

**Technical Data Sheet for AvK-Alternators**

FM 7.3-5

Date:	30/09/13	Customer:	GENERIC DATASHEET only
Project No.:		AvK Reference:	DSG086M1_4_59_400

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

<b>Generator data:</b>					
Generator:	DSG 86 M1/4	Poles:	4	Standards: IEC 60034	
Rated power:	2400 kVA	1920 kWe	2006 kWm		
Power factor:	0.80				
Power at pf 1,0	1946 kVA	1946 kWe	2006 kWm		
Rated voltage:	0.4 kV				
Speed:	1500 1/min				
Frequency:	50 Hz	Voltage range / frequency range:			
Rated current:	3464.1 A	Zone A according IEC 60034-1 (dU = +/-5%, df = +/-2%)			
Winding pitch:	2/3				
Insulation class:	Stator: Class H	Rotor: Class H	Temperature rise:	H	
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.:	2.9 m³/s	Cooling water quantity:	n/a
Moment of inertia (I):	70 kgm²	Weight:	5750 Kg	Losses (environment):	86 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	94,3
Power factor 0.9	96,17	96,35	96,5	96,25	94,5
Power factor 1.0	96,85	97	97	96,6	94,7

<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.	$T_{d0'}$	3.35 s	$T_{d0''}$	0.02827 s
$X_d'$	0.262	0.262	p.u.	$X_q'$	1.20	1.18	p.u.	$T_{d'}$	0.37 s	$T_{q0'}$	0.3 s
$X_d''$	0.153	0.139	p.u.	$X_q''$	0.153	0.153	p.u.	$T_{d''}$	0.015 s	$T_{q0''}$	0.23529 s
$X_2$	0.161	0.146	p.u.	$X_0$	0.046	0.042	p.u.	$T_a$	0.04 s	$T_{q'}$	0.3 s
$X_{1s}$	n.a.	0.083	p.u.							$T_{q''}$	0.03 s
Short circuit ratio saturated: 0.46					$Z_n$ 0.067 Ohm						

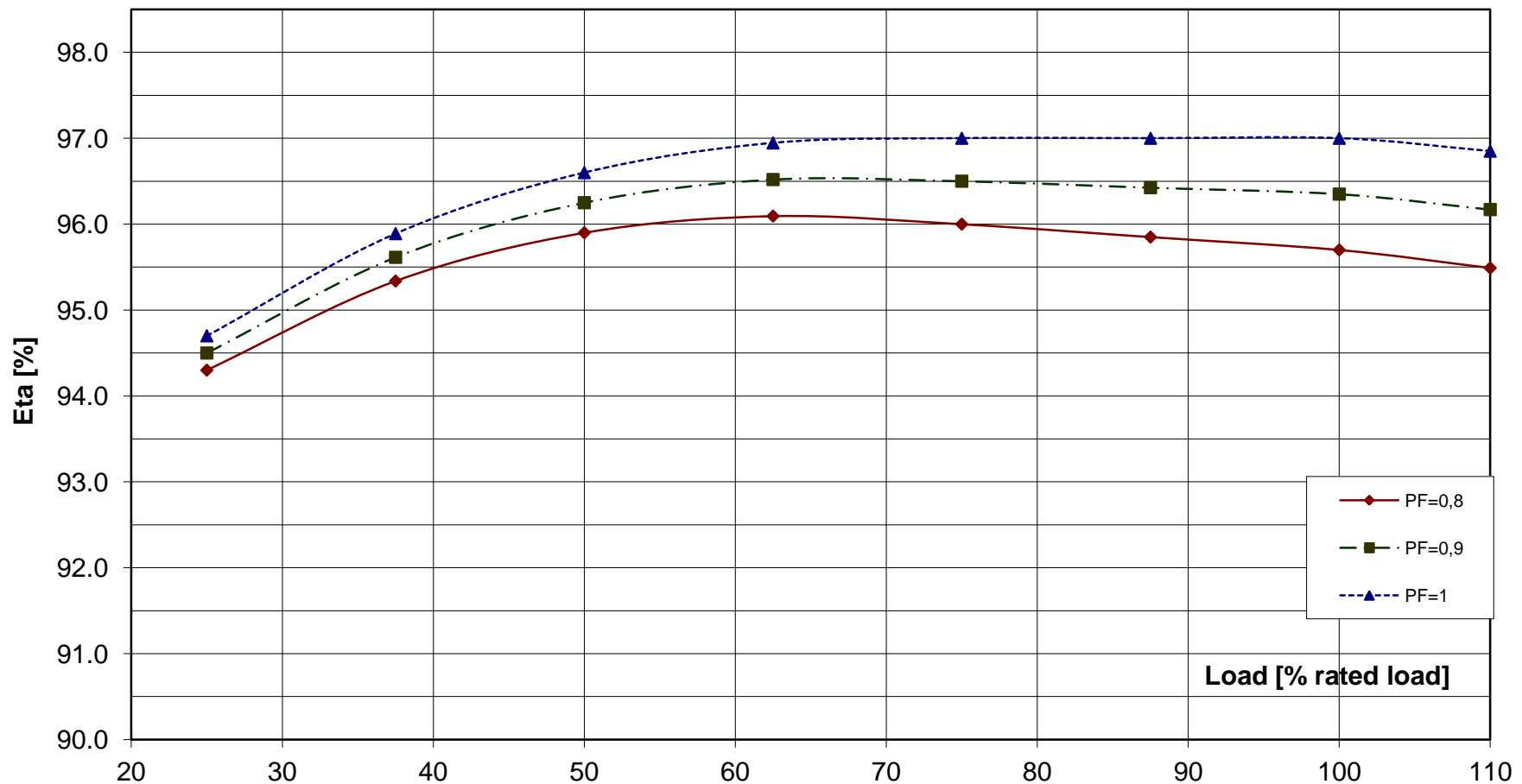
<b>Short circuit data:</b>		
Initial short circuit current (3-phase):	$I_k''$	24922 A
Max. peak current (3-phase):	$I_s$	63441 A
Sustained short circuit current:	$I_k$	10392 A
Minimum 3 x rated current for max.10 s		
Initial short circuit torque:	$M_{k2}$	142.9 kNm
	$M_{k3}$	85.7 kNm
Max. faulty synchron moment:	$M_f$	307.2 kNm
Rated kVA torque:	$M_{SN}$	15.28 kNm
Rated torque	$M_N$	12.22 kNm
Shaft torque	$M_{Sh}$	12.77 kNm

<b>Load application:</b>	
max. load application: 1374 kVA (corresponds to 57,25 % from 2400 kVA) for Power factor 0.4 15% transient voltage drop	Power: 2400 kVA Power factor: 0.8 transient voltage drop: -20.8 %

**Remarks:**

<b>Alternator :</b>	<b>DSG 86 M1/4</b>		
Rated output [kVA]	2400	Rated power factor:	0.8
Rated frequency [Hz]	50	Rated speed [rpm]	1500
			Rated voltage [kV]: 0.4

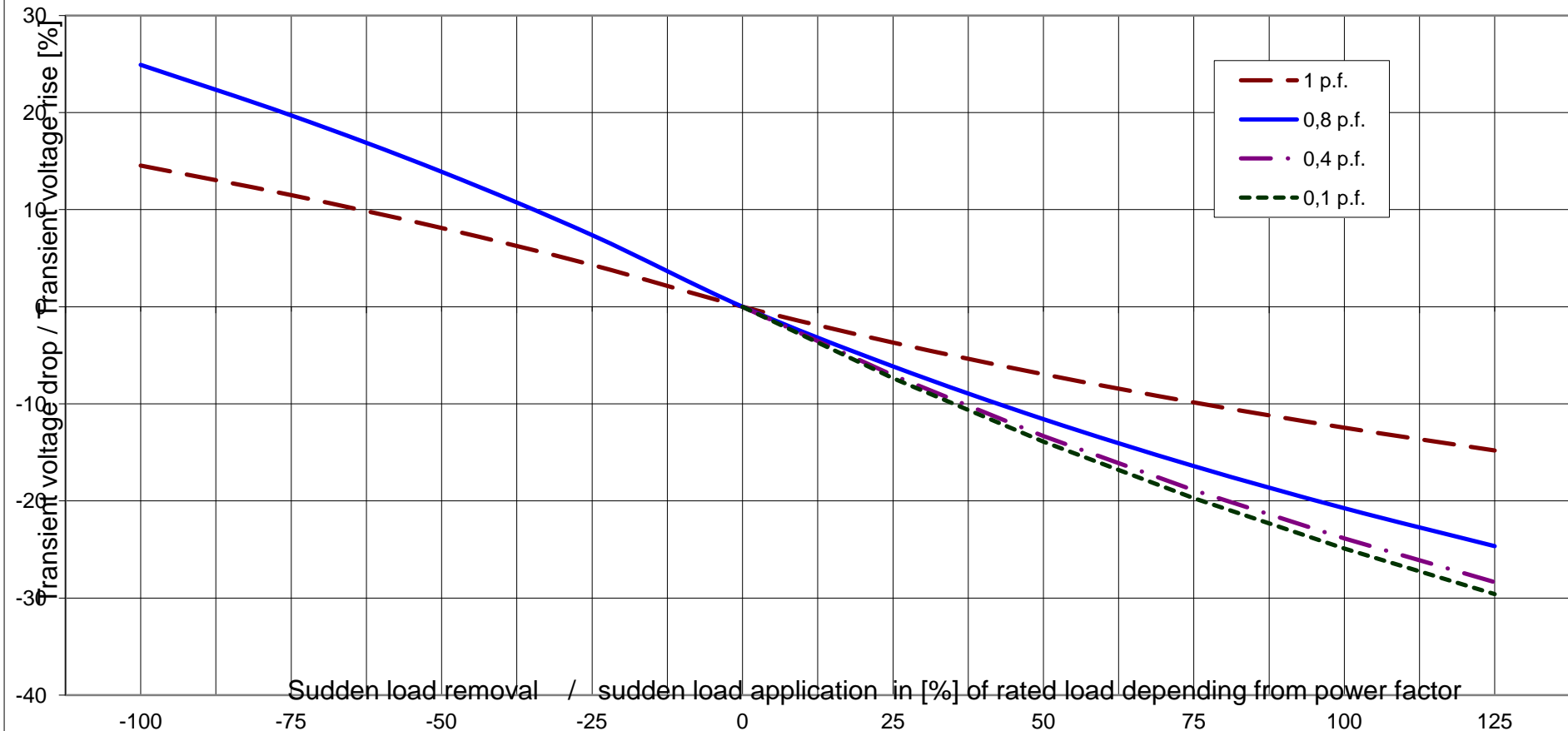
### Wirkungsgrad-Kennlinie - Efficiency Curve



**Alternator : DSG 86 M1/4**

Rated output [kVA]	2400	Rated power factor:	0.8	Rated voltage [kV]:	0.4
Rated frequency [Hz]	50	Rated speed [rpm]	1500		

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



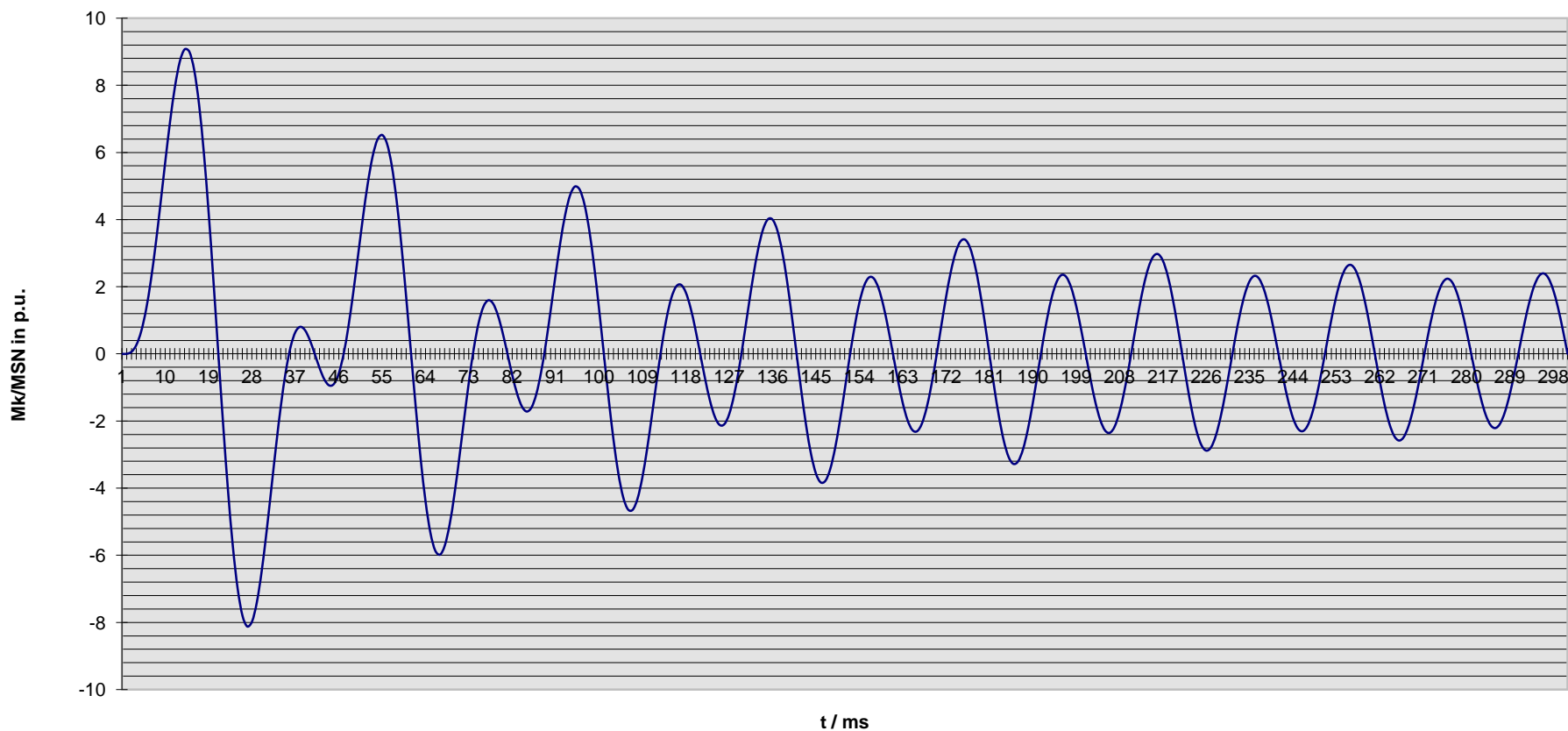


Technisches Datenblatt - Diagramme  
Technical data sheet - Diagrams

ING-FCD-0112

<b>Alternator :</b>	<b>DSG 86 M1/4</b>			
Rated output [kVA]	2400	Rated power factor:	0.8	Rated voltage [kV]: 0.4
Rated frequency [Hz]	50	Rated speed [rpm]	1500	MSN related to kVA: 15.28 KNm

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



#### Nenn Daten / nominal data

DSG 86 M1/4

Leistung  $S_N$ : **2400** kVA

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

*Rating*

*p.f.*

Spannung  $U_N$ : **0.40** kV

Strom  $I_N$ : **3464** A

*Voltage*

*Current*

Frequenz  $f$ : **50** Hz

Drehzahl  $n$ : **1,500** min<sup>-1</sup>

*Frequency*

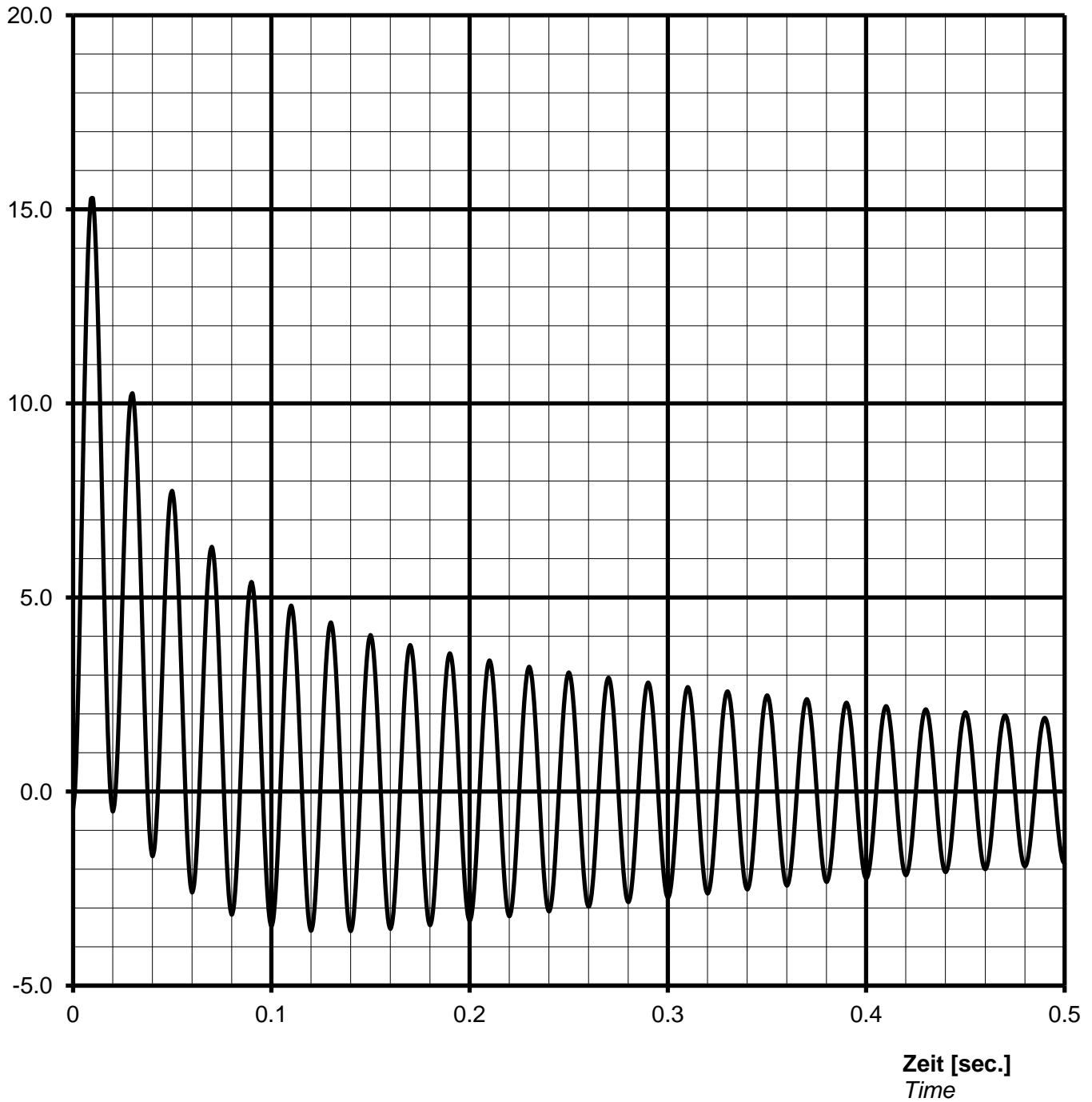
*Speed*

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  $I_{\text{speak}} =$  **52943 A** or **15.28 p.u.**

#### Nenn Daten / nominal data

DSG 86 M1/4

Leistung  $S_N$ : **2400 kVA**

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

Rating

p.f.

Spannung  $U_N$ : **0.40 kV**

Strom  $I_N$ : **3464 A**

Voltage

Current

Frequenz f: **50 Hz**

Drehzahl n: **1500 min<sup>-1</sup>**

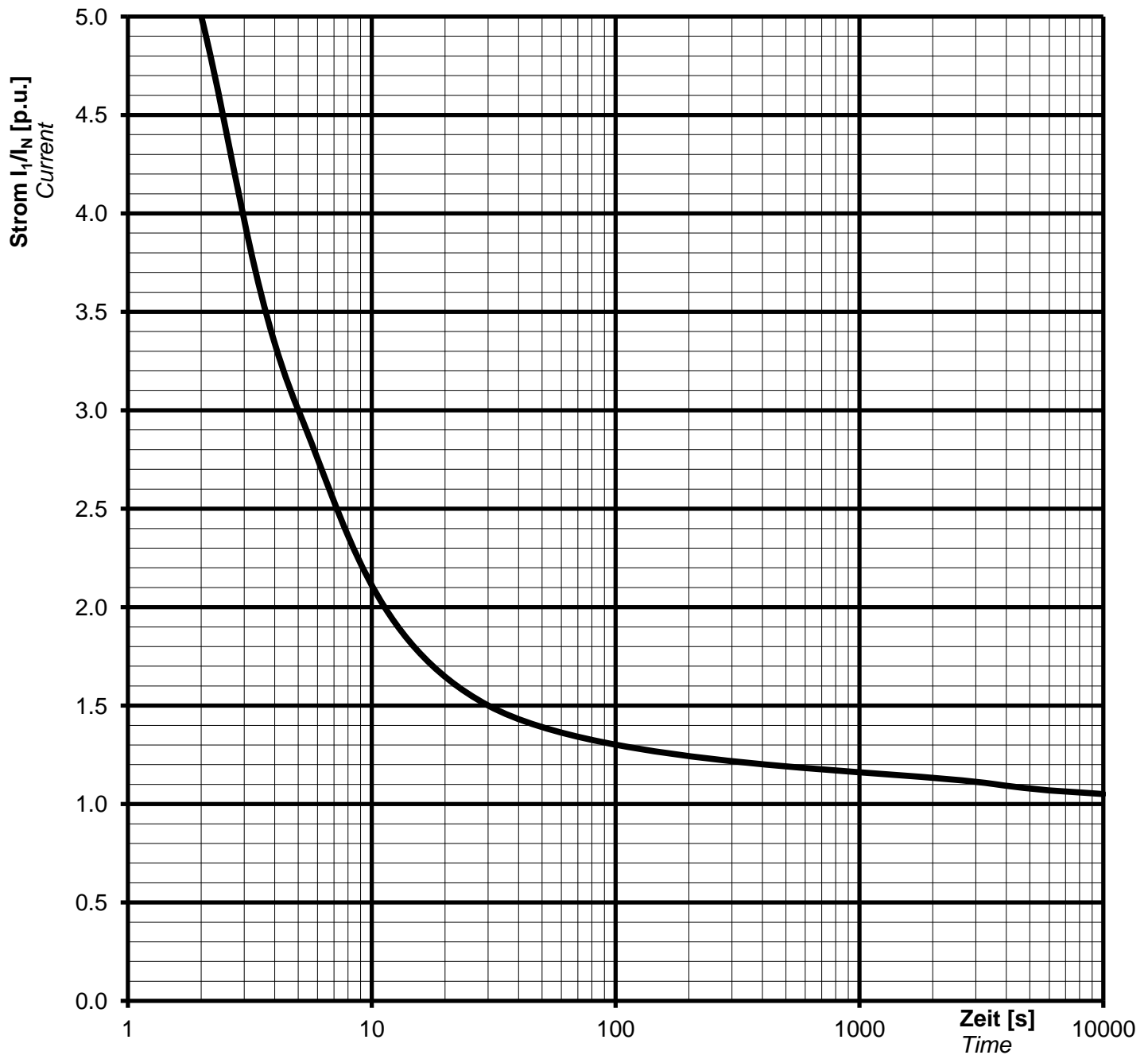
Frequency

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

#### Nennwerten / nominal data

DSG 86 M1/4

Rating  $S_N$ : **2400 kVA**

*p.f.* **0.80**

*Bemessungsleistung*

Leistungsfaktor  $\cos \varphi$ :

Nominal voltage  $U_N$ : **0.40 kV**

Nominal current  $I_N$ : **3464 A**

*Bemessungsspannung*

*Bemessungsstrom*

Frequency  $f_N$ : **50 Hz**

Speed  $n$ : **1500 min<sup>-1</sup>**

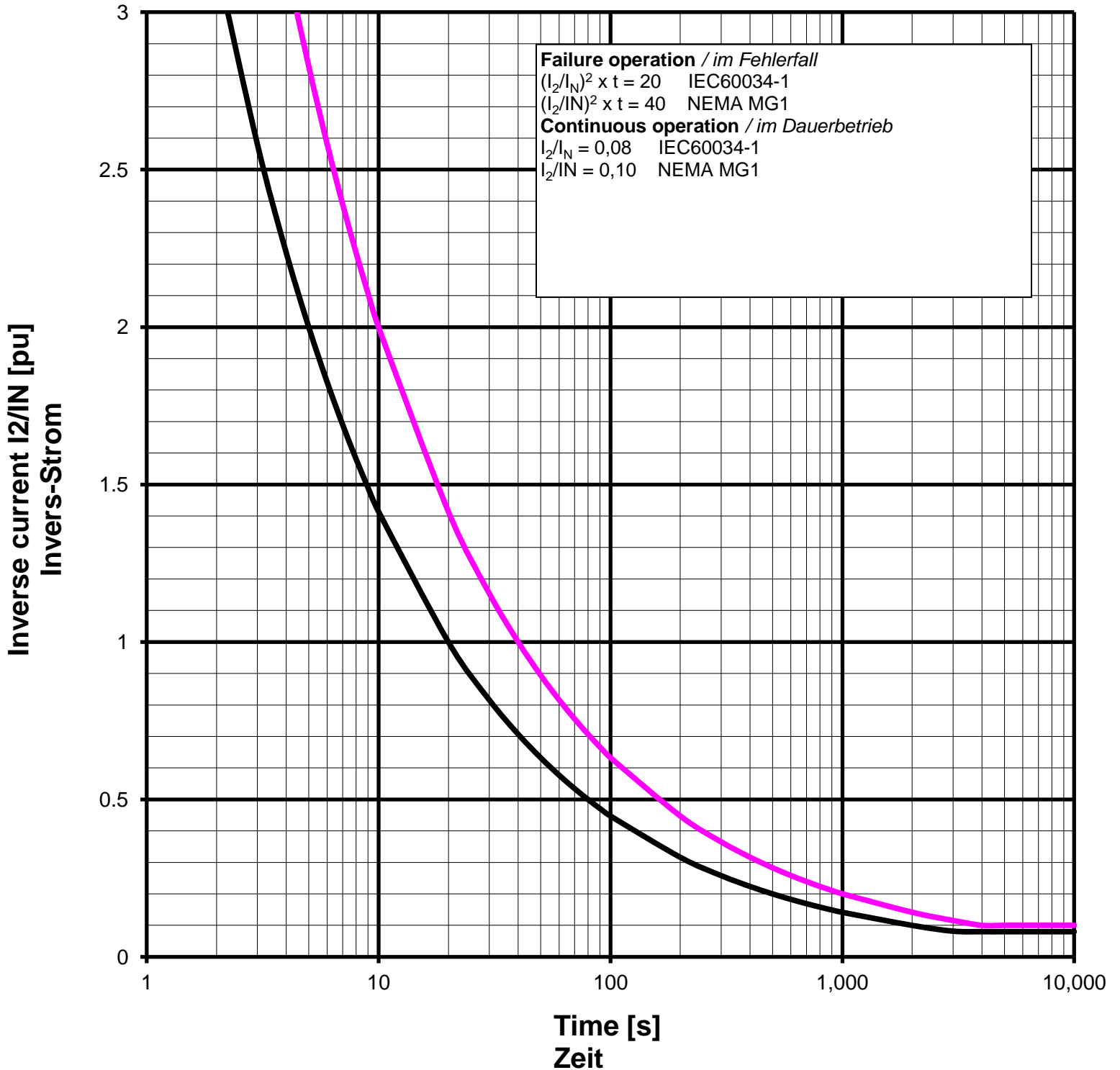
*Frequenz*

*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

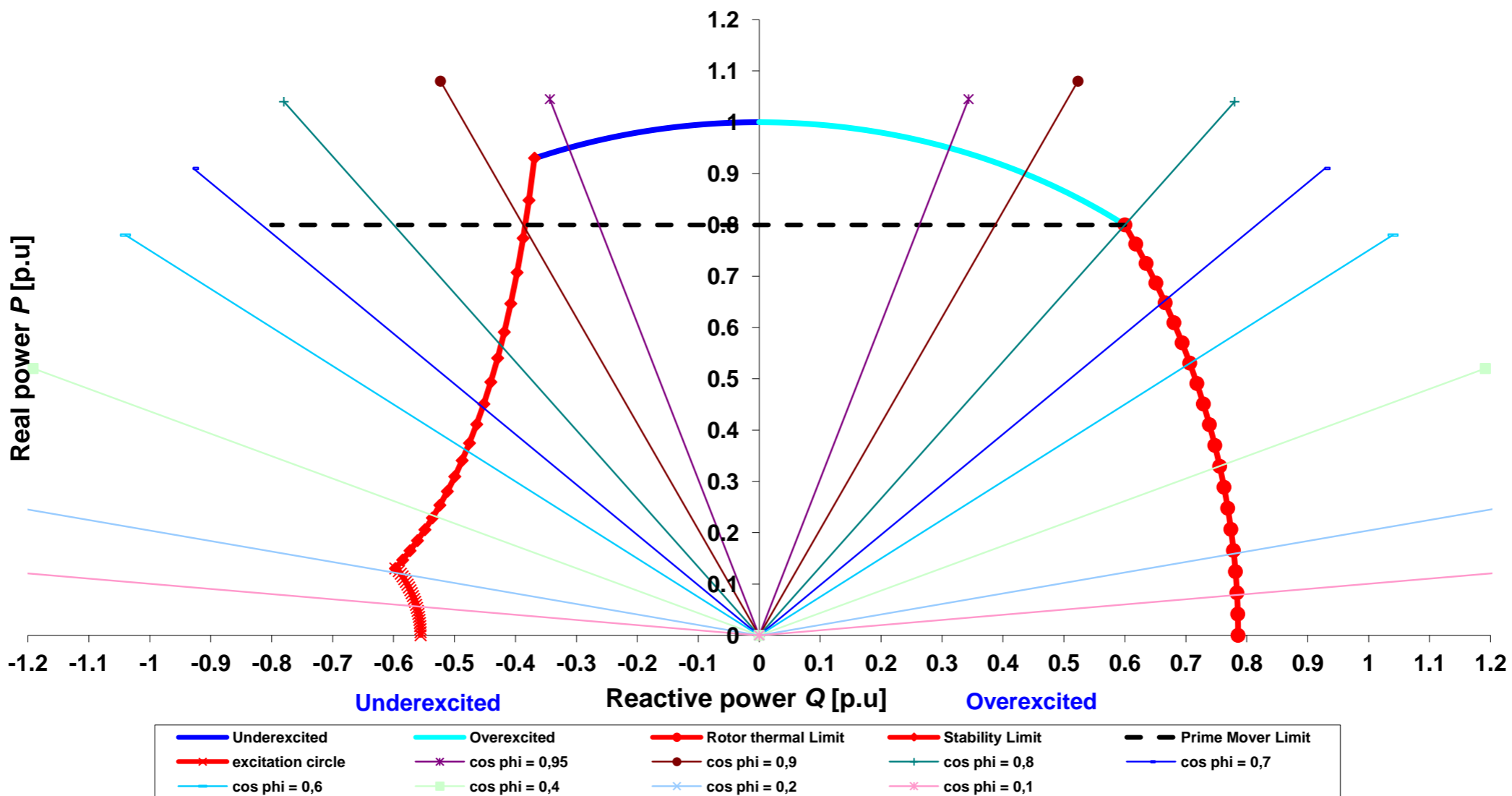
TYPE

DSG 86 M1/4

Projekt:

Order Nr.:

### Capability (P-Q) Diagram



Cummins Generator Technologies

Datum / date:

30/09/2013



TYPE

DSG 86 M1/4

Projekt:

Order Nr.:

