

**Technical Data Sheet for AvK-Alternators**

FM 7.3-5

Date:	30/09/13	Customer:	GENERIC DATASHEET only
Project No.:		AvK Reference:	DSG074L1_4_60_480

**Object data:**

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

**Generator data:**

Generator:	DSG 74 L1/4	Poles:	4	Standards:	IEC 60034
Rated power:	2100 kVA	1680 kWe	1758 kWm		
Power factor:	0.80				
Power at pf 1,0	1699 kVA	1699 kWe	1758 kWm		
Rated voltage:	0.48 kV				
Speed:	1800 1/min				
Frequency:	60 Hz			Voltage range / frequency range:	
Rated current:	2525.9 A			Zone A according IEC 60034-1 (dU = +/-5%, df = +/-2%)	

Winding pitch:	2/3				
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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
		Coolant:		generator:	

		Cooling air vol.:	2.9 m³/s	Cooling water quantity:	n/a
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Moment of inertia (I):	44.7 kgm²	Weight:	3800 Kg	Losses (environment):	78 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	95,34	95,56	95,59	95,04	92,33
Power factor 0.9	95,9	96,09	96,01	95,35	92,51
Power factor 1.0	96,45	96,62	96,43	95,65	92,69

**Reactances and time constants**

	unsaturated	saturated		unsaturated	saturated				
$X_d$	2.78	2.50 p.u.	$X_q$	1.30	1.27 p.u.	$T_{d0'}$	3.52 s	$T_{d0''}$	0.02 s
$X_d'$	0.216	0.216 p.u.	$X_q'$	1.30	1.27 p.u.	$T_{d'}$	0.28 s	$T_{q0'}$	0.2 s
$X_d''$	0.119	0.108 p.u.	$X_q''$	0.134	0.134 p.u.	$T_{d''}$	0.01 s	$T_{q0''}$	0.19403 s
$X_2$	0.133	0.121 p.u.	$X_0$	0.046	0.042 p.u.	$T_a$	0.0241 s	$T_{q'}$	0.2 s
$X_{1s}$	n.a.	0.065 p.u.						$T_{q''}$	0.02 s

Short circuit ratio saturated:	0.4	$Z_n$	0.110 Ohm
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**Short circuit data:**

Initial short circuit current (3-phase):	$I_k''$	23388 A	
Max. peak current (3-phase):	$I_s$	59536 A	
Sustained short circuit current:	$I_k$	7578 A	Minimum 3 x rated current for max.10 s
Initial short circuit torque:	$M_{k2}$	134.1 kNm	
	$M_{k3}$	80.5 kNm	
Max. faulty synchron moment:	$M_f$	288.3 kNm	
Rated kVA torque:	$M_{SN}$	11.14 kNm	
Rated torque	$M_N$	8.91 kNm	
Shaft torque	$M_{Sh}$	9.32 kNm	

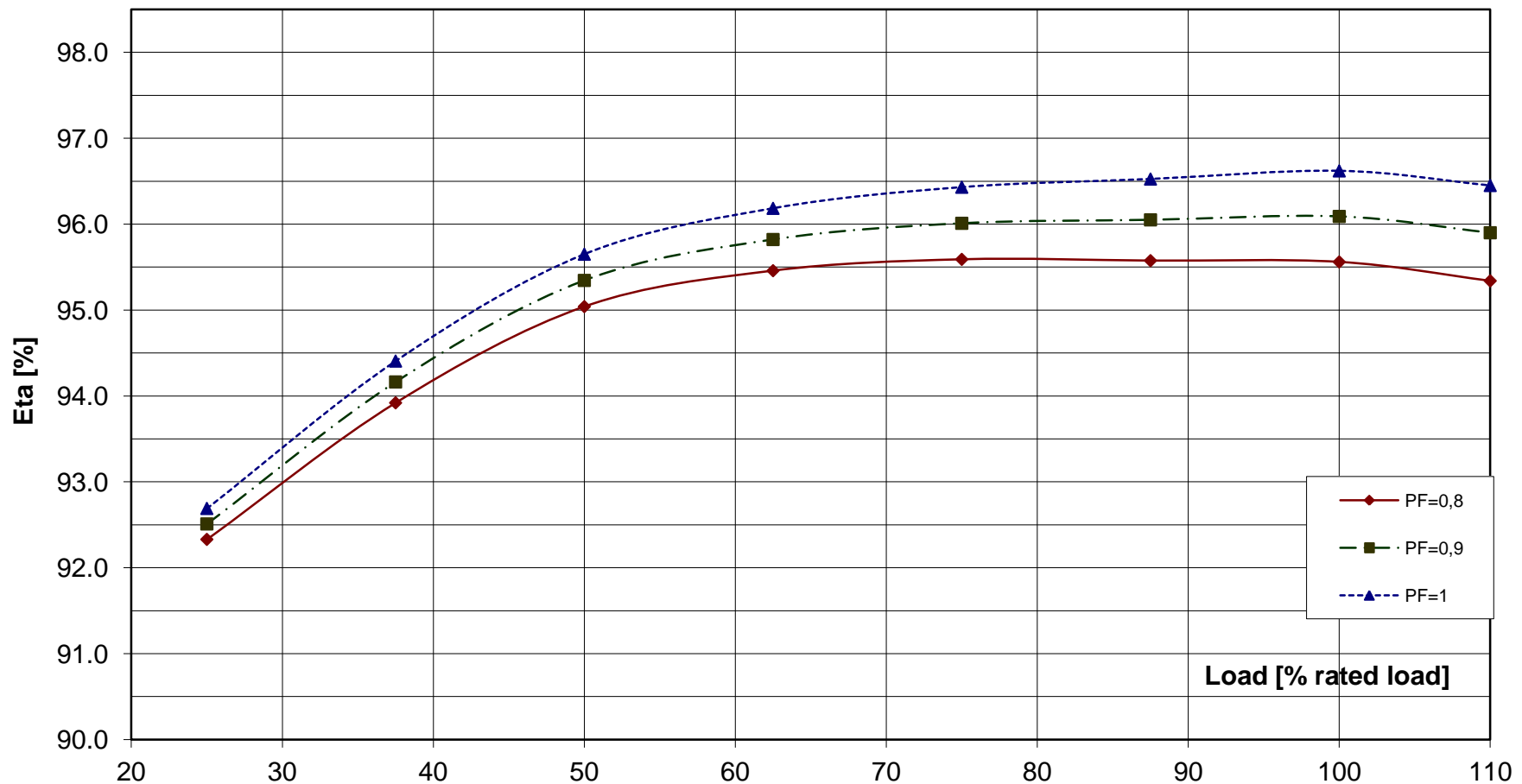
**Load application:**

max. load application: 1458 kVA (corresponds to 69,44 % from 2100 kVA) for Power factor 0.4 15% transient voltage drop	Power: 2100 kVA Power factor: 0.8 transient voltage drop: -17.8 %
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**Remarks:**

<b>Alternator :</b>	<b>DSG 74 L1/4</b>		
Rated output [kVA]	2100	Rated power factor:	0.8
Rated frequency [Hz]	60	Rated speed [rpm]	1800
		Rated voltage [kV]: 0.48	

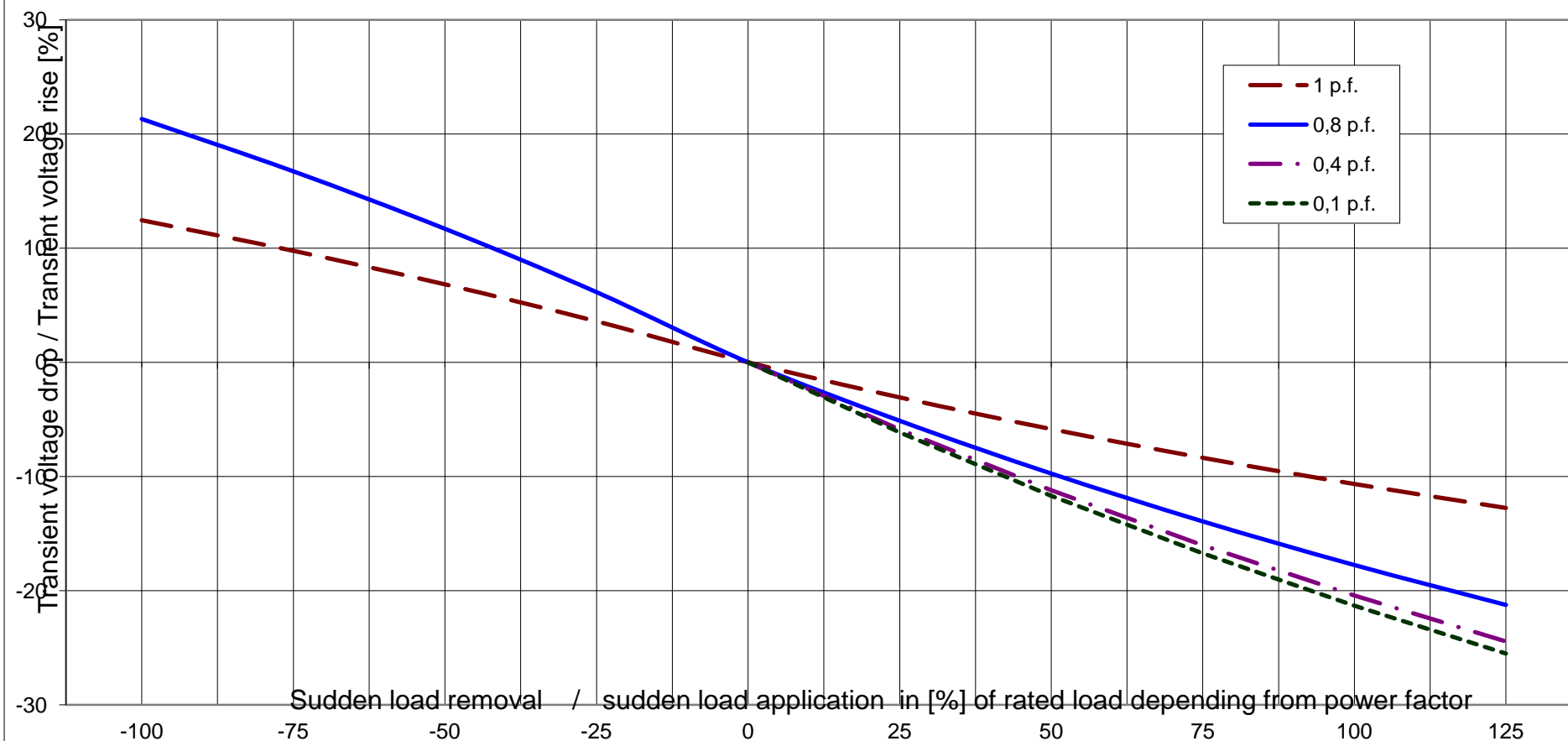
### Wirkungsgrad-Kennlinie - Efficiency Curve



**Alternator : DSG 74 L1/4**

Rated output [kVA]	2100	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**



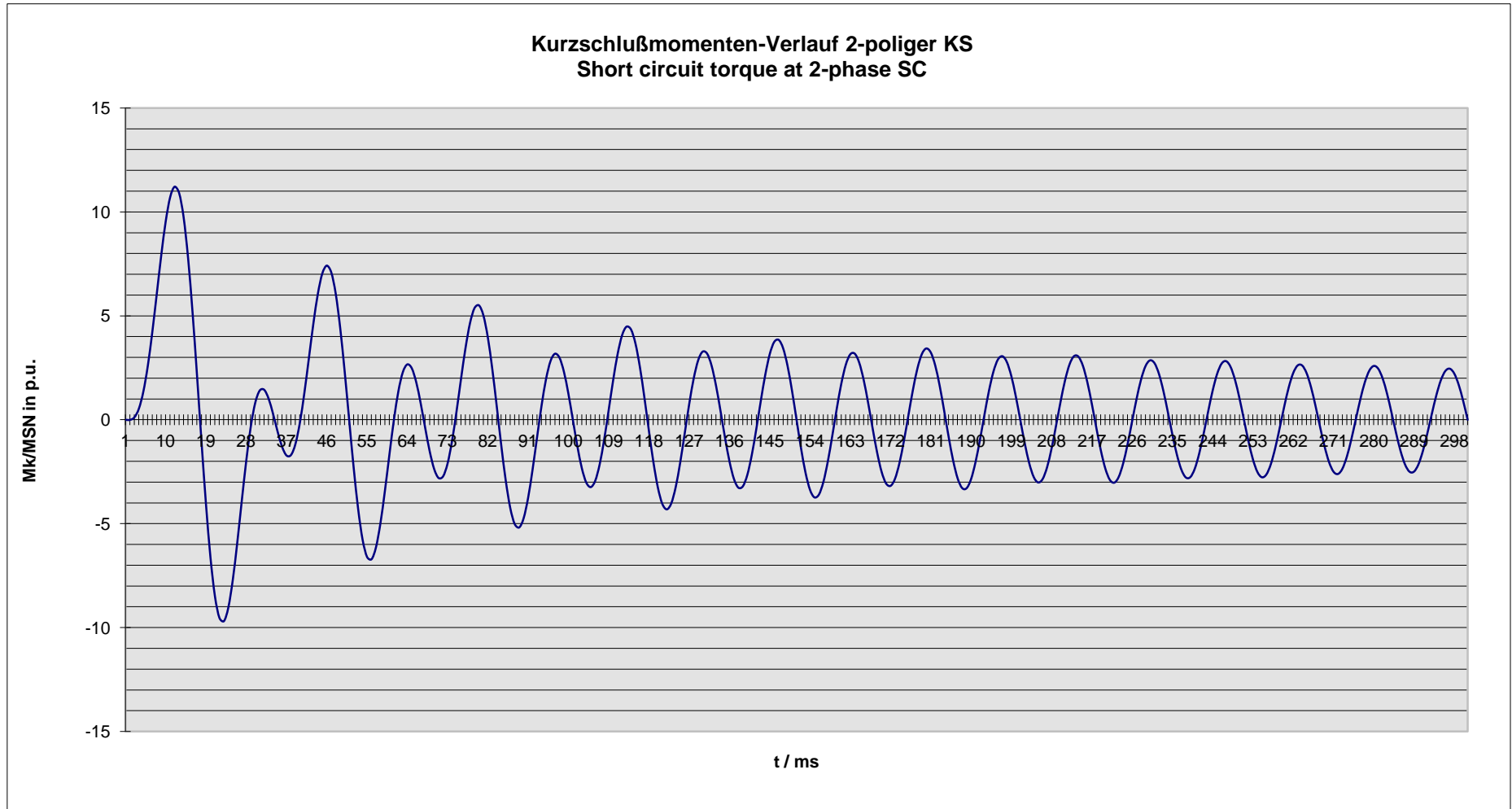


Technisches Datenblatt - Diagramme  
Technical data sheet - Diagrams

ING-FCD-0112

<b>Alternator :</b>	<b>DSG 74 L1/4</b>			
Rated output [kVA]	2100	Rated power factor:	0.8	Rated voltage [kV]: 0.48
Rated frequency [Hz]	60	Rated speed [rpm]	1800	MSN related to kVA: 11.14 KNm

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



#### Nenn Daten / nominal data

DSG 74 L1/4

Leistung  $S_N$ : **2100 kVA**

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

Rating

p.f.

Spannung  $U_N$ : **0.48 kV**

Strom  $I_N$ : **2526 A**

Voltage

Current

Frequenz  $f$ : **60 Hz**

Drehzahl  $n$ : **1,800 min<sup>-1</sup>**

Frequency

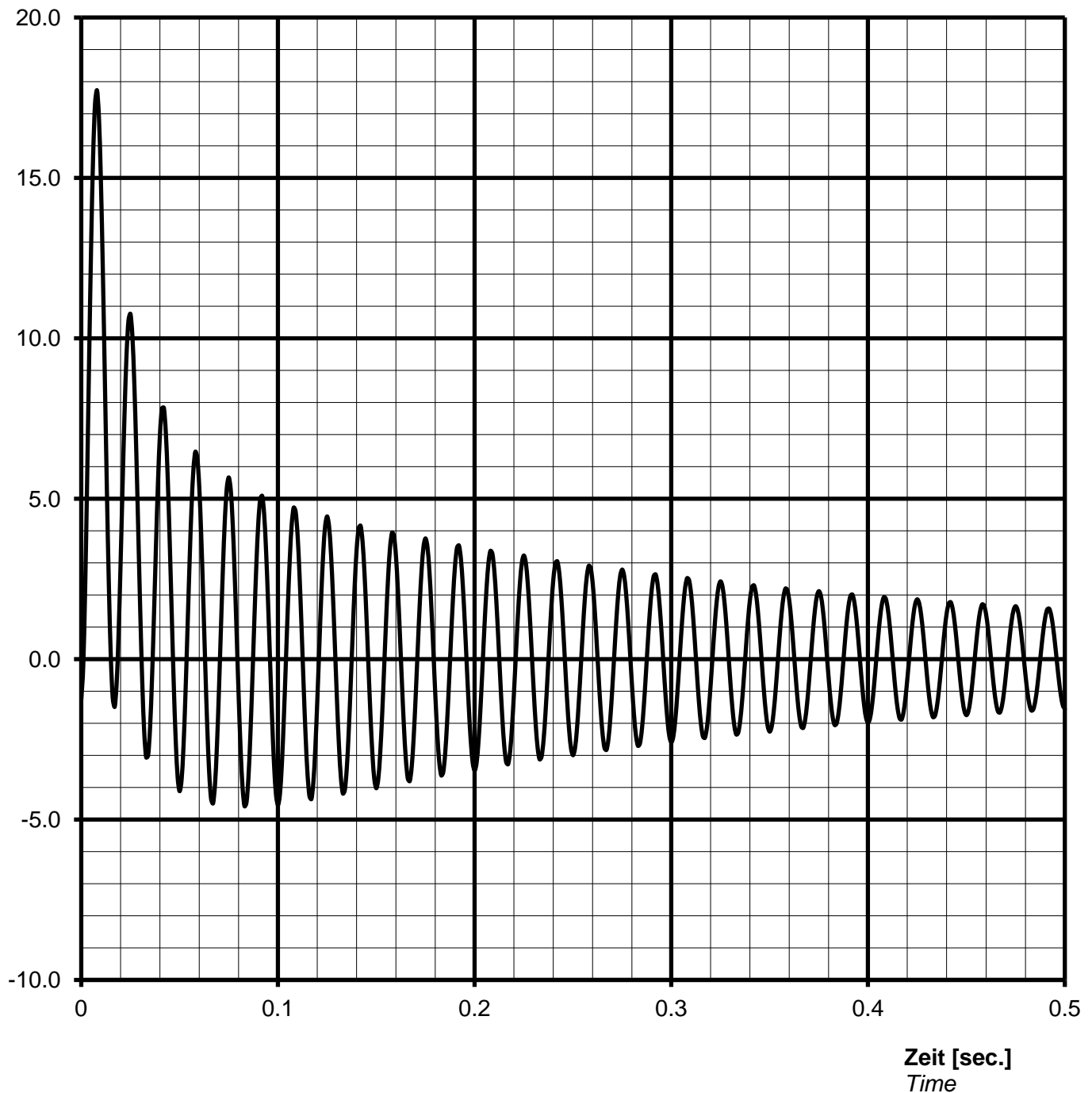
Speed

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  $I_{\text{speak}} =$  **44785 A** or **17.73 p.u.**

**Nenndaten / nominal data**

**DSG 74 L1/4**

Leistung  $S_N$ : **2100 kVA**

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

Rating

p.f.

Spannung  $U_N$ : **0.48 kV**

Strom  $I_N$ : **2526 A**

Voltage

Current

Frequenz f: **60 Hz**

Drehzahl n: **1800 min<sup>-1</sup>**

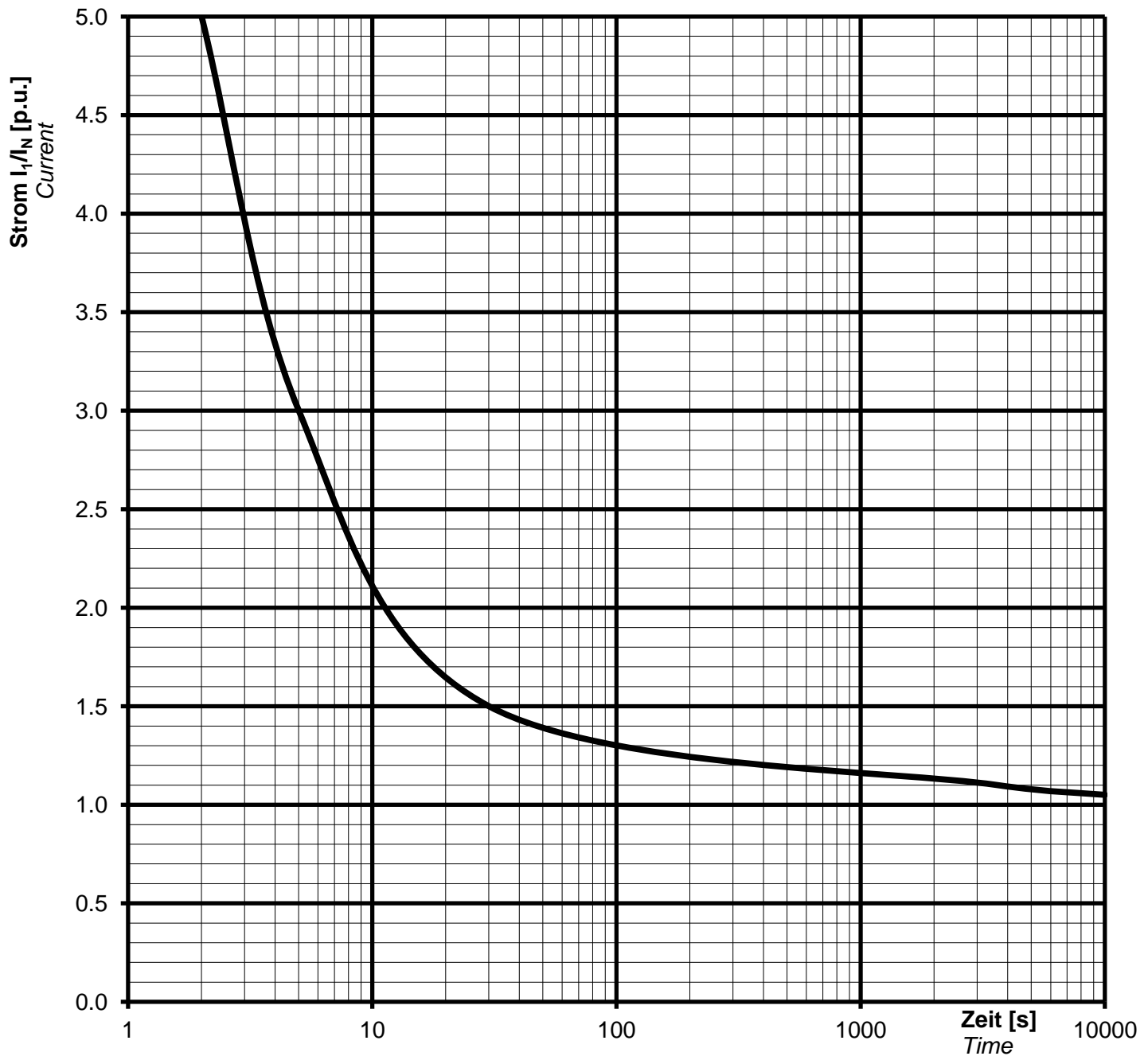
Frequency

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 74 L1/4**

Rating  $S_N$ : **2100 kVA**

*p.f.* **0.80**

*Bemessungsleistung*

Leistungsfaktor  $\cos \varphi$ :

Nominal voltage  $U_N$ : **0.48 kV**

Nominal current  $I_N$ : **2526 A**

*Bemessungsspannung*

*Bemessungsstrom*

Frequency  $f_N$ : **60 Hz**

Speed  $n$ : **1800 min<sup>-1</sup>**

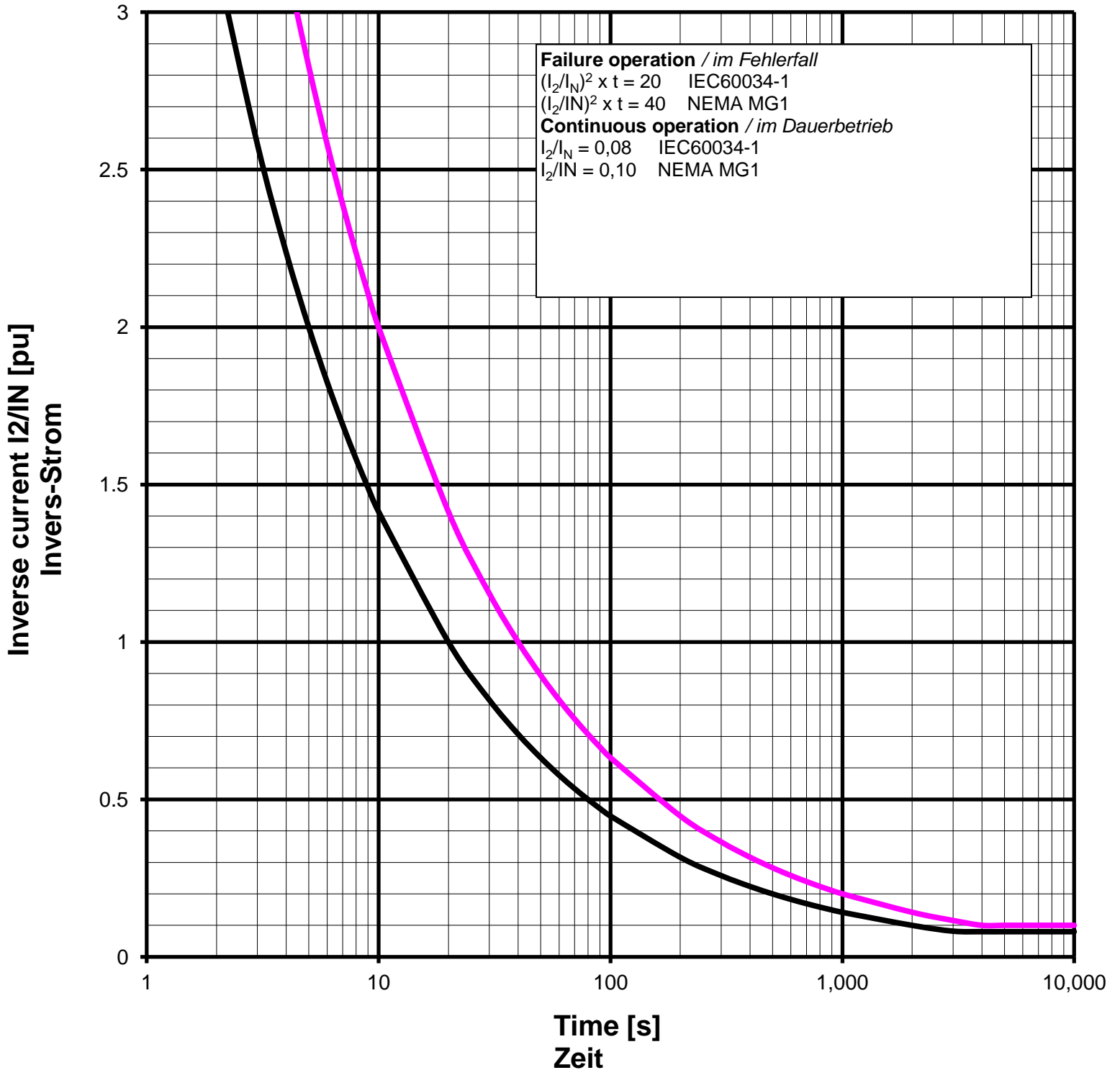
*Frequenz*

*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

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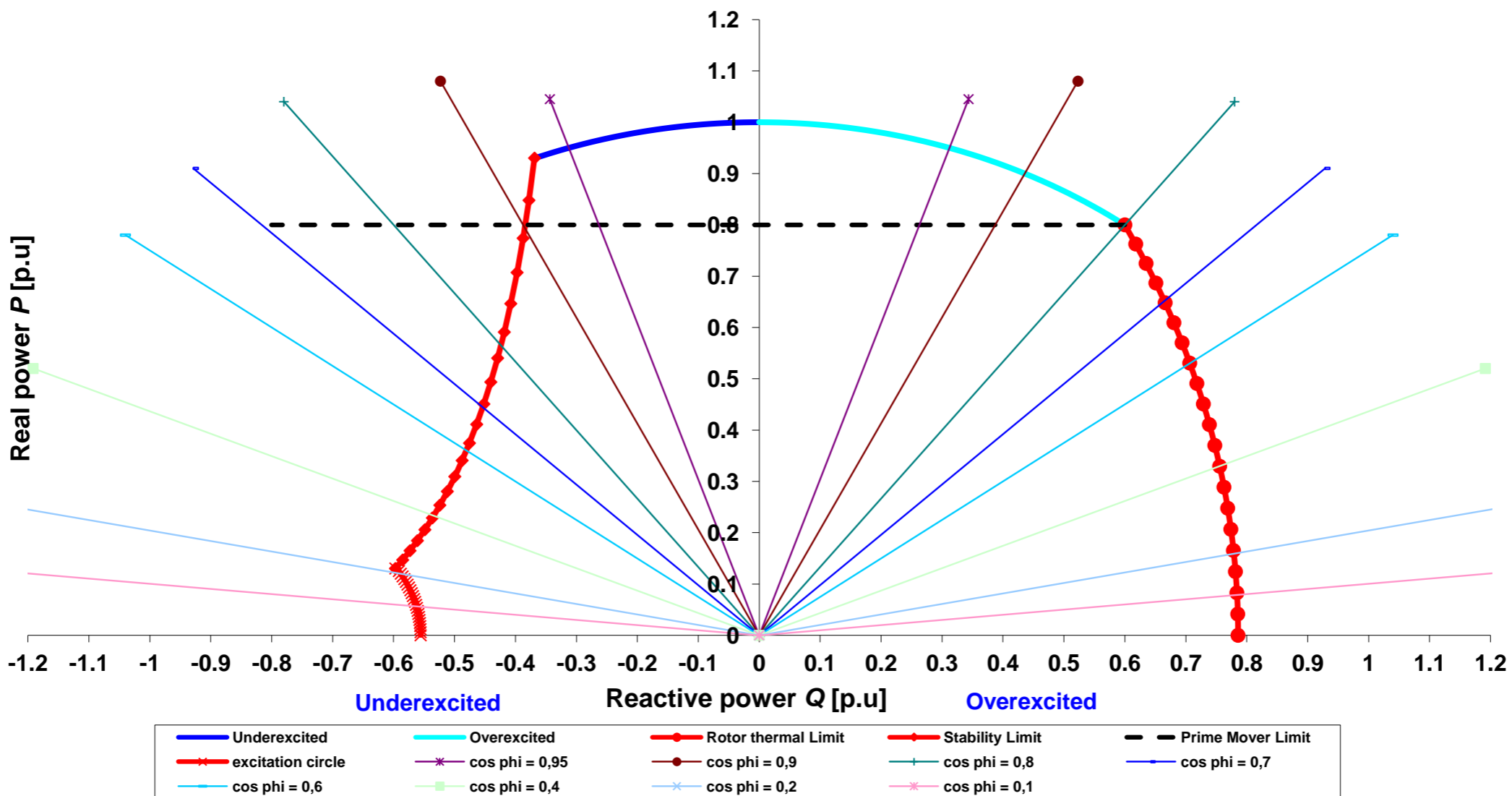
TYPE

DSG 74 L1/4

Projekt:

Order Nr.:

### Capability (P-Q) Diagram



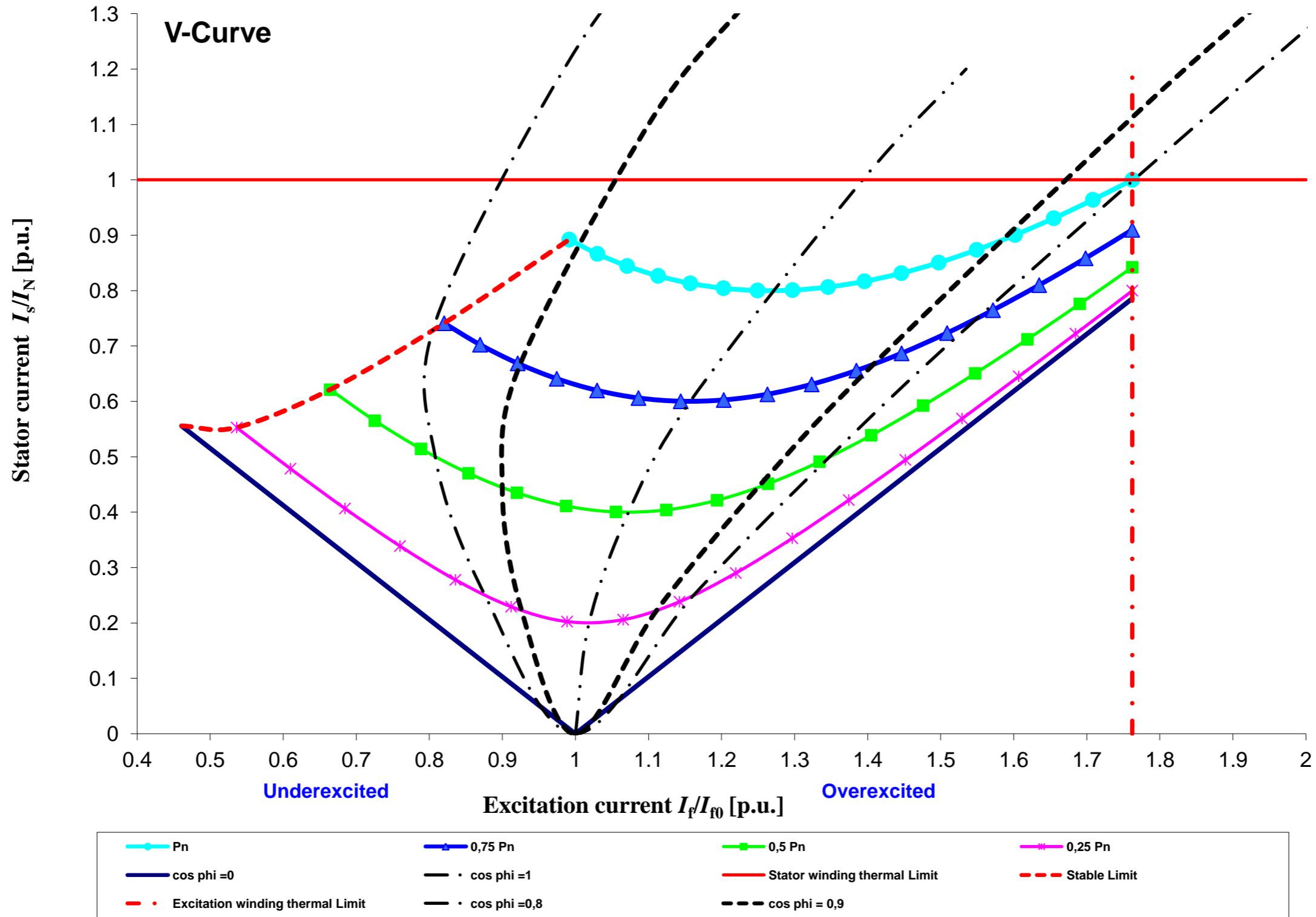
Cummins Generator Technologies

Datum / date:

30/09/2013



TYPE	DSG 74 L1/4	Projekt:		Order Nr.:	
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