



Technical Data Sheet for AvK-Alternators

FM 7.3-5

Date:	09/01/14	Customer:	GENERIC DATASHEET only
Project No.:		AvK Reference:	dig156n_10_50_10000_A048N154

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

Generator data:					
Generator:	DIG 156 n/10	Poles:	10	Standards: IEC 60034	
Rated power:	4000 kVA	3200 kWe	3320 kWm		
Power factor:	0.80				
Power at pf 1,0	3229 kVA	3229 kWe	3320 kWm		
Rated voltage:	10 kV				
Speed:	600 1/min				
Frequency:	50 Hz	Voltage range / frequency range:			
Rated current:	230.9 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	Filter:			
Enclosure:	IP23				
Cooling:	IC 01 - Open-circuit ventilation				
Coolant:	Ambient Air	Temperature	40 ° C	Temperature Air inlet	40 ° C
		Coolant:		generator:	
		Cooling air vol.:	4.0 m³/s	Cooling water quantity:	n/a
Moment of inertia (I):	1100 kgm²	Weight:	19500 Kg	Losses (environment):	120 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	96,22	96,4	96,38	95,73	93,51
Power factor 0.9	96,68	96,84	96,71	96,02	93,69
Power factor 1.0	97,13	97,27	97,03	96,3	93,86

Reactances and time constants											
	unsaturated		saturated			unsaturated		saturated			
X_d	1.47	1.32	p.u.	X_q	0.74	0.73	p.u.	$T_{d0'}$	2.35 s	$T_{d0''}$	0.03764 s
X_d'	0.265	0.265	p.u.	X_q'	0.74	0.73	p.u.	$T_{d'}$	0.42 s	$T_{q0'}$	0.5 s
X_d''	0.194	0.176	p.u.	X_q''	0.194	0.194	p.u.	$T_{d''}$	0.025 s	$T_{q0''}$	0.19072 s
X_2	0.204	0.185	p.u.	X_0	0.058	0.053	p.u.	T_a	0.08 s	$T_{q'}$	0.5 s
X_{1s}	n.a.	0.106	p.u.							$T_{q''}$	0.05 s
Short circuit ratio saturated: 0.76					Z_n 25.000 Ohm						

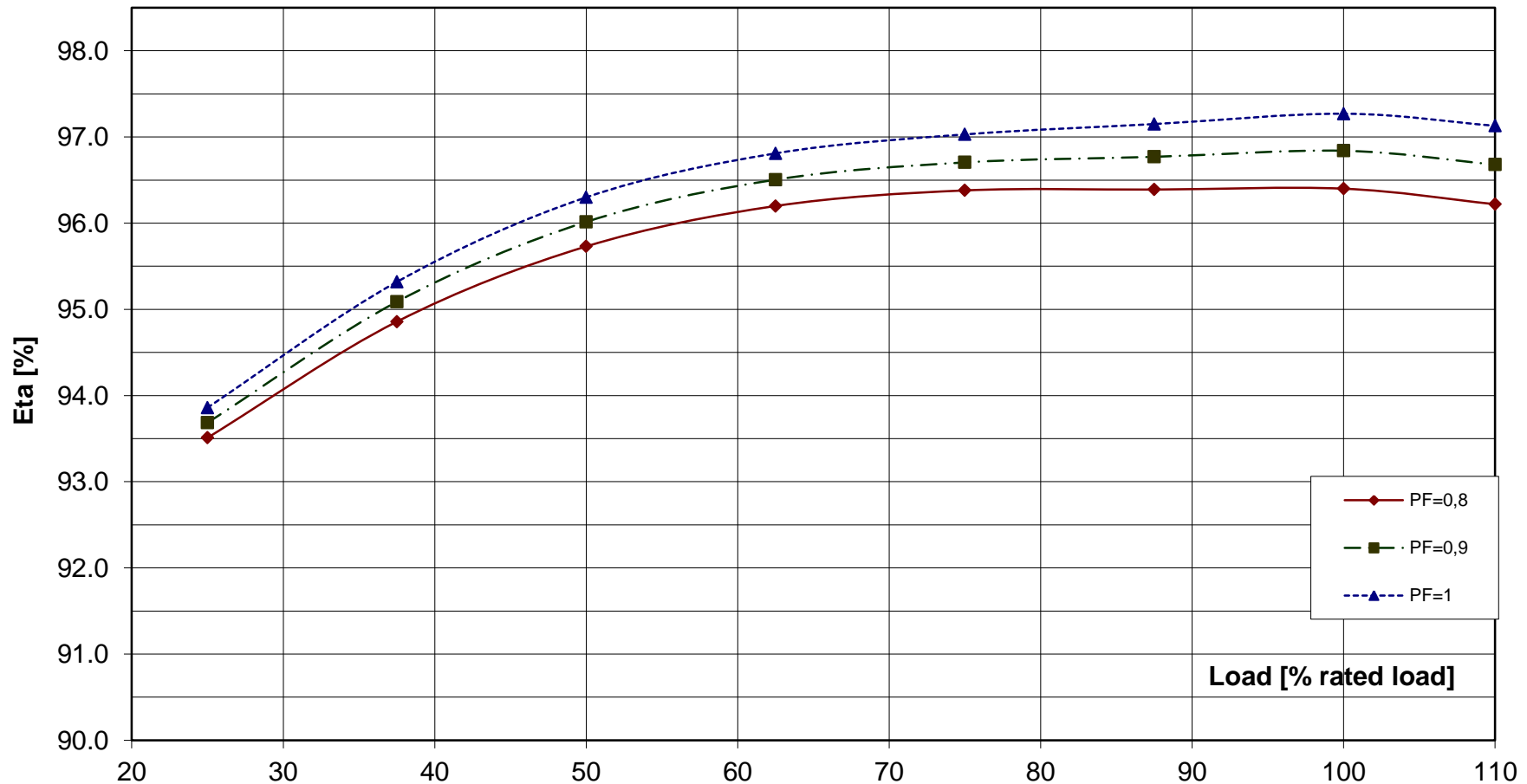
Short circuit data:		
Initial short circuit current (3-phase):	I_k''	1312 A
Max. peak current (3-phase):	I_s	3340 A
Sustained short circuit current:	I_k	693 A
Minimum 3 x rated current for max.10 s		
Initial short circuit torque:	M_{k2}	470.2 kNm
	M_{k3}	282.1 kNm
Max. faulty synchron moment:	M_f	1010.9 kNm
Rated kVA torque:	M_{SN}	63.67 kNm
Rated torque	M_N	50.94 kNm
Shaft torque	M_{Sh}	52.84 kNm

Load application:	
max. load application: 2264 kVA (corresponds to 56,61 % from 4000 kVA) for Power factor 0.4 15% transient voltage drop	Power: 4000 kVA Power factor: 0.8 transient voltage drop: -20.9 %

Remarks:

Alternator :	DIG 156 n/10			
Rated output [kVA]	4000	Rated power factor:	0.8	Rated voltage [kV]: 10
Rated frequency [Hz]	50	Rated speed [rpm]	600	

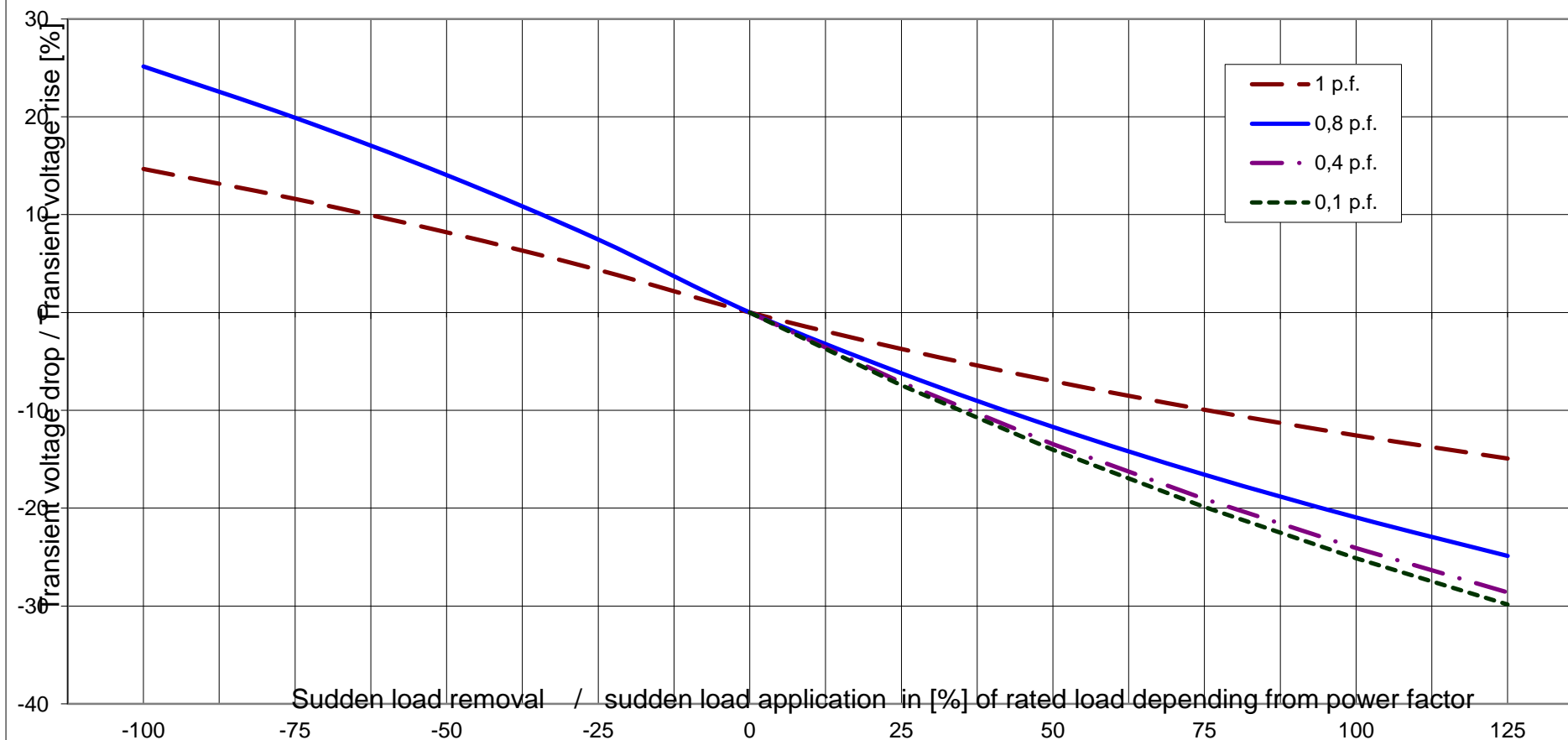
Wirkungsgrad-Kennlinie - Efficiency Curve



Alternator : DIG 156 n/10

Rated output [kVA]	4000	Rated power factor:	0.8	Rated voltage [kV]:	10
Rated frequency [Hz]	50	Rated speed [rpm]	600		

Transient Voltage rise or drop for sudden load removal or application

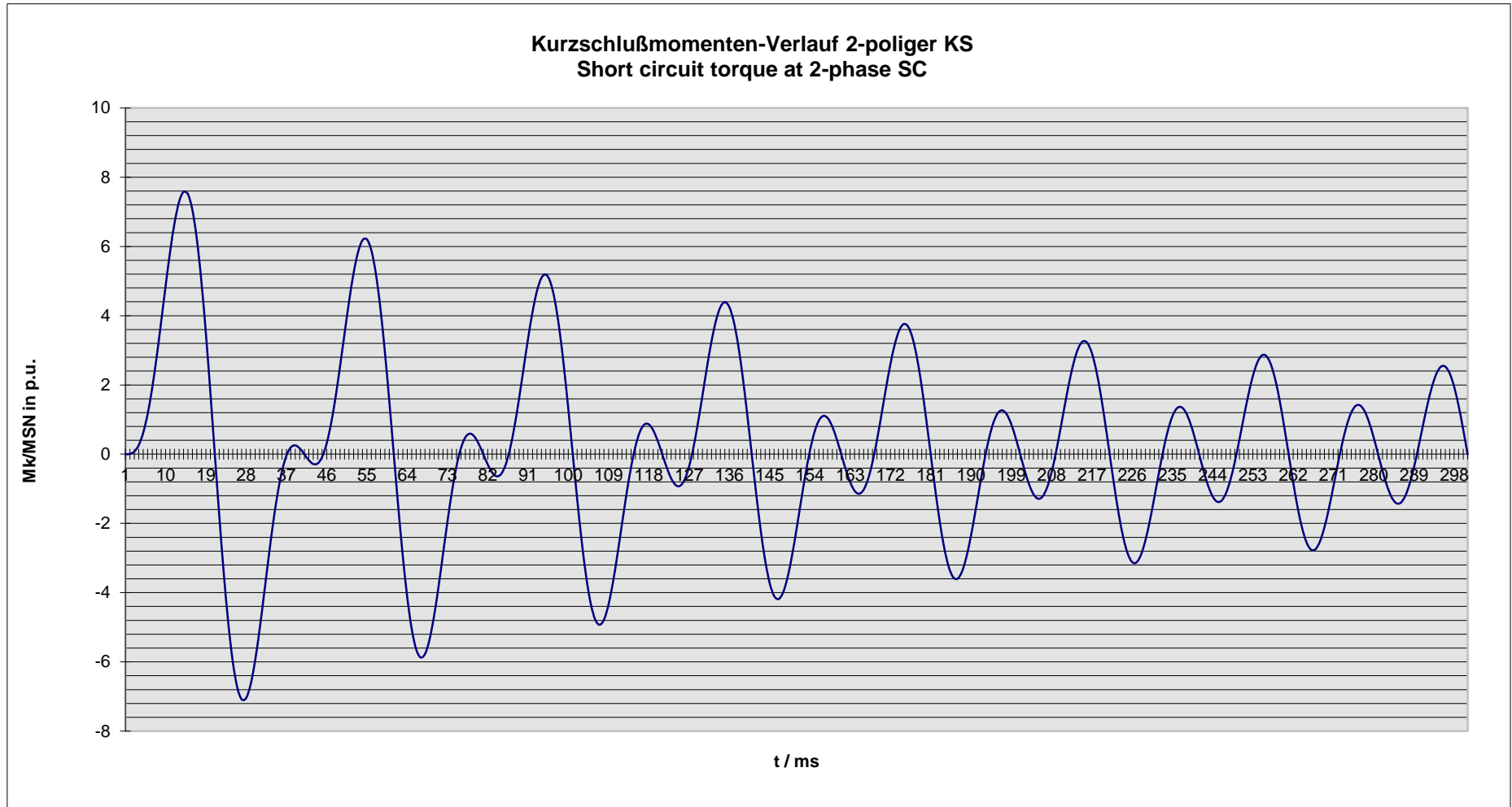




Technisches Datenblatt - Diagramme
Technical data sheet - Diagrams

ING-FCD-0112

Alternator :	DIG 156 n/10			
Rated output [kVA]	4000	Rated power factor:	0.8	Rated voltage [kV]: 10
Rated frequency [Hz]	50	Rated speed [rpm]	600	MSN related to kVA: 63.66 KNm



Nenn Daten / nominal data

DIG 156 n/10

Leistung S_N : **4000 kVA**

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

Rating

p.f.

Spannung U_N : **10.00 kV**

Strom I_N : **231 A**

Voltage

Current

Frequenz f : **50 Hz**

Drehzahl n : **600 min⁻¹**

Frequency

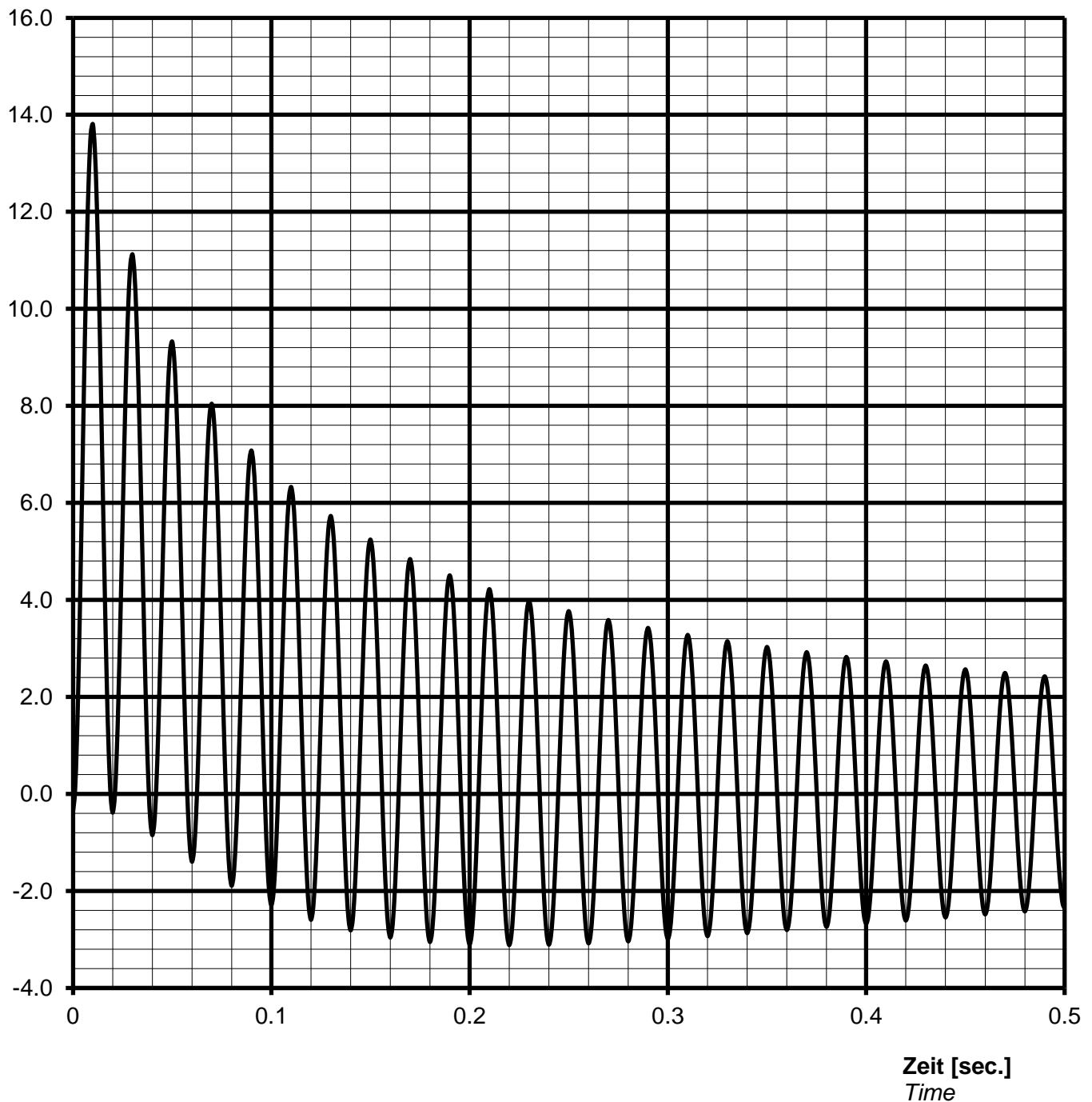
Speed

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 $I_{\text{peak}} =$ **3189 A** or **13.81 p.u.**

Nenn Daten / nominal data

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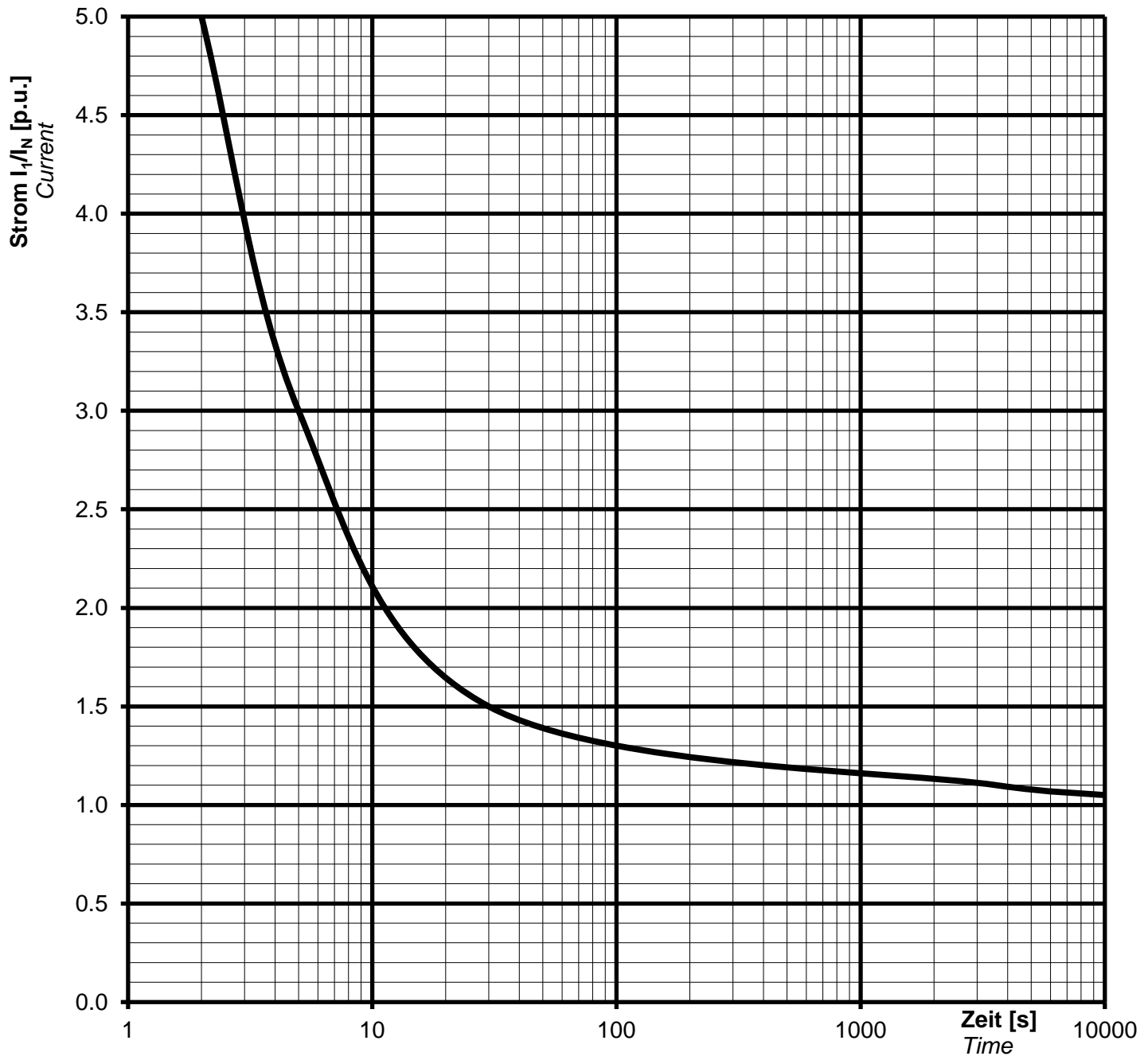
Frequency

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

Nennwerten / nominal data

DIG 156 n/10

Rating S_N : **4000 kVA**

p.f. **0.80**

Bemessungsleistung

Leistungsfaktor $\cos \varphi$:

Nominal voltage U_N : **10.00 kV**

Nominal current I_N : **231 A**

Bemessungsspannung

Bemessungsstrom

Frequency f_N : **50 Hz**

Speed n : **600 min⁻¹**

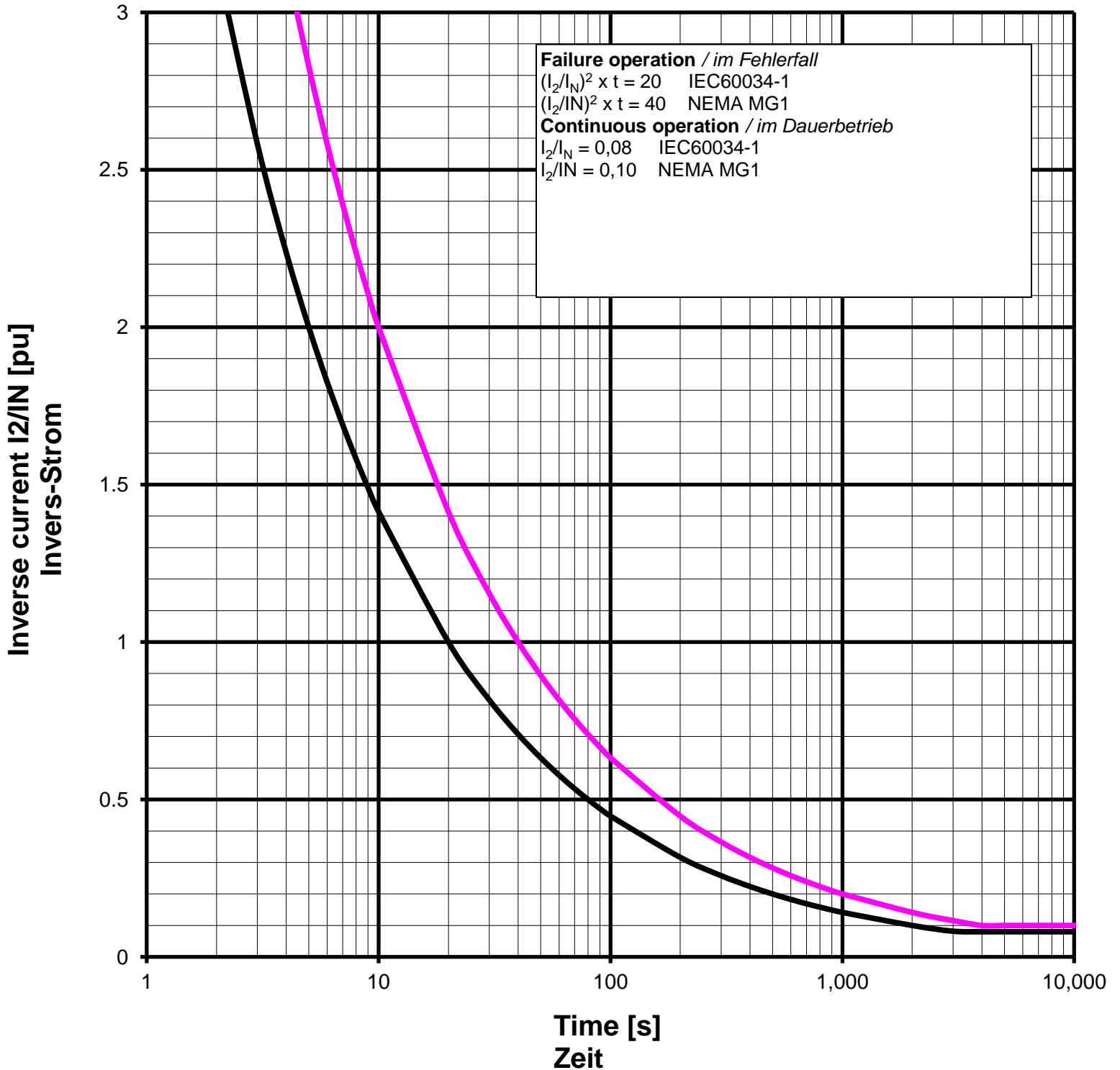
Frequenz

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

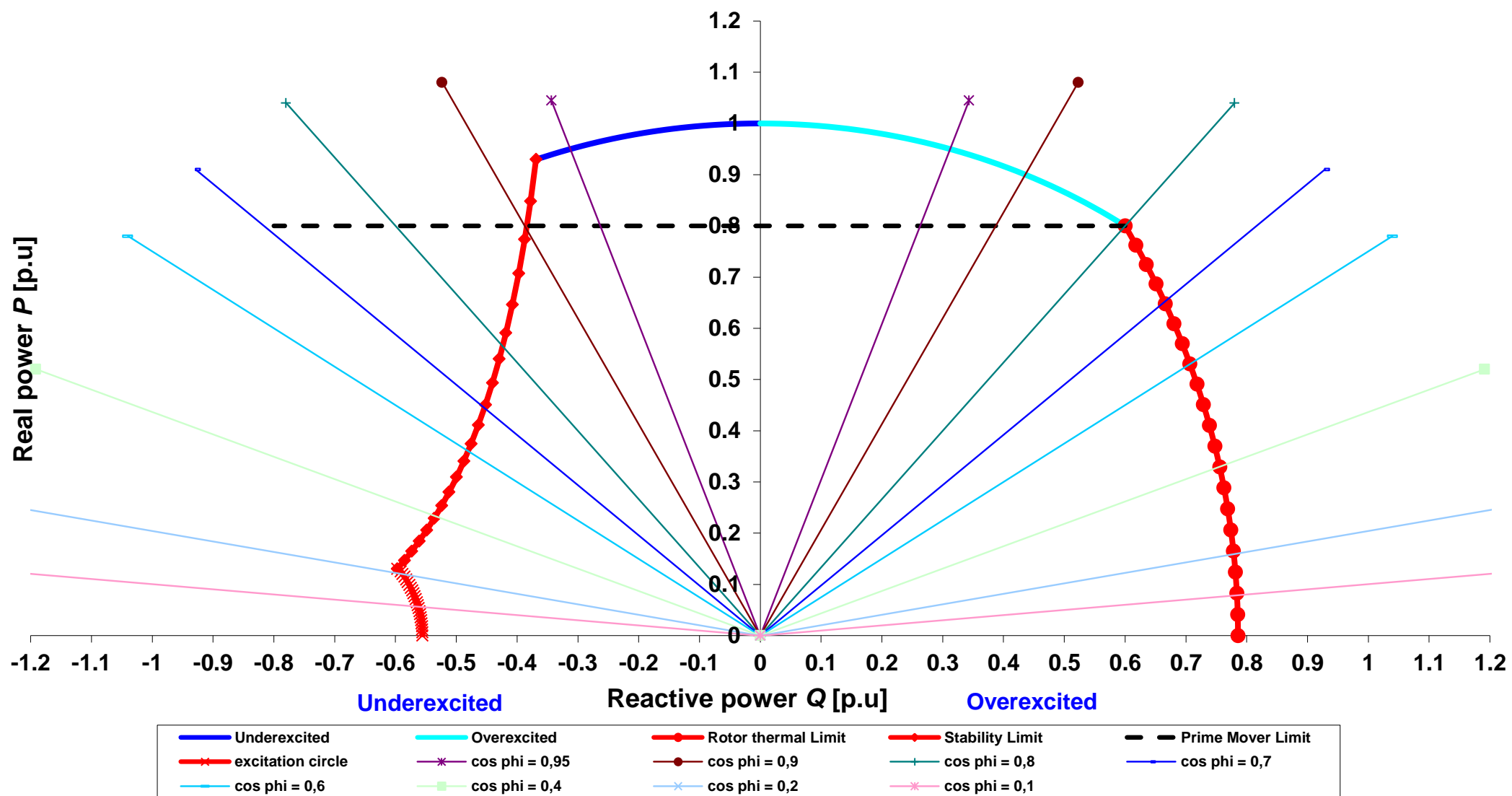
TYPE

DIG 156 n/10

Projekt:

Order Nr.:

Capability (P-Q) Diagram

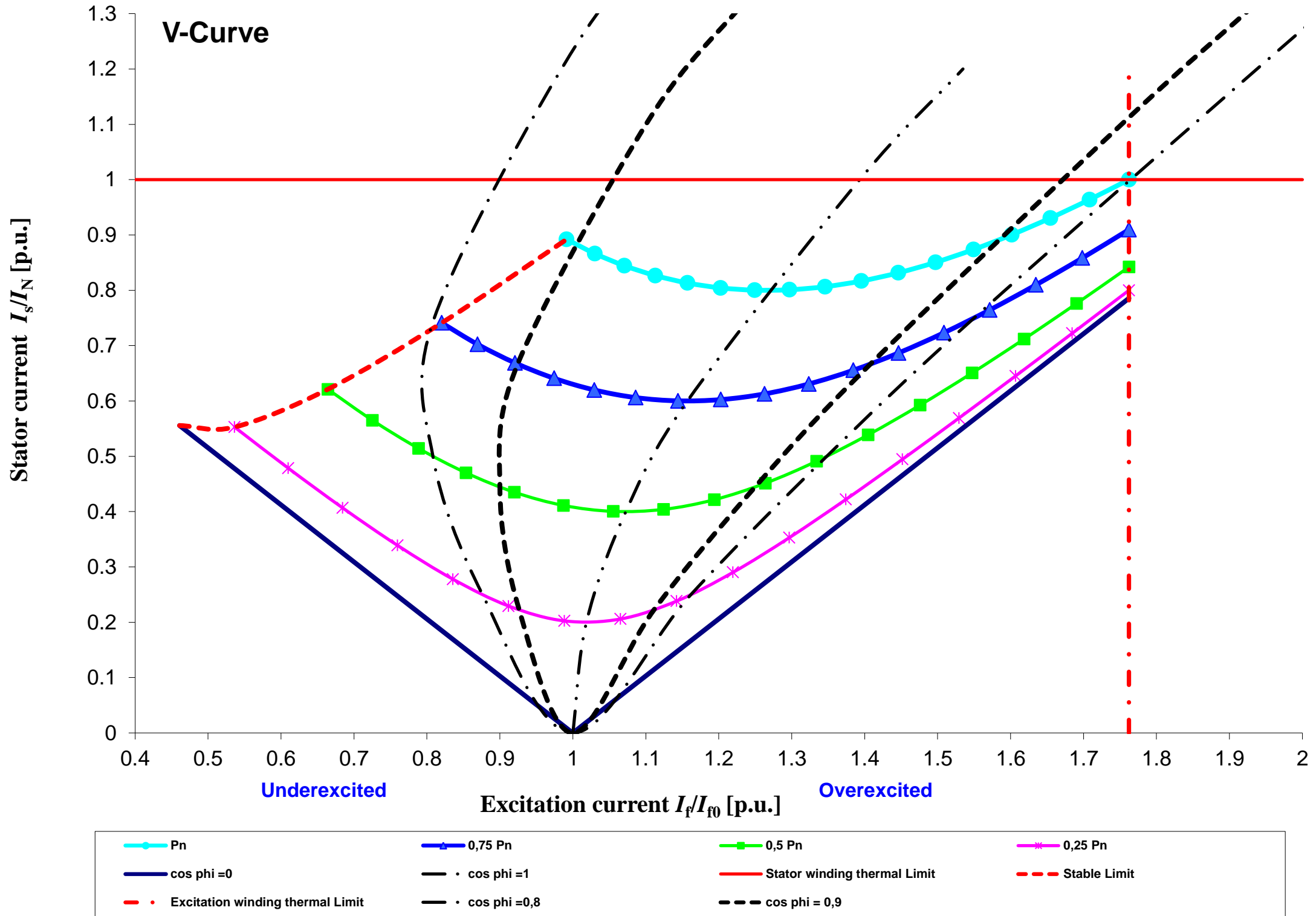


Cummins Generator Technologies

Datum / date:

21/01/2014

TYPE	DIG 156 n/10	Projekt:		Order Nr.:	
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Cummins Generator Technologies	Datum / date:	
	21/01/2014	