

**Technical Data Sheet for AvK-Alternators**

FM 7.3-5

Date:	09/10/13	Customer:	GENERIC DATASHEET only
Project No.:		AvK Reference:	dig142d_4_60_13800

Object data:

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

Generator data:

Generator:	DIG 142 d/4	Poles:	4	Standards:	IEC 60034
Rated power:	4450 kVA	3560 kWe	3677 kWm		
Power factor:	0.80				
Power at pf 1,0	3584 kVA	3584 kWe	3677 kWm		
Rated voltage:	13.8 kV				
Speed:	1800 1/min				
Frequency:	60 Hz			Voltage range / frequency range:	
Rated current:	186.2 A			Zone A according IEC 60034-1 (dU = +/-5%, df = +/-2%)	

Winding pitch:	ca. 5/6
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Insulation class:	Stator: Class F	Rotor: Class F	Temperature rise:	F
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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:	

Moment of inertia (I):	165 kgm ²	Cooling air vol.:	5.0 m ³ /s	Cooling water quantity:	n/a
		Weight:	9850 Kg	Losses (environment):	117 KW
				Losses (cooling):	n/a

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	96,65	96,81	96,76	96,24	94,05
Power factor 0.9	97	97,15	97,01	96,41	94,18
Power factor 1.0	97,35	97,48	97,26	96,57	94,3

Reactances and time constants

	unsaturated	saturated		unsaturated	saturated				
x_d	2.60	2.34 p.u.	x_q	1.30	1.27 p.u.	$T_{d0'}$	3.6 s	$T_{d0''}$	0.02788 s
x_d'	0.237	0.237 p.u.	x_q'	1.30	1.27 p.u.	$T_{d'}$	0.33 s	$T_{q0'}$	0.4 s
x_d''	0.187	0.170 p.u.	x_q''	0.187	0.187 p.u.	$T_{d''}$	0.02 s	$T_{q0''}$	0.27807 s
x_2	0.196	0.178 p.u.	x_0	0.056	0.051 p.u.	T_a	0.12 s	$T_{q'}$	0.4 s
x_{1s}	n.a.	0.102 p.u.						$T_{q''}$	0.04 s

Short circuit ratio saturated: 0.43	Z_n 42.796 Ohm
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Short circuit data:

Initial short circuit current (3-phase):	I_k''	1095 A	
Max. peak current (3-phase):	I_s	2787 A	
Sustained short circuit current:	I_k	559 A	Minimum 3 x rated current for max.10 s
Initial short circuit torque:	M_{k2}	180.5 kNm	
	M_{k3}	108.3 kNm	
Max. faulty synchron moment:	M_f	388.1 kNm	
Rated kVA torque:	M_{SN}	23.61 kNm	
Rated torque	M_N	18.89 kNm	
Shaft torque	MSh	19.51 kNm	

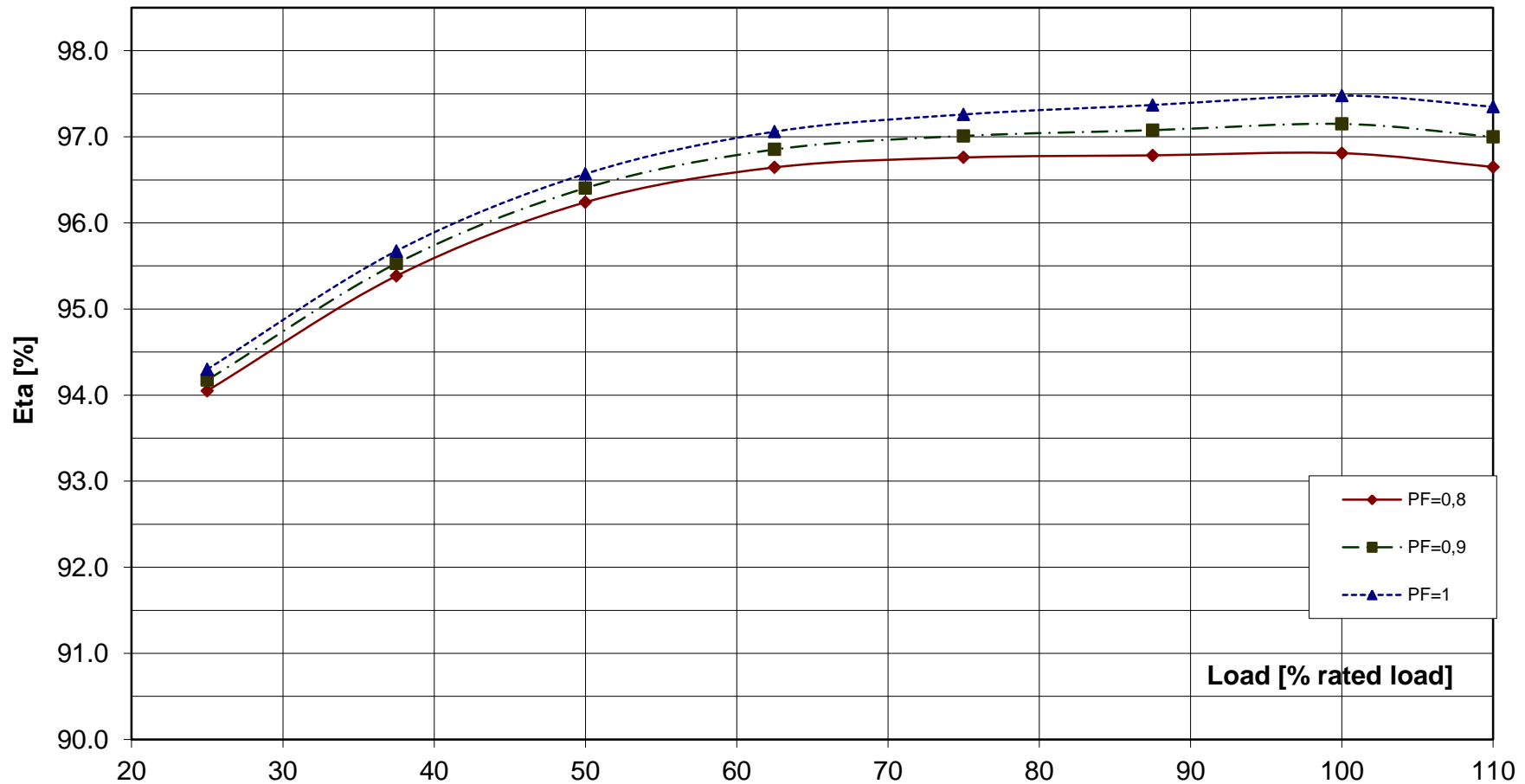
Load application:

max. load application: 2817 kVA (corresponds to 63,29 % from 4450 kVA) for Power factor 0.4 15% transient voltage drop	Power: 4450 kVA Power factor: 0.8 transient voltage drop: -19.2 %
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Remarks:

Alternator :	DIG 142 d/4		
Rated output [kVA]	4450	Rated power factor:	0.8
Rated frequency [Hz]	60	Rated speed [rpm]	1800
			Rated voltage [kV]: 13.8

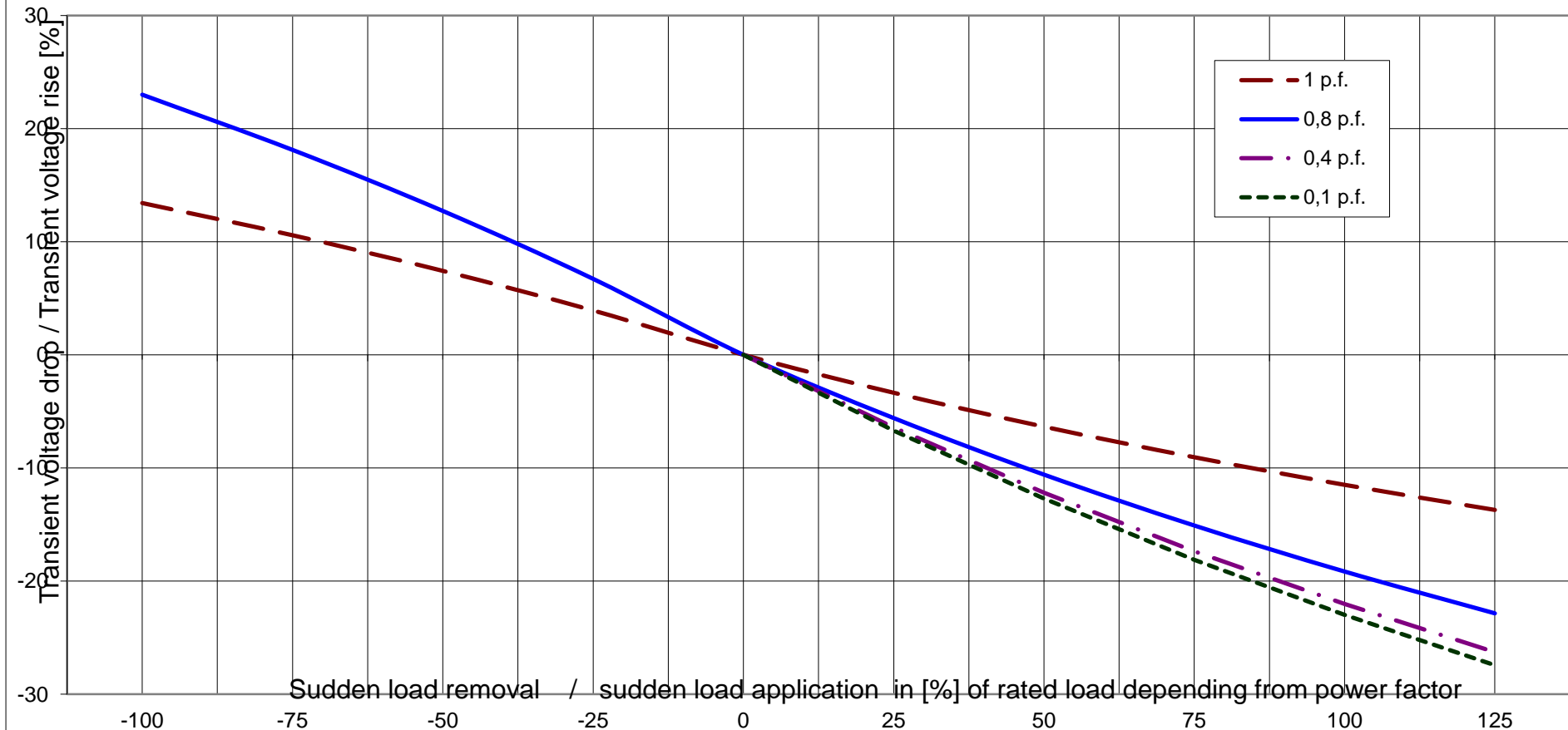
Wirkungsgrad-Kennlinie - Efficiency Curve



Alternator : DIG 142 d/4

Rated output [kVA]	4450	Rated power factor:	0.8	Rated voltage [kV]:	13.8
Rated frequency [Hz]	60	Rated speed [rpm]	1800		

Transient Voltage rise or drop for sudden load removal or application

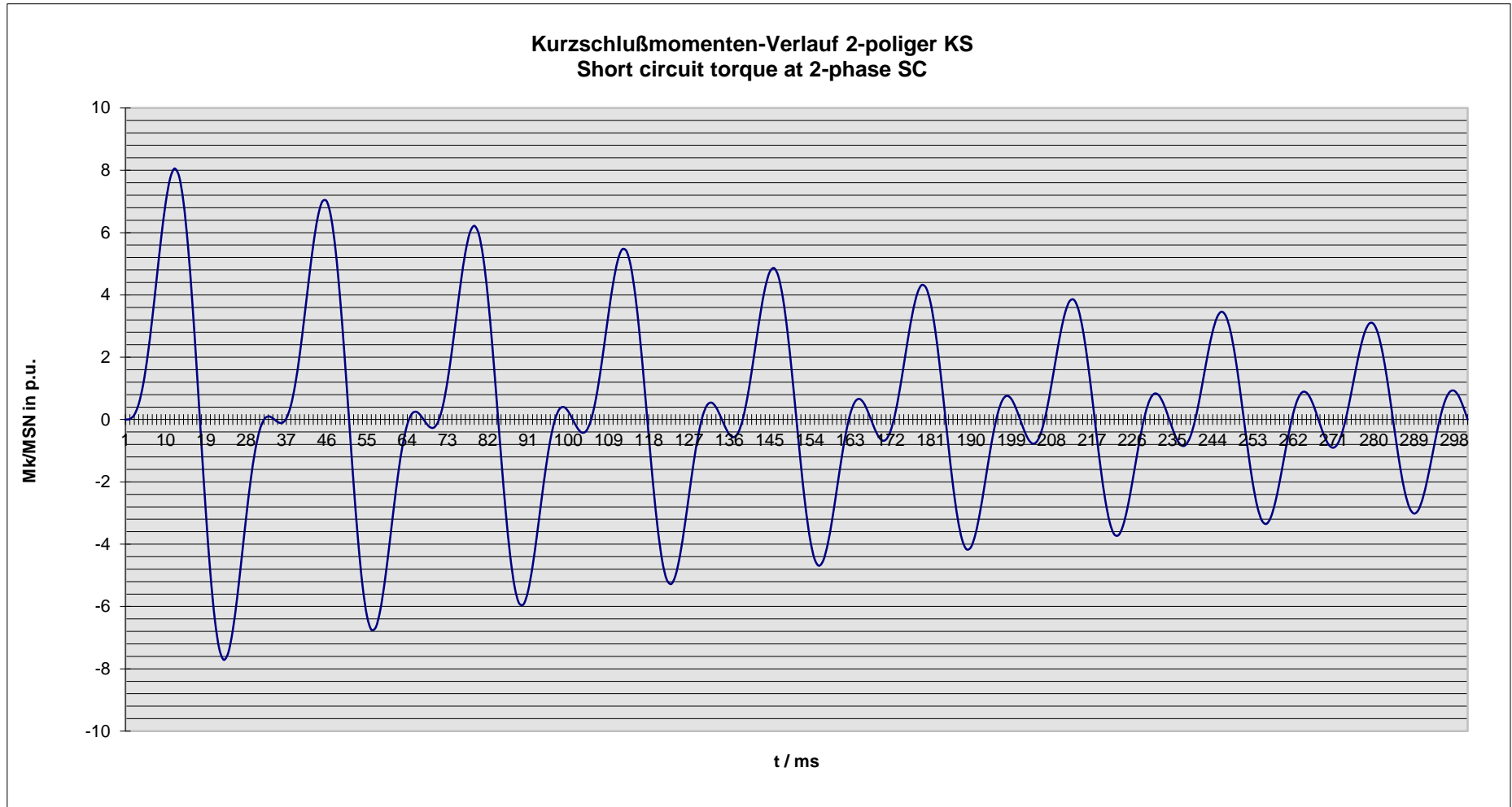




Technisches Datenblatt - Diagramme
Technical data sheet - Diagrams

ING-FCD-0112

Alternator :	DIG 142 d/4			
Rated output [kVA]	4450	Rated power factor:	0.8	Rated voltage [kV]: 13.8
Rated frequency [Hz]	60	Rated speed [rpm]	1800	MSN related to kVA: 23.61 KNm



Nenn Daten / nominal data

DIG 142 d/4

Leistung S_N : **4450** kVA

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

Rating

p.f.

Spannung U_N : **13.80** kV

Strom I_N : **186** A

Voltage

Current

Frequenz f : **60** Hz

Drehzahl n : **1,800** min⁻¹

Frequency

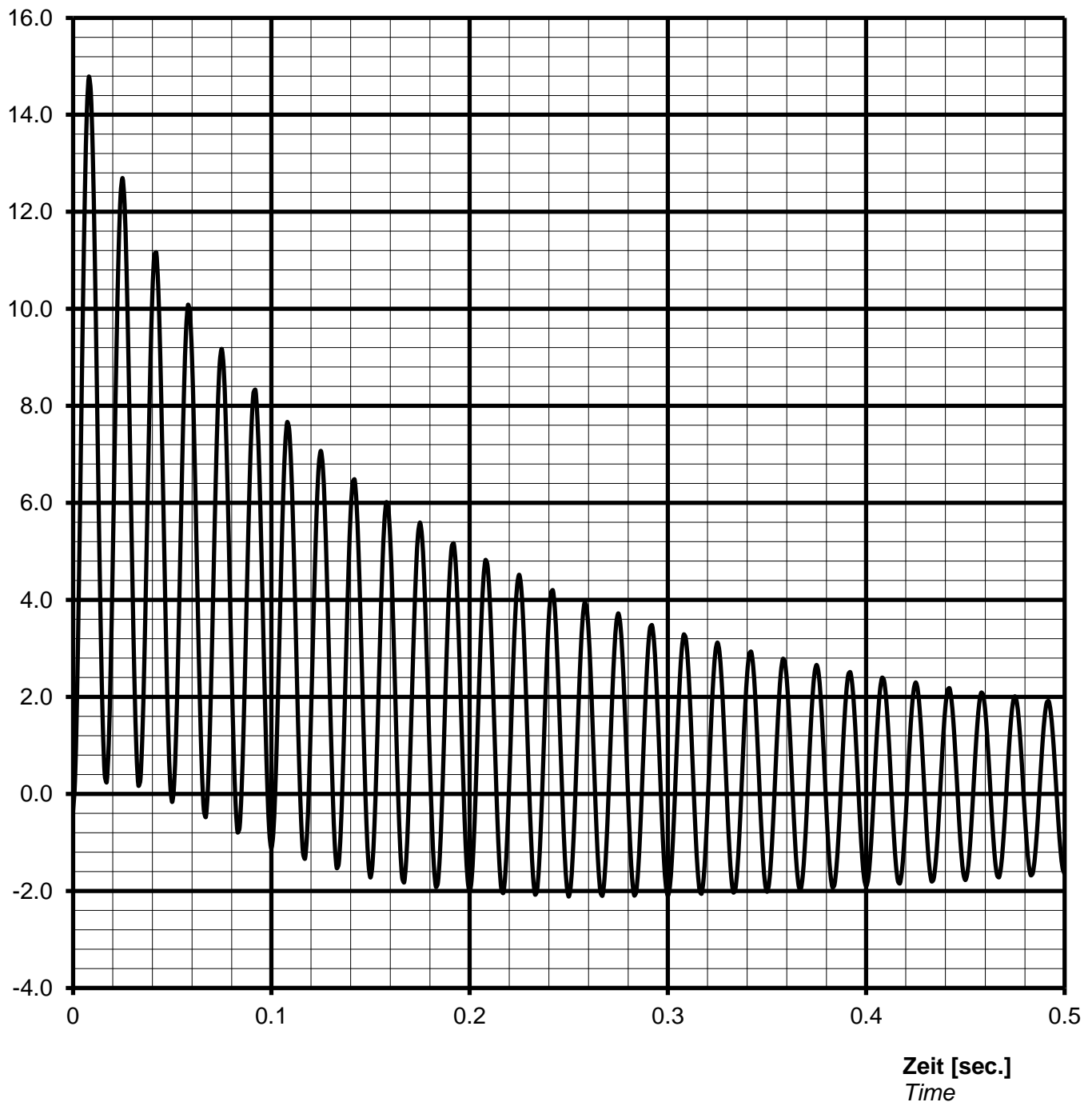
Speed

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

$I_{\text{peak}} =$ **2752 A** or **14.78 p.u.**

Nennwerten / nominal data

DIG 142 d/4

Leistung S_N : **4450** kVA

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

Rating

p.f.

Spannung U_N : **13.80** kV

Strom I_N : **186** A

Voltage

Current

Frequenz f: **60** Hz

Drehzahl n: **1800** min⁻¹

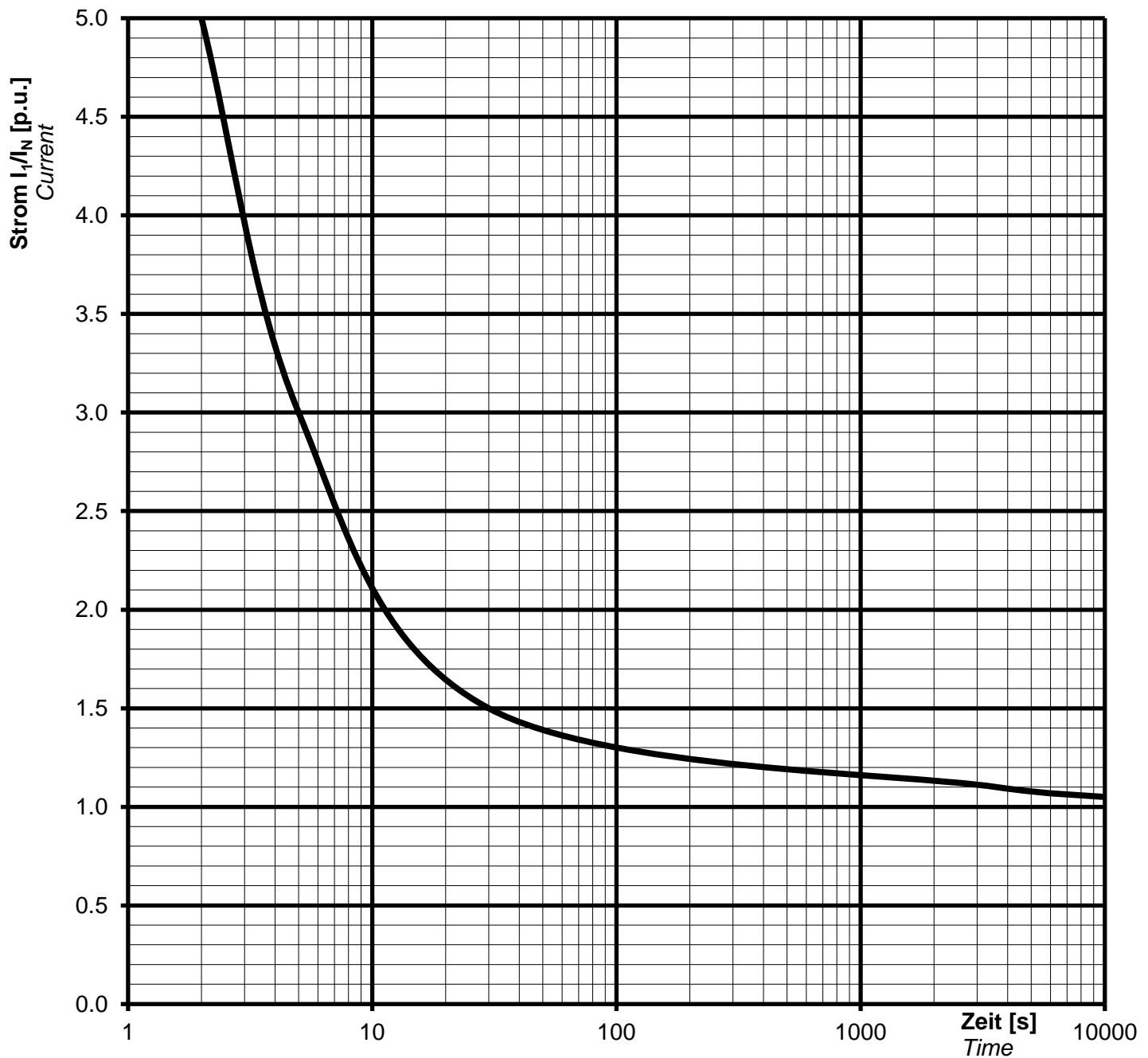
Frequency

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

DIG 142 d/4

Rating S_N : **4450 kVA**

p.f. **0.80**

Bemessungsleistung

Leistungsfaktor $\cos \varphi$:

Nominal voltage U_N : **13.80 kV**

Nominal current I_N : **186 A**

Bemessungsspannung

Bemessungsstrom

Frequency f_N : **60 Hz**

Speed n : **1800 min⁻¹**

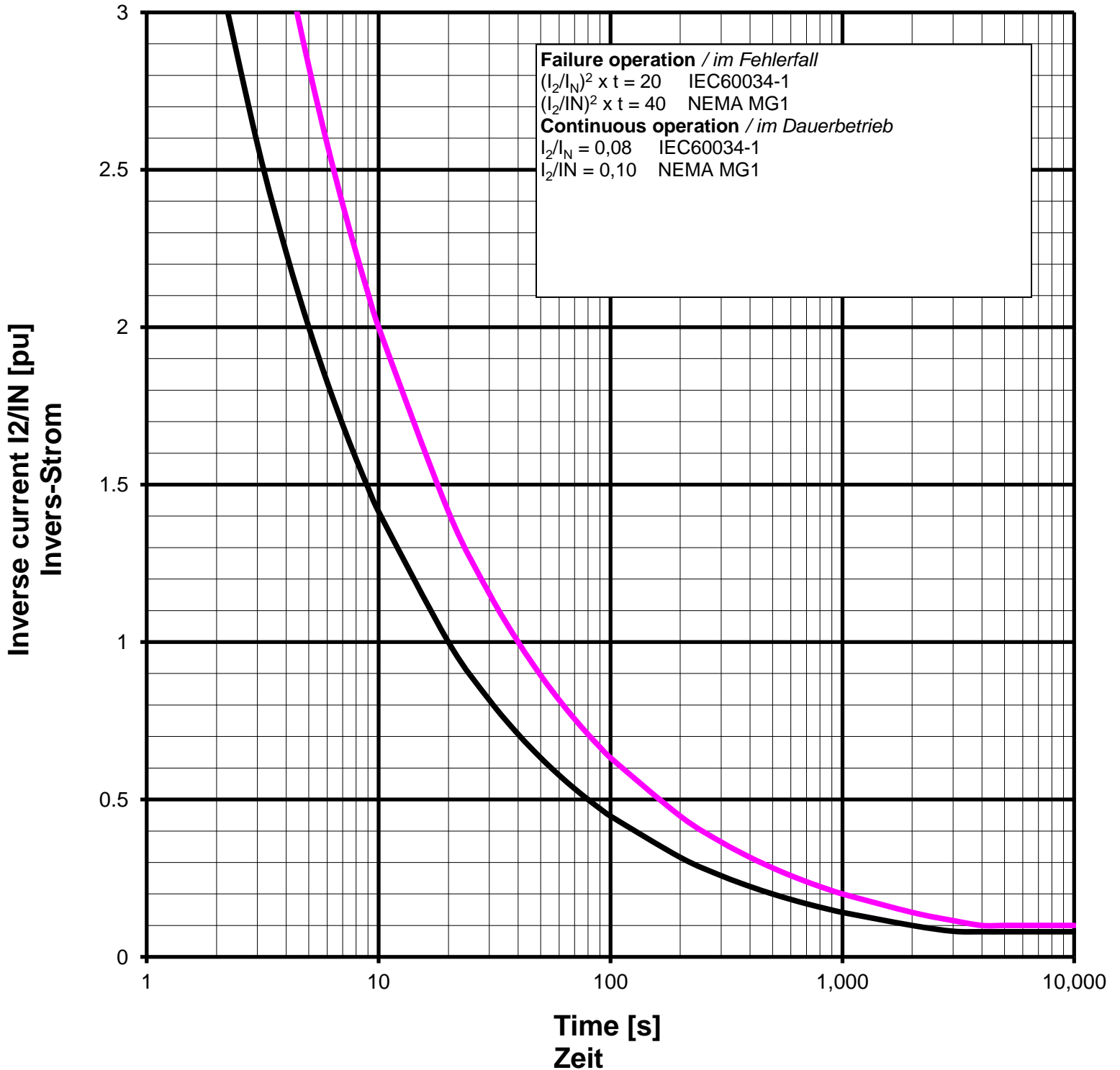
Frequenz

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

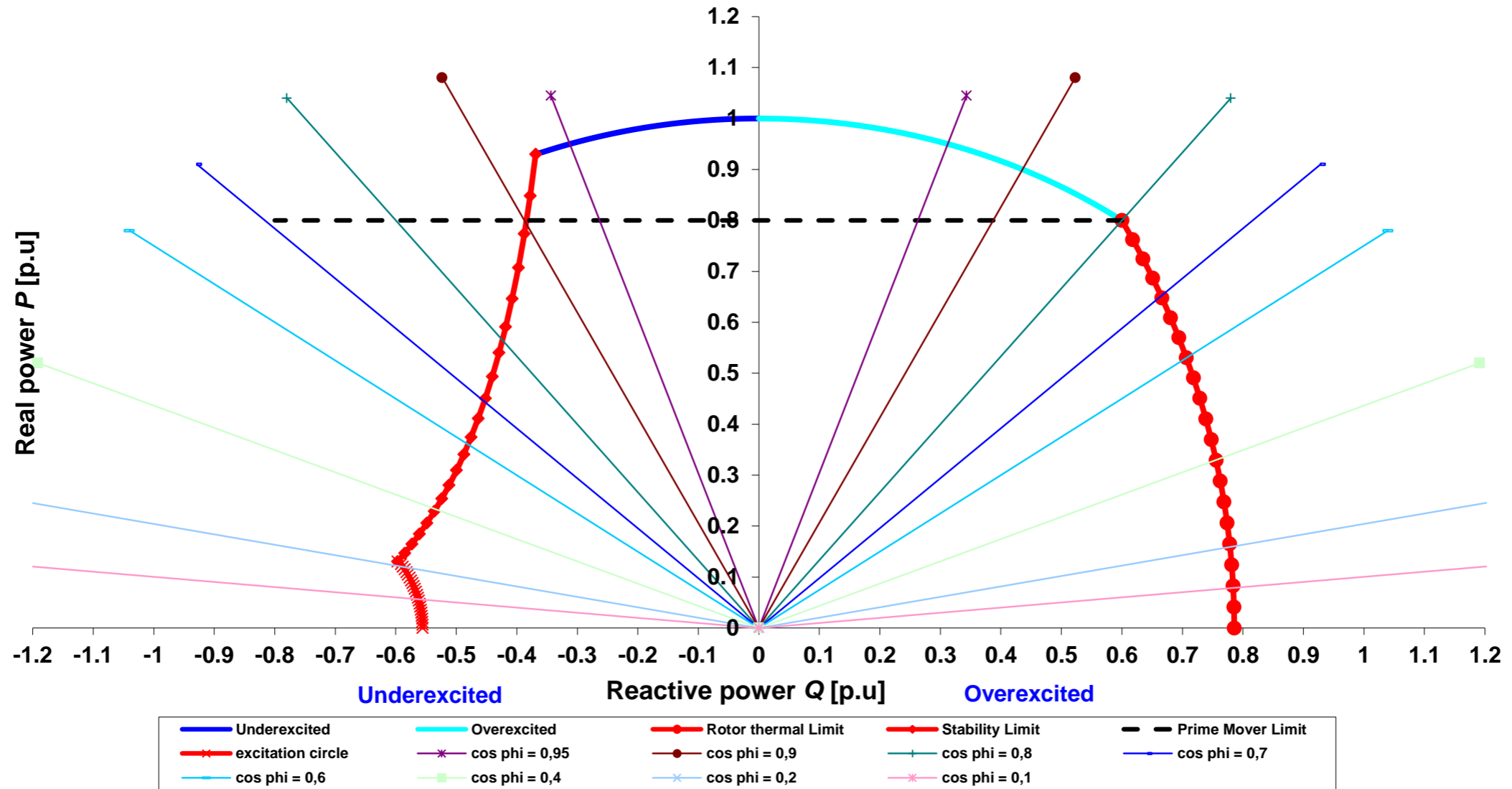
TYPE

DIG 142 d/4

Projekt:

Order Nr.:

Capability (P-Q) Diagram

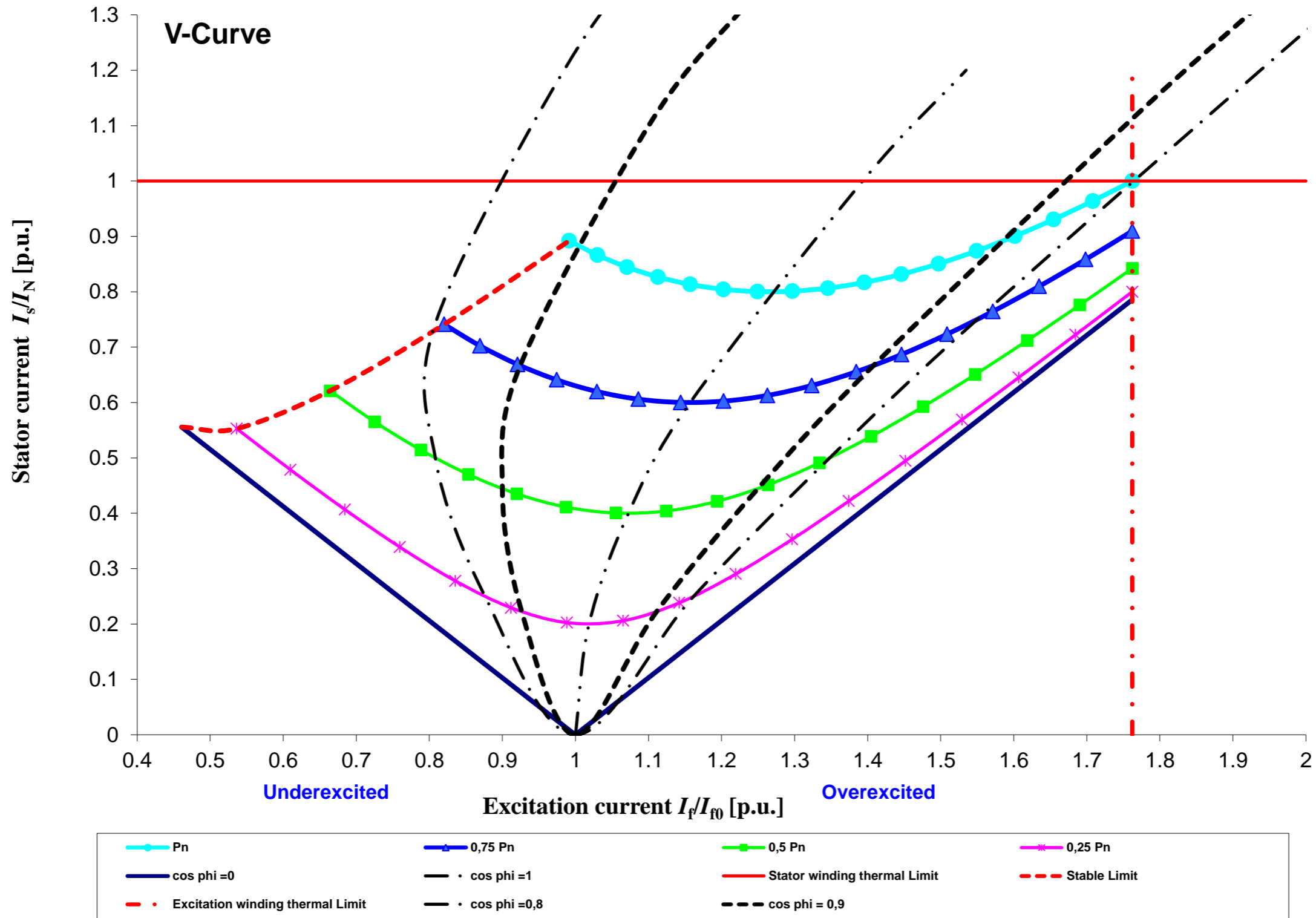


Cummins Generator Technologies

Datum / date:

17/10/2013

TYPE	DIG 142 d/4	Projekt:		Order Nr.:	
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Cummins Generator Technologies	Datum / date:	
	17/10/2013	