



## Technical Data Sheet for AvK-Alternators

FM 7.3-5

Date:	03/10/13	Customer:	GENERIC DATASHEET only
Project No.:		AvK Reference:	DSG099K1_6_60_480

<b>Object data:</b>	
Site:	Prime Mover:
Application: Stationary Power Plant	Manufacturer:

<b>Generator data:</b>					
Generator:	DSG 99 K1/6	Poles:	6	Standards: IEC 60034	
Rated power:	3072 kVA	2458 kWe	2568 kWm		
Power factor:	0.80				
Power at pf 1,0	2487 kVA	2487 kWe	2568 kWm		
Rated voltage:	0.48 kV				
Speed:	1200 1/min				
Frequency:	60 Hz		Voltage range / frequency range:		
Rated current:	3695.0 A		Zone A according IEC 60034-1 (dU = +/-5%, df = +/-2%)		
Winding pitch:	ca. 5/6				
Insulation class:	Stator: Class H	Rotor: Class H	Temperature rise:	H	
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.:	3.0 m³/s	Cooling water quantity:	n/a
Moment of inertia (I):	151 kgm²	Weight:	6800 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

<b>Electrical data: (acc. IEC)</b>					
Efficiencies:	110%	100%	75%	50%	25%
Power factor 0.8	95,49	95,7	96	95,9	94,5
Power factor 0.9	96,1	96,28	96,5	96,28	94,74
Power factor 1.0	96,7	96,86	97	96,65	94,97

<b>Reactances and time constants</b>									
	unsaturated		saturated			unsaturated		saturated	
$X_d$	2.40	2.16 p.u.	$X_q$	1.20	1.18 p.u.	$T_{d0'}$	2.4 s	$T_{d0''}$	0.02563 s
$X_d'$	0.328	0.328 p.u.	$X_q'$	1.20	1.18 p.u.	$T_d'$	0.33 s	$T_{q0'}$	0.3 s
$X_d''$	0.211	0.192 p.u.	$X_q''$	0.211	0.211 p.u.	$T_d''$	0.015 s	$T_{q0''}$	0.17062 s
$X_2$	0.222	0.202 p.u.	$X_0$	0.064	0.058 p.u.	$T_a$	0.045 s	$T_{q1'}$	0.3 s
$X_{1s}$	n.a.	0.115 p.u.						$T_{q1''}$	0.03 s
Short circuit ratio saturated: 0.46					$Z_n$ 0.075 Ohm				

<b>Short circuit data:</b>		
Initial short circuit current (3-phase):	$I_k'$	19245 A
Max. peak current (3-phase):	$I_s$	48990 A
Sustained short circuit current:	$I_k$	11085 A
Minimum 3 x rated current for max.10 s		
Initial short circuit torque:	$M_{k2}$	165.5 kNm
	$M_{k3}$	99.3 kNm
Max. faulty synchron moment:	$M_f$	355.8 kNm
Rated kVA torque:	$M_{SN}$	24.45 kNm
Rated torque	$M_N$	19.56 kNm
Shaft torque	$M_{Sh}$	20.44 kNm

<b>Load application:</b>	
max. load application: 1405 kVA (corresponds to 45,73 % from 3072 kVA) for Power factor 0.4 15% transient voltage drop	Power: 3072 kVA Power factor: 0.8 transient voltage drop: -24.7 %

**Remarks:**

**Alternator :****DSG 99 K1/6**

Rated output [kVA]

3072

Rated power factor:

0.8

Rated voltage [kV]: 0.48

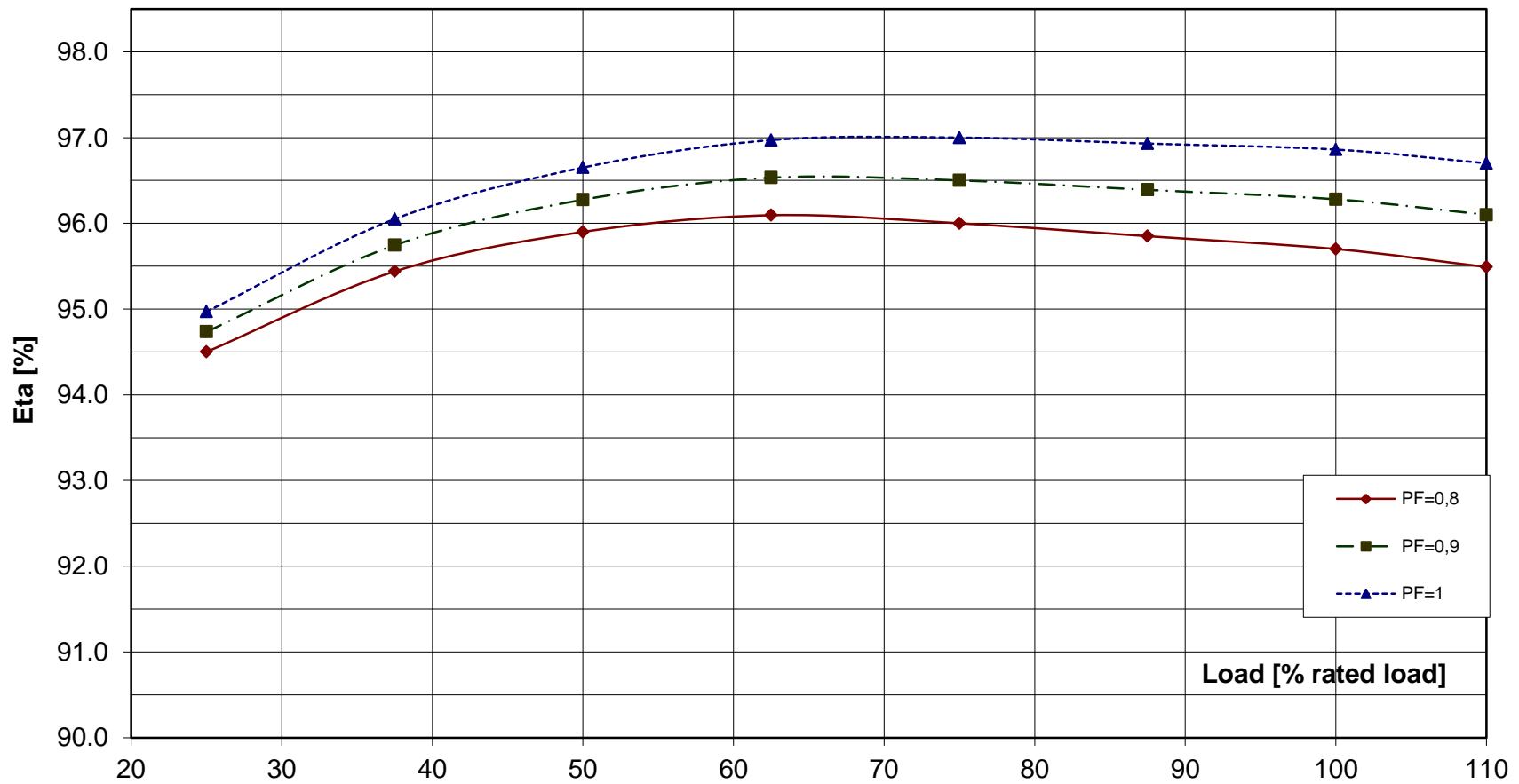
Rated frequency [Hz]

60

Rated speed [rpm]

1200

### Wirkungsgrad-Kennlinie - Efficiency Curve



**Alternator : DSG 99 K1/6**

Rated output [kVA]

3072

Rated power factor:

0.8

Rated voltage [kV]: 0.48

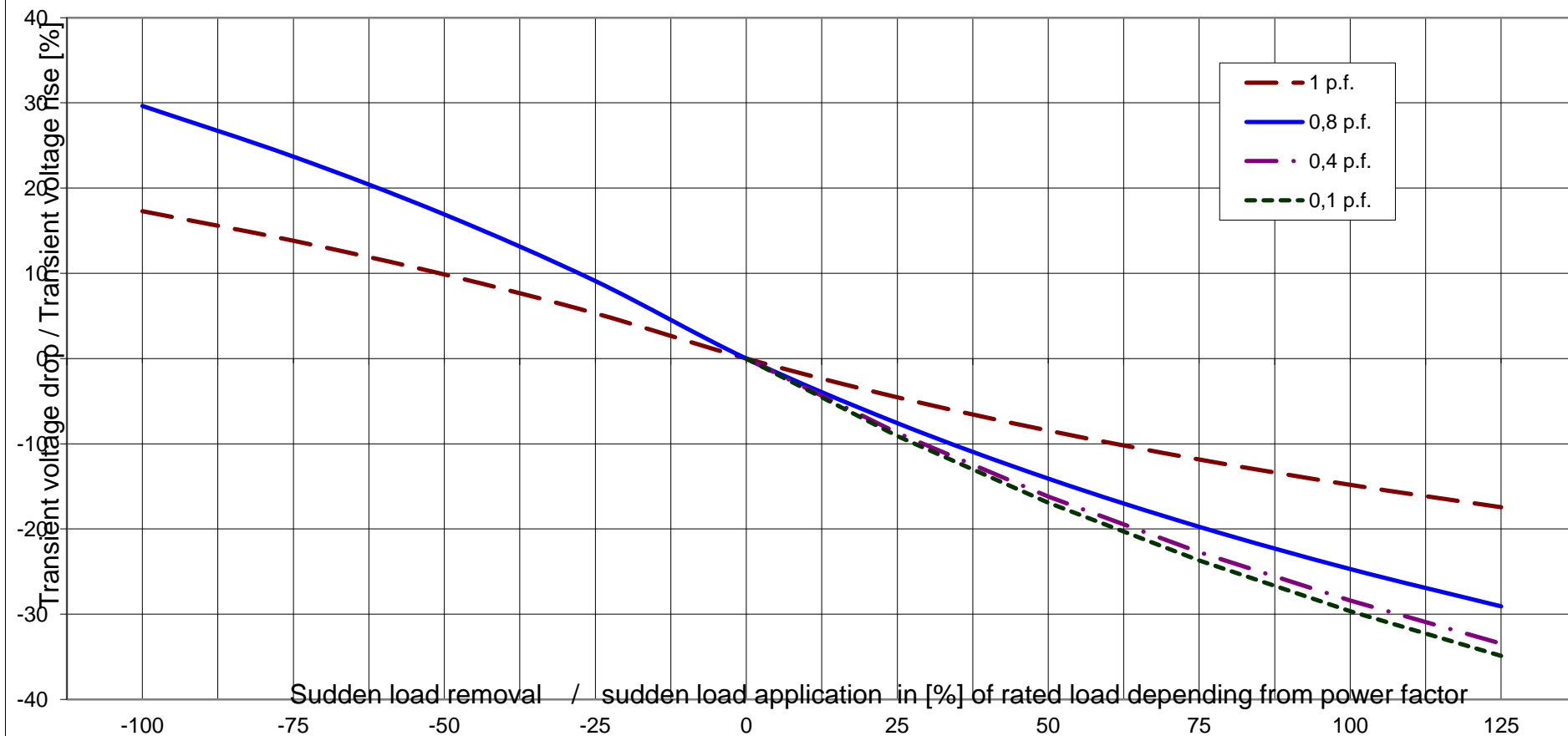
Rated frequency [Hz]

60

Rated speed [rpm]

1200

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





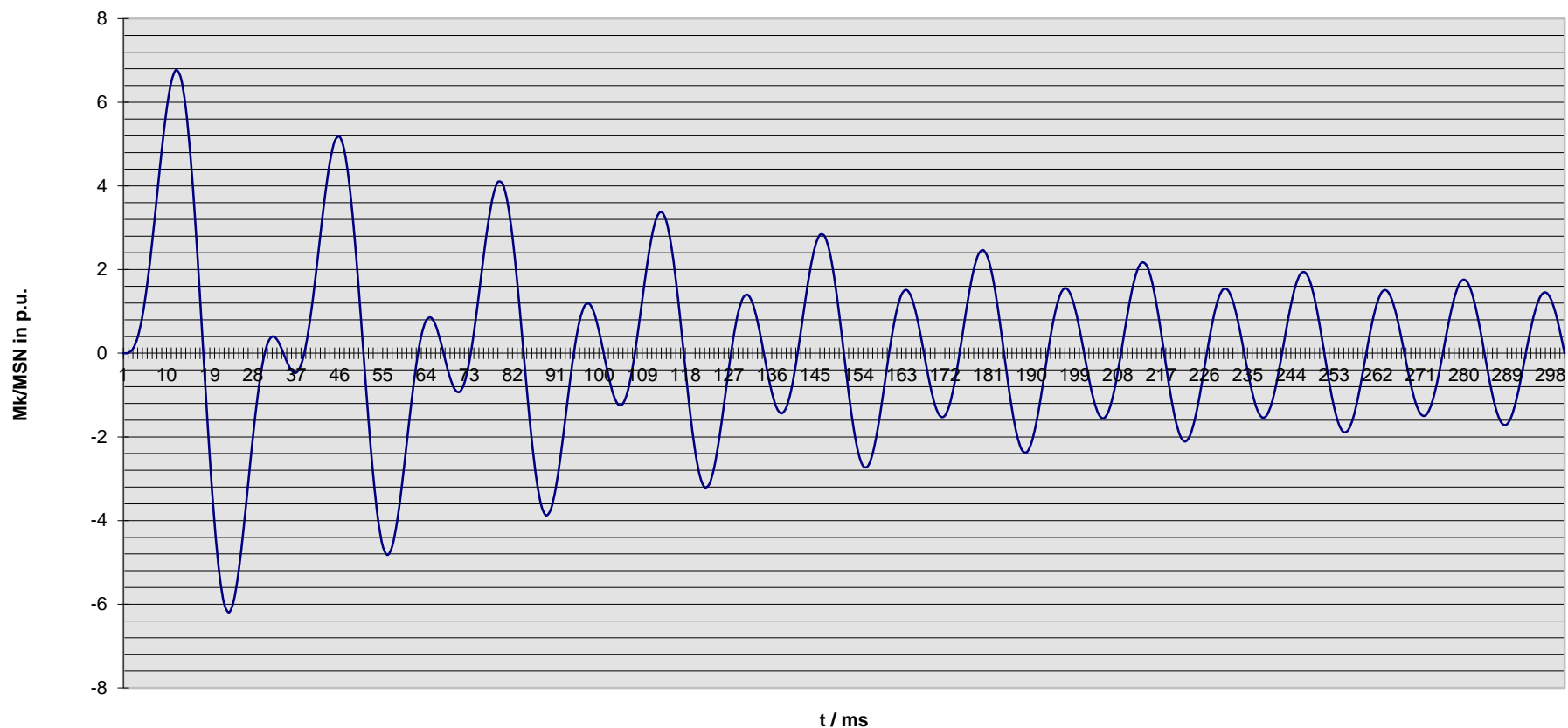
Technisches Datenblatt - Diagramme  
Technical data sheet - Diagrams

**ING-FCD-0112**

**Alternator : DSG 99 K1/6**

Rated output [kVA]	3072	Rated power factor:	0.8	Rated voltage [kV]:	0.48
Rated frequency [Hz]	60	Rated speed [rpm]	1200	MSN related to kVA:	24.45 KNm

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



**Nenn Daten / nominal data**

**DSG 99 K1/6**

Leistung  $S_N$ : **3072 kVA**

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

*Rating*

*p.f.*

Spannung  $U_N$ : **0.48 kV**

Strom  $I_N$ : **3695 A**

*Voltage*

*Current*

Frequenz  $f$ : **60 Hz**

Drehzahl  $n$ : **1,200 min<sup>-1</sup>**

*Frequency*

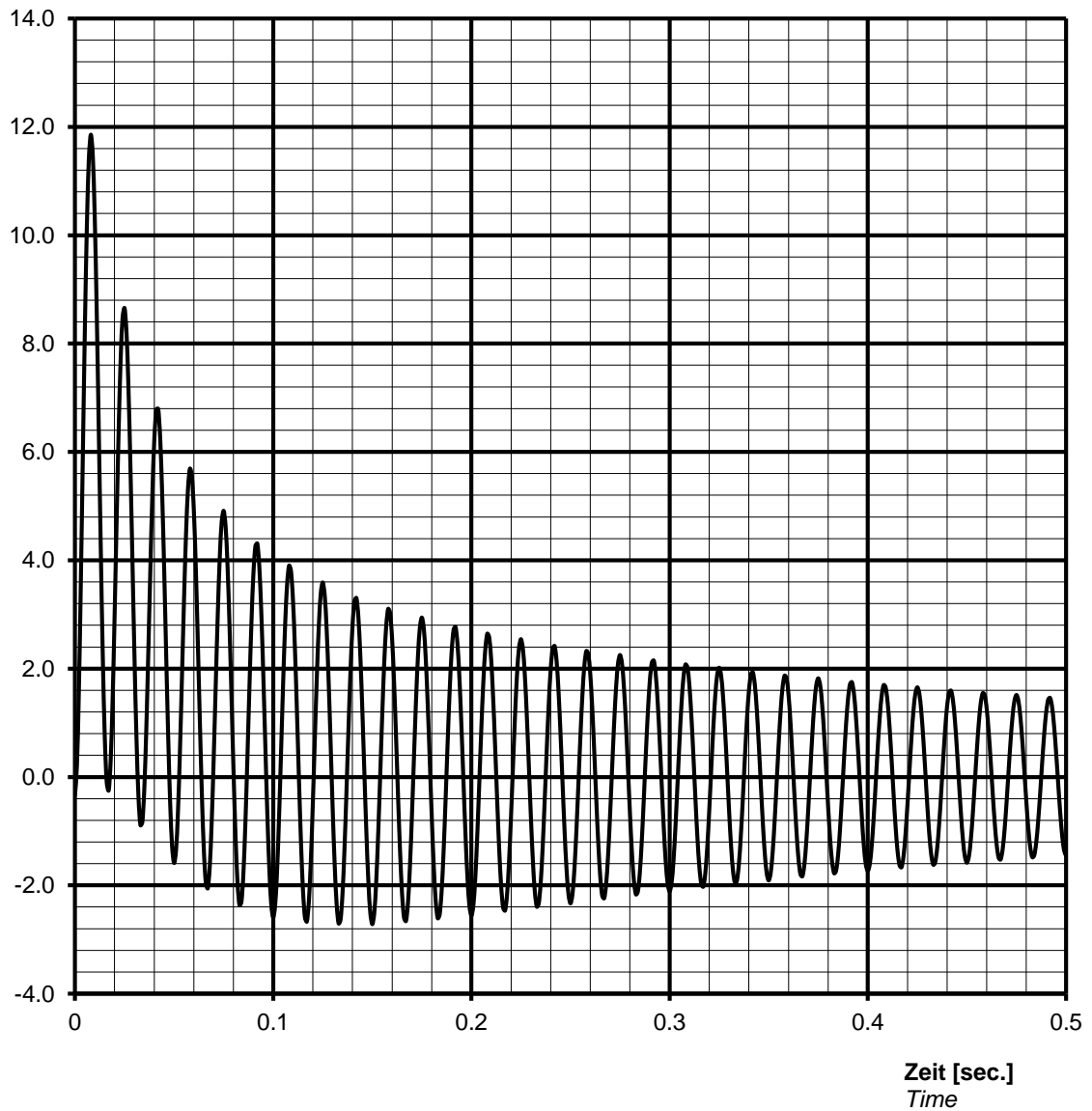
*Speed*

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**  $I_{\text{speak}} =$  **43809 A** or **11.86 p.u.**

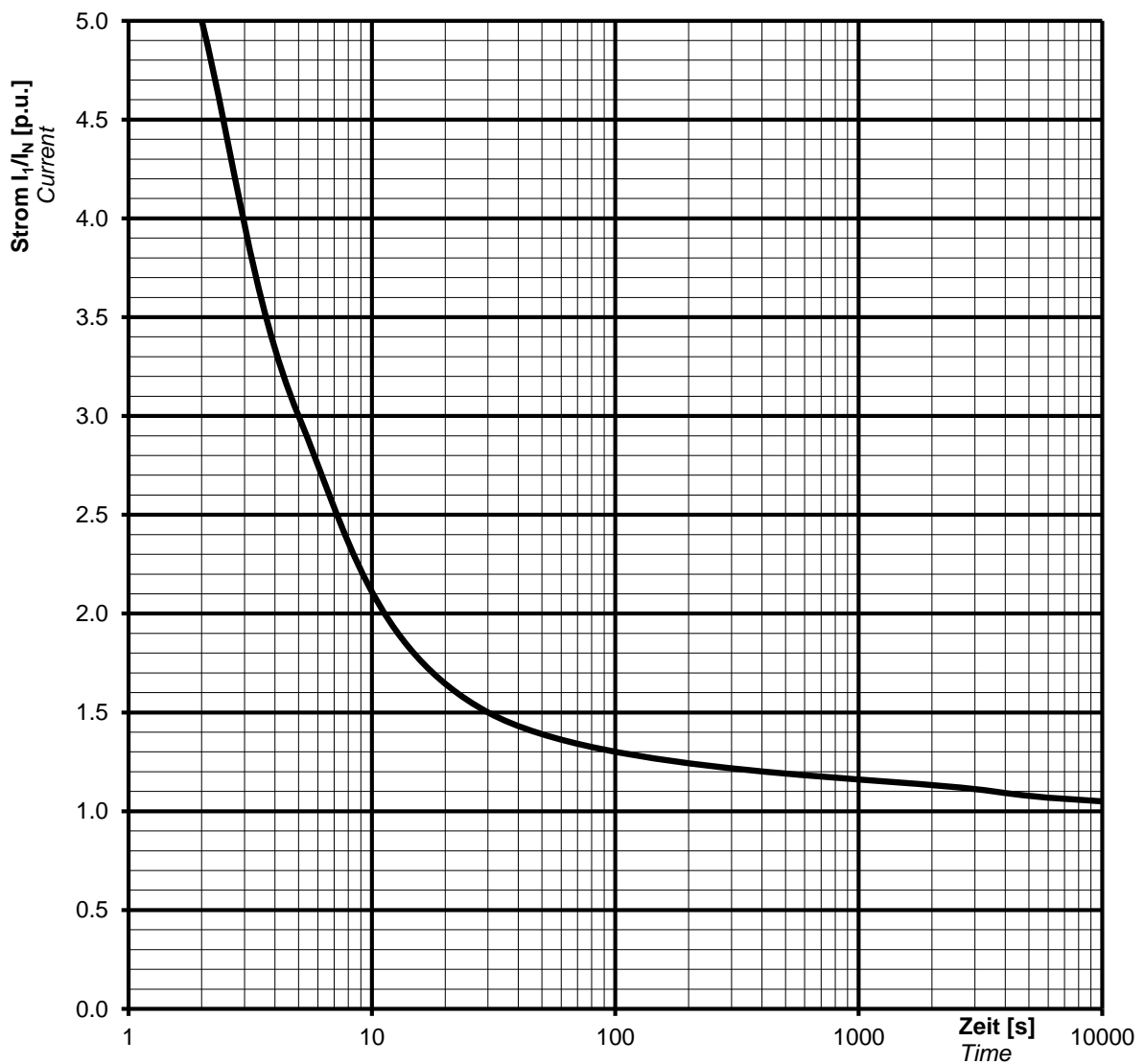
**Nenndaten / nominal data**

**DSG 99 K1/6**

Leistung  $S_N$ : **3072** kVA  
*Rating*  
 Spannung  $U_N$ : **0.48** kV  
*Voltage*  
 Frequenz  $f$ : **60** Hz  
*Frequency*  
 Schutzart **IP23**  
*Protection*

$\cos \varphi$ : **0.80**  
*p.f.*  
 Strom  $I_N$ : **3695** A  
*Current*  
 Drehzahl  $n$ : **1200** min<sup>-1</sup>  
*Speed*

**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

#### Nennndaten / nominal data

DSG 99 K1/6

Rating  $S_N$ : **3072 kVA**

Bemessungsleistung

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

Bemessungsspannung

Frequency  $f_N$ : **60 Hz**

Frequenz

Protection: **IP23**

Schutzart

*p.f.* **0.80**

Leistungsfaktor  $\cos \varphi$ :

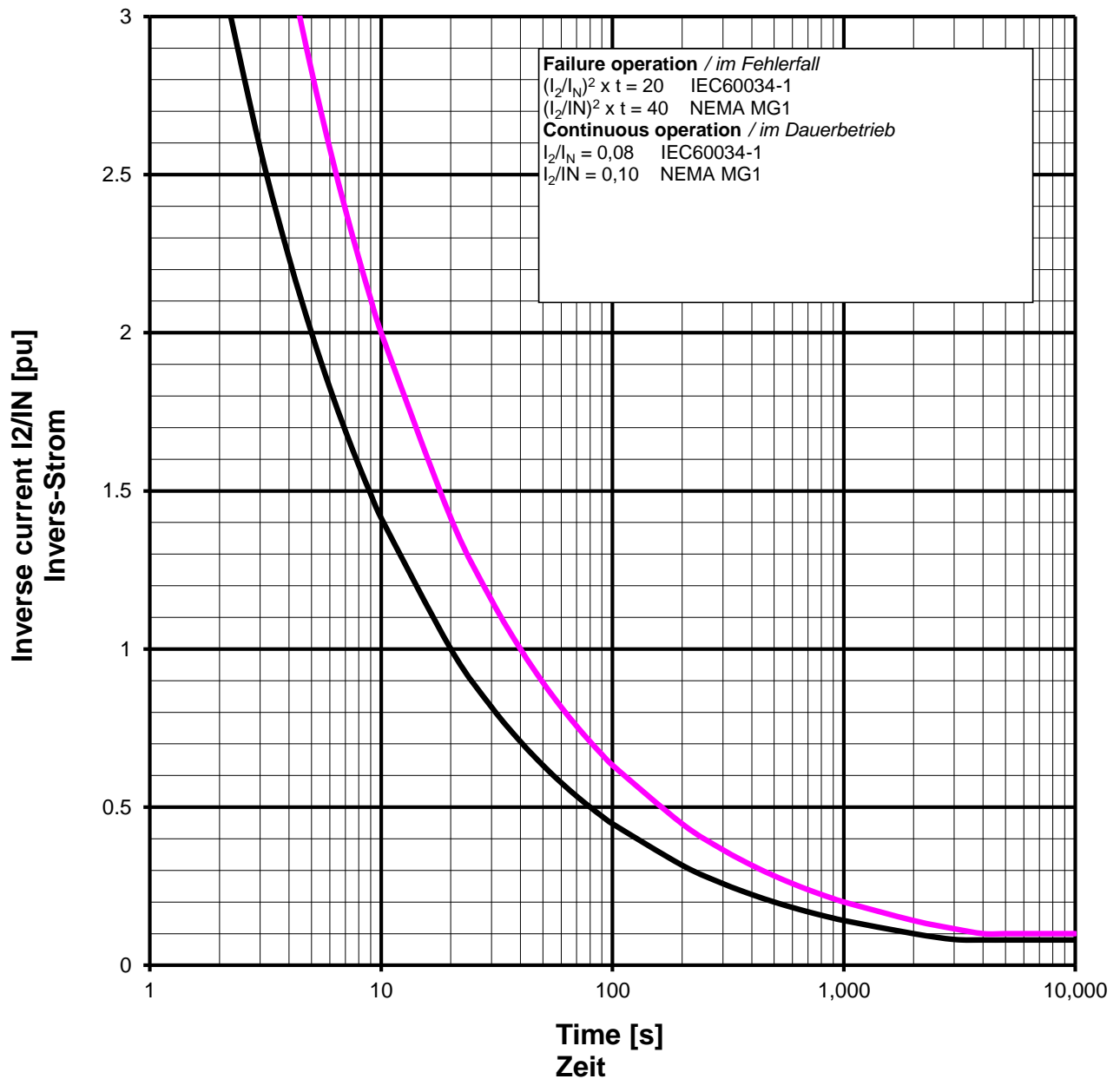
Nominal current  $I_N$ : **3695 A**

Bemessungsstrom

Speed  $n$ : **1200 min<sup>-1</sup>**

Drehzahl

#### Inverse current or unbalanced negative sequence current



Remarks / Notizen:

All data according IEC 60034-1, NEMA MG1



Technische Daten selbstregelnden Drehstrom-Synchrongenerator  
technical data for self regulating three phase alternator

ING-FCD-0112

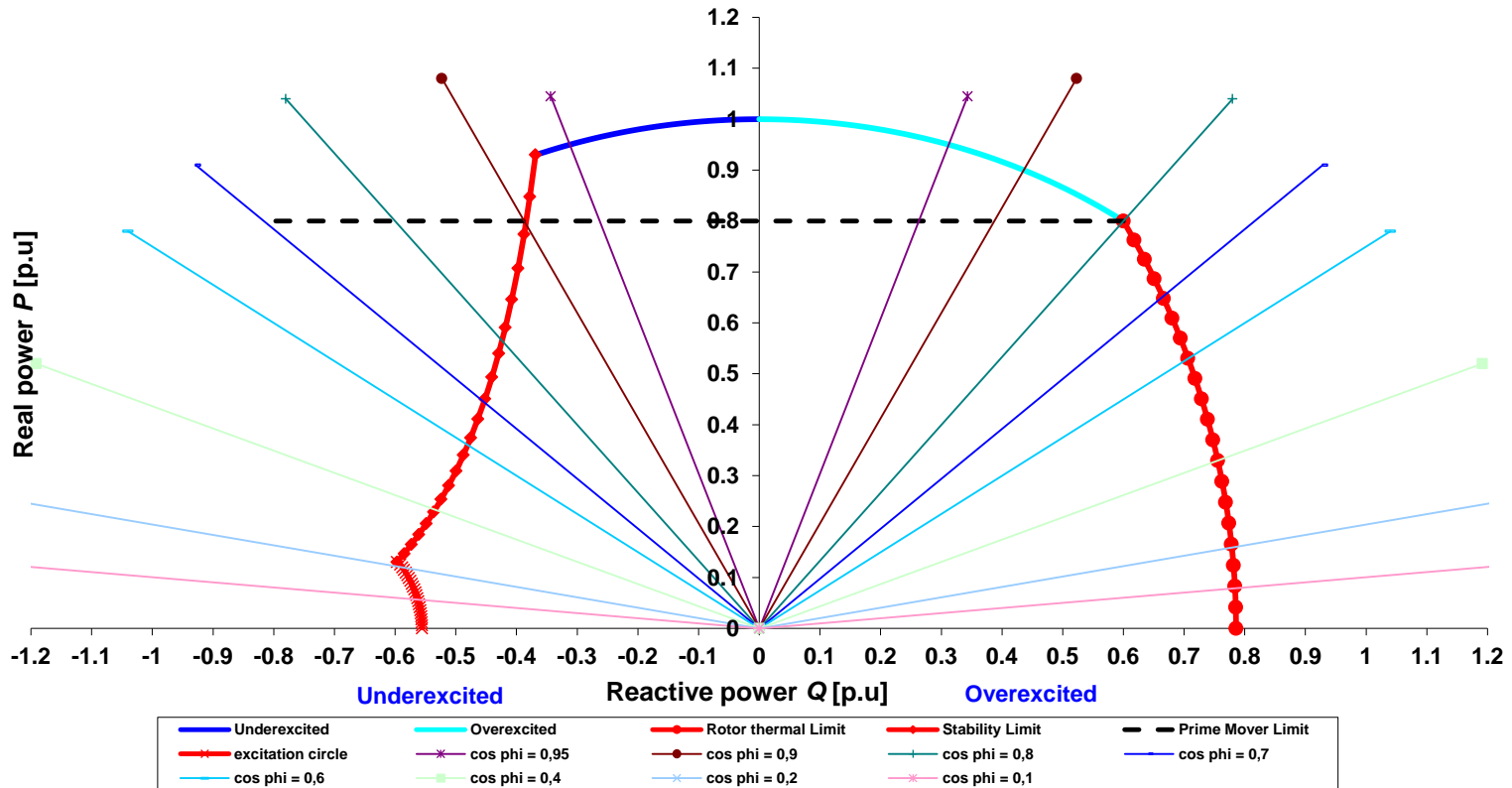
TYPE

DSG 99 K1/6

Projekt:

Order Nr.:

### Capability (P-Q) Diagram



Cummins Generator Technologies

Datum / date:

03/10/2013





Technische Daten selbstregelnden Drehstrom-Synchrongenerator  
 technical data for self regulating three phase alternator

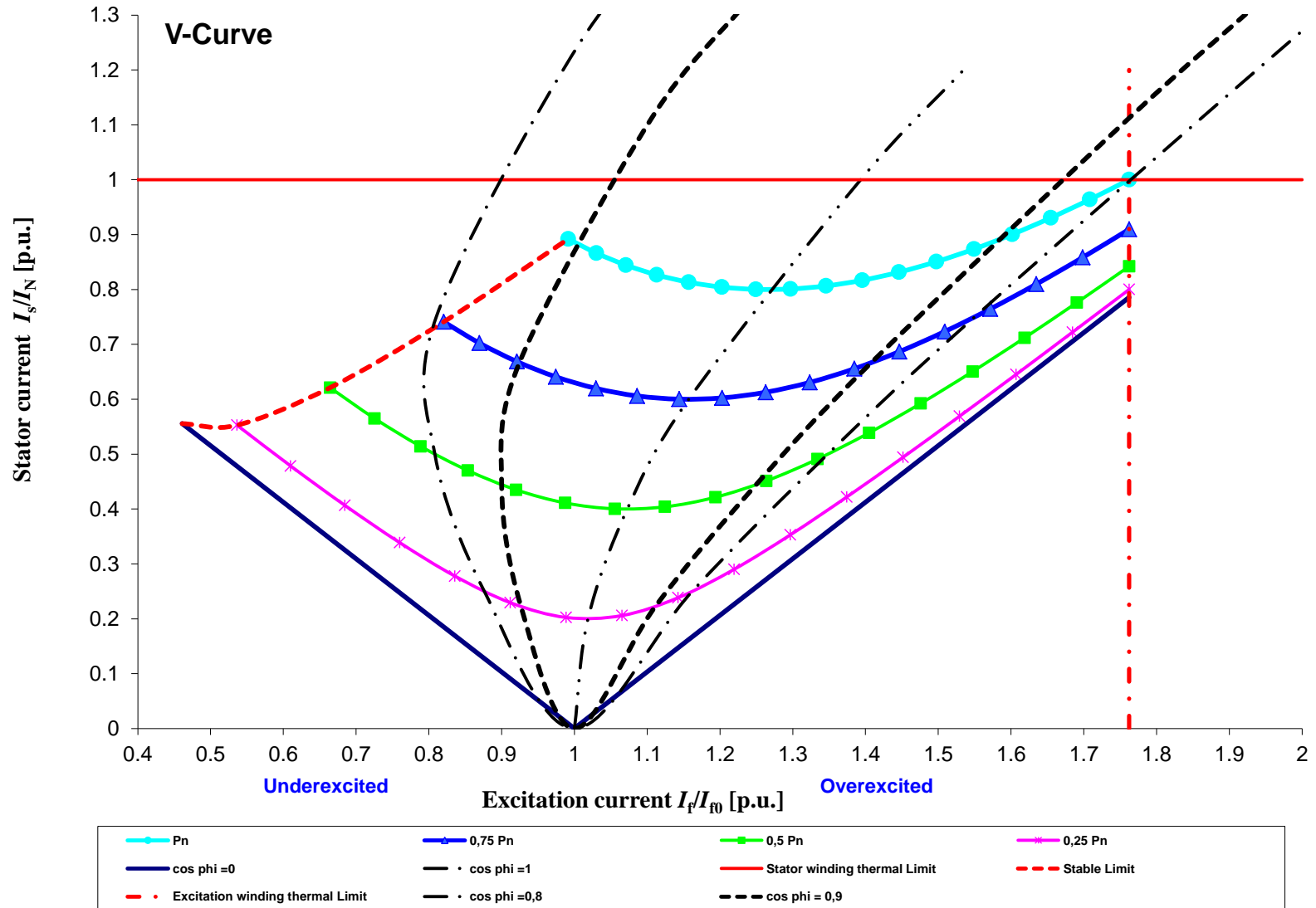
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