

**Technical Data Sheet for AvK-Alternators**

FM 7.3-5

Date:	03/10/13	Customer:	GENERIC DATASHEET only
Project No.:		AvK Reference:	DSG099L1_6_60_480

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

<b>Generator data:</b>					
Generator:	DSG 99 L1/6	Poles:	6	Standards: IEC 60034	
Rated power:	3660 kVA	2928 kWe	3050 kWm		
Power factor:	0.80				
Power at pf 1,0	2962 kVA	2962 kWe	3050 kWm		
Rated voltage:	0.48 kV				
Speed:	1200 1/min				
Frequency:	60 Hz		Voltage range / frequency range:		
Rated current:	4402.3 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):	189 kgm²	Weight:	8100 Kg	Losses (environment):	122 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	95,8	96	96,1	96	94,7
Power factor 0.9	96,38	96,55	96,6	96,4	94,95
Power factor 1.0	96,96	97,1	97,1	96,8	95,2

<b>Reactances and time constants</b>										
	unsaturated		saturated			unsaturated		saturated		
X <sub>d</sub>	2.13	1.92	p.u.	X <sub>q</sub>	1.07	1.05	p.u.	T <sub>d0'</sub>	2.55	s
X <sub>d'</sub>	0.264	0.264	p.u.	X <sub>q'</sub>	1.07	1.05	p.u.	T <sub>d'</sub>	0.32	s
X <sub>d''</sub>	0.165	0.150	p.u.	X <sub>q''</sub>	0.165	0.165	p.u.	T <sub>d''</sub>	0.015	s
X <sub>2</sub>	0.174	0.158	p.u.	X <sub>0</sub>	0.050	0.045	p.u.	T <sub>a</sub>	0.05	s
X <sub>1s</sub>	n.a.	0.090	p.u.					T <sub>q'</sub>	0.3	s
								T <sub>q''</sub>	0.03	s
Short circuit ratio saturated: 0.52					Z <sub>n</sub> 0.063 Ohm					

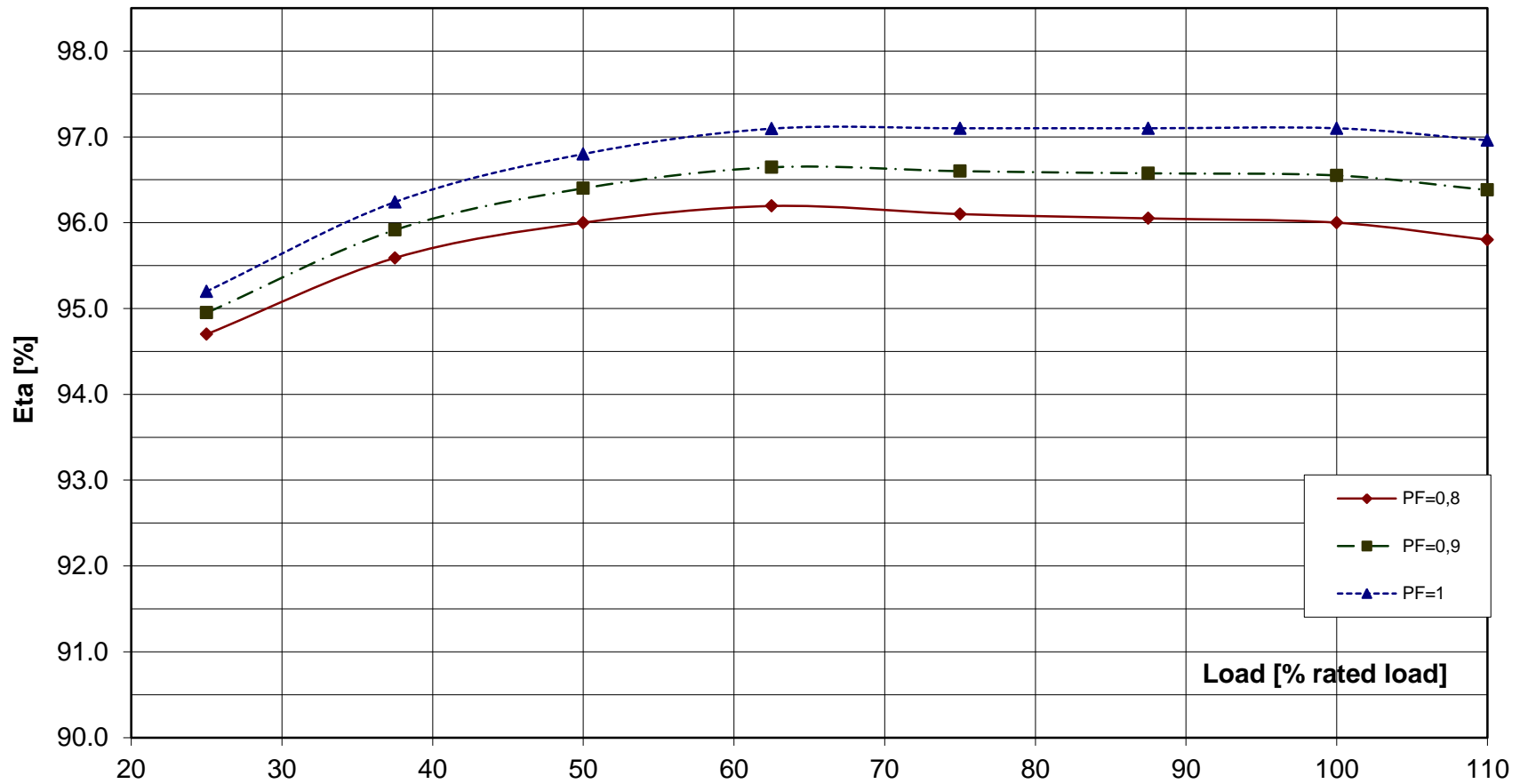
<b>Short circuit data:</b>		
Initial short circuit current (3-phase):	I <sub>k'</sub>	29349 A
Max. peak current (3-phase):	I <sub>s</sub>	74710 A
Sustained short circuit current:	I <sub>k</sub>	13207 A
Minimum 3 x rated current for max.10 s		
Initial short circuit torque:	M <sub>k2</sub>	252.4 kNm
	M <sub>k3</sub>	151.4 kNm
Max. faulty synchron moment:	M <sub>f</sub>	542.7 kNm
Rated kVA torque:	M <sub>SN</sub>	29.13 kNm
Rated torque	M <sub>N</sub>	23.30 kNm
Shaft torque	M <sub>Sh</sub>	24.27 kNm

<b>Load application:</b>	
max. load application: 2080 kVA (corresponds to 56,82 % from 3660 kVA) for Power factor 0.4 15% transient voltage drop	Power: 3660 kVA Power factor: 0.8 transient voltage drop: -20.9 %

**Remarks:**

<b>Alternator :</b>	<b>DSG 99 L1/6</b>			
Rated output [kVA]	3660	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 L1/6**

Rated output [kVA]

3660

Rated power factor:

0.8

Rated voltage [kV]: 0.48

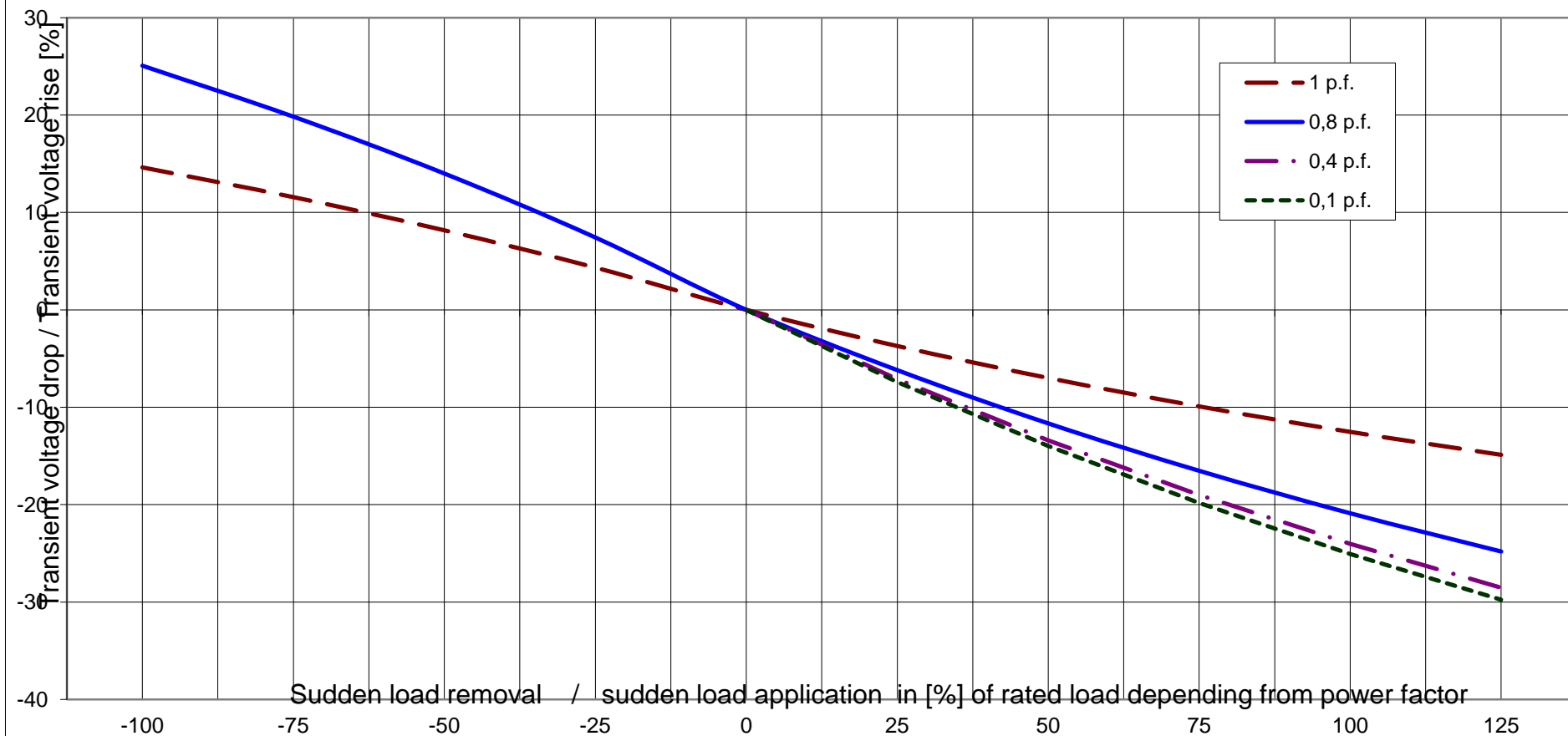
Rated frequency [Hz]

60

Rated speed [rpm]

1200

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





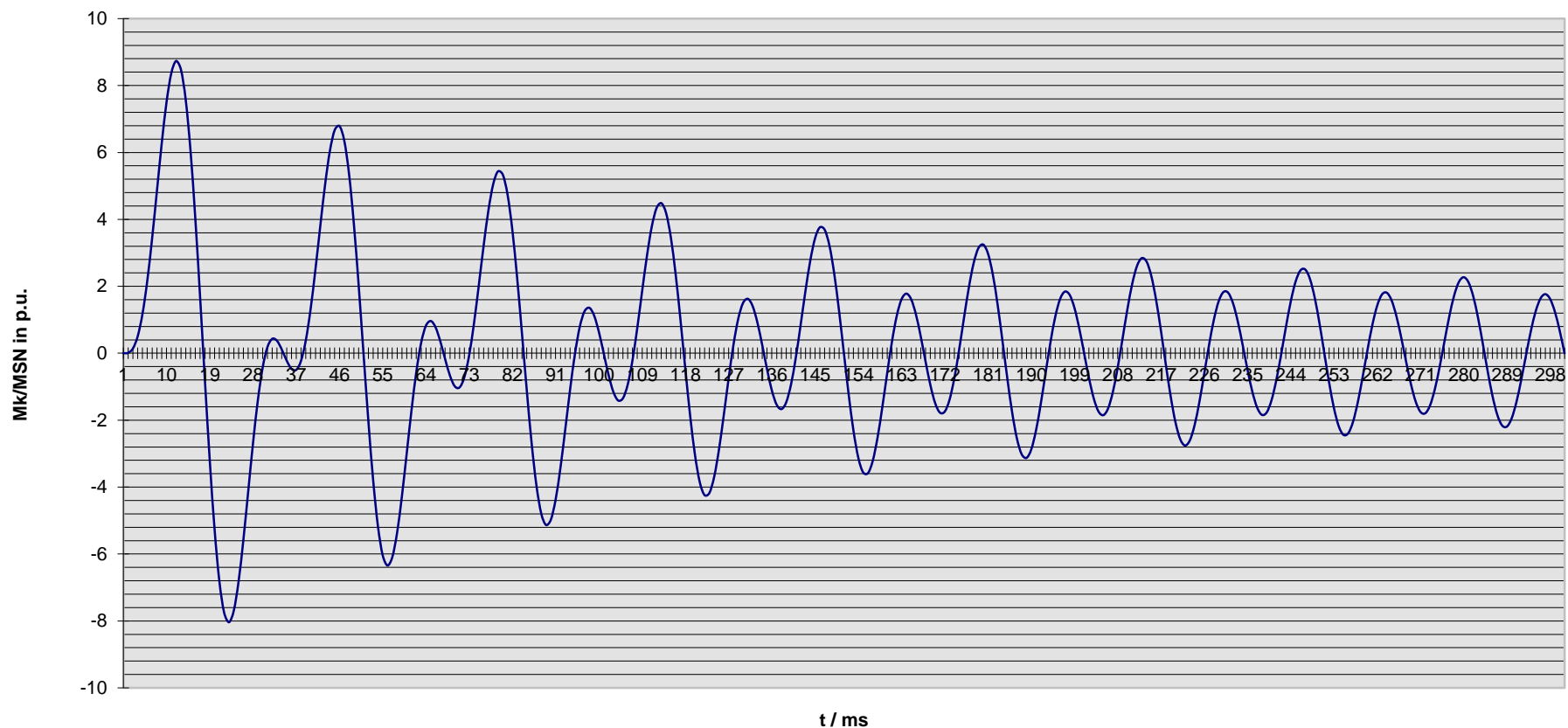
Technisches Datenblatt - Diagramme  
Technical data sheet - Diagrams

**ING-FCD-0112**

**Alternator : DSG 99 L1/6**

Rated output [kVA]	3660	Rated power factor:	0.8	Rated voltage [kV]:	0.48
Rated frequency [Hz]	60	Rated speed [rpm]	1200	MSN related to kVA:	29.13 KNm

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



#### Nenn Daten / nominal data

DSG 99 L1/6

Leistung  $S_N$ : **3660** kVA

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

*Rating*

*p.f.*

Spannung  $U_N$ : **0.48** kV

Strom  $I_N$ : **4402** A

*Voltage*

*Current*

Frequenz  $f$ : **60** Hz

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

*Frequency*

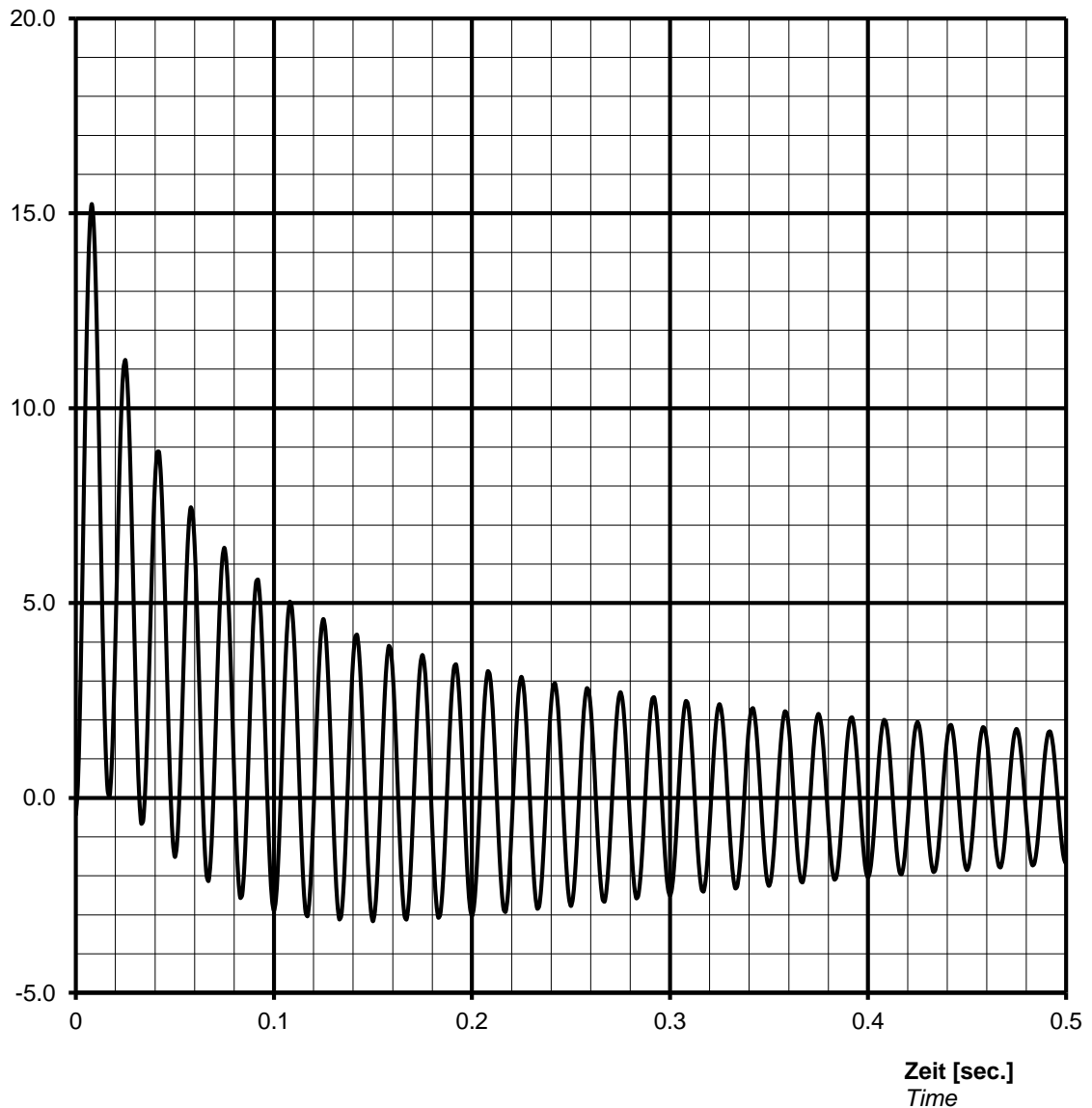
*Speed*

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

$I_{\text{speak}} =$  **67085** A or **15.24** p.u.

**Nenndaten / nominal data**

**DSG 99 L1/6**

Leistung  $S_N$ : **3660** kVA

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

Rating

p.f.

Spannung  $U_N$ : **0.48** kV

Strom  $I_N$ : **4402** A

Voltage

Current

Frequenz f: **60** Hz

Drehzahl n: **1200** min<sup>-1</sup>

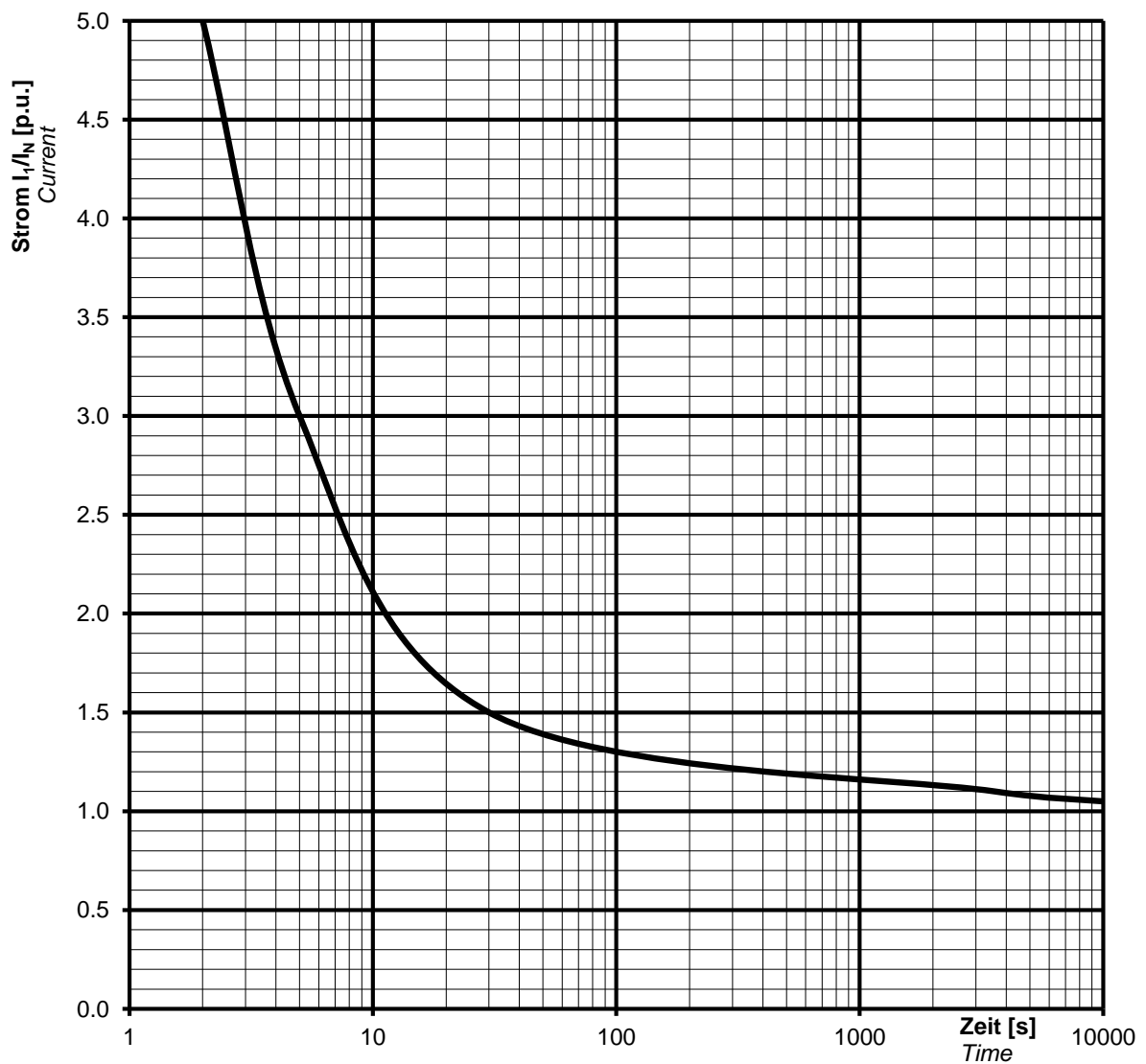
Frequency

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

#### Nennenden / nominal data

DSG 99 L1/6

Rating  $S_N$ : **3660** kVA

Bemessungsleistung

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

Bemessungsspannung

Frequency  $f_N$ : **60** Hz

Frequenz

Protection: **IP23**

Schutzart

p.f. **0.80**

Leistungsfaktor  $\cos \varphi$ :

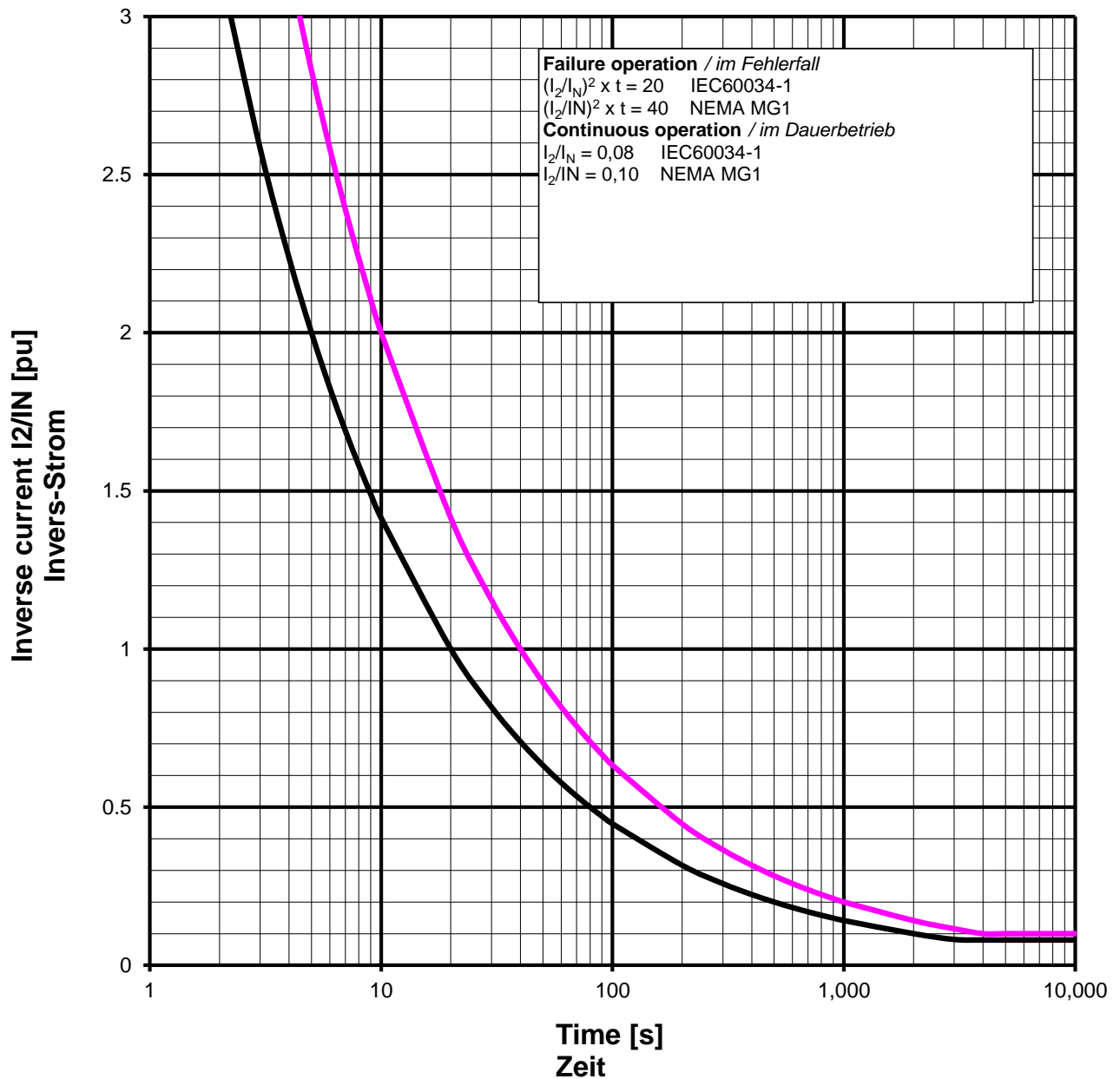
Nominal current  $I_N$ : **4402** A

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

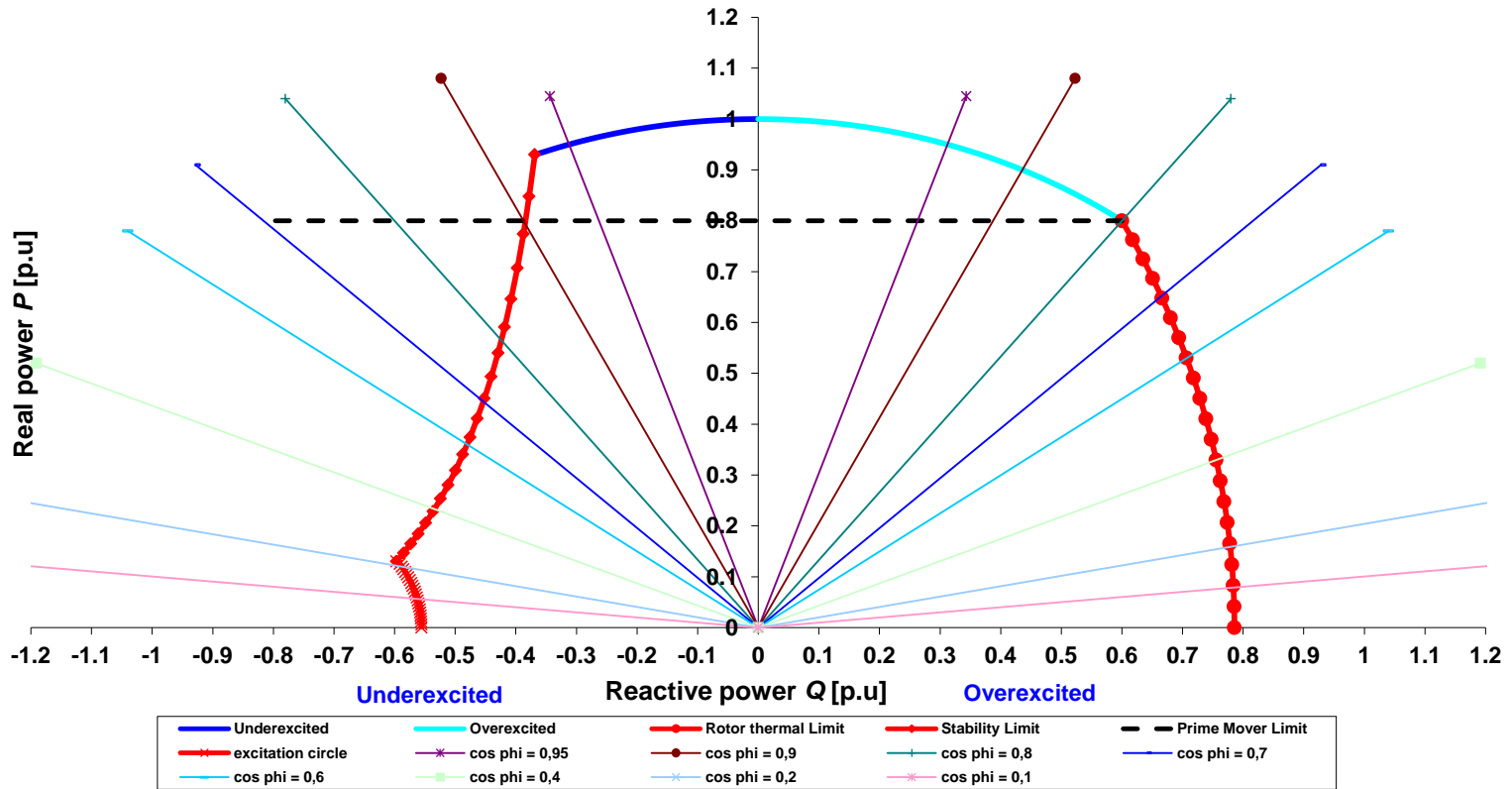
TYPE

DSG 99 L1/6

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

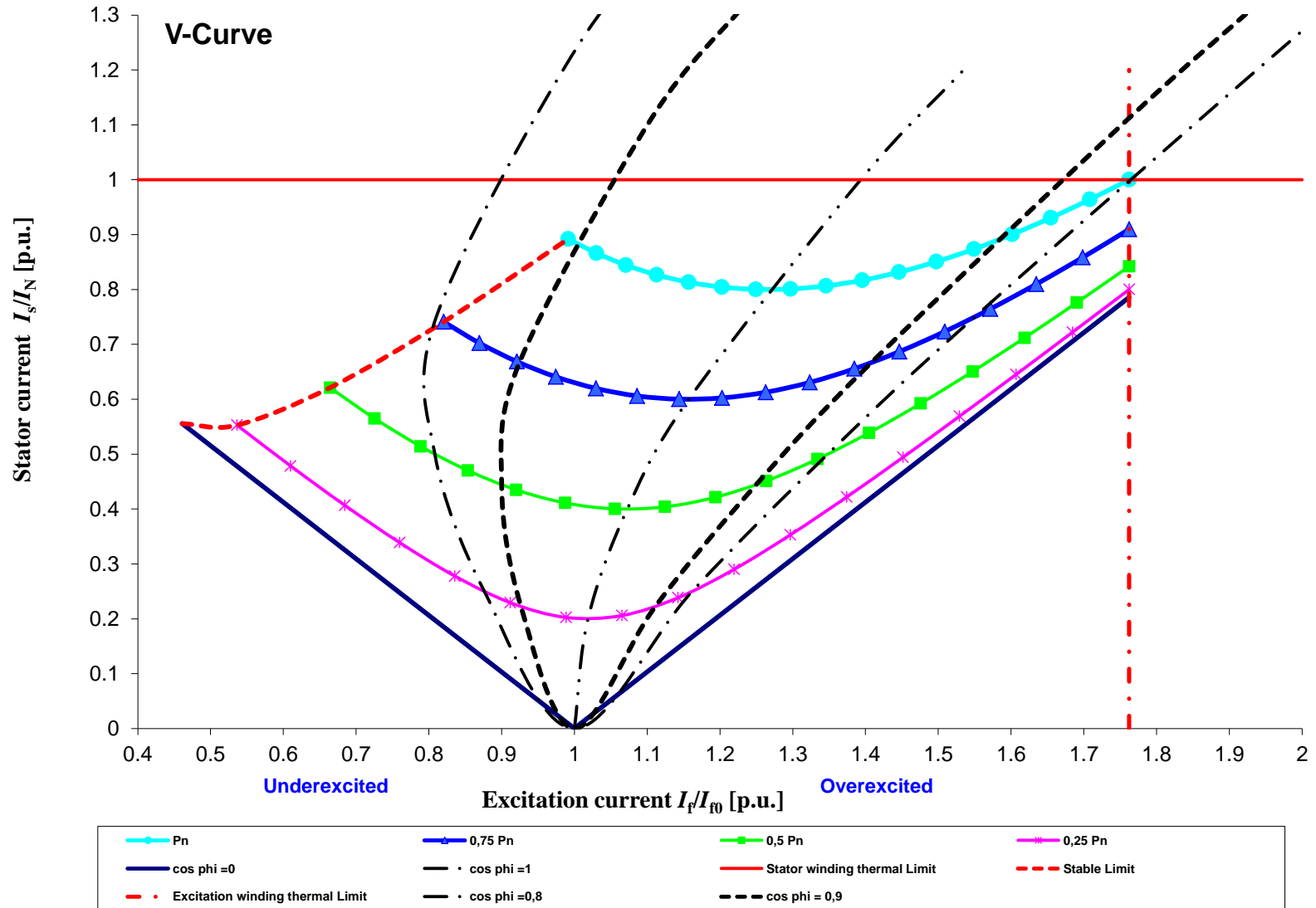
ING-FCD-0112

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