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:	DSG099K1_4_60_480

Object data:

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

Generator data:

Generator:	DSG 99 K1/4	Poles:	4	Standards: IEC 60034	
Rated power:	4140 kVA	3312 kWe	3446 kWm		
Power factor:	0.80				
Power at pf 1,0	3343 kVA	3343 kWe	3446 kWm		
Rated voltage:	0.48 kV				
Speed:	1800 1/min				
Frequency:	60 Hz		Voltage range / frequency range:		
Rated current:	4979.6 A		Zone A according IEC 60034-1 (dU = +/-5%, df = +/-2%)		
Winding pitch:					
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 Coolant:	40 ° C	Temperature Air inlet generator:	40 ° C
		Cooling air vol.:	3.9 m³/s	Cooling water quantity:	n/a
Moment of inertia (I):	130 kgm²	Weight:	6500 Kg	Losses (environment):	134 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	95,91	96,1	96	95,5	92,7
Power factor 0.9	96,38	96,55	96,4	95,7	92,85
Power factor 1.0	96,85	97	96,8	95,9	93

Reactances and time constants

	unsaturated	saturated			unsaturated	saturated						
x_d	2.20	1.98	p.u.	x_q	1.10	1.08	p.u.	$T_{d0'}$	3.87 s	$T_{d0''}$	0.03959	s
$x_{d'}$	0.287	0.287	p.u.	$x_{q'}$	1.10	1.08	p.u.	$T_{d'}$	0.50 s	$T_{q0'}$	0.4	s
$x_{d''}$	0.160	0.145	p.u.	$x_{q''}$	0.160	0.160	p.u.	$T_{d''}$	0.02 s	$T_{q0''}$	0.275	s
x_2	0.167	0.152	p.u.	x_0	0.048	0.044	p.u.	T_a	0.055 s	$T_{q'}$	0.4	s
x_{1s}	n.a.	0.087	p.u.							$T_{q''}$	0.04	s

Short circuit ratio saturated: 0.51 Z_n 0.056 Ohm

Short circuit data:

Initial short circuit current (3-phase):	$I_{k''}$	34342 A	
Max. peak current (3-phase):	I_S	87420 A	
Sustained short circuit current:	I_k	14939 A	Minimum 3 x rated current for max.10 s
Initial short circuit torque:	M_{k2}	196.9 kNm	
	M_{k3}	118.1 kNm	
Max. faulty synchron moment:	M_f	423.3 kNm	
Rated kVA torque:	M_{SN}	21.97 kNm	
Rated torque	M_N	17.58 kNm	
Shaft torque	MSh	18.29 kNm	

Load application:

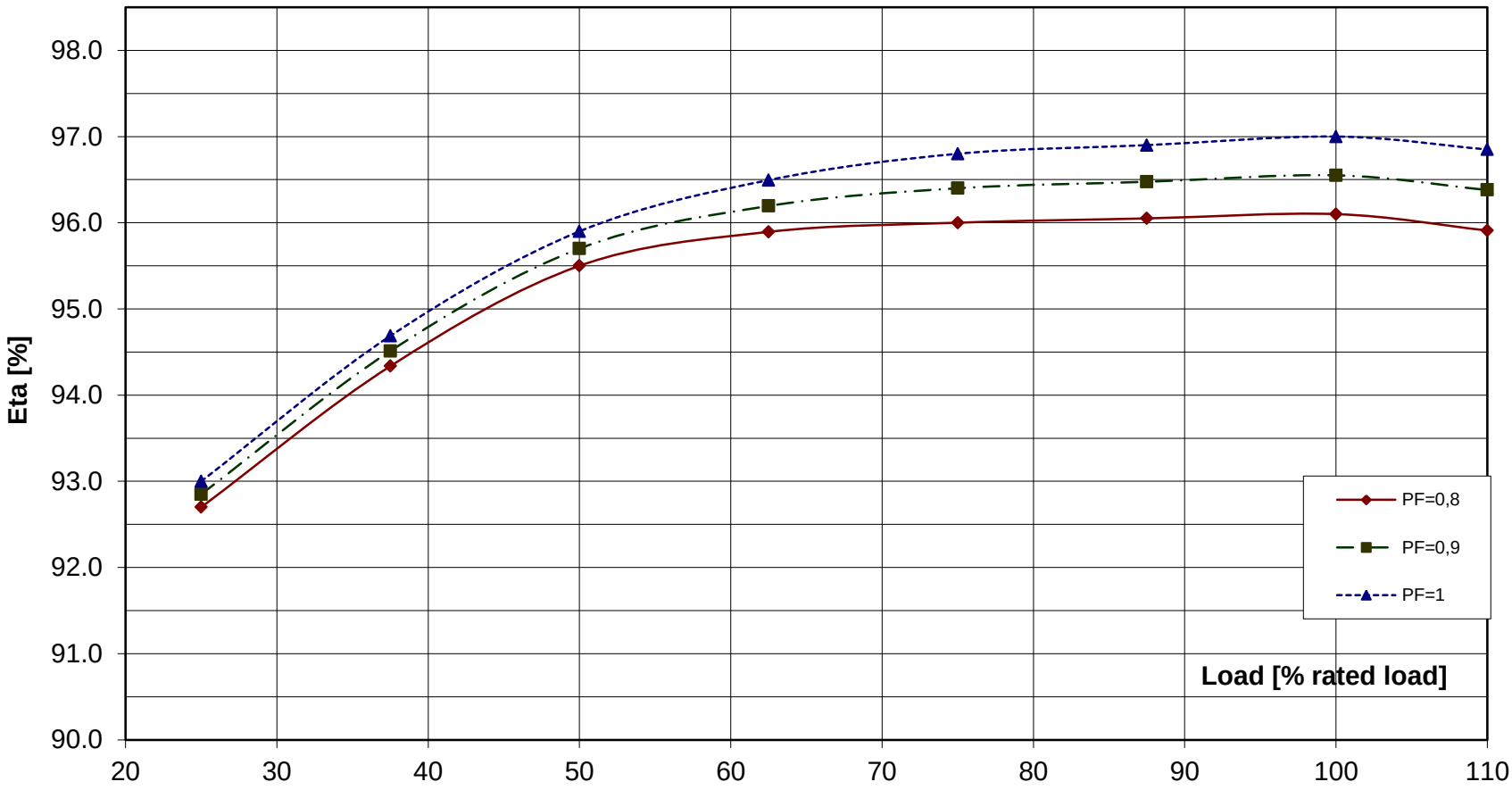
max. load application: 2164 kVA(corresponds to 52,27 % from 4140 kVA)	Power: 4140 kVA
for Power factor 0.4	Power factor: 0.8
15% transient voltage drop	transient voltage drop: -22.3 %

Remarks:

AvK	Technisches Datenblatt - Diagramme Technical data sheet - Diagrams	ING-FCD-0112

Alternator :	**DSG 99 K1/4**			
Rated output [kVA]	4140	Rated power factor:	0.8	Rated voltage [kV]: 0.48
Rated frequency [Hz]	60	Rated speed [rpm]	1800	

Wirkungsgrad-Kennlinie - Efficiency Curve



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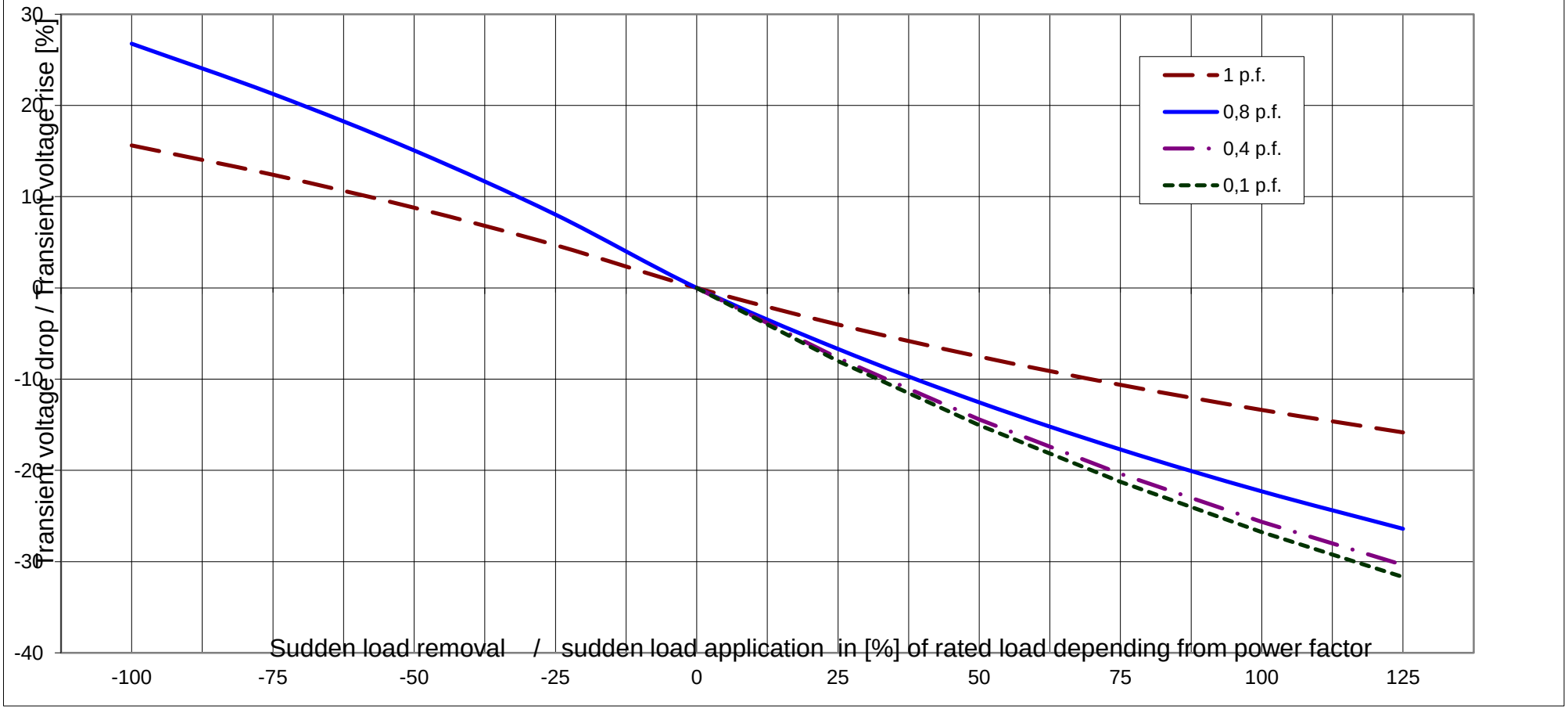
Rated output [kVA]	4140	Rated power factor:	0.8	Rated voltage [kV]: 0.48	
Rated frequency [Hz]	60	Rated speed [rpm]	1800		

Transient Voltage rise or drop for sudden load removal or application



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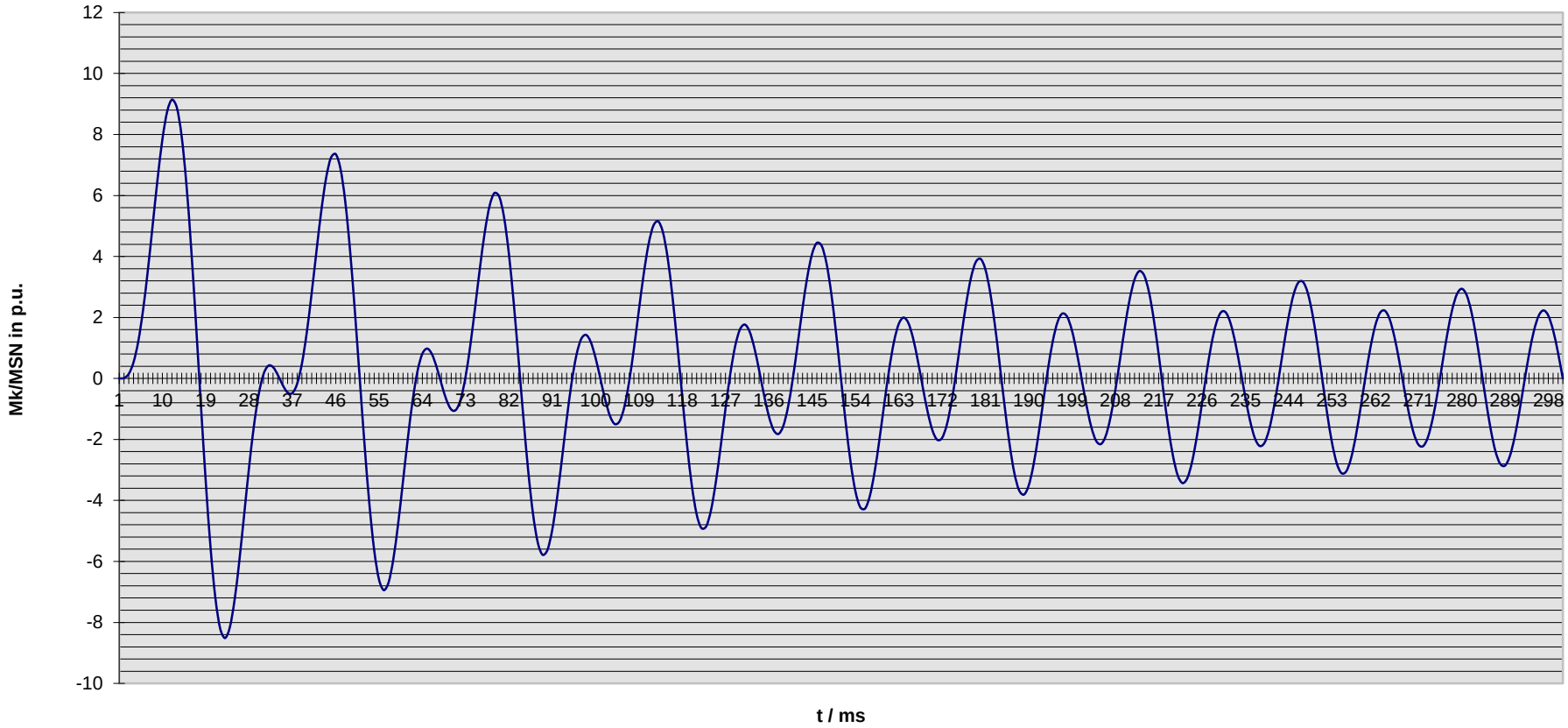
Rated output [kVA]	4140	Rated power factor:	0.8	Rated voltage [kV]: 0.48
Rated frequency [Hz]	60	Rated speed [rpm]	1800	MSN related to kVA: 21.96 KNm

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



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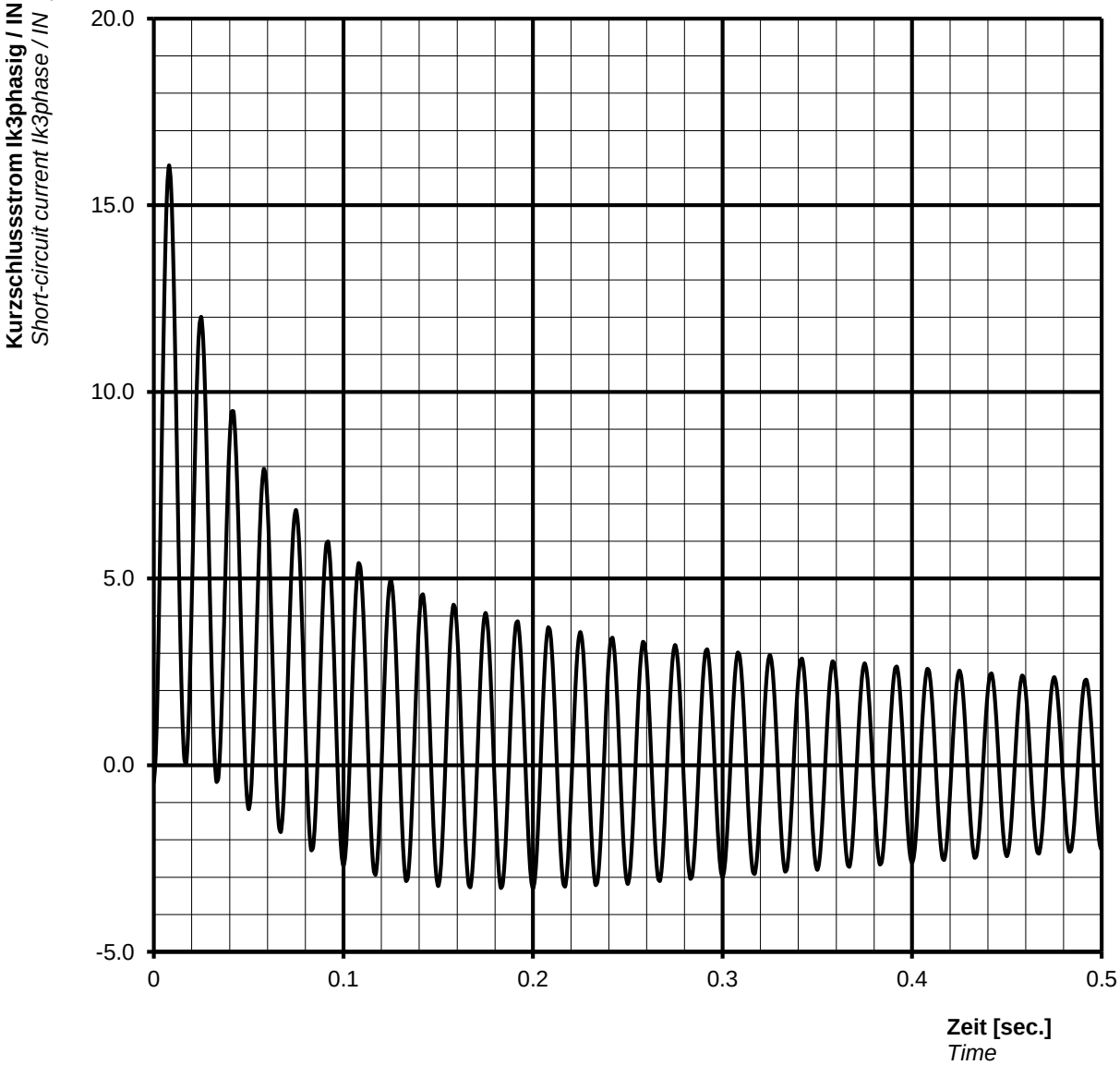
Nenndaten / ***nominal data*** **DSG 99 K1/4**

Leistung S_N: *Rating*	**4140** kVA	cos φ: *p.f.*	**0.80**
Spannung U_N: *Voltage*	**0.48** kV	Strom I_N: *Current*	**4980** A
Frequenz f: *Frequency*	**60** Hz	Drehzahl n: *Speed*	**1,800** min^{-1}
Schutzart *Protection*	**IP23**		

Stosskurzschluss-Strom, 3-phasig, asymmetrisch /
Sudden short circuit current, 3-phase, asymmetrical



Notizen / **remarks:**

Maximum asymmetric peak value I_{speak}= **80022 A** **or** **16.07 p.u.**

Alle Angaben gemäß VDE 0530, IEC600 34 — *All data according VDE 0530, IEC600 34*

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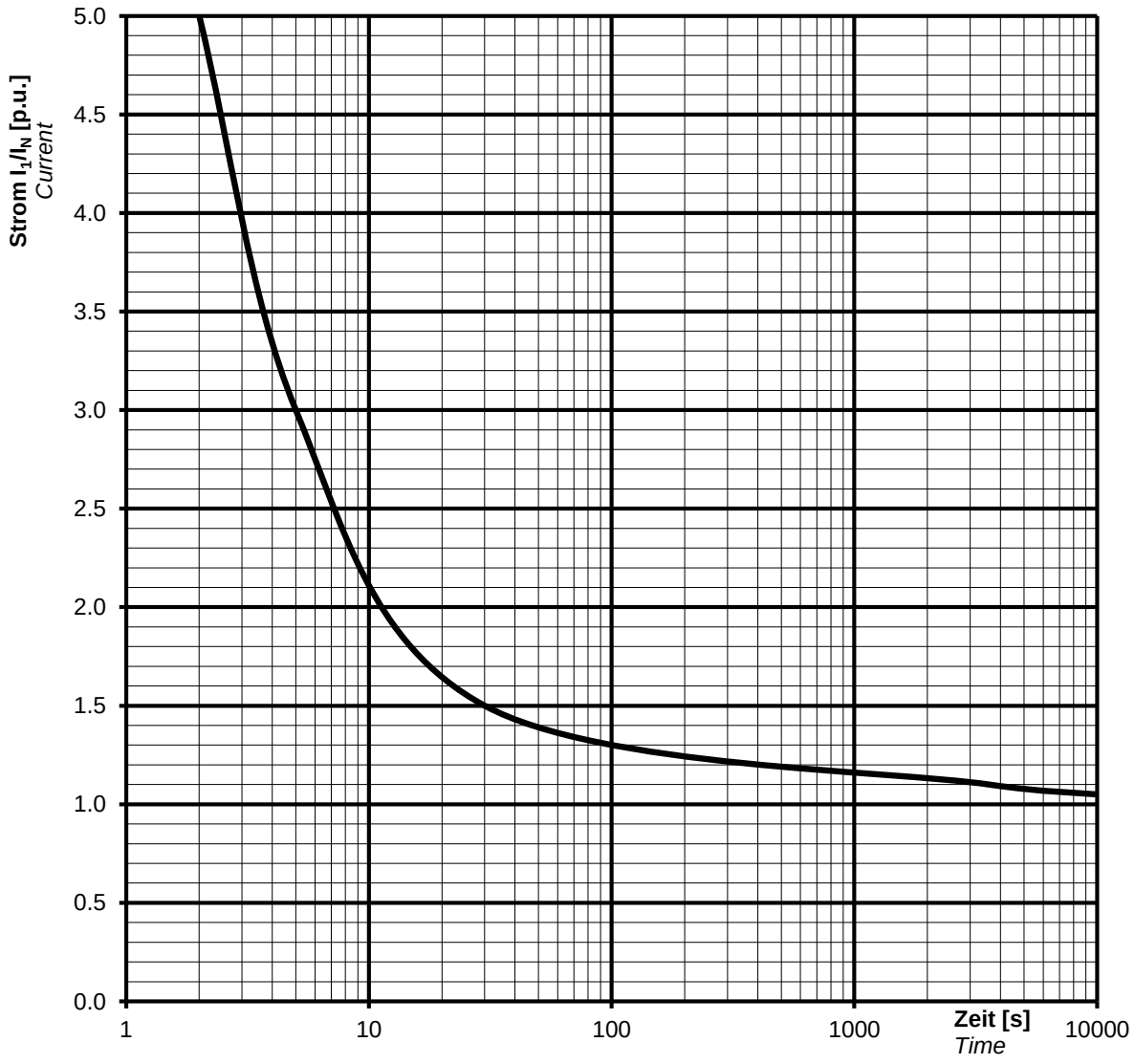
Nenndaten / ***nominal data*** **DSG 99 K1/4**

Leistung S_N: *Rating*	**4140** kVA	cos φ: *p.f.*	**0.80**
Spannung U_N: *Voltage*	**0.48** kV	Strom I_N: *Current*	**4980** A
Frequenz f: *Frequency*	**60** Hz	Drehzahl n: *Speed*	**1800** min^{-1}
Schutzart *Protection*	**IP23**		

Überlast Kennlinie
Overload capability



Notizen / **remarks:**

Strom / Zeit Kriterien:	**$(I / I_N)^2 * t$ =45s**
Current/time characteristics:	**1,5*I_N for 30 s**
	1,1*I_N for 1 h in 6h

Alle Angaben gemäß VDE 0530, IEC600 34 ***All data according VDE 0530, IEC600 34***

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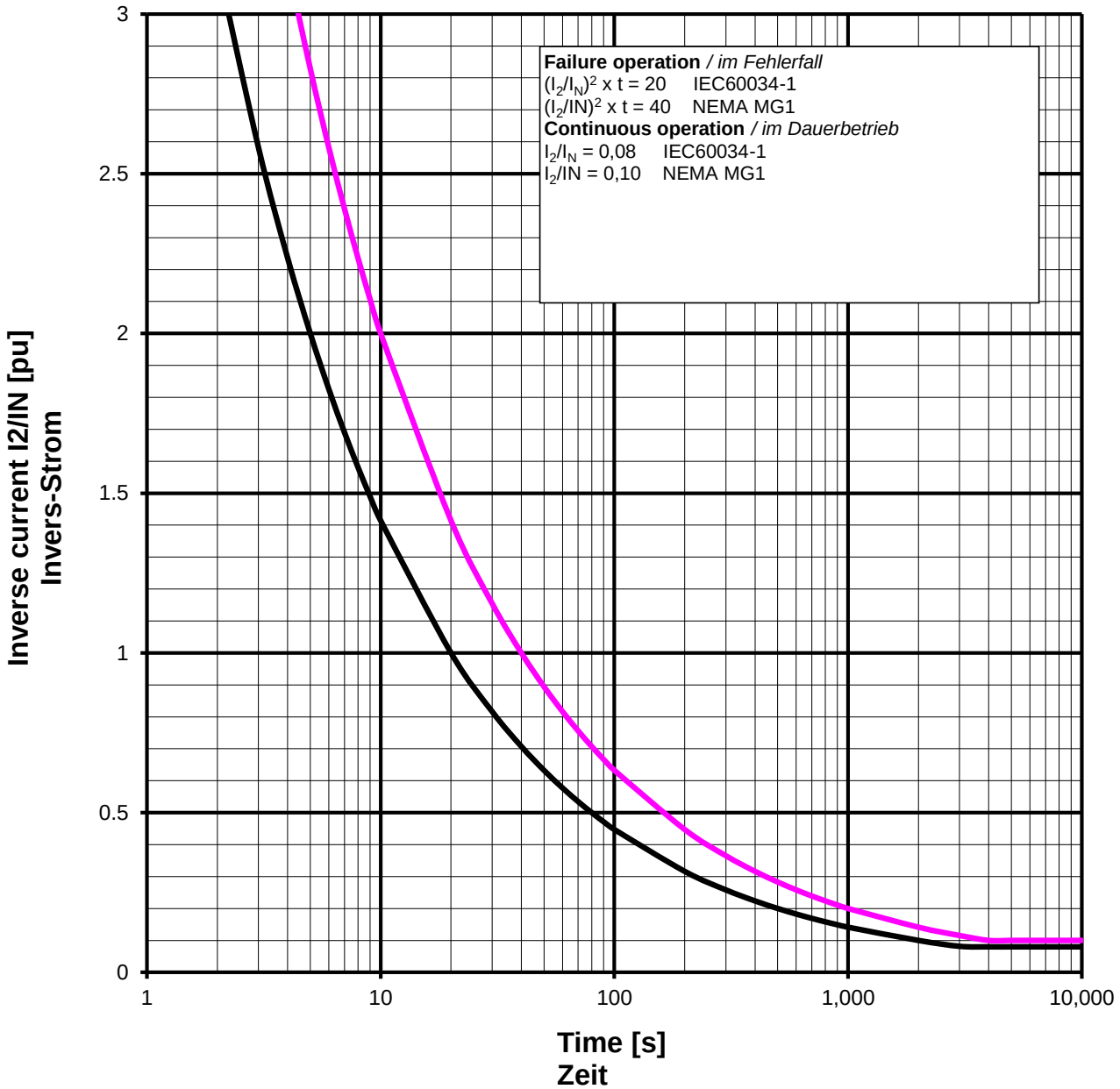
Nenndaten / *nominal data* **DSG 99 K1/4**

Rating S_N: *Bemessungsleistung*	**4140** kVA	*p.f.* Leistungsfaktor cos φ:	**0.80**
Nominal voltage U_N: *Bemessungsspannung*	**0.48** kV	Nominal current I_N: *Bemessungsstrom*	**4980** A
Frequency f_N: *Frequenz*	**60** Hz	Speed n: *Drehzahl*	**1800** min^{-1}
Protection: *Schutzart*	**IP23**		

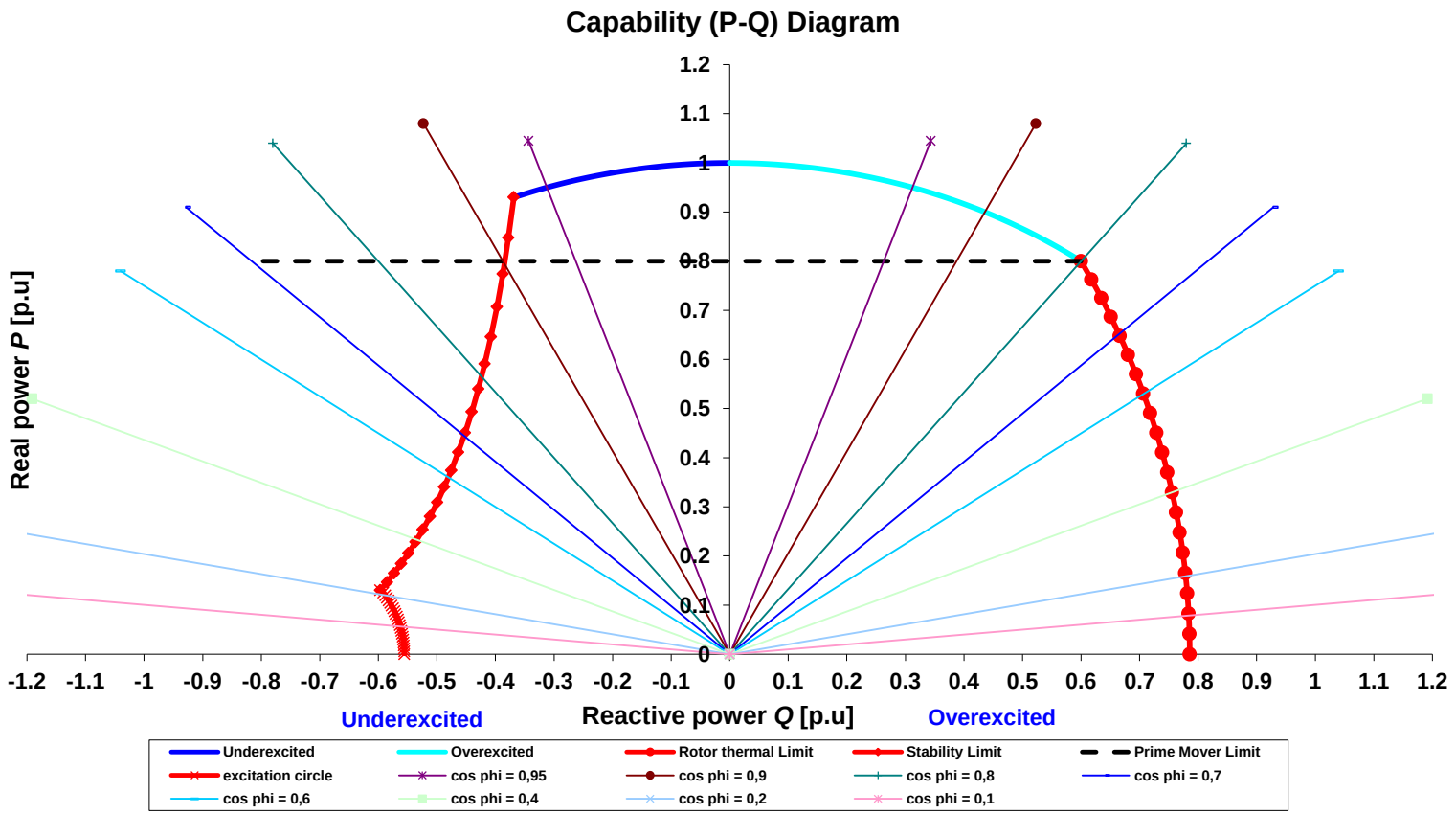
Inverse current or unbalanced negative sequence current



Remarks / Notizen:

All data according IEC 60034-1, NEMA MG1

AvK	Technische Daten selbstregelnden Drehstrom-Synchrongenerator technical data for self regulating three phase alternator					ING-FCD-0112
TYPE	DSG 99 K1/4	Projekt:		Order Nr.:		



Cummins Generator Technologies		Datum / *date* :	
		03/10/2013	

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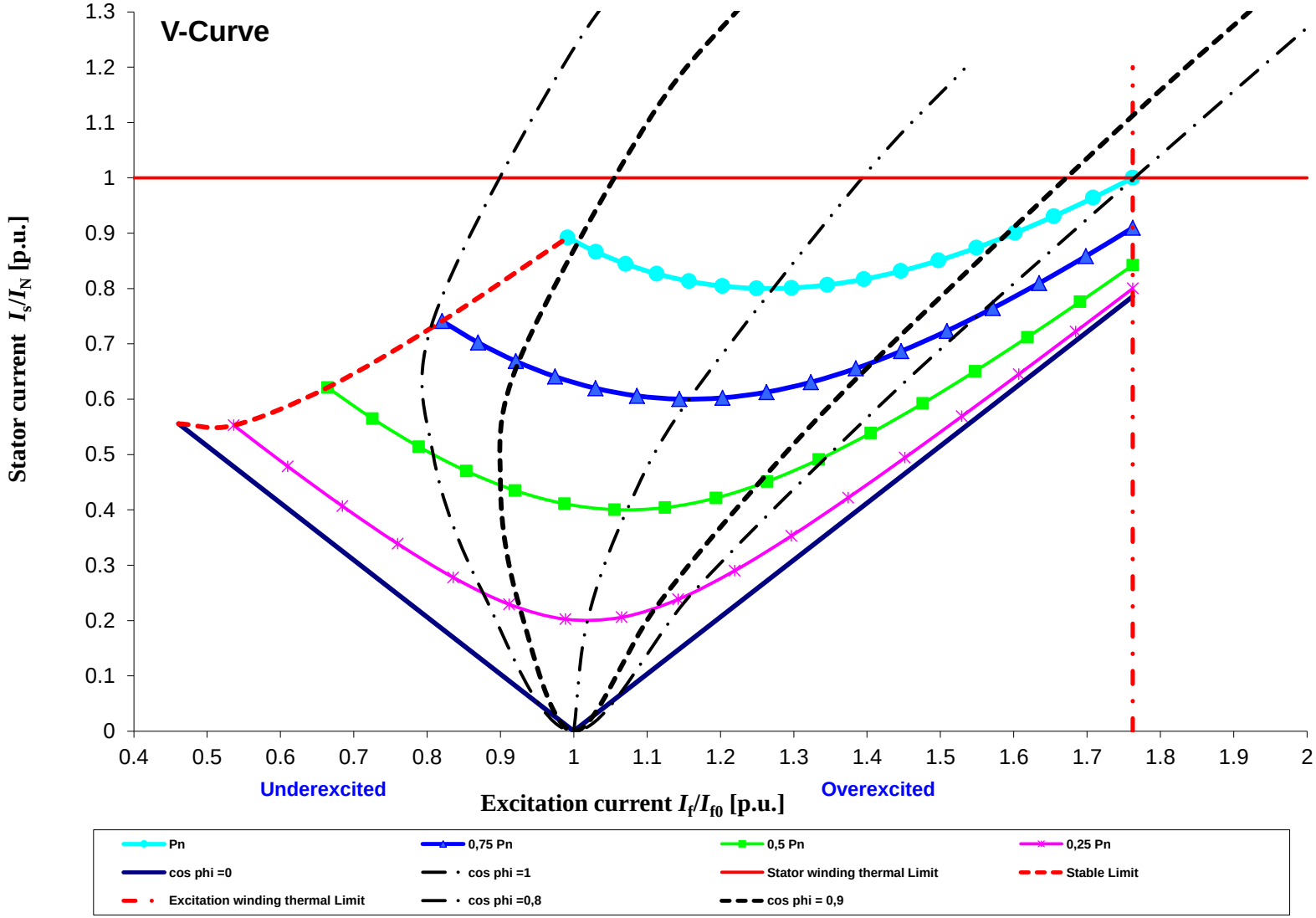

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