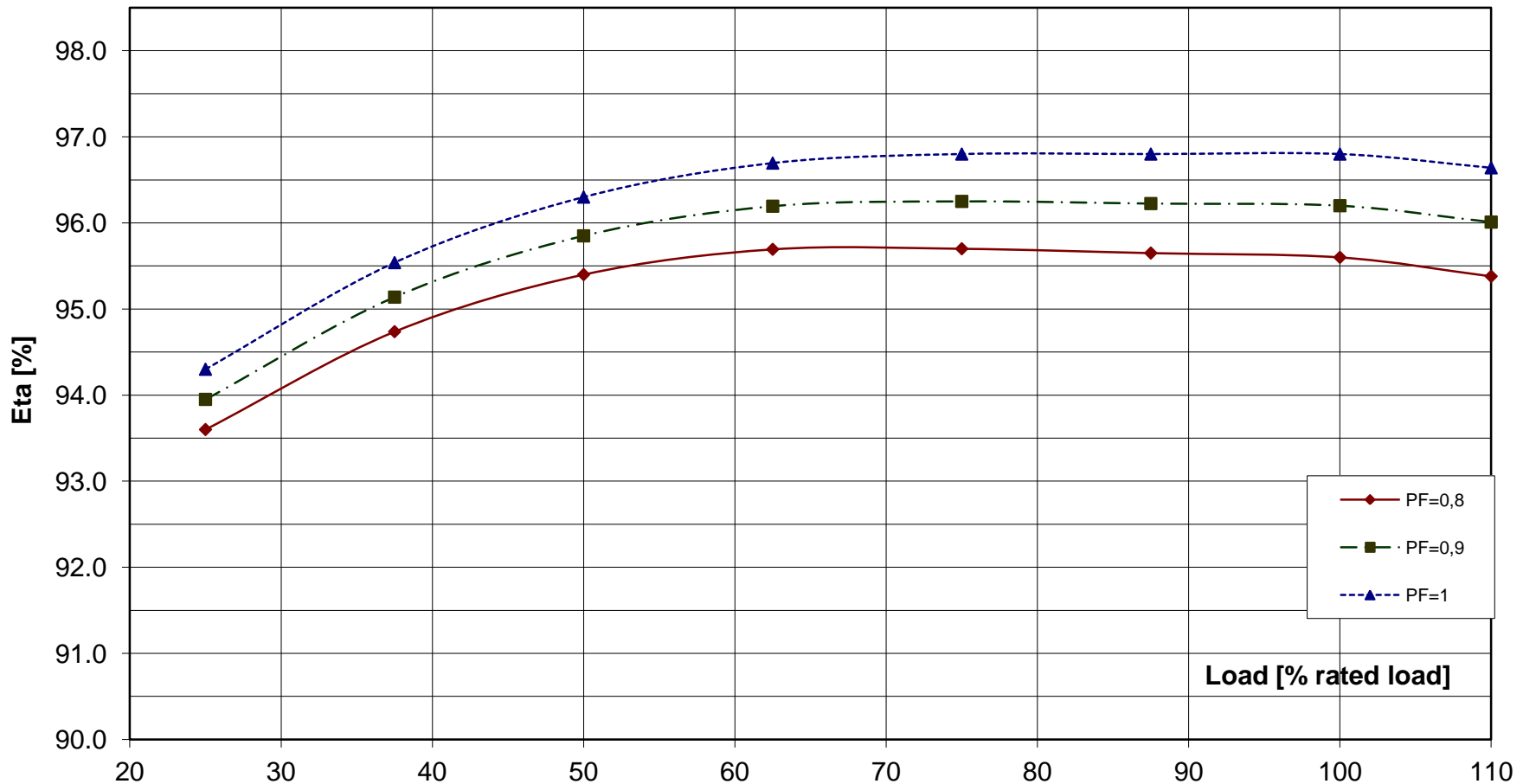
<b>Short circuit data:</b>		
Initial short circuit current (3-phase):	I <sub>k''</sub>	16070 A
Max. peak current (3-phase):	I <sub>s</sub>	40908 A
Sustained short circuit current:	I <sub>k</sub>	7231 A
		Minimum 3 x rated current for max.10 s
Initial short circuit torque:	M <sub>k2</sub>	138.2 kNm
	M <sub>k3</sub>	82.9 kNm
Max. faulty synchron moment:	M <sub>f</sub>	297.1 kNm
Rated kVA torque:	M <sub>SN</sub>	15.95 kNm
Rated torque	M <sub>N</sub>	12.76 kNm
Shaft torque	M <sub>Sh</sub>	13.35 kNm

<b>Load application:</b>	
max. load application: 1156 kVA (corresponds to 57,69 % from 2004 kVA) for Power factor 0.4 15% transient voltage drop	Power: 2004 kVA Power factor: 0.8 transient voltage drop: -20.6 %

**Remarks:**

<b>Alternator :</b>	<b>DSG 86 M1/6</b>			
Rated output [kVA]	2004	Rated power factor:	0.8	Rated voltage [kV]: 0.48
Rated frequency [Hz]	60	Rated speed [rpm]	1200	

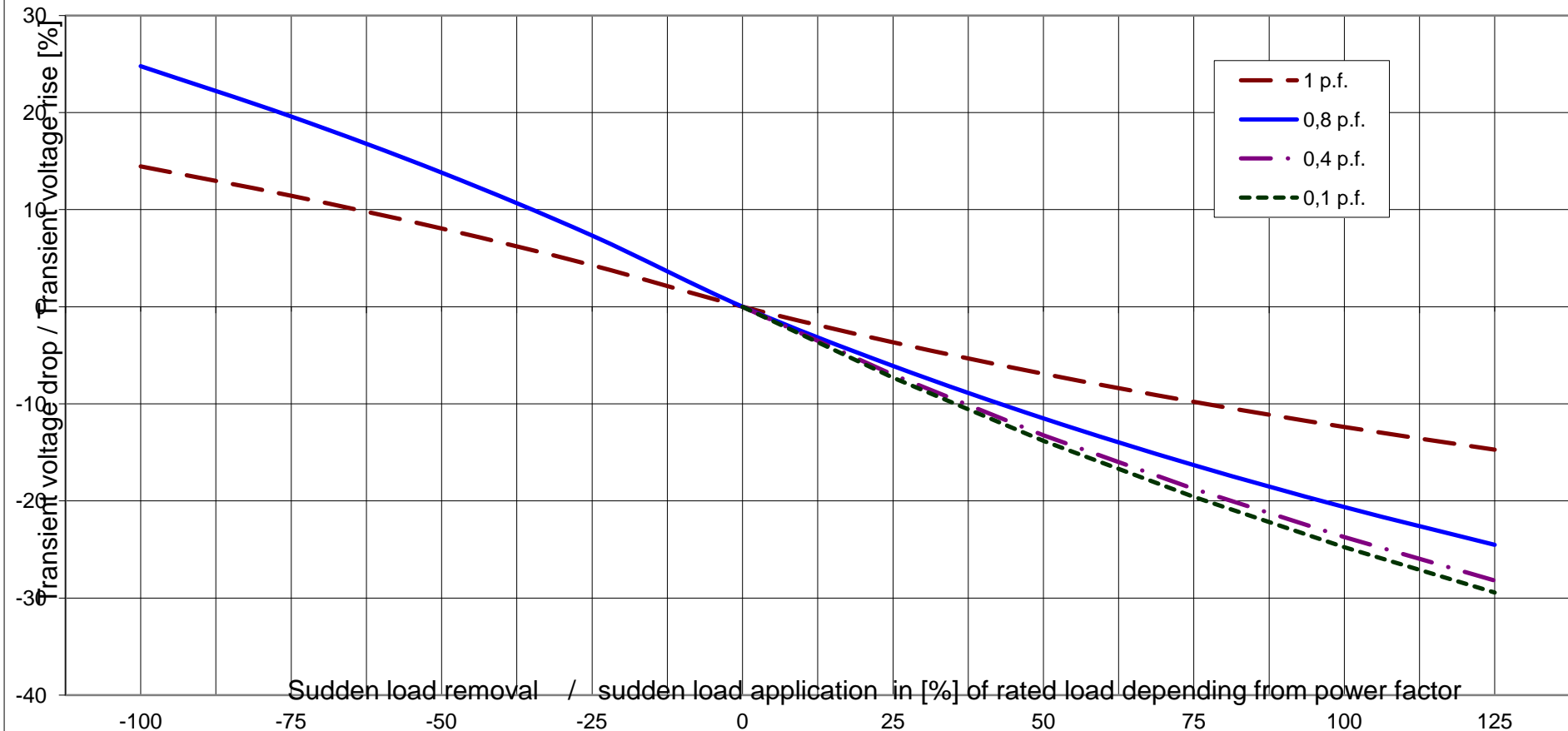
### Wirkungsgrad-Kennlinie - Efficiency Curve



**Alternator : DSG 86 M1/6**

Rated output [kVA]	2004	Rated power factor:	0.8	Rated voltage [kV]:	0.48
Rated frequency [Hz]	60	Rated speed [rpm]	1200		

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



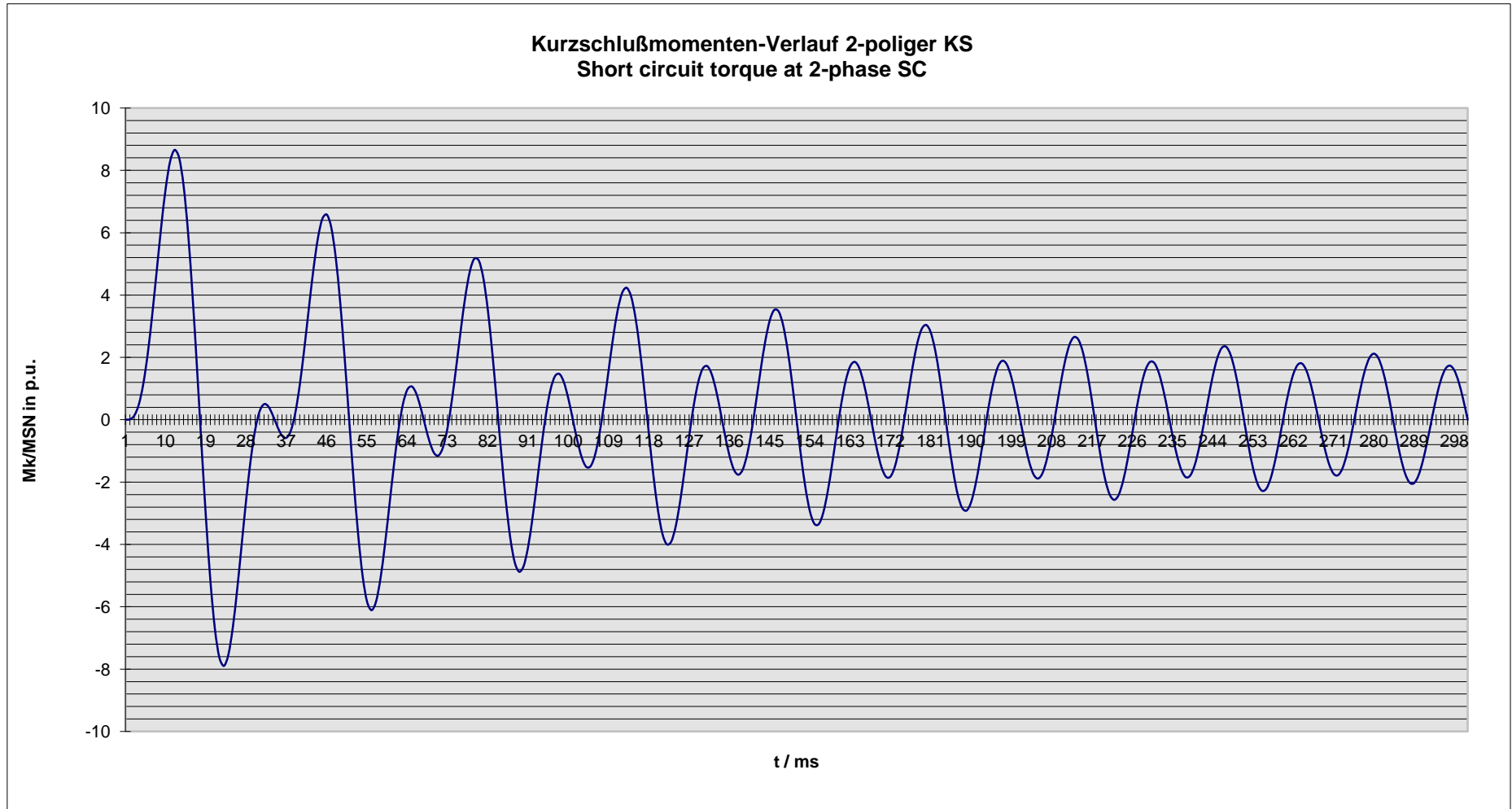


Technisches Datenblatt - Diagramme  
Technical data sheet - Diagrams

ING-FCD-0112

<b>Alternator :</b>	<b>DSG 86 M1/6</b>			
Rated output [kVA]	2004	Rated power factor:	0.8	Rated voltage [kV]: 0.48
Rated frequency [Hz]	60	Rated speed [rpm]	1200	MSN related to kVA: 15.95 KNm

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



**Nenndaten / nominal data**

**DSG 86 M1/6**

Leistung  $S_N$ : **2004 kVA**

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

*Rating*

*p.f.*

Spannung  $U_N$ : **0.48 kV**

Strom  $I_N$ : **2410 A**

*Voltage*

*Current*

Frequenz  $f$ : **60 Hz**

Drehzahl  $n$ : **1,200 min<sup>-1</sup>**

*Frequency*

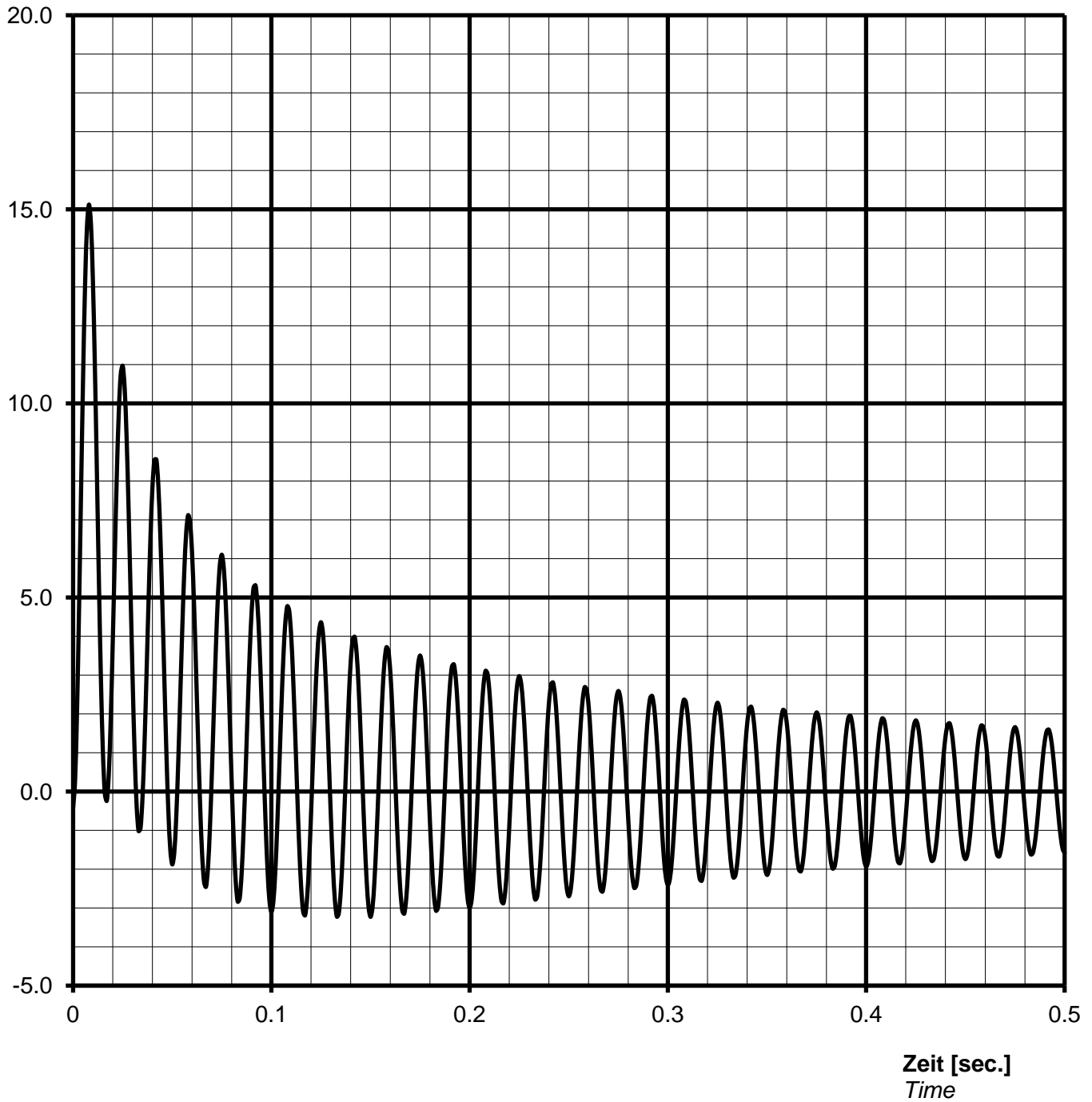
*Speed*

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  $I_{\text{peak}} = 36460 \text{ A}$  or  $15.13 \text{ p.u.}$**

#### Nenn Daten / nominal data

DSG 86 M1/6

Leistung  $S_N$ : **2004 kVA**

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

Rating

p.f.

Spannung  $U_N$ : **0.48 kV**

Strom  $I_N$ : **2410 A**

Voltage

Current

Frequenz f: **60 Hz**

Drehzahl n: **1200 min<sup>-1</sup>**

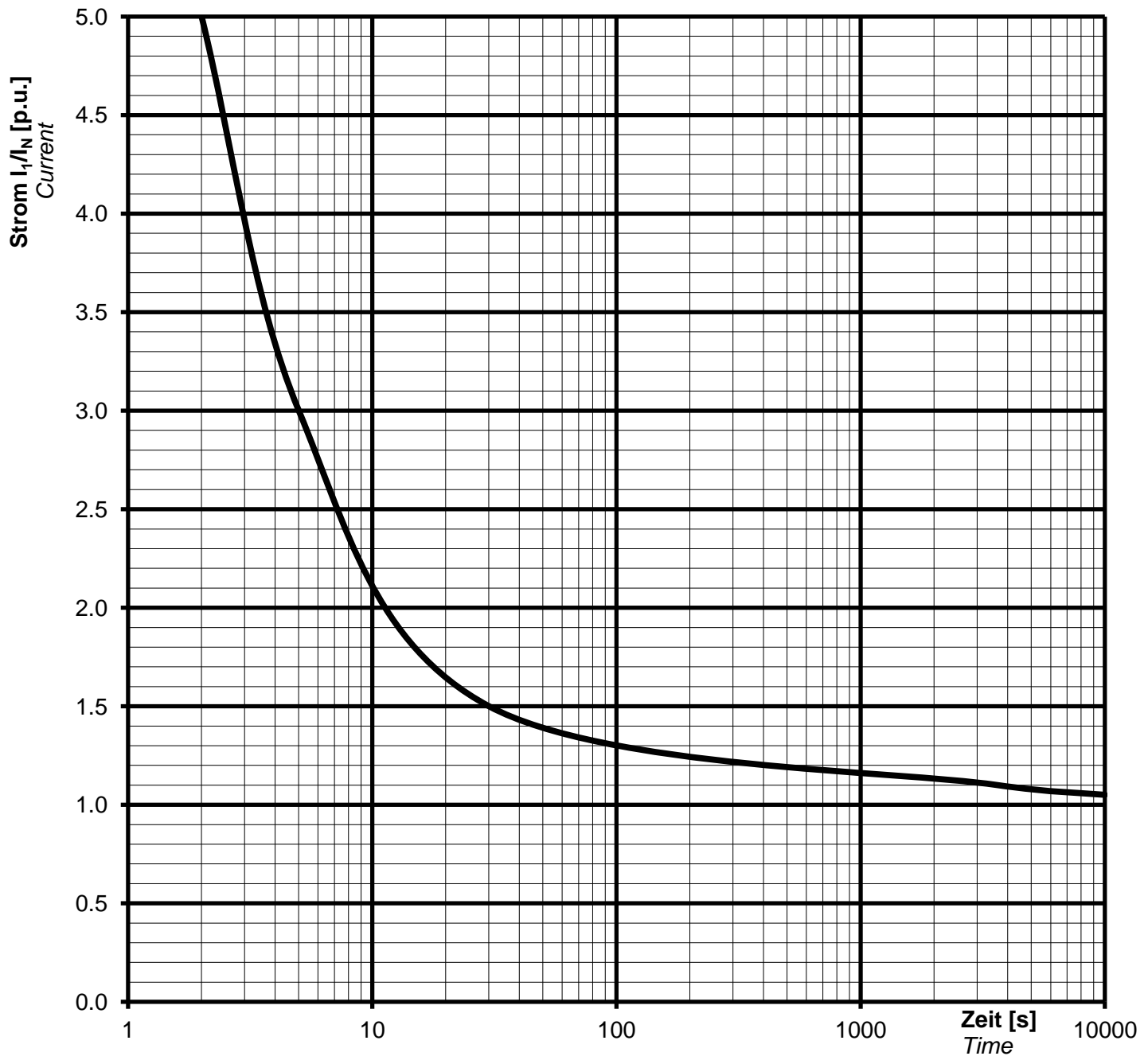
Frequency

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

#### Nenndaten / nominal data

**DSG 86 M1/6**

Rating  $S_N$ : **2004 kVA**

*p.f.* **0.80**

*Bemessungsleistung*

Leistungsfaktor  $\cos \varphi$ :

Nominal voltage  $U_N$ : **0.48 kV**

Nominal current  $I_N$ : **2410 A**

*Bemessungsspannung*

*Bemessungsstrom*

Frequency  $f_N$ : **60 Hz**

Speed  $n$ : **1200 min<sup>-1</sup>**

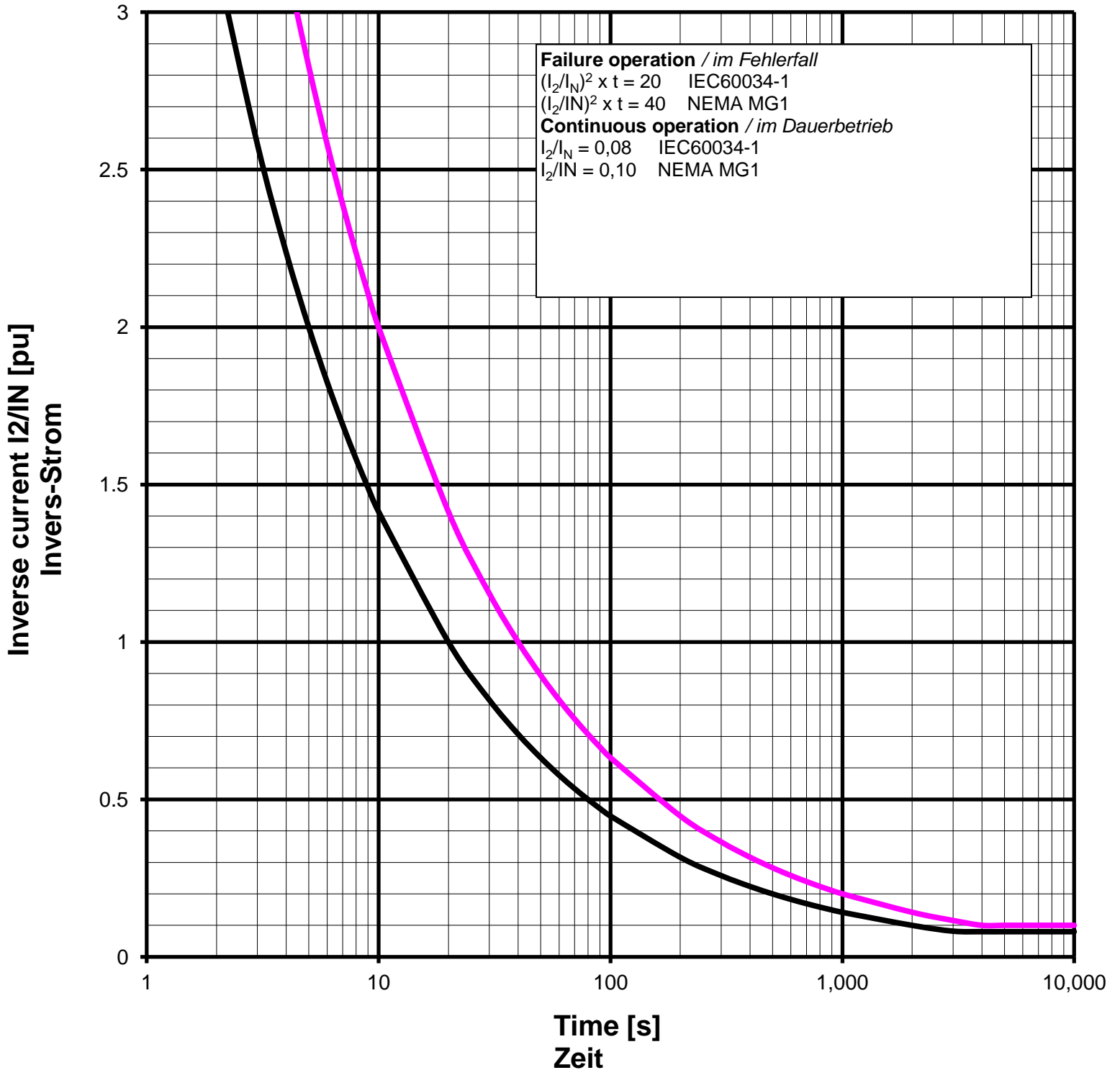
*Frequenz*

*Drehzahl*

Protection: **IP23**

*Schutzart*

#### Inverse current or unbalanced negative sequence current



Remarks / Notizen:



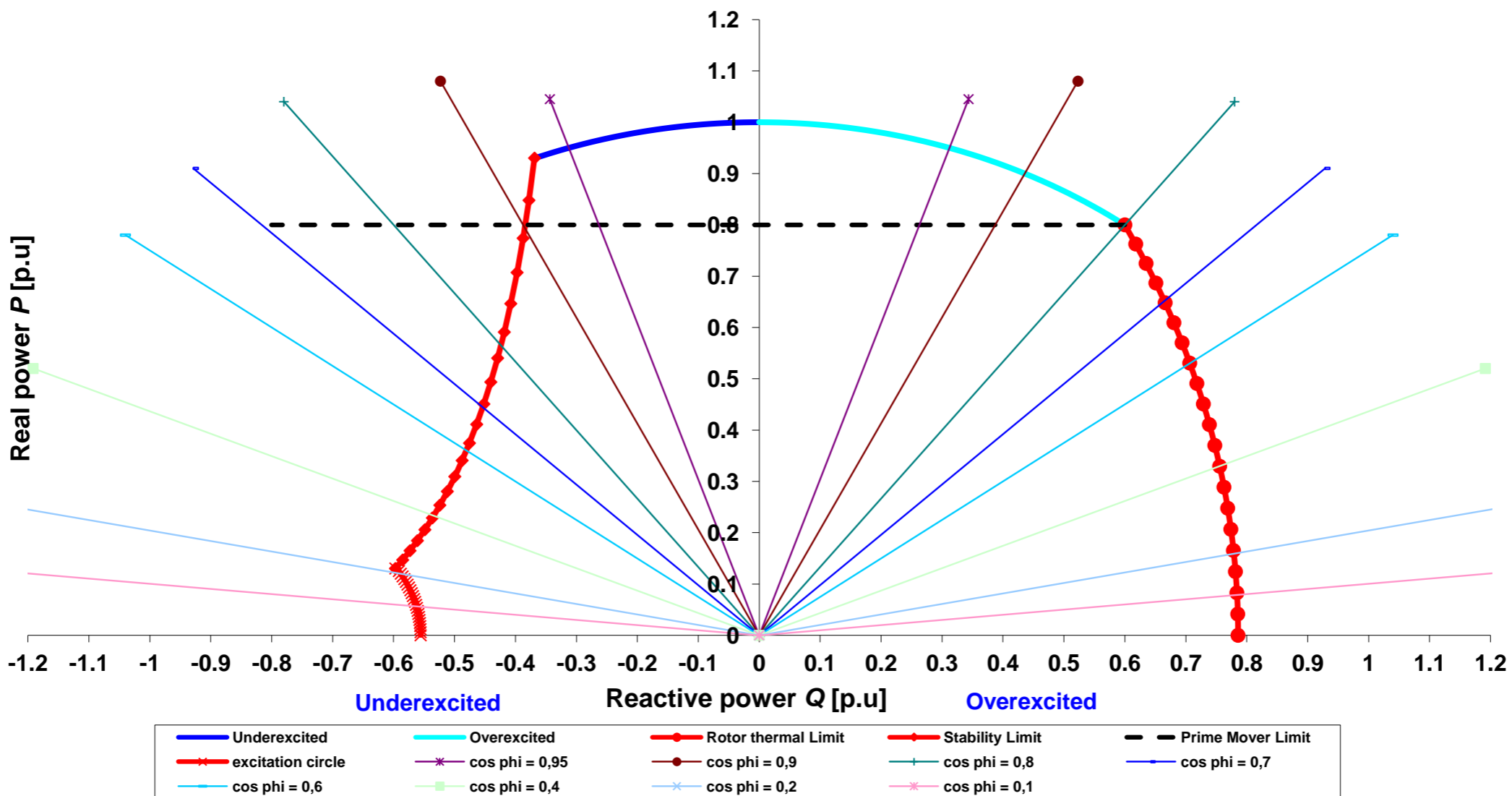
TYPE

DSG 86 M1/6

Projekt:

Order Nr.:

### Capability (P-Q) Diagram



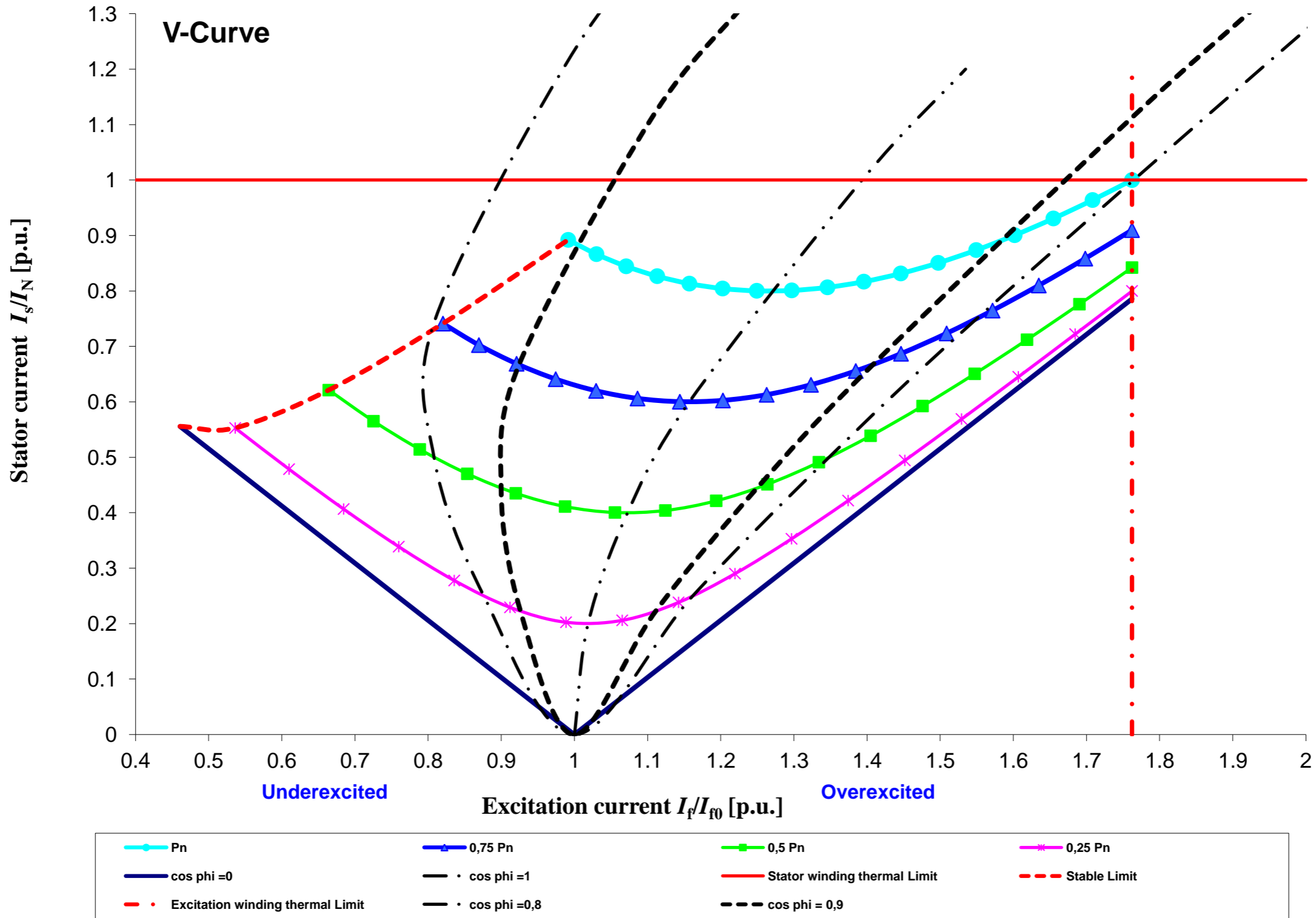
Cummins Generator Technologies

Datum / date:

30/09/2013



TYPE	DSG 86 M1/6	Projekt:		Order Nr.:	
------	-------------	----------	--	------------	--



Cummins Generator Technologies	Datum / date:	
	30/09/2013	