

**Technical Data Sheet for AvK-Alternators**

FM 7.3-5

Date:	08/01/14	Customer:	GENERIC DATASHEET only
Project No.:		AvK Reference:	dsg11411_6_50_690_A048M988

**Object data:**

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

**Generator data:**

Generator:	DSG 114 L1/6	Poles:	6	Standards:	IEC 60034
Rated power:	5000 kVA	4000 kWe	4128 kWm		
Power factor:	0.80				
Power at pf 1,0	4037 kVA	4037 kWe	4128 kWm		
Rated voltage:	0.69 kV				
Speed:	1000 1/min				
Frequency:	50 Hz			Voltage range / frequency range:	
Rated current:	4183.7 A			Zone A according IEC 60034-1 (dU = +/-5%, df = +/-2%)	

Winding pitch:	ca. 5/6
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Insulation class:	Stator: Class H	Rotor: Class H	Temperature rise:	H
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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
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		Coolant:		generator:	
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		Cooling air vol.:	3.3 m³/s	Cooling water quantity:	n/a
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Moment of inertia (I):	410 kgm²	Weight:	12800 Kg	Losses (environment):	128 KW
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		Losses (cooling):	n/a		
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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	96,75	96,9	97	96,85	95,4
Power factor 0.9	97,22	97,35	97,35	97,1	95,55
Power factor 1.0	97,69	97,8	97,7	97,35	95,7

**Reactances and time constants**

	unsaturated	saturated		unsaturated	saturated				
$X_d$	2.20	1.98 p.u.	$X_q$	1.10	1.08 p.u.	$T_{d0'}$	3.4 s	$T_{d0''}$	0.03459 s
$X_d'$	0.256	0.256 p.u.	$X_q'$	1.10	1.08 p.u.	$T_{d'}$	0.40 s	$T_{q0'}$	0.4 s
$X_d''$	0.163	0.148 p.u.	$X_q''$	0.163	0.163 p.u.	$T_{d''}$	0.02 s	$T_{q0''}$	0.26994 s
$X_2$	0.171	0.155 p.u.	$X_0$	0.048	0.044 p.u.	$T_a$	0.06 s	$T_{q'}$	0.4 s
$X_{1s}$	n.a.	0.089 p.u.						$T_{q''}$	0.04 s

Short circuit ratio saturated:	0.51	$Z_n$	0.095 Ohm
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**Short circuit data:**

Initial short circuit current (3-phase):	$I_k''$	28268 A	
Max. peak current (3-phase):	$I_s$	71959 A	
Sustained short circuit current:	$I_k$	12551 A	Minimum 3 x rated current for max.10 s
Initial short circuit torque:	$M_{k2}$	419.4 kNm	
	$M_{k3}$	251.6 kNm	
Max. faulty synchron moment:	$M_f$	901.7 kNm	
Rated kVA torque:	$M_{SN}$	47.75 kNm	
Rated torque	$M_N$	38.20 kNm	
Shaft torque	$M_{Sh}$	39.42 kNm	

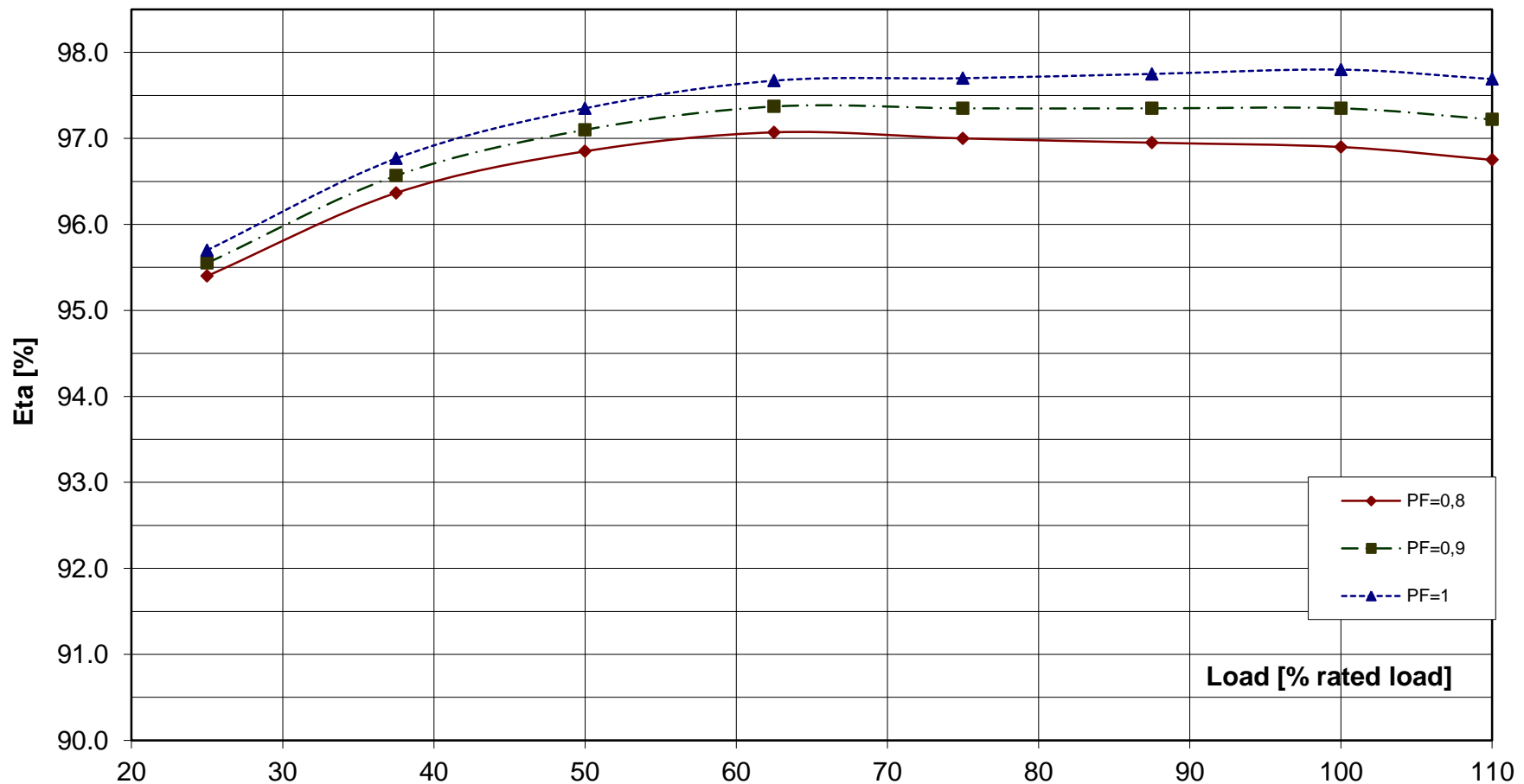
**Load application:**

max. load application: 2930 kVA (corresponds to 58,59 % from 5000 kVA) for Power factor 0.4 15% transient voltage drop	Power: 5000 kVA Power factor: 0.8 transient voltage drop: -20.4 %
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**Remarks:**

<b>Alternator :</b>	<b>DSG 114 L1/6</b>			
Rated output [kVA]	5000	Rated power factor:	0.8	Rated voltage [kV]: 0.69
Rated frequency [Hz]	50	Rated speed [rpm]	1000	

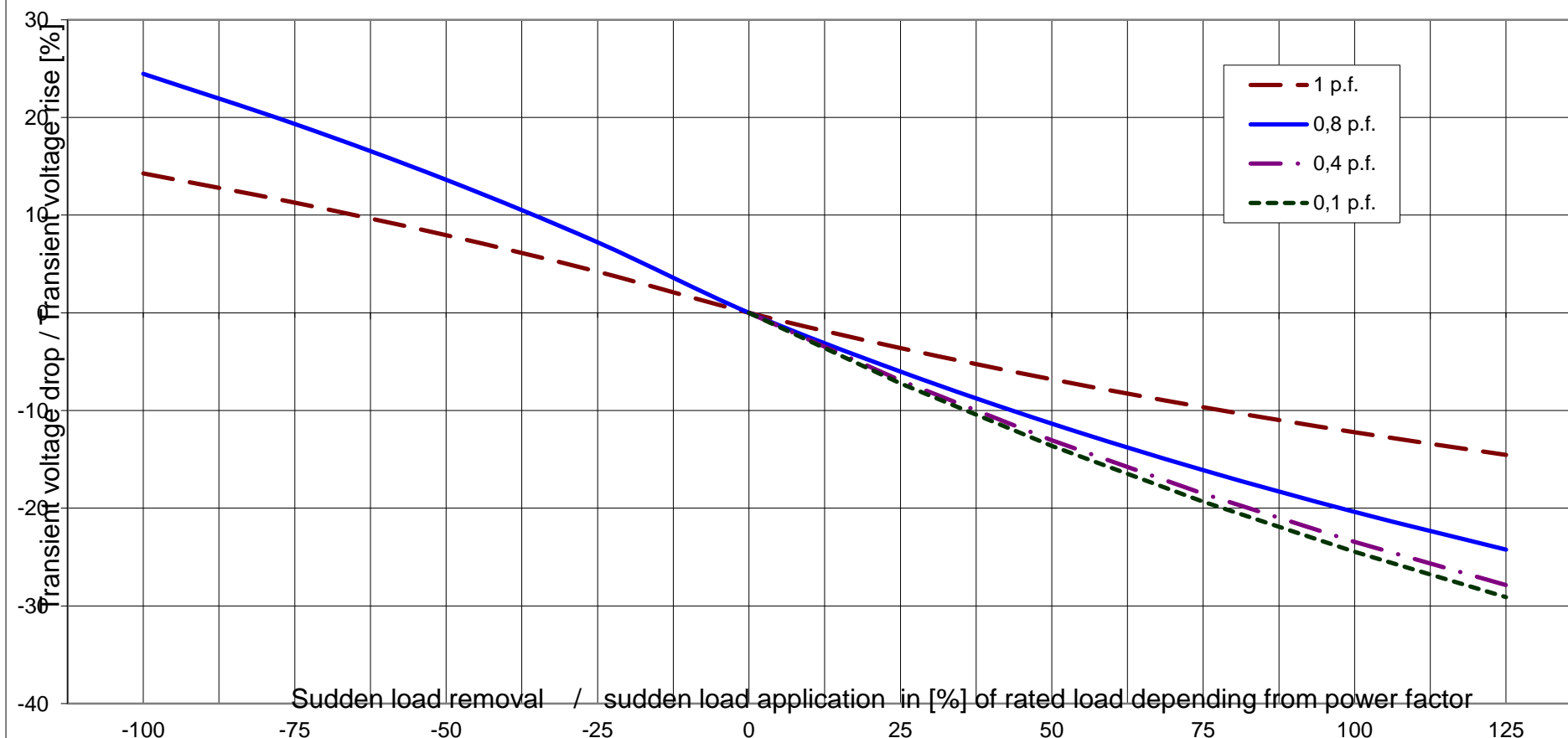
### Wirkungsgrad-Kennlinie - Efficiency Curve



**Alternator : DSG 114 L1/6**

Rated output [kVA]	5000	Rated power factor:	0.8	Rated voltage [kV]:	0.69
Rated frequency [Hz]	50	Rated speed [rpm]	1000		

**Transient Voltage rise or drop for sudden load removal or application**



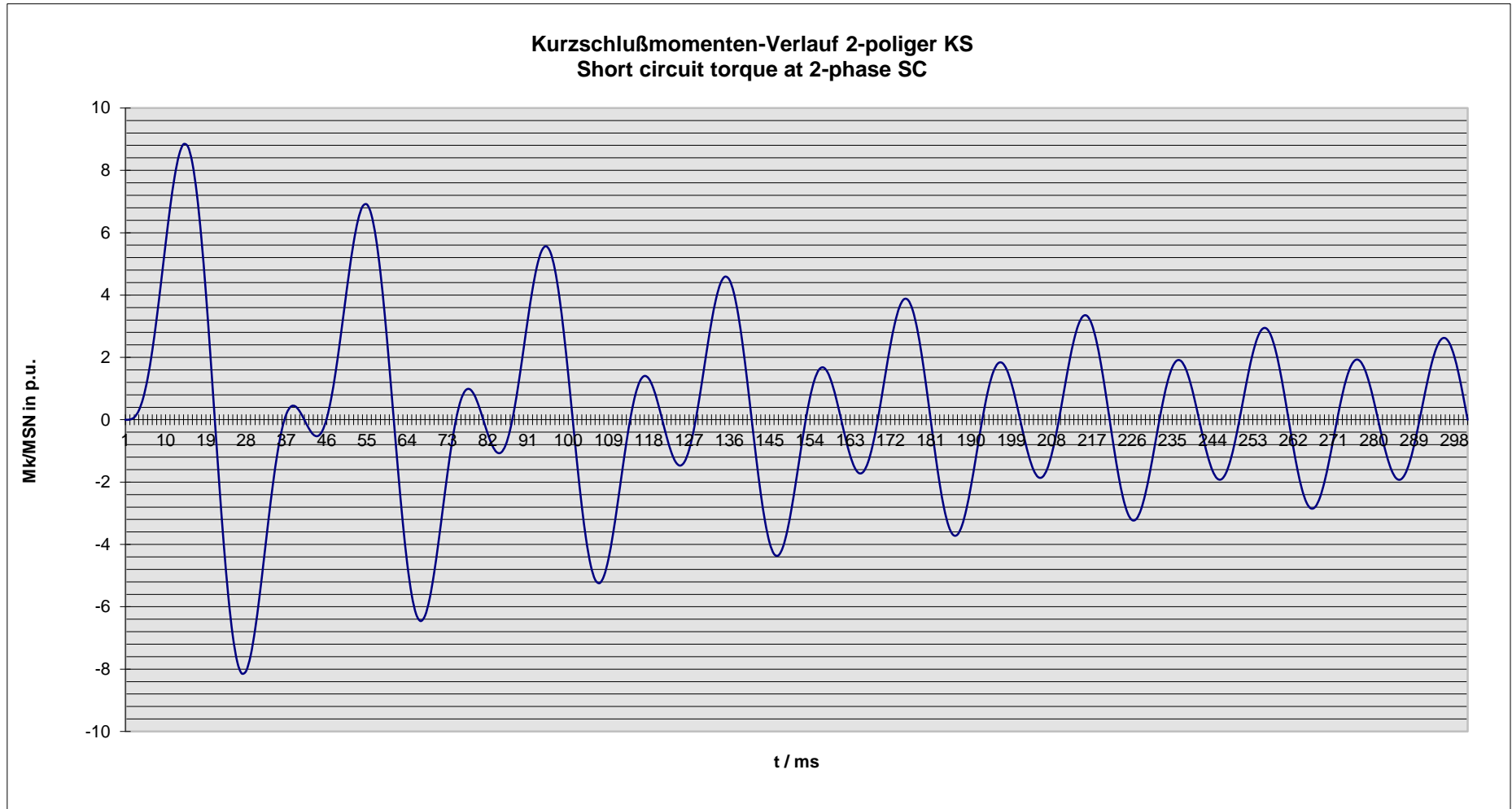


Technisches Datenblatt - Diagramme  
Technical data sheet - Diagrams

ING-FCD-0112

<b>Alternator :</b>	<b>DSG 114 L1/6</b>			
Rated output [kVA]	5000	Rated power factor:	0.8	Rated voltage [kV]: 0.69
Rated frequency [Hz]	50	Rated speed [rpm]	1000	MSN related to kVA: 47.75 KNm

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



#### Nenn Daten / nominal data

DSG 114 L1/6

Leistung  $S_N$ : **5000** kVA

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

*Rating*

*p.f.*

Spannung  $U_N$ : **0.69** kV

Strom  $I_N$ : **4184** A

*Voltage*

*Current*

Frequenz  $f$ : **50** Hz

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

*Frequency*

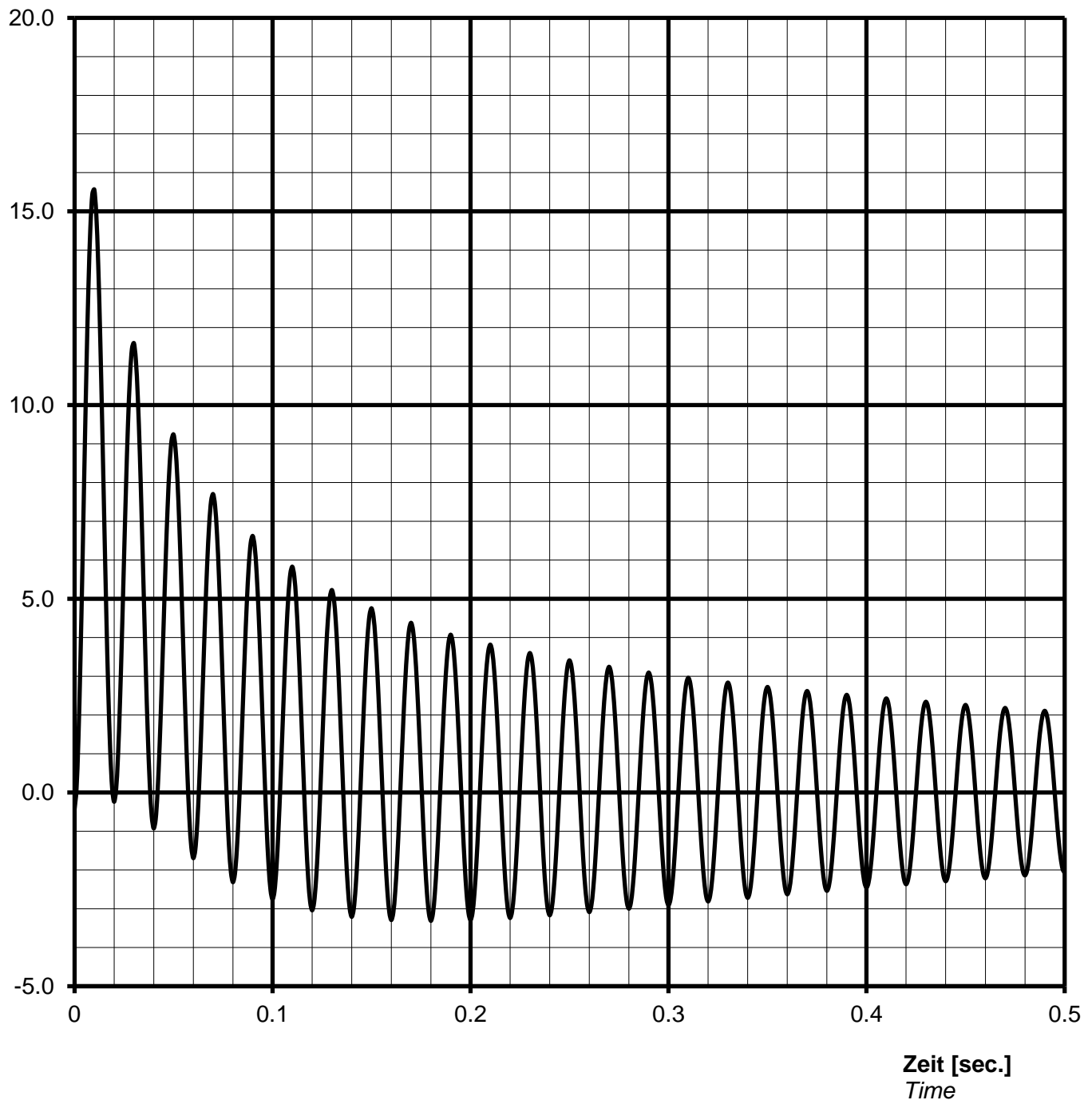
*Speed*

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  $I_{\text{peak}} =$  **65122 A** or **15.77 p.u.**

**Nenn Daten / nominal data**

**DSG 114 L1/6**

Leistung  $S_N$ : **5000 kVA**

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

Rating

p.f.

Spannung  $U_N$ : **0.69 kV**

Strom  $I_N$ : **4184 A**

Voltage

Current

Frequenz f: **50 Hz**

Drehzahl n: **1000 min<sup>-1</sup>**

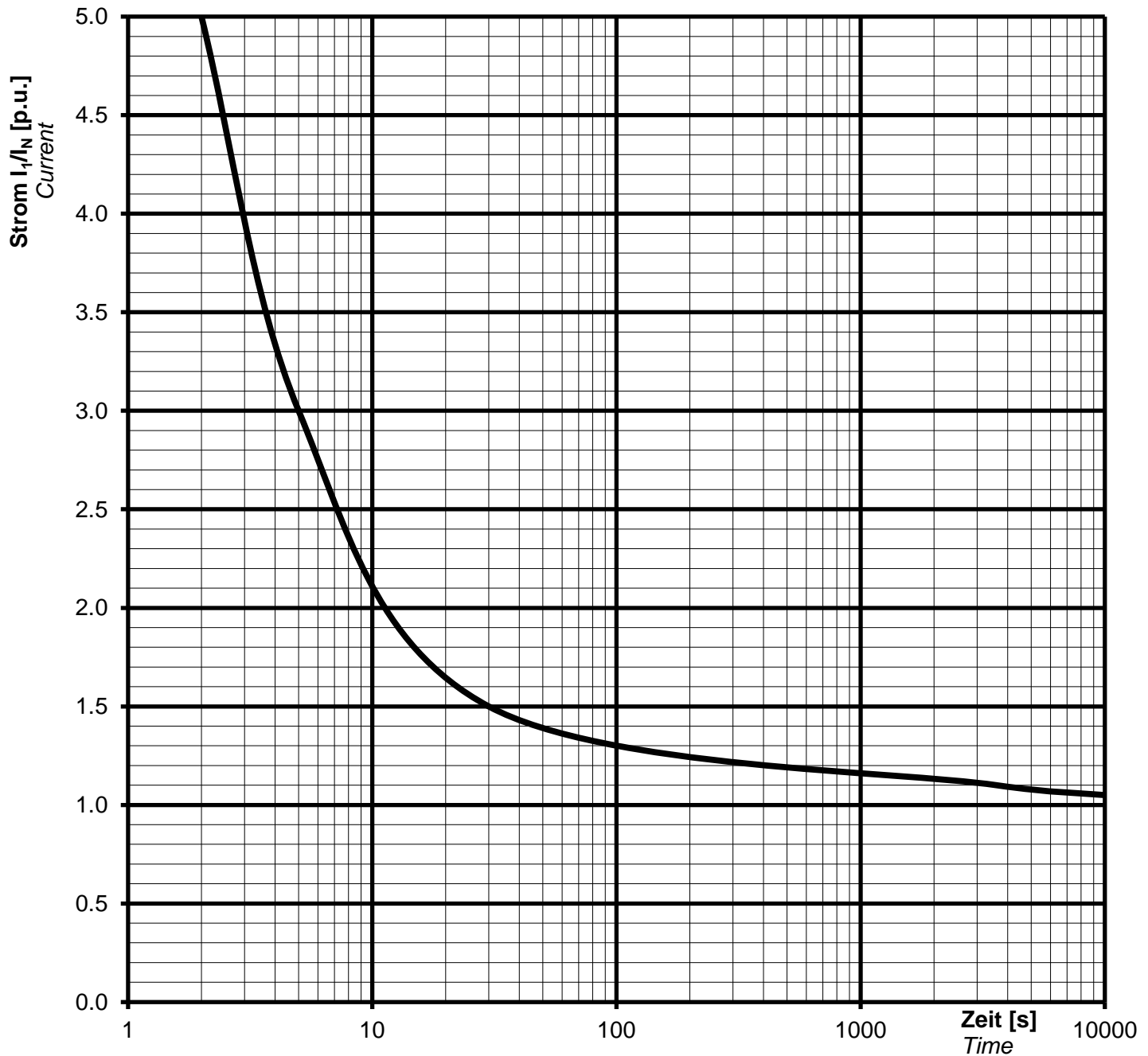
Frequency

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

**DSG 114 L1/6**

Rating  $S_N$ : **5000 kVA**

*p.f.* **0.80**

*Bemessungsleistung*

Leistungsfaktor  $\cos \varphi$ :

Nominal voltage  $U_N$ : **0.69 kV**

Nominal current  $I_N$ : **4184 A**

*Bemessungsspannung*

*Bemessungsstrom*

Frequency  $f_N$ : **50 Hz**

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

*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

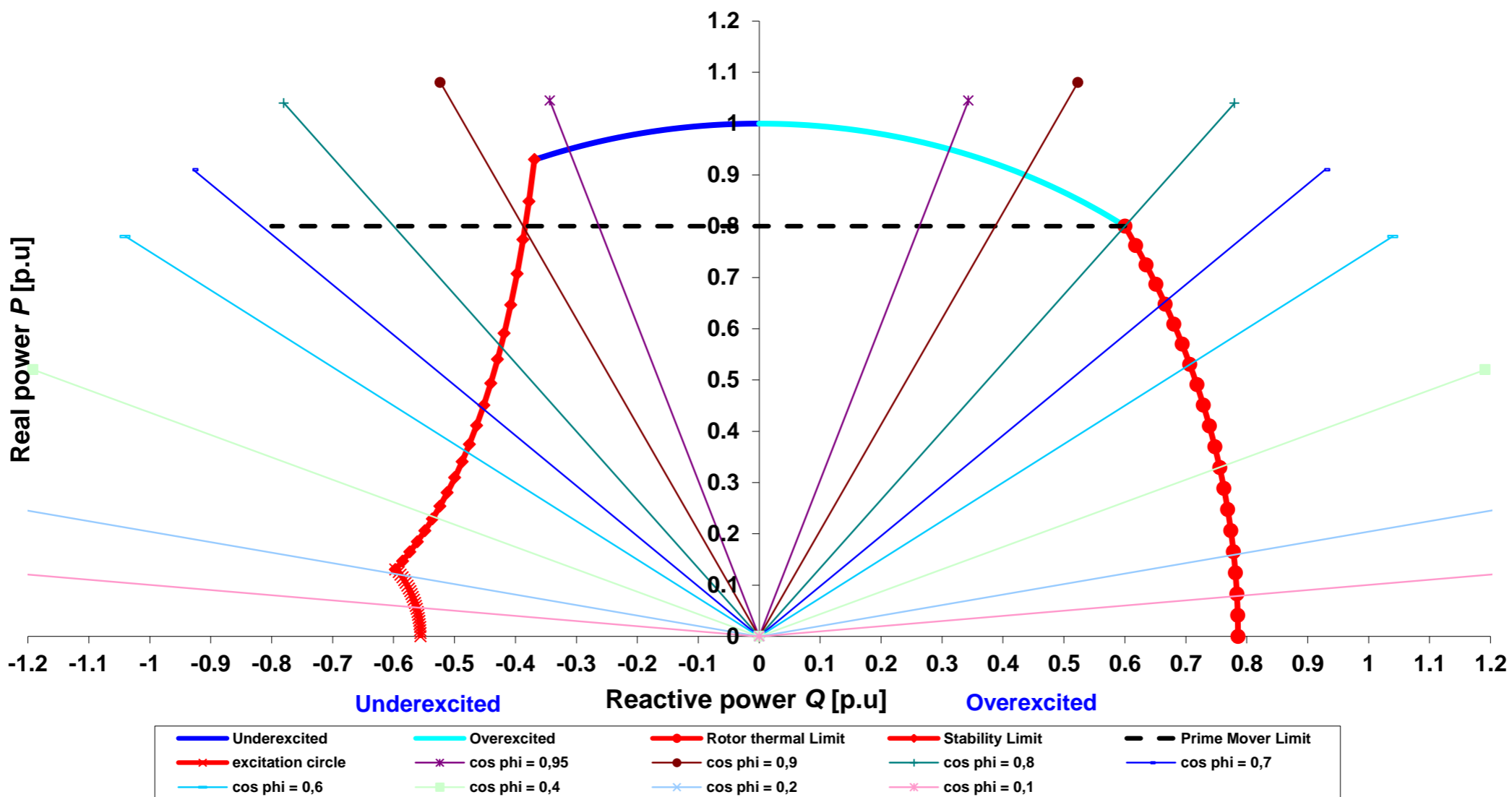
TYPE

DSG 114 L1/6

Projekt:

Order Nr.:

Capability (P-Q) Diagram



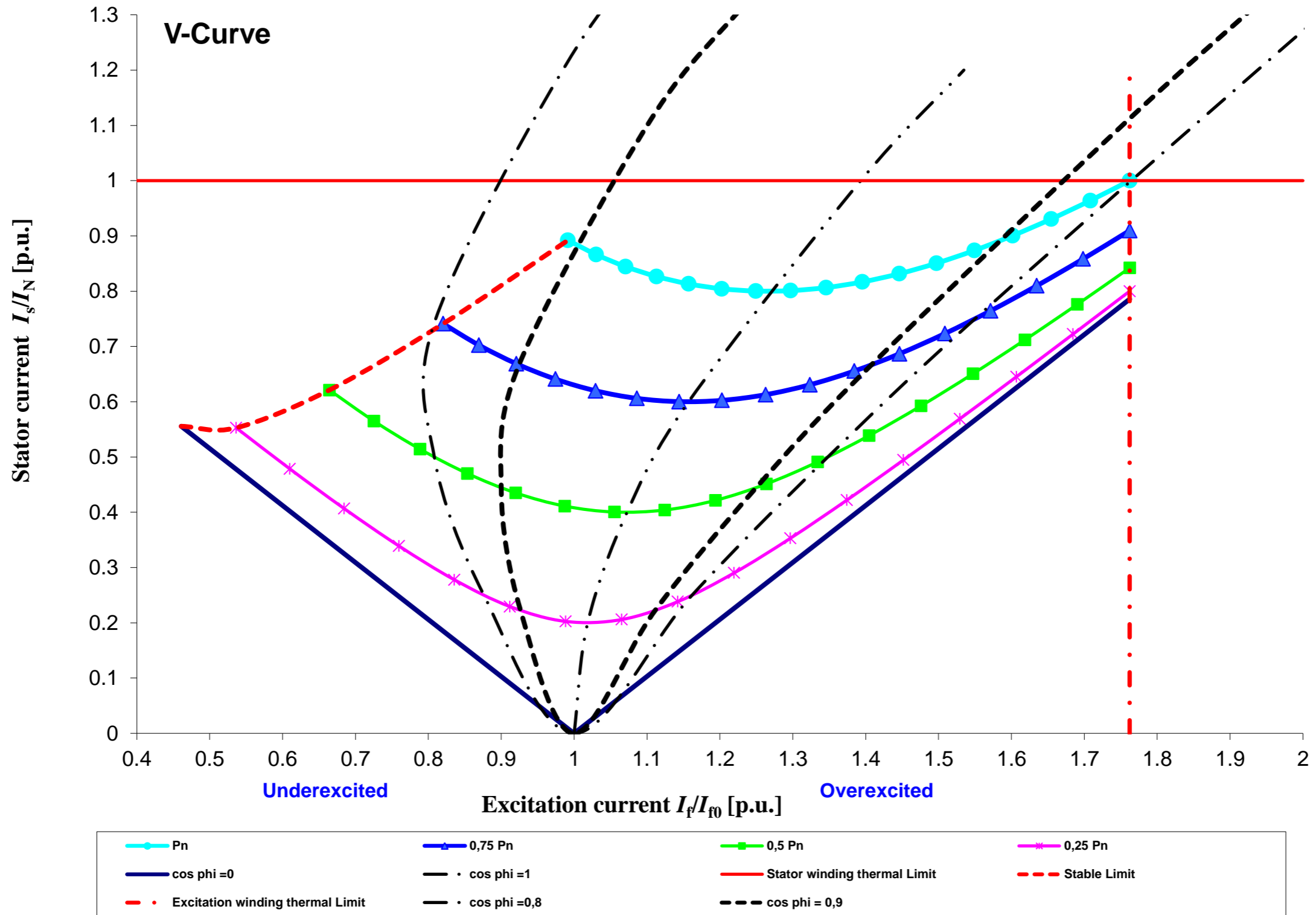
Cummins Generator Technologies

Datum / date:

21/01/2014



TYPE	DSG 114 L1/6	Projekt:		Order Nr.:	
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Cummins Generator Technologies	Datum / date:	
	21/01/2014	