



Technical Data Sheet for AvK-Alternators

FM 7.3-5

Date:	09/10/13	Customer:	GENERIC DATASHEET only
Project No.:		AvK Reference:	dig142e_4_50_11000

Object data:

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

Generator data:

Generator:	DIG 142 e/4	Poles:	4	Standards:	IEC 60034
Rated power:	4450 kVA	3560 kWe	3670 kWm		
Power factor:	0.80				
Power at pf 1,0	3584 kVA	3584 kWe	3670 kWm		
Rated voltage:	11 kV				
Speed:	1500 1/min				
Frequency:	50 Hz			Voltage range / frequency range:	
Rated current:	233.6 A			Zone A according IEC 60034-1 (dU = +/-5%, df = +/-2%)	
Winding pitch:	ca. 5/6				
Insulation class:	Stator: Class F	Rotor: Class F		Temperature rise:	F
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.:	4.2 m³/s	Cooling water quantity:	n/a
Moment of inertia (I):	177 kgm²	Weight:	10250 Kg	Losses (environment):	110 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	96,85	97	97	96,7	95
Power factor 0.9	97,19	97,33	97,28	96,88	95,1
Power factor 1.0	97,53	97,65	97,55	97,05	95,2

Reactances and time constants

	unsaturated	saturated		unsaturated	saturated				
X_d	2.70	2.43 p.u.	X_q	1.35	1.32 p.u.	$T_{d0'}$	3.7 s	$T_{d0''}$	0.02814 s
X_d'	0.235	0.235 p.u.	X_q'	1.35	1.32 p.u.	$T_{d'}$	0.32 s	$T_{q0'}$	0.4 s
X_d''	0.184	0.167 p.u.	X_q''	0.184	0.184 p.u.	$T_{d''}$	0.02 s	$T_{q0''}$	0.29348 s
X_2	0.194	0.176 p.u.	X_0	0.055	0.050 p.u.	T_a	0.12 s	$T_{q'}$	0.4 s
X_{1s}	n.a.	0.100 p.u.						$T_{q''}$	0.04 s

Short circuit ratio saturated: 0.41	Z_n 27.191 Ohm
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Short circuit data:

Initial short circuit current (3-phase):	I_k''	1399 A	
Max. peak current (3-phase):	I_s	3561 A	
Sustained short circuit current:	I_k	701 A	Minimum 3 x rated current for max.10 s
Initial short circuit torque:	M_{k2}	220.5 kNm	
	M_{k3}	132.3 kNm	
Max. faulty synchron moment:	M_f	474.1 kNm	
Rated kVA torque:	M_{SN}	28.33 kNm	
Rated torque	M_N	22.66 kNm	
Shaft torque	M_{Sh}	23.36 kNm	

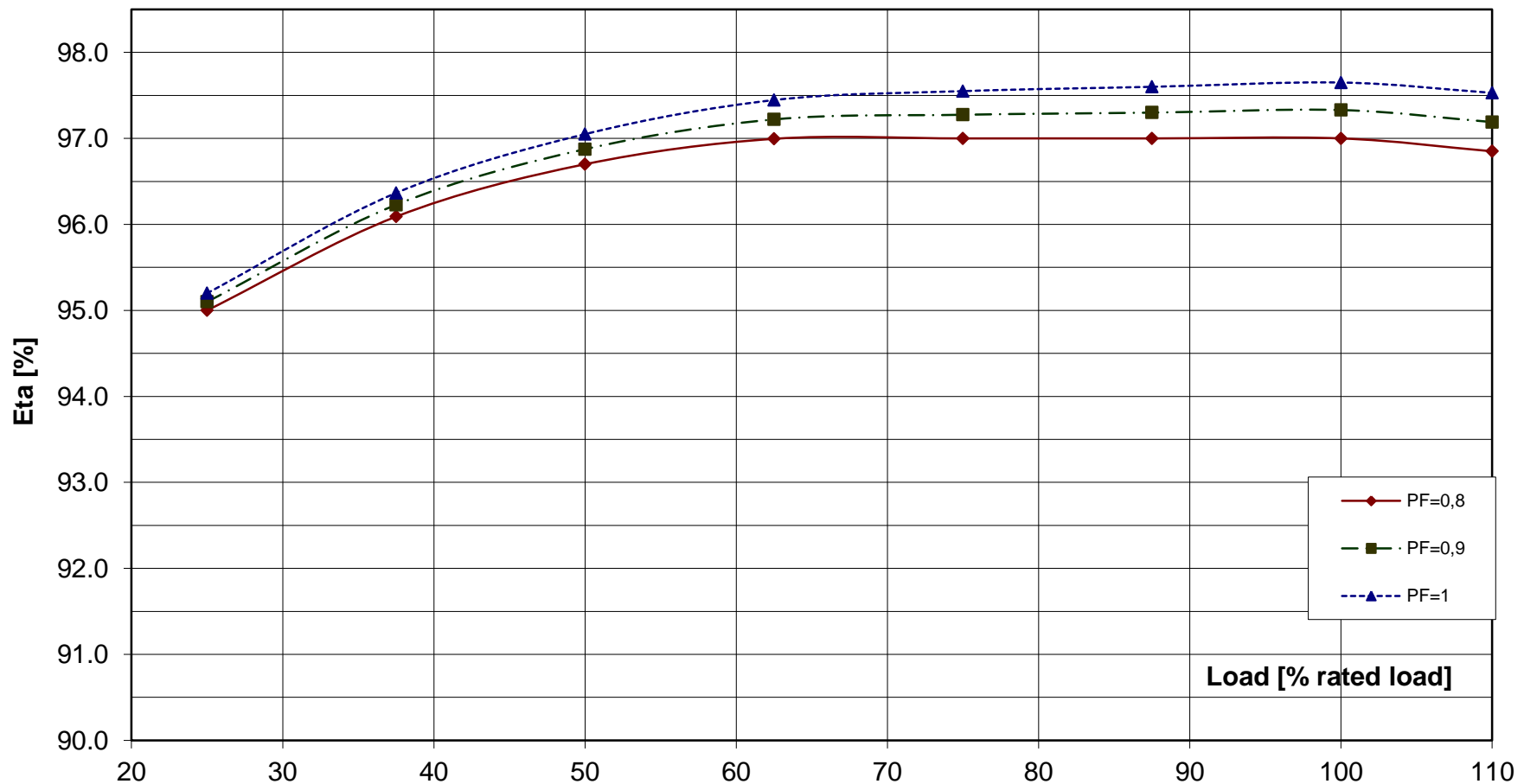
Load application:

max. load application: 2840 kVA (corresponds to 63,83 % from 4450 kVA) for Power factor 0.4 15% transient voltage drop	Power: 4450 kVA Power factor: 0.8 transient voltage drop: -19.0 %
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Remarks:

Alternator :	DIG 142 e/4			
Rated output [kVA]	4450	Rated power factor:	0.8	Rated voltage [kV]: 11
Rated frequency [Hz]	50	Rated speed [rpm]	1500	

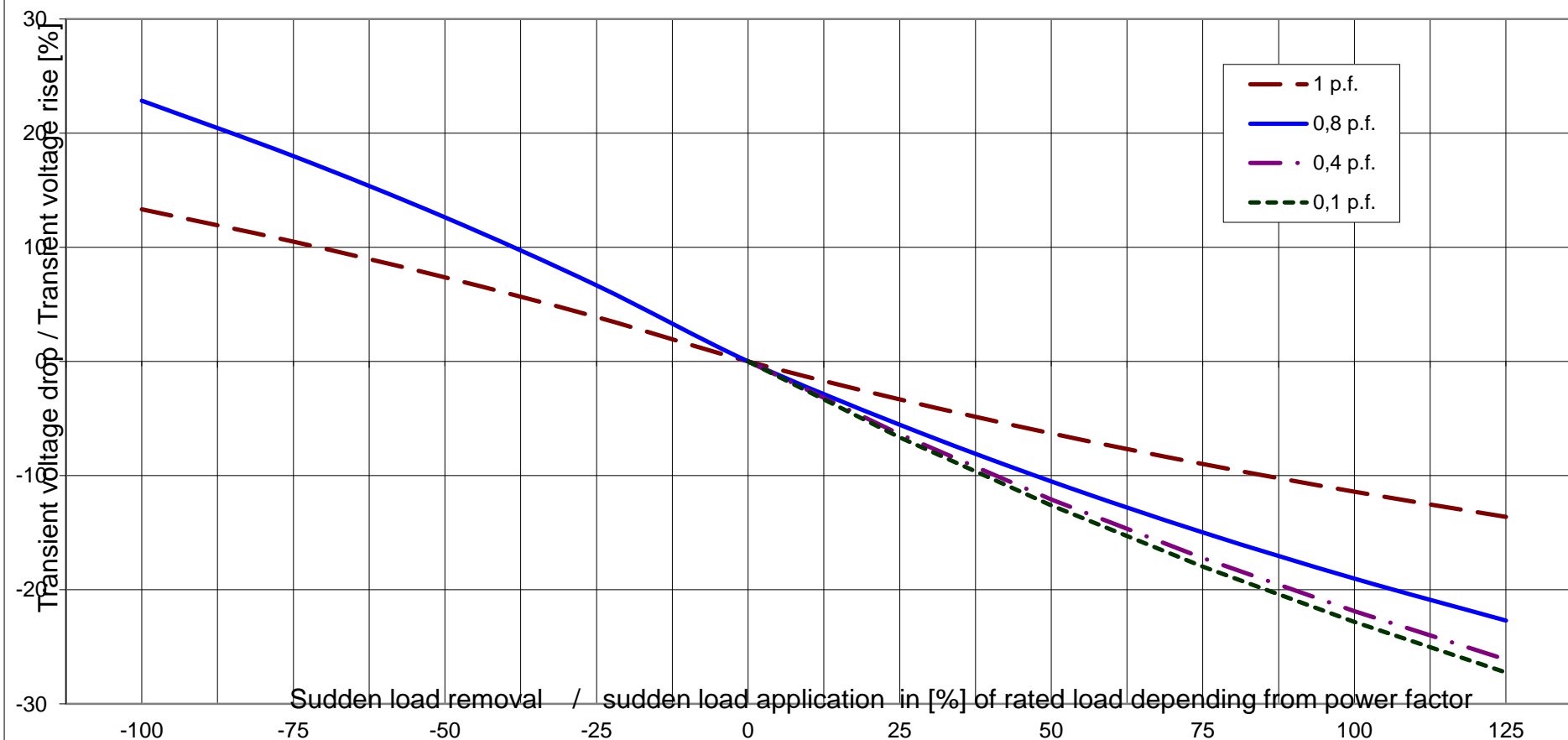
Wirkungsgrad-Kennlinie - Efficiency Curve



Alternator : DIG 142 e/4

Rated output [kVA]	4450	Rated power factor:	0.8	Rated voltage [kV]:	11
Rated frequency [Hz]	50	Rated speed [rpm]	1500		

Transient Voltage rise or drop for sudden load removal or application





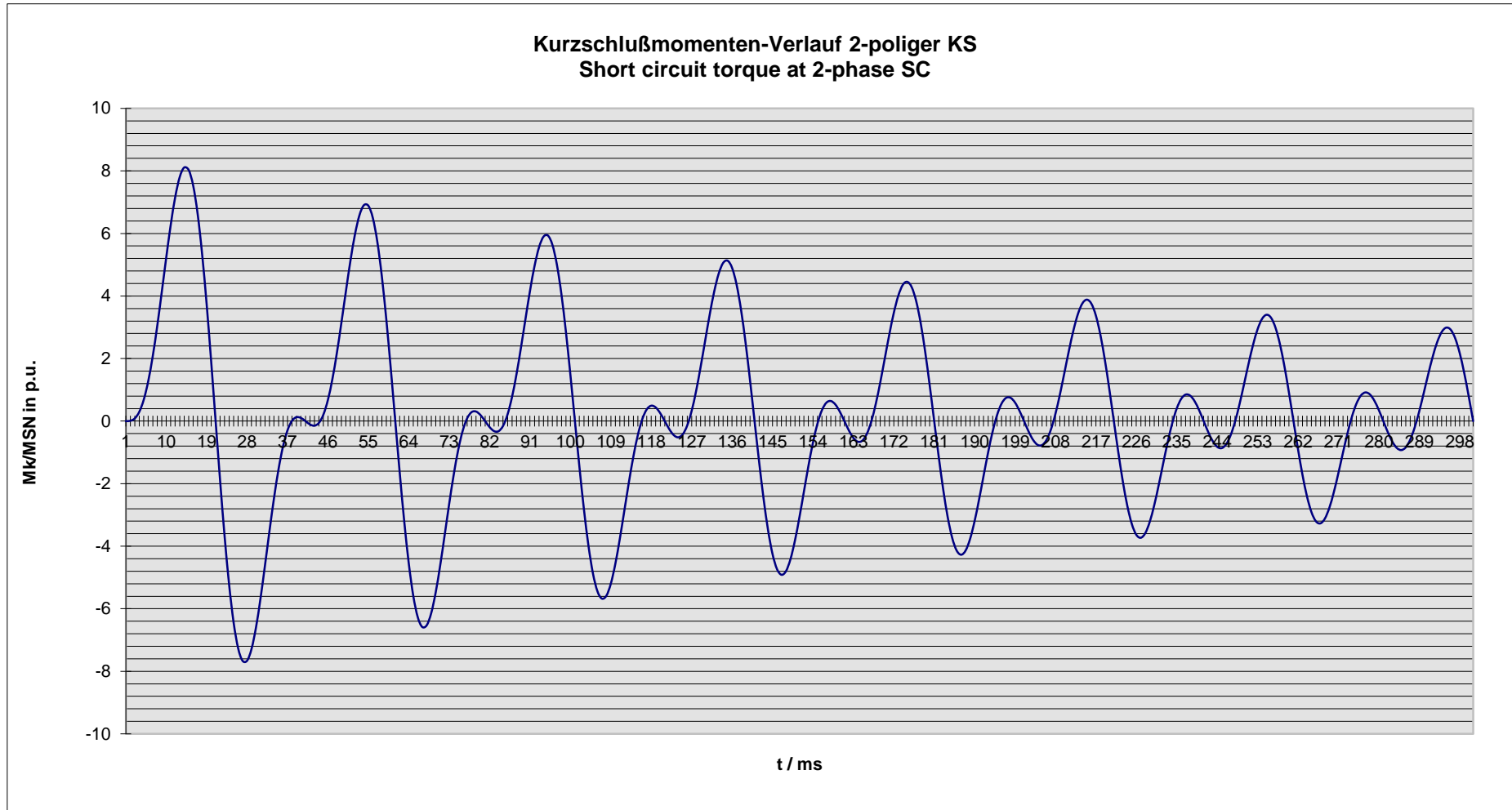
Technisches Datenblatt - Diagramme
Technical data sheet - Diagrams

ING-FCD-0112

Alternator : **DIG 142 e/4**

Rated output [kVA]	4450	Rated power factor:	0.8	Rated voltage [kV]:	11
Rated frequency [Hz]	50	Rated speed [rpm]	1500	MSN related to kVA:	28.33 KNm

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



Nenndaten / nominal data

DIG 142 e/4

Leistung S_N : **4450 kVA**

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

Rating

p.f.

Spannung U_N : **11.00 kV**

Strom I_N : **234 A**

Voltage

Current

Frequenz f : **50 Hz**

Drehzahl n : **1,500 min⁻¹**

Frequency

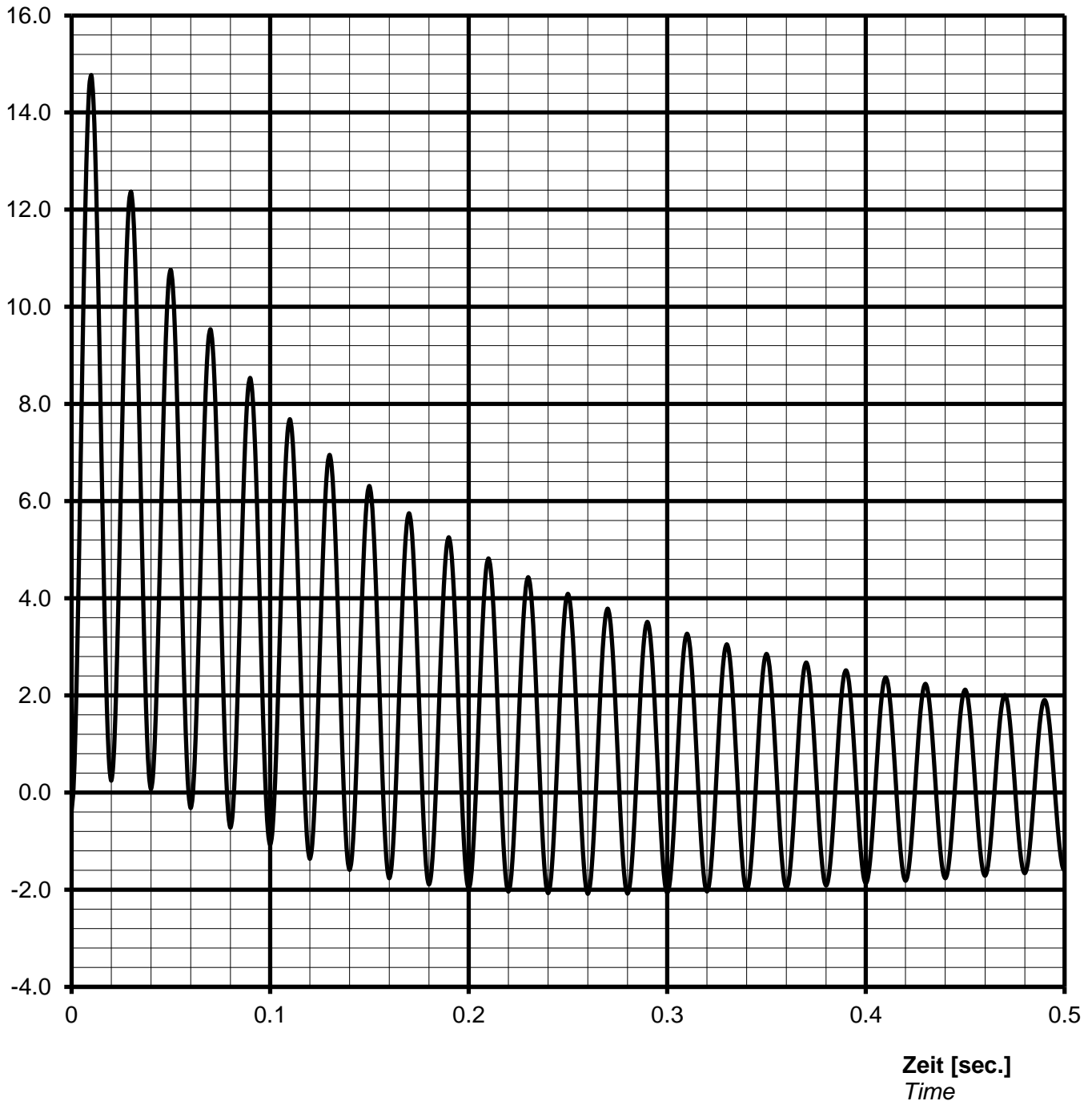
Speed

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 $I_{\text{peak}} = 3450 \text{ A}$ or 14.77 p.u.

Nennwerten / nominal data

DIG 142 e/4

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

Rating

p.f.

Spannung U_N : **11.00 kV**

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Frequenz f: **50 Hz**

Drehzahl n: **1500 min⁻¹**

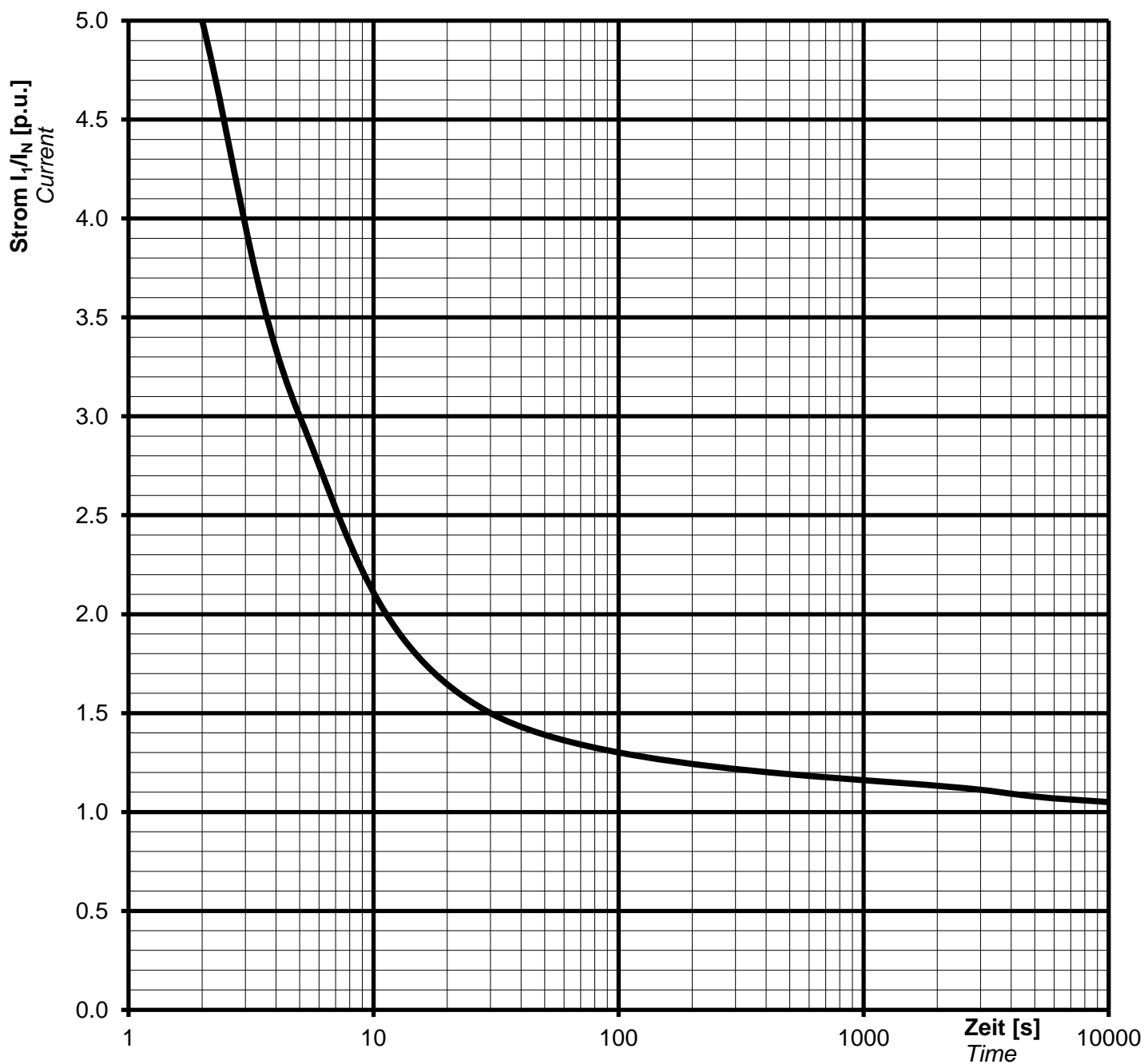
Frequency

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 e/4

Rating S_N : **4450 kVA**

p.f. **0.80**

Bemessungsleistung

Leistungsfaktor $\cos \varphi$:

Nominal voltage U_N : **11.00 kV**

Nominal current I_N : **234 A**

Bemessungsspannung

Bemessungsstrom

Frequency f_N : **50 Hz**

Speed n : **1500 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

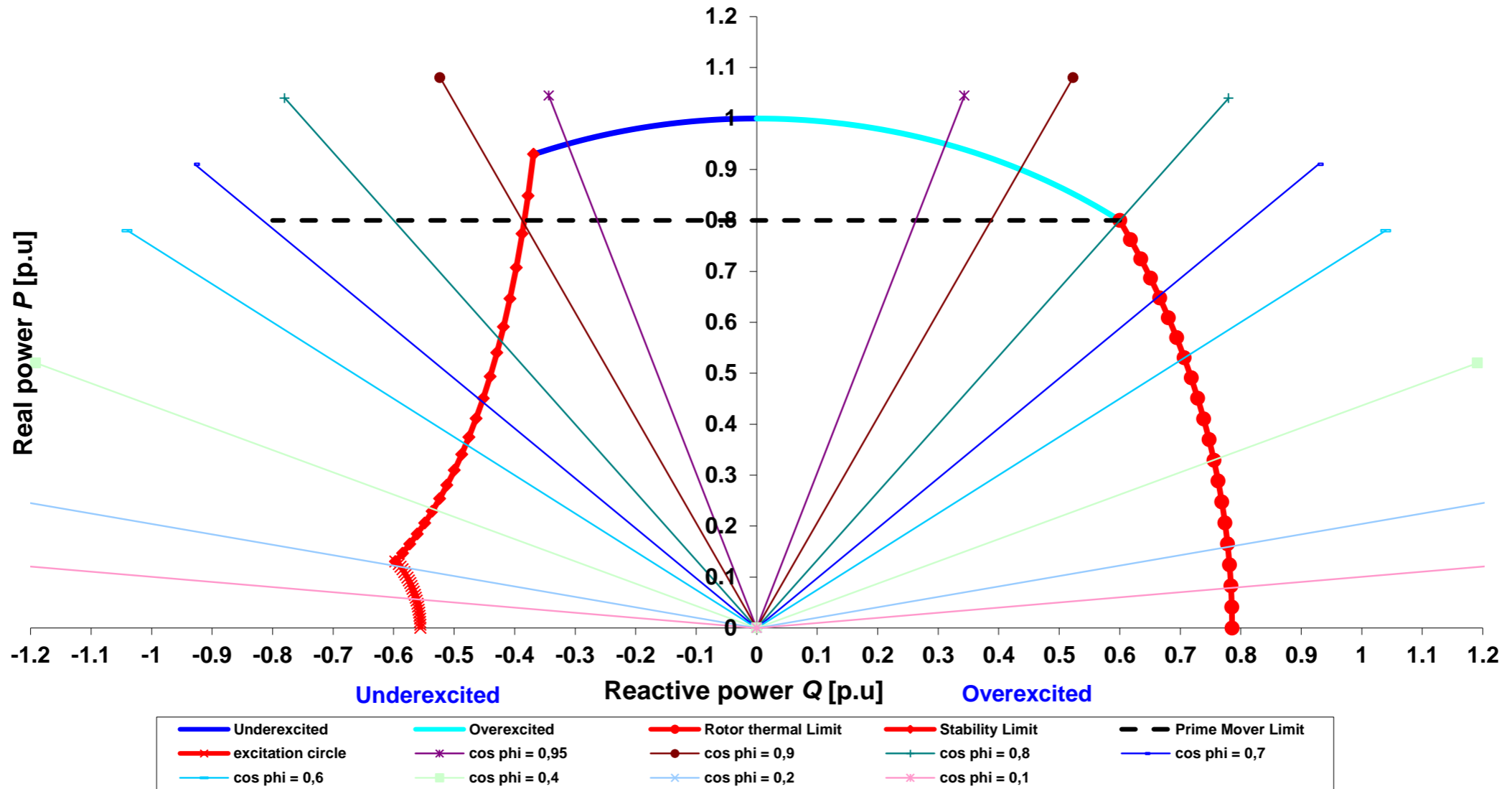
TYPE

DIG 142 e/4

Projekt:

Order Nr.:

Capability (P-Q) Diagram

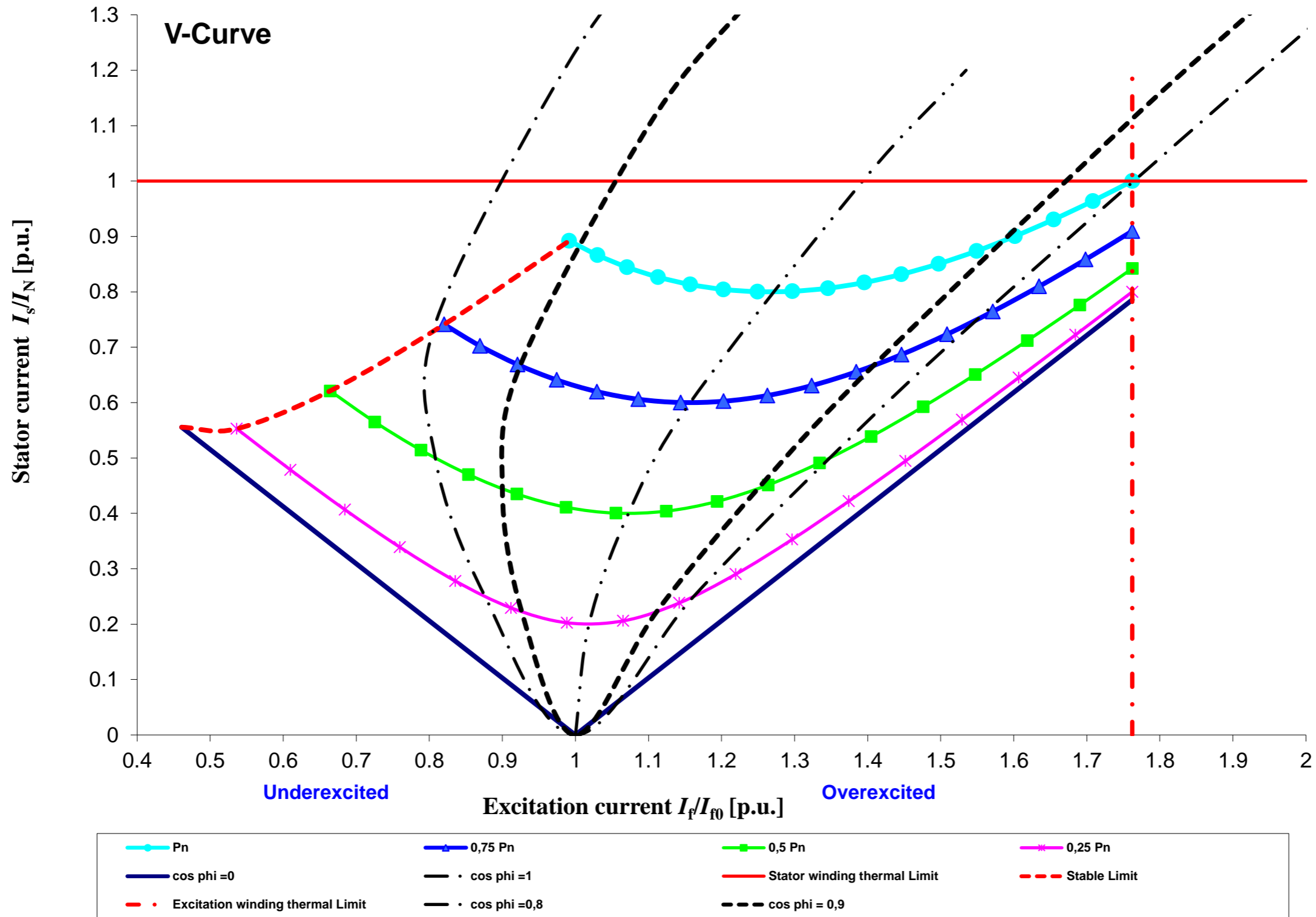


Cummins Generator Technologies

Datum / date:

17/10/2013

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