

**Technical Data Sheet for AvK-Alternators**

FM 7.3-5

Date:	02/10/13	Customer:	GENERIC DATASHEET only
Project No.:	GENERIC DATASHEET only	AvK Reference:	DSG099M1_6_50_400

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

<b>Generator data:</b>					
Generator:	DSG 99 M1/6	Poles:	6	Standards: IEC 60034	
Rated power:	2700 kVA	2160 kWe	2252 kWm		
Power factor:	0.80				
Power at pf 1,0	2184 kVA	2184 kWe	2252 kWm		
Rated voltage:	0.4 kV				
Speed:	1000 1/min				
Frequency:	50 Hz		Voltage range / frequency range:		
Rated current:	3897.1 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.:	2.5 m³/s	Cooling water quantity:	n/a
Moment of inertia (I):	160 kgm²	Weight:	7200 Kg	Losses (environment):	92 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	95,7	95,9	96	96	94,8
Power factor 0.9	96,28	96,45	96,5	96,35	94,95
Power factor 1.0	96,85	97	97	96,7	95,1

<b>Reactances and time constants</b>									
	unsaturated		saturated			unsaturated		saturated	
X <sub>d</sub>	2.25	2.03 p.u.	X <sub>q</sub>	1.13	1.11 p.u.	T <sub>d0'</sub>	2.5 s	T <sub>d0''</sub>	0.02636 s
X <sub>d'</sub>	0.297	0.297 p.u.	X <sub>q'</sub>	1.13	1.11 p.u.	T <sub>d'</sub>	0.33 s	T <sub>q0'</sub>	0.3 s
X <sub>d''</sub>	0.186	0.169 p.u.	X <sub>q''</sub>	0.186	0.186 p.u.	T <sub>d''</sub>	0.015 s	T <sub>q0''</sub>	0.18226 s
X <sub>2</sub>	0.196	0.178 p.u.	X <sub>0</sub>	0.056	0.051 p.u.	T <sub>a</sub>	0.05 s	T <sub>q'</sub>	0.3 s
X <sub>1s</sub>	n.a.	0.101 p.u.						T <sub>q''</sub>	0.03 s
Short circuit ratio saturated:	0.49		Z <sub>n</sub>	0.059 Ohm					

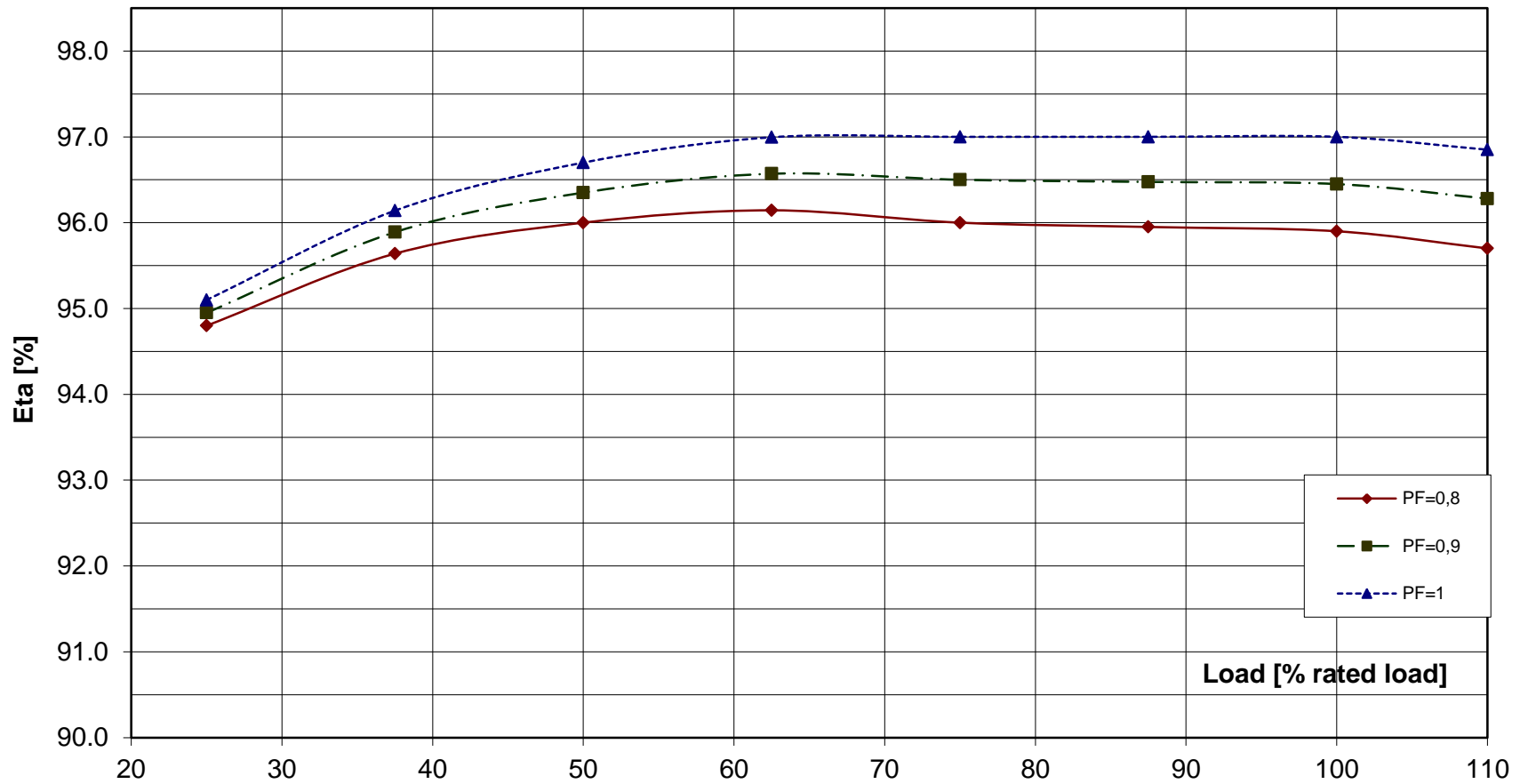
<b>Short circuit data:</b>		
Initial short circuit current (3-phase):	I <sub>k'</sub>	23060 A
Max. peak current (3-phase):	I <sub>s</sub>	58701 A
Sustained short circuit current:	I <sub>k</sub>	11691 A
		Minimum 3 x rated current for max.10 s
Initial short circuit torque:	M <sub>k2</sub>	198.3 kNm
	M <sub>k3</sub>	119.0 kNm
Max. faulty synchron moment:	M <sub>f</sub>	426.3 kNm
Rated kVA torque:	M <sub>SN</sub>	25.79 kNm
Rated torque	M <sub>N</sub>	20.63 kNm
Shaft torque	M <sub>Sh</sub>	21.51 kNm

<b>Load application:</b>	
max. load application: 1364 kVA (corresponds to 50,5 % from 2700 kVA) for Power factor 0.4 15% transient voltage drop	Power: 2700 kVA Power factor: 0.8 transient voltage drop: -22.9 %

**Remarks:**

<b>Alternator :</b>	<b>DSG 99 M1/6</b>		
Rated output [kVA]	2700	Rated power factor:	0.8
Rated frequency [Hz]	50	Rated speed [rpm]	1000
			Rated voltage [kV]: 0.4

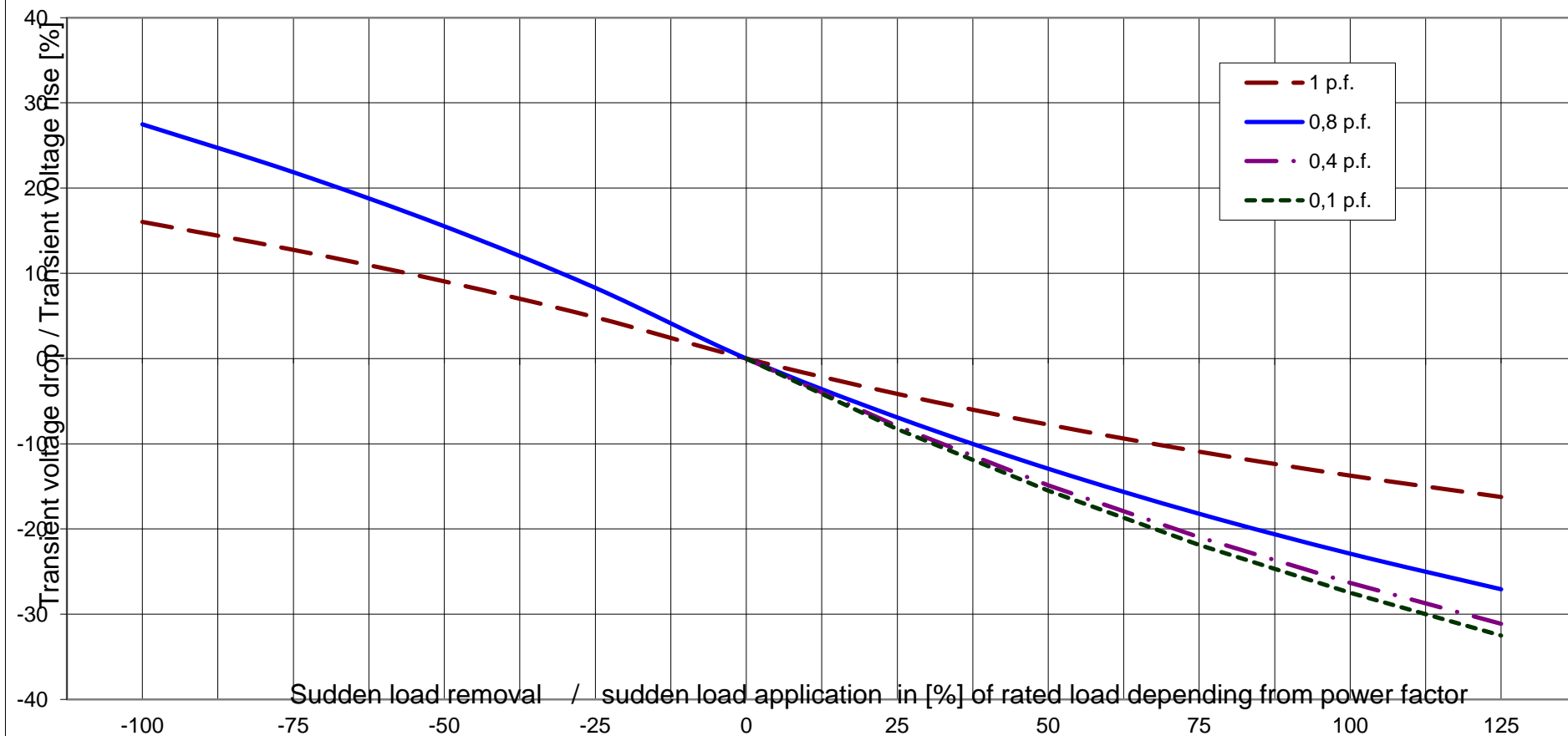
### Wirkungsgrad-Kennlinie - Efficiency Curve



**Alternator : DSG 99 M1/6**

Rated output [kVA]	2700	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**





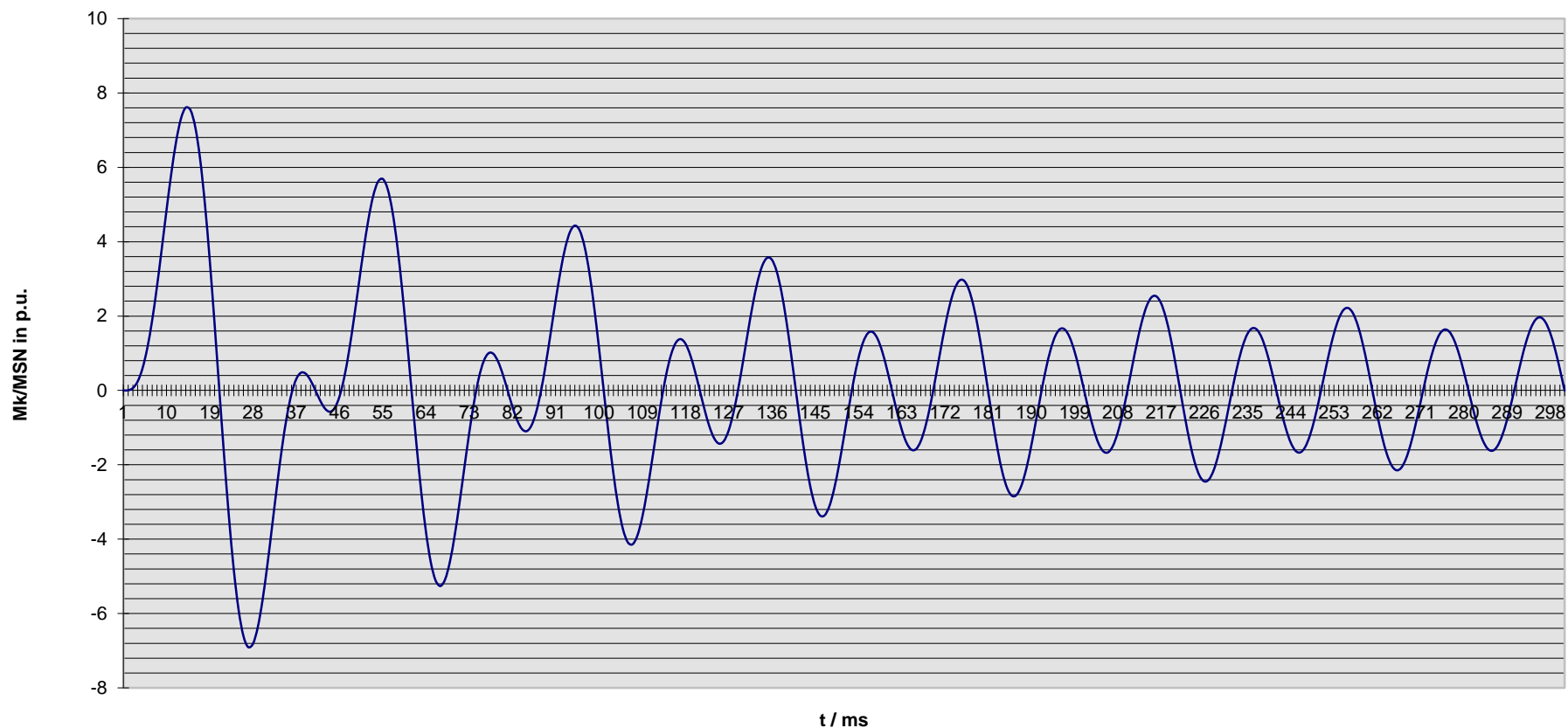
Technisches Datenblatt - Diagramme  
Technical data sheet - Diagrams

**ING-FCD-0112**

**Alternator : DSG 99 M1/6**

Rated output [kVA]	2700	Rated power factor:	0.8	Rated voltage [kV]:	0.4
Rated frequency [Hz]	50	Rated speed [rpm]	1000	MSN related to kVA:	25.78 KNm

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



#### Nennwerten / nominal data

DSG 99 M1/6

Leistung  $S_N$ : **2700** kVA

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

*Rating*

*p.f.*

Spannung  $U_N$ : **0.40** kV

Strom  $I_N$ : **3897** A

*Voltage*

*Current*

Frequenz  $f$ : **50** Hz

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

*Frequency*

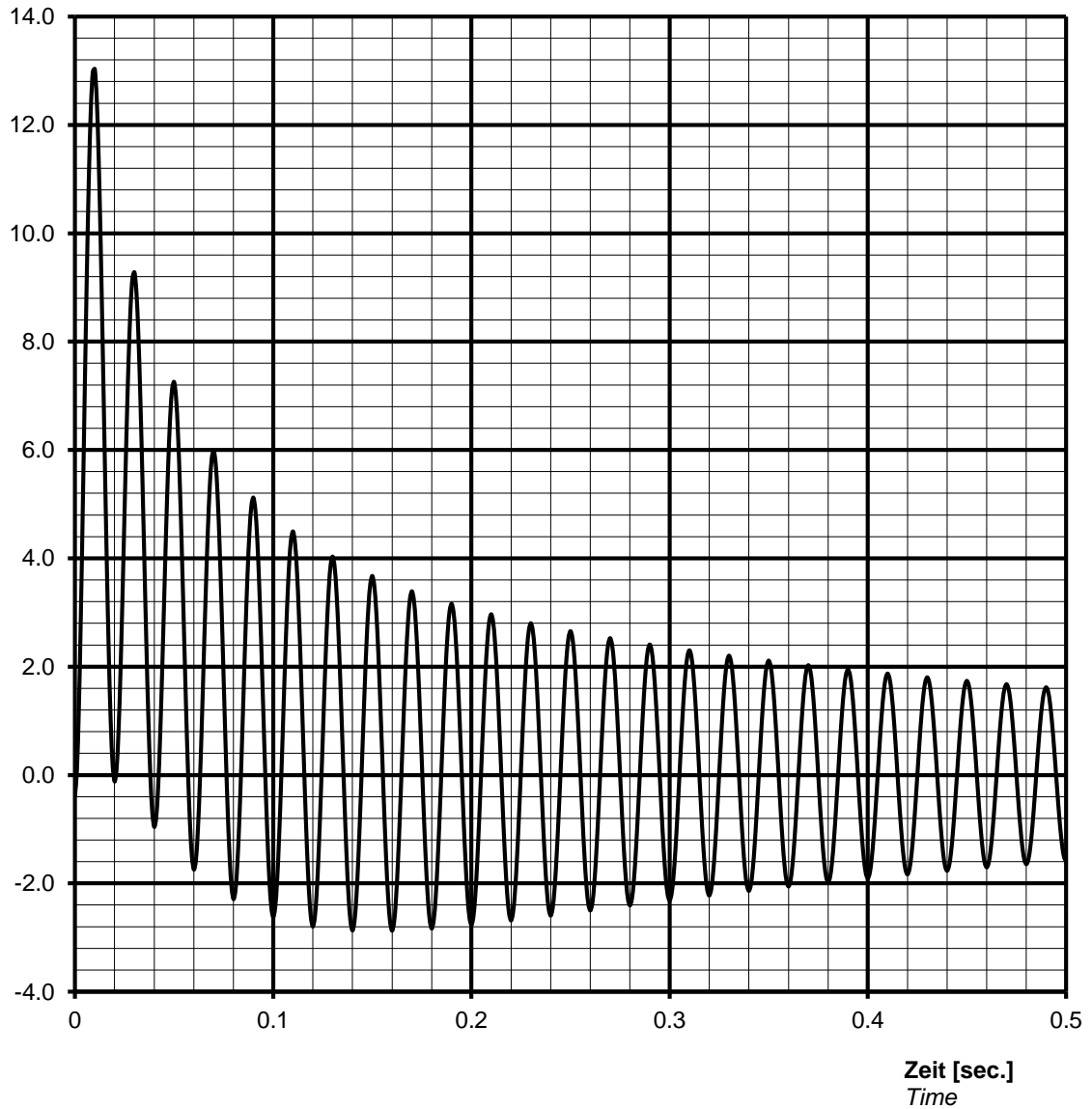
*Speed*

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

$I_{\text{speak}} =$  **50780** A or **13.03** p.u.

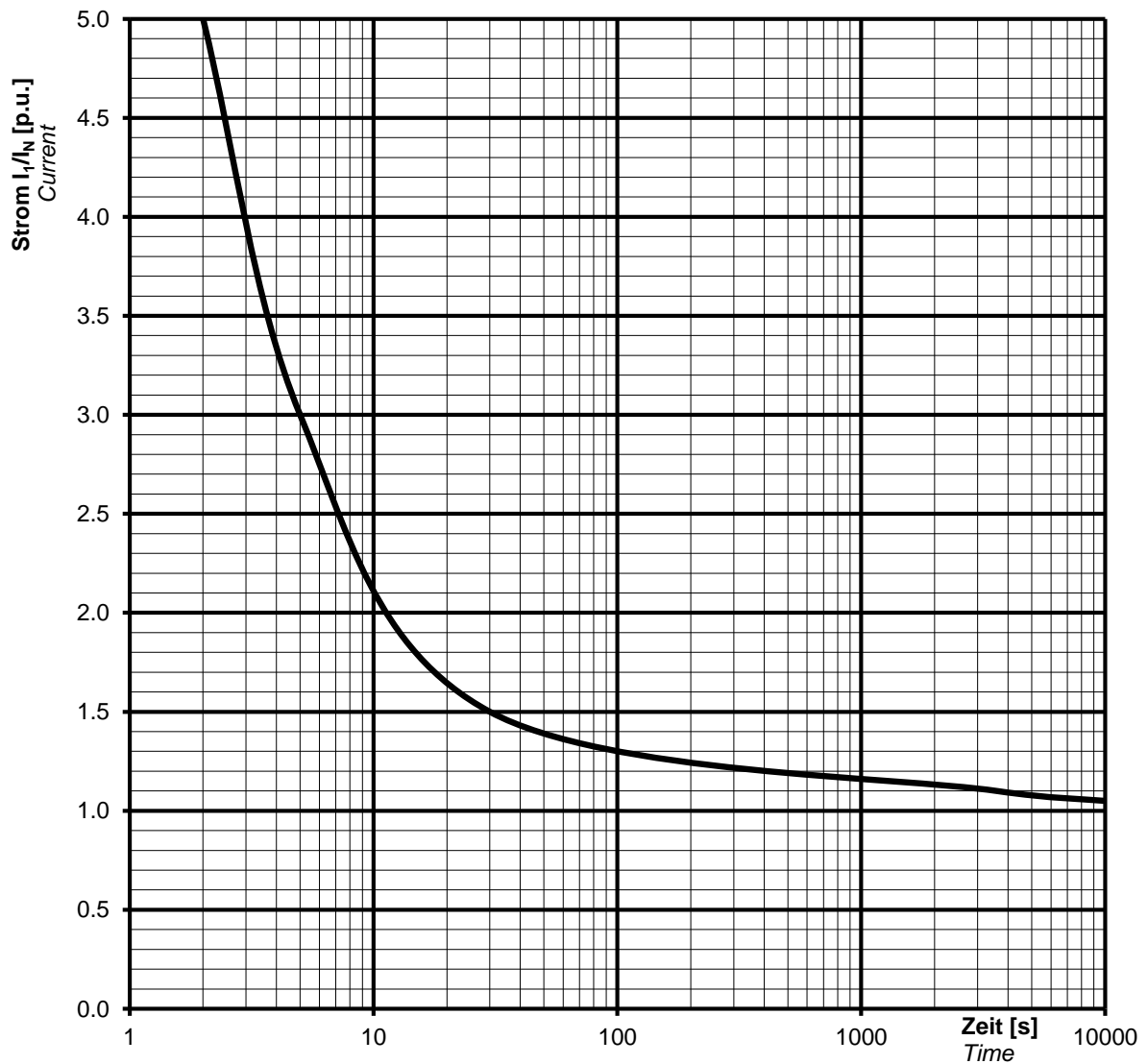
**Nenndaten / nominal data**

**DSG 99 M1/6**

Leistung  $S_N$ : **2700** kVA  
*Rating*  
 Spannung  $U_N$ : **0.40** kV  
*Voltage*  
 Frequenz  $f$ : **50** Hz  
*Frequency*  
 Schutzart **IP23**  
*Protection*

$\cos \varphi$ : **0.80**  
*p.f.*  
 Strom  $I_N$ : **3897** A  
*Current*  
 Drehzahl  $n$ : **1000** min<sup>-1</sup>  
*Speed*

**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

#### Neurdaten / nominal data

DSG 99 M1/6

Rating  $S_N$ : **2700** kVA  
*Bemessungsleistung*

*p.f.* **0.80**

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

Leistungsfaktor  $\cos \varphi$ :

Nominal current  $I_N$ : **3897** A

Frequency  $f_N$ : **50** Hz  
*Frequenz*

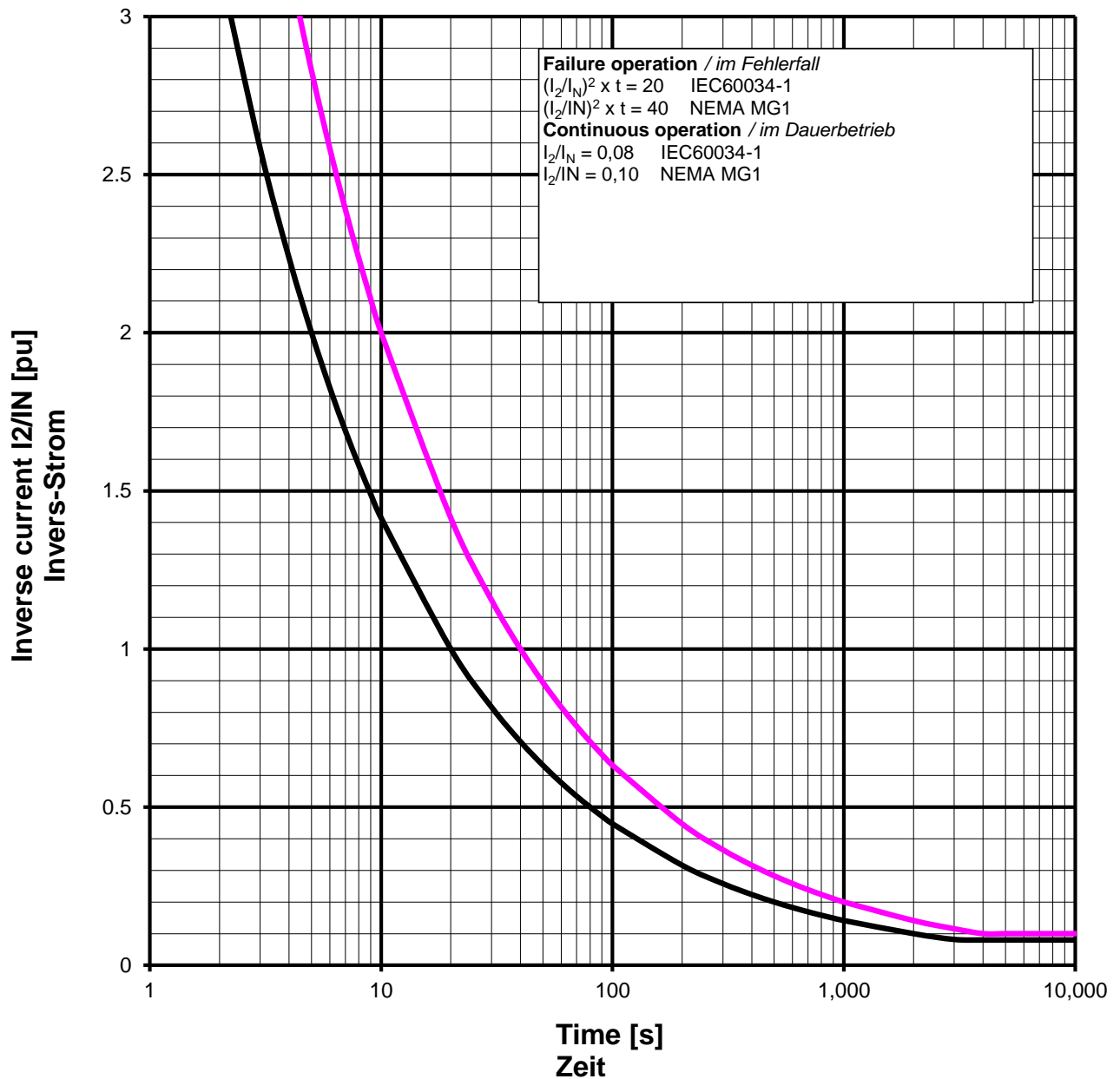
*Bemessungsstrom*

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

Protection: **IP23**  
*Schutzart*

*Drehzahl*

#### 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

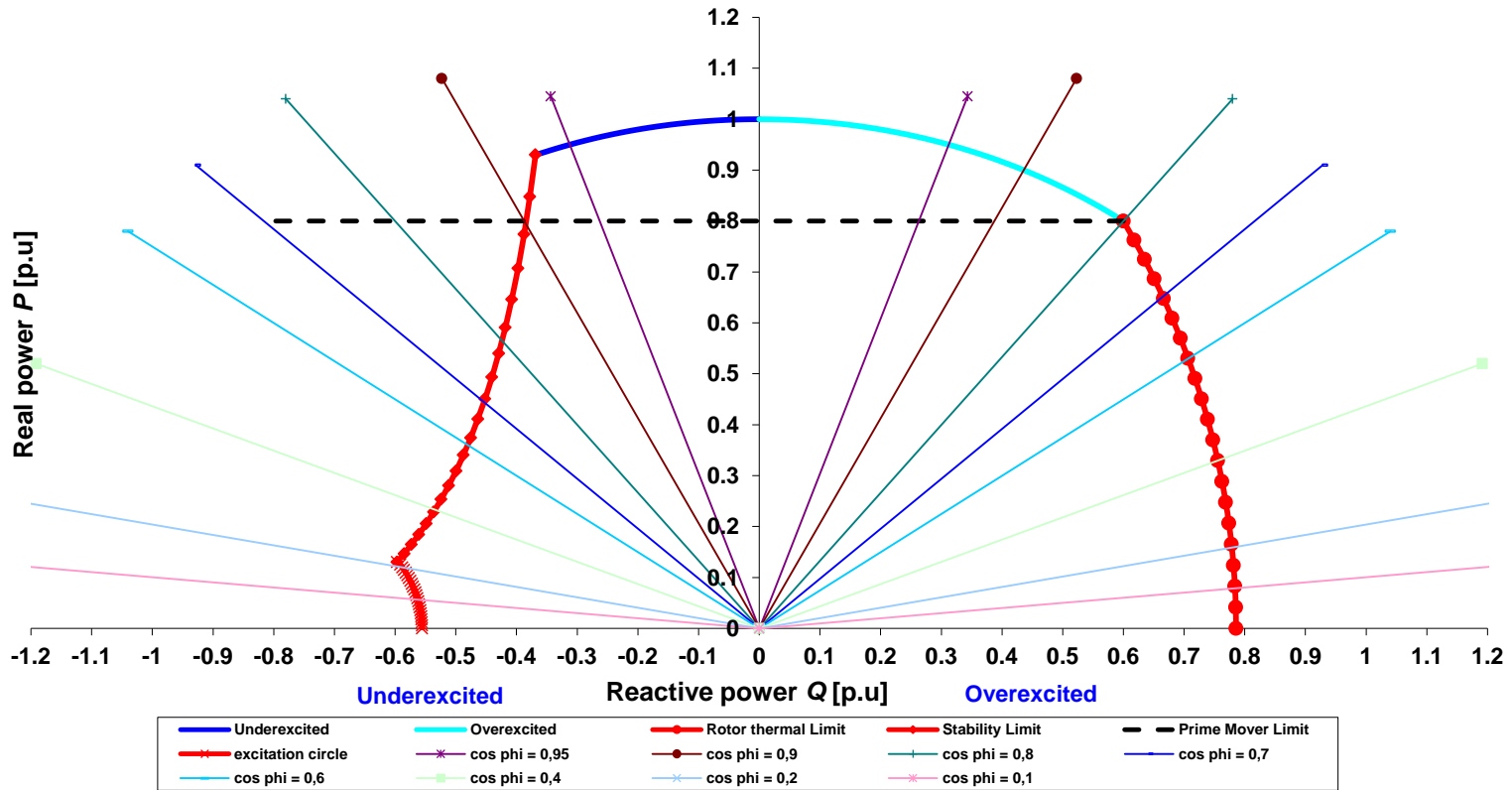
TYPE

DSG 99 M1/6

Projekt:

Order Nr.:

### Capability (P-Q) Diagram



Cummins Generator Technologies

Datum / date:

03/10/2013

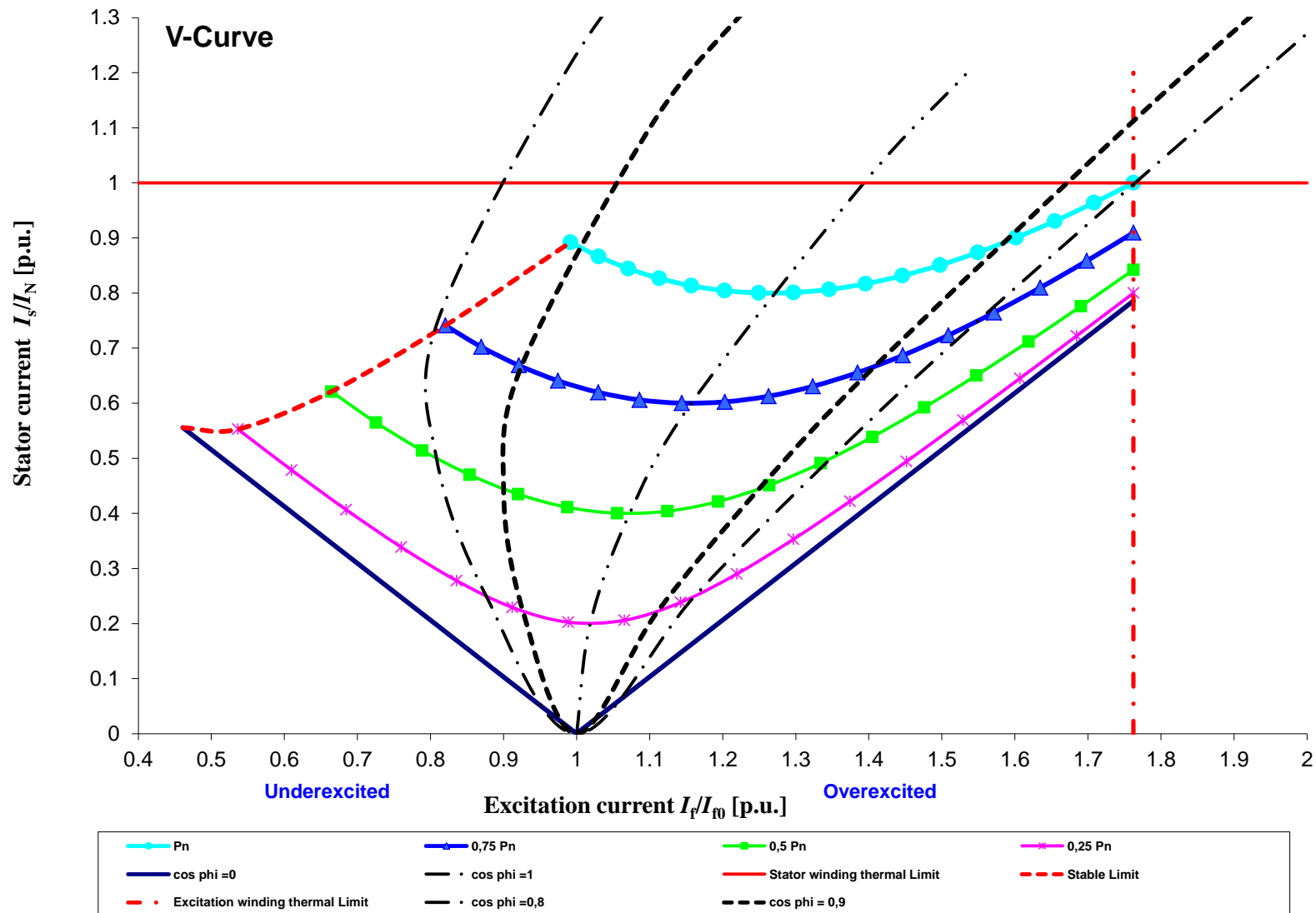




Technische Daten selbstregelnden Drehstrom-Synchrongenerator  
 technical data for self regulating three phase alternator

ING-FCD-0112

TYPE DSG 99 M1/6 Projekt: Order Nr.:



Cummins Generator Technologies

Datum / date:

03/10/2013