

**Technical Data Sheet for AvK-Alternators**

FM 7.3-5

Date:	30/09/13	Customer:	GENERIC DATASHEET ONLY
Project No.:		AvK Reference:	DSG086L1_8_60_480

**Object data:**

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

**Generator data:**

Generator:	DSG 86 L1/8	Poles:	8	Standards:	IEC 60034
Rated power:	1780 kVA	1424 kWe	1497 kWm		
Power factor:	0.80				
Power at pf 1,0	1445 kVA	1445 kWe	1497 kWm		
Rated voltage:	0.48 kV				
Speed:	900 1/min				
Frequency:	60 Hz			Voltage range / frequency range:	
Rated current:	2141.0 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.:	2.0 m³/s	Cooling water quantity:	n/a
--	--	-------------------	----------	-------------------------	-----

Moment of inertia (I):	108 kgm²	Weight:	5000 Kg	Losses (environment):	73 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	94,85	95,1	95,3	95	93,2
Power factor 0.9	95,59	95,8	95,9	95,5	93,5
Power factor 1.0	96,33	96,5	96,5	96	93,8

**Reactances and time constants**

	unsaturated	saturated		unsaturated	saturated				
$X_d$	2.04	1.84 p.u.	$X_q$	1.02	1.00 p.u.	$T_{d0'}$	1.9 s	$T_{d0''}$	0.02296 s
$X_d'$	0.295	0.295 p.u.	$X_q'$	1.02	1.00 p.u.	$T_{d'}$	0.27 s	$T_{q0'}$	0.26 s
$X_d''$	0.184	0.167 p.u.	$X_q''$	0.184	0.184 p.u.	$T_{d''}$	0.013 s	$T_{q0''}$	0.14413 s
$X_2$	0.193	0.175 p.u.	$X_0$	0.055	0.050 p.u.	$T_a$	0.036 s	$T_{q'}$	0.26 s
$X_{1s}$	n.a.	0.100 p.u.						$T_{q''}$	0.026 s

Short circuit ratio saturated:	0.54	$Z_n$	0.129 Ohm
--------------------------------	------	-------	-----------

**Short circuit data:**

Initial short circuit current (3-phase):	$I_k''$	12820 A	
Max. peak current (3-phase):	$I_s$	32634 A	
Sustained short circuit current:	$I_k$	6423 A	Minimum 3 x rated current for max.10 s

Initial short circuit torque:	$M_{k2}$	147.0 kNm
	$M_{k3}$	88.2 kNm

Max. faulty synchron moment:	$M_f$	316.1 kNm
------------------------------	-------	-----------

Rated kVA torque:	$M_{SN}$	18.89 kNm
-------------------	----------	-----------

Rated torque	$M_N$	15.11 kNm
--------------	-------	-----------

Shaft torque	$M_{Sh}$	15.89 kNm
--------------	----------	-----------

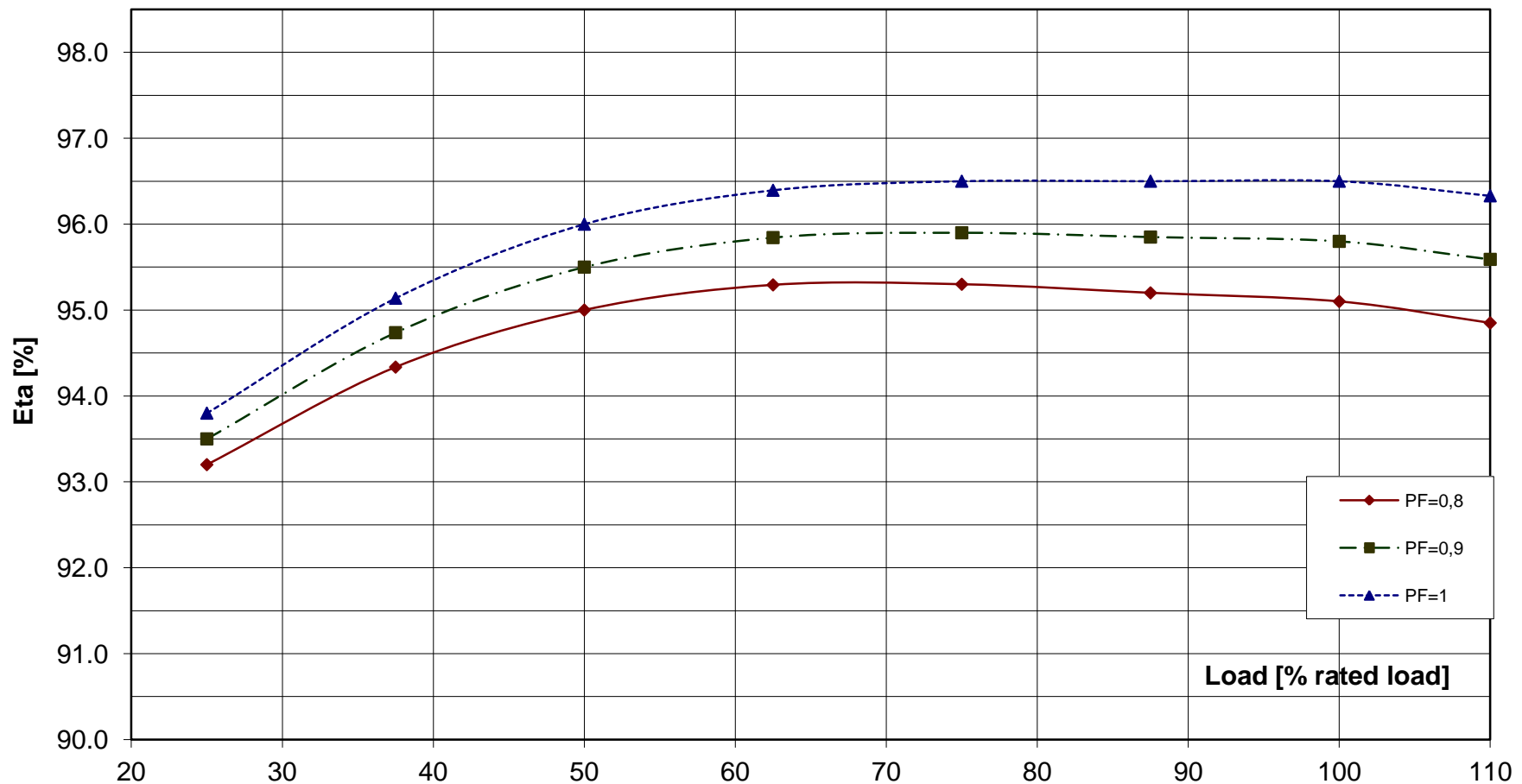
**Load application:**

max. load application: 905 kVA (corresponds to 50,85 % from 1780 kVA) for Power factor 0.4	Power: 1780 kVA
15% transient voltage drop	Power factor: 0.8
	transient voltage drop: -22.8 %

**Remarks:**

<b>Alternator :</b>	<b>DSG 86 L1/8</b>			
Rated output [kVA]	1780	Rated power factor:	0.8	Rated voltage [kV]: 0.48
Rated frequency [Hz]	60	Rated speed [rpm]	900	

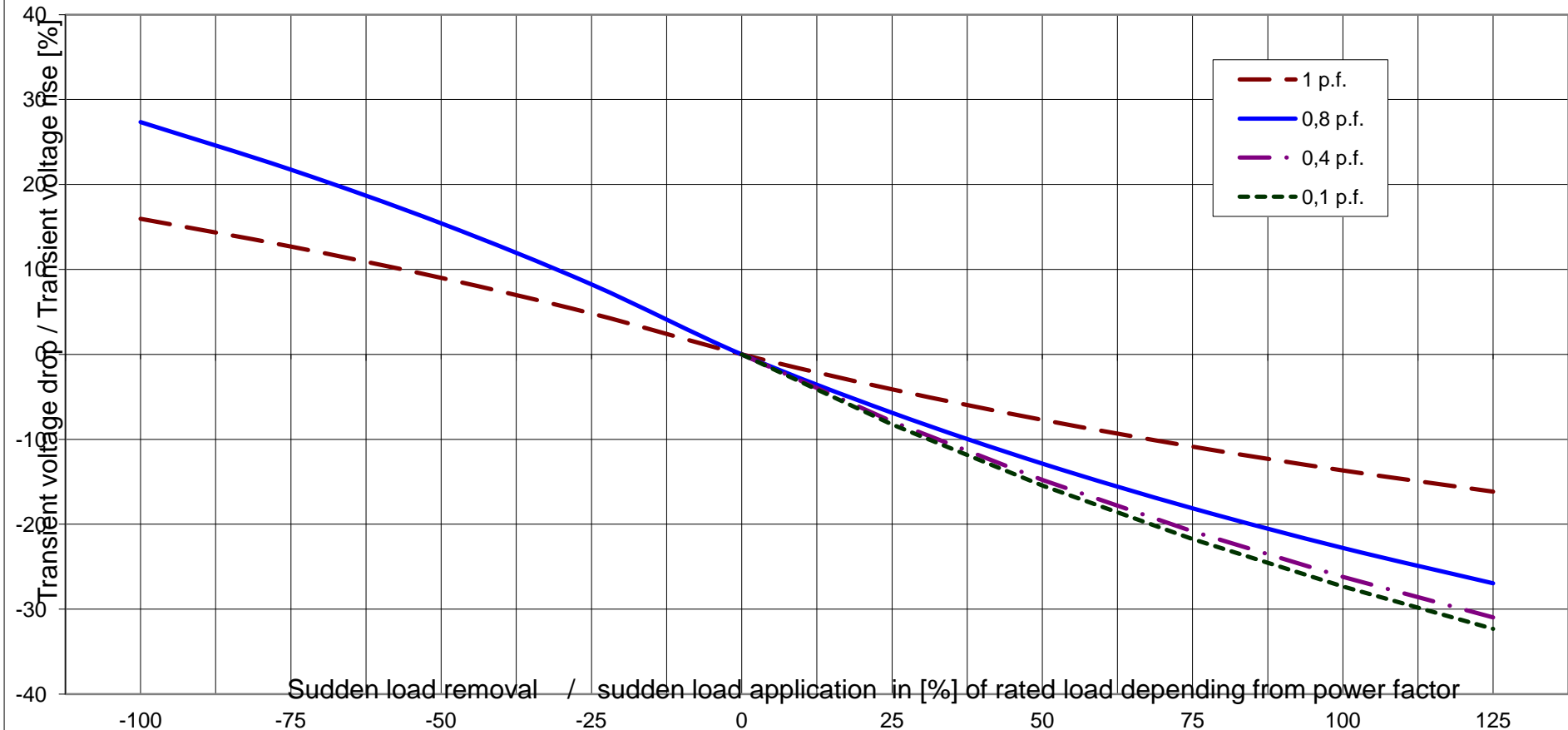
### Wirkungsgrad-Kennlinie - Efficiency Curve



**Alternator : DSG 86 L1/8**

Rated output [kVA]	1780	Rated power factor:	0.8	Rated voltage [kV]:	0.48
Rated frequency [Hz]	60	Rated speed [rpm]	900		

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



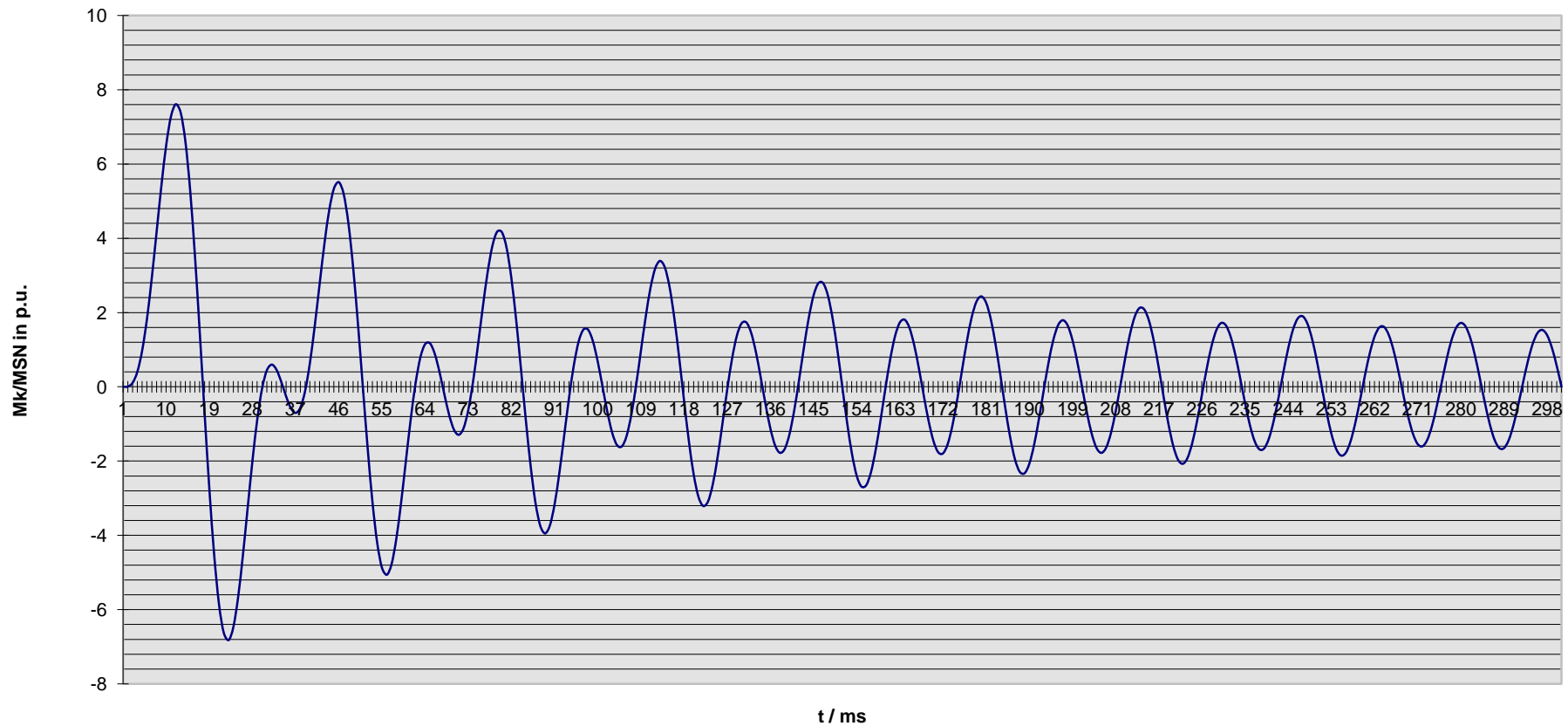


Technisches Datenblatt - Diagramme  
Technical data sheet - Diagrams

ING-FCD-0112

<b>Alternator :</b>	<b>DSG 86 L1/8</b>			
Rated output [kVA]	1780	Rated power factor:	0.8	Rated voltage [kV]: 0.48
Rated frequency [Hz]	60	Rated speed [rpm]	900	MSN related to kVA: 18.89 KNm

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



#### Nenn Daten / nominal data

DSG 86 L1/8

Leistung  $S_N$ : **1780 kVA**

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

*Rating*

*p.f.*

Spannung  $U_N$ : **0.48 kV**

Strom  $I_N$ : **2141 A**

*Voltage*

*Current*

Frequenz  $f$ : **60 Hz**

Drehzahl  $n$ : **900 min<sup>-1</sup>**

*Frequency*

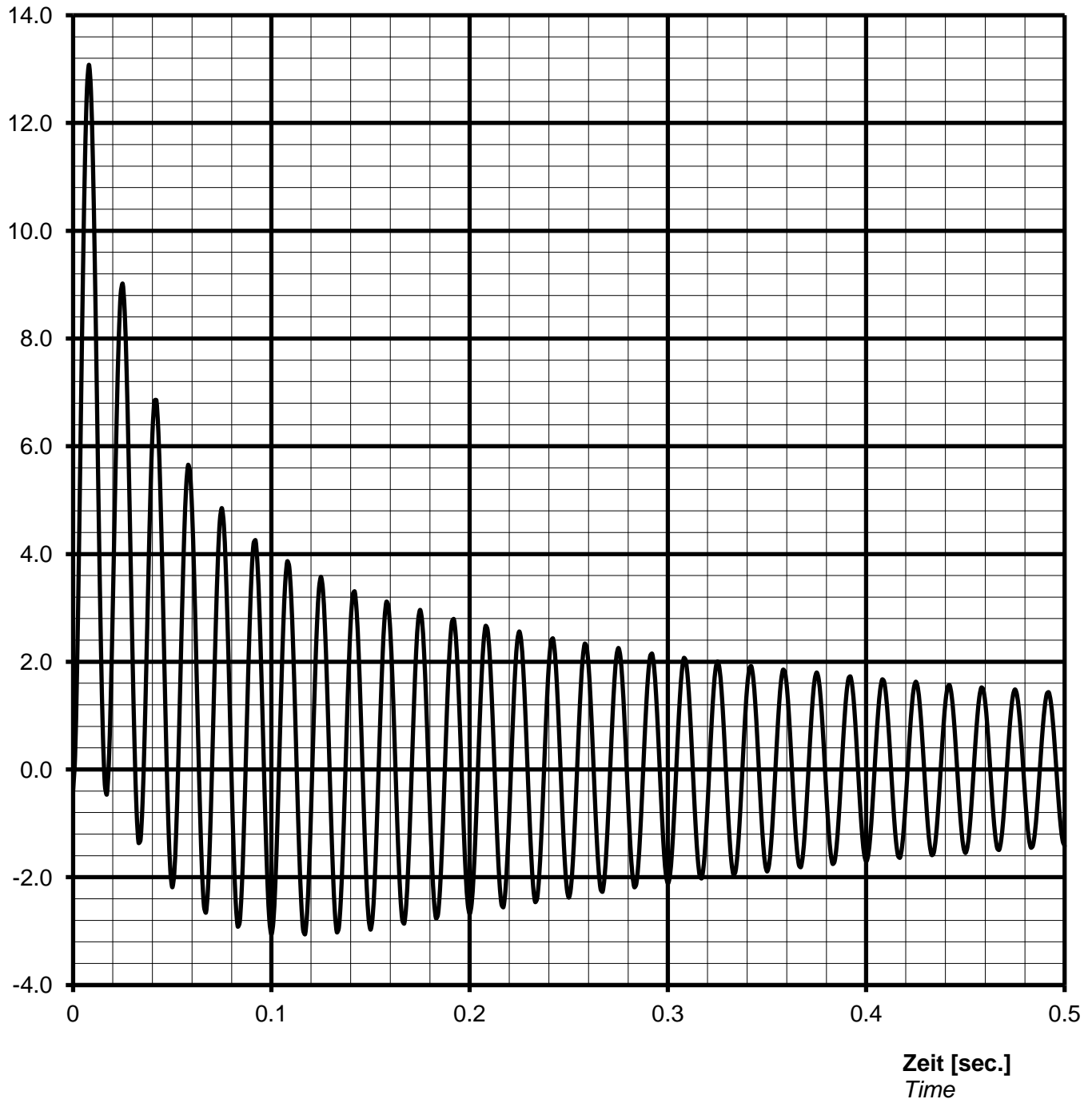
*Speed*

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  $I_{\text{peak}} =$  **28003 A** or **13.08 p.u.**

**Nenn Daten / nominal data**

**DSG 86 L1/8**

Leistung  $S_N$ : **1780 kVA**

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

Rating

p.f.

Spannung  $U_N$ : **0.48 kV**

Strom  $I_N$ : **2141 A**

Voltage

Current

Frequenz f: **60 Hz**

Drehzahl n: **900 min<sup>-1</sup>**

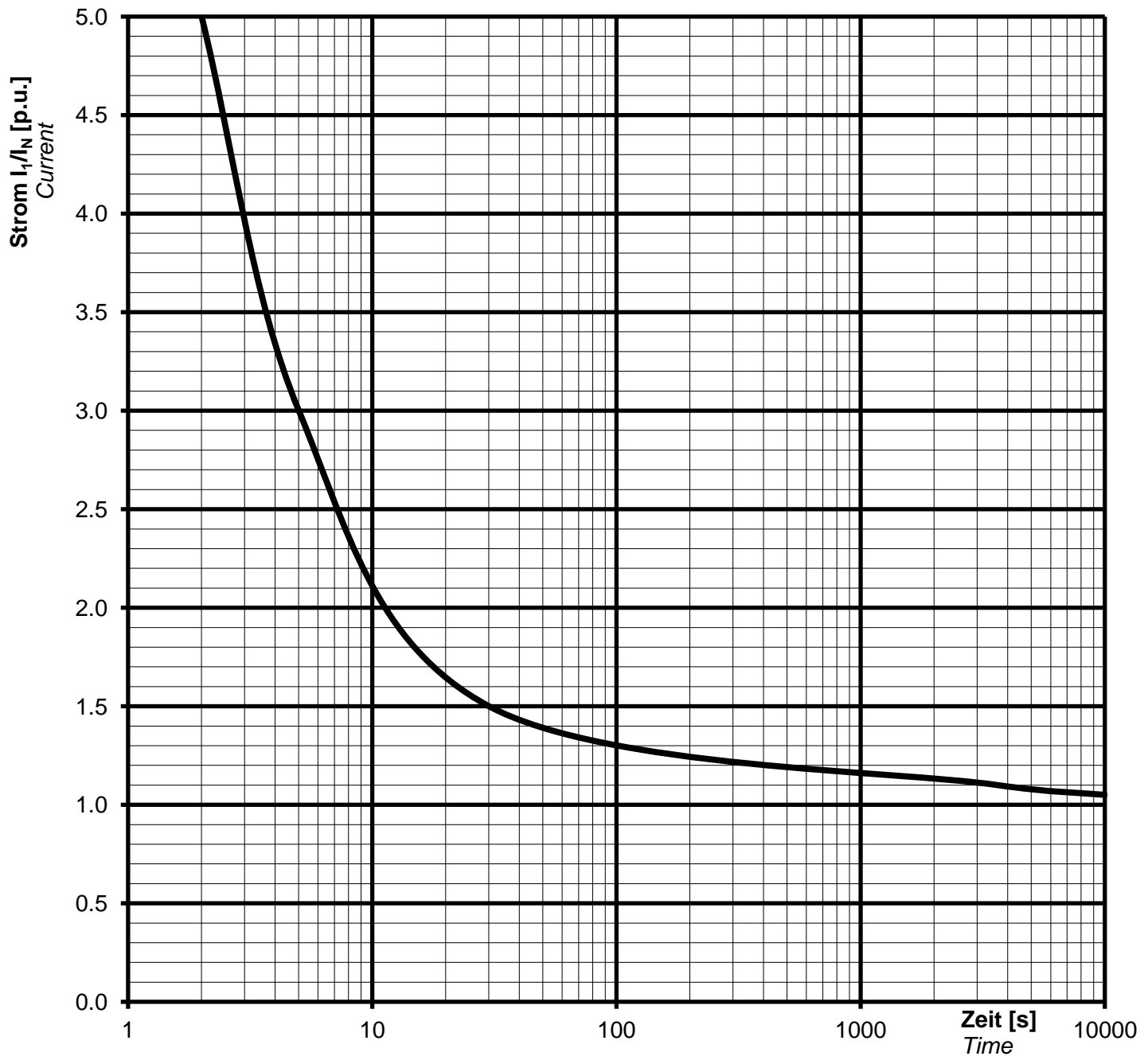
Frequency

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 86 L1/8

Rating  $S_N$ : **1780 kVA**

*p.f.* **0.80**

*Bemessungsleistung*

Leistungsfaktor  $\cos \varphi$ :

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

Nominal current  $I_N$ : **2141 A**

*Bemessungsspannung*

*Bemessungsstrom*

Frequency  $f_N$ : **60 Hz**

Speed  $n$ : **900 min<sup>-1</sup>**

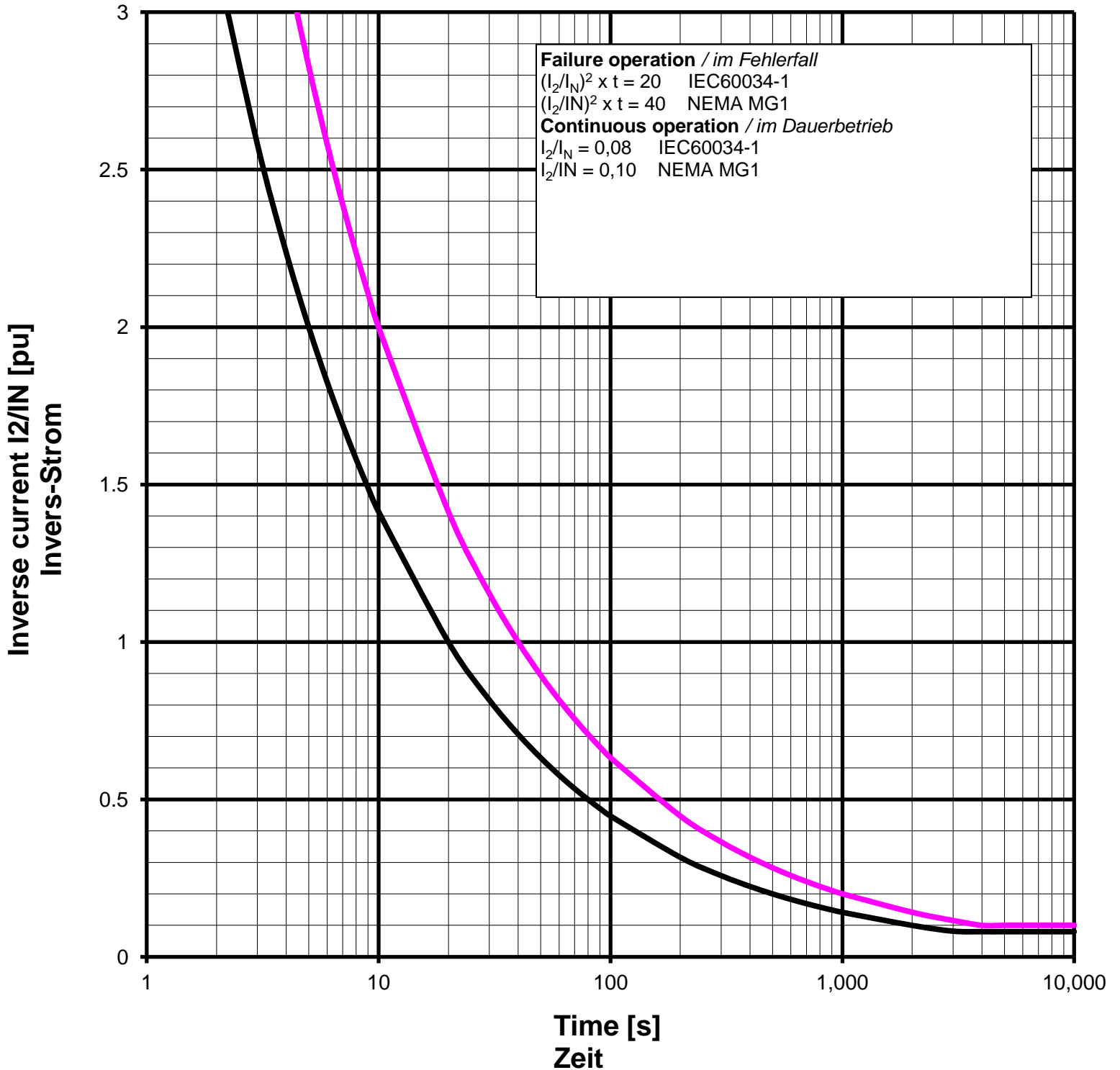
*Frequenz*

*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

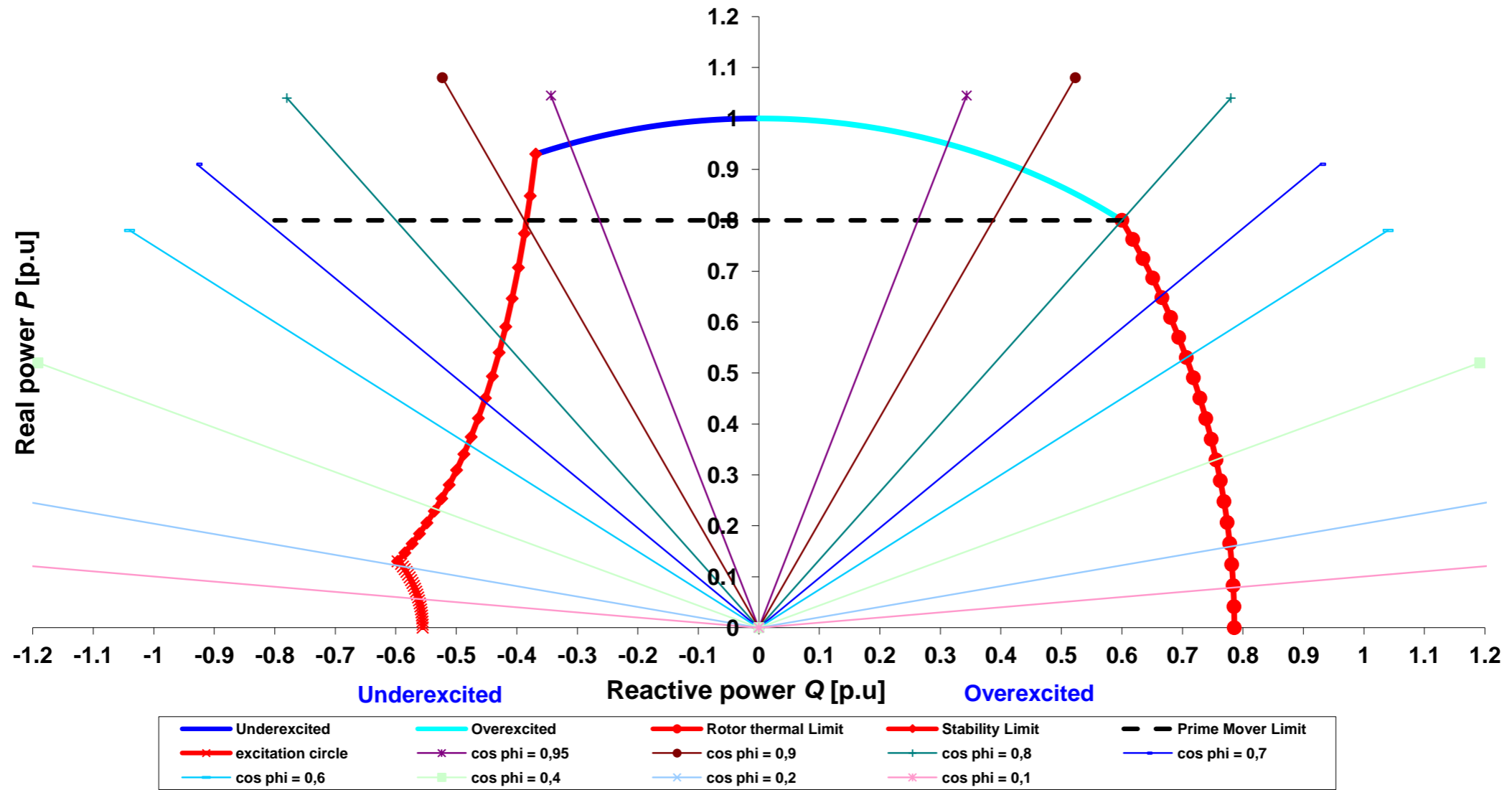
TYPE

DSG 86 L1/8

Projekt:

Order Nr.:

### Capability (P-Q) Diagram



Cummins Generator Technologies

Datum / date:

30/09/2013



