

**Technical Data Sheet for AvK-Alternators**

FM 7.3-5

Date:	09/10/13	Customer:	GENERIC DATASHEET only
Project No.:		AvK Reference:	dig150m_6_60_13800

**Object data:**

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

**Generator data:**

Generator:	DIG 150 m/6	Poles:	6	Standards:	IEC 60034
Rated power:	5500 kVA	4400 kWe	4555 kWm		
Power factor:	0.80				
Power at pf 1,0	4437 kVA	4437 kWe	4555 kWm		
Rated voltage:	13.8 kV				
Speed:	1200 1/min				
Frequency:	60 Hz			Voltage range / frequency range:	
Rated current:	230.1 A			Zone A according IEC 60034-1 (dU = +/-5%, df = +/-2%)	

Winding pitch:	ca. 5/6
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Insulation class:	Stator: Class F	Rotor: Class F	Temperature rise:	F
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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
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		Coolant:		generator:	
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		Cooling air vol.:	4.2 m³/s	Cooling water quantity:	n/a
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Moment of inertia (I):	448 kgm²	Weight:	14200 Kg	Losses (environment):	155 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	96,43	96,6	96,6	96,1	93,8
Power factor 0.9	96,85	97	96,95	96,35	93,9
Power factor 1.0	97,27	97,4	97,3	96,6	94

**Reactances and time constants**

	unsaturated	saturated		unsaturated	saturated				
X <sub>d</sub>	1.80	1.62 p.u.	X <sub>q</sub>	0.90	0.88 p.u.	T <sub>d0'</sub>	3.1 s	T <sub>d0''</sub>	0.03222 s
X <sub>d'</sub>	0.290	0.290 p.u.	X <sub>q'</sub>	0.90	0.88 p.u.	T <sub>d'</sub>	0.50 s	T <sub>q0'</sub>	0.4 s
X <sub>d''</sub>	0.198	0.180 p.u.	X <sub>q''</sub>	0.198	0.198 p.u.	T <sub>d''</sub>	0.02 s	T <sub>q0''</sub>	0.18182 s
X <sub>2</sub>	0.208	0.189 p.u.	X <sub>0</sub>	0.059	0.054 p.u.	T <sub>a</sub>	0.08 s	T <sub>q'</sub>	0.4 s
X <sub>1s</sub>	n.a.	0.108 p.u.						T <sub>q''</sub>	0.04 s

Short circuit ratio saturated: 0.62	Z <sub>n</sub> 34.625 Ohm
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**Short circuit data:**

Initial short circuit current (3-phase):	I <sub>k''</sub>	1278 A	
Max. peak current (3-phase):	I <sub>s</sub>	3253 A	
Sustained short circuit current:	I <sub>k</sub>	690 A	Minimum 3 x rated current for max.10 s

Initial short circuit torque:	M <sub>k2</sub>	316.1 kNm
	M <sub>k3</sub>	189.7 kNm

Max. faulty synchron moment:	M <sub>f</sub>	679.6 kNm
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Rated kVA torque:	M <sub>SN</sub>	43.77 kNm
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Rated torque	M <sub>N</sub>	35.02 kNm
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Shaft torque	M <sub>Sh</sub>	36.25 kNm
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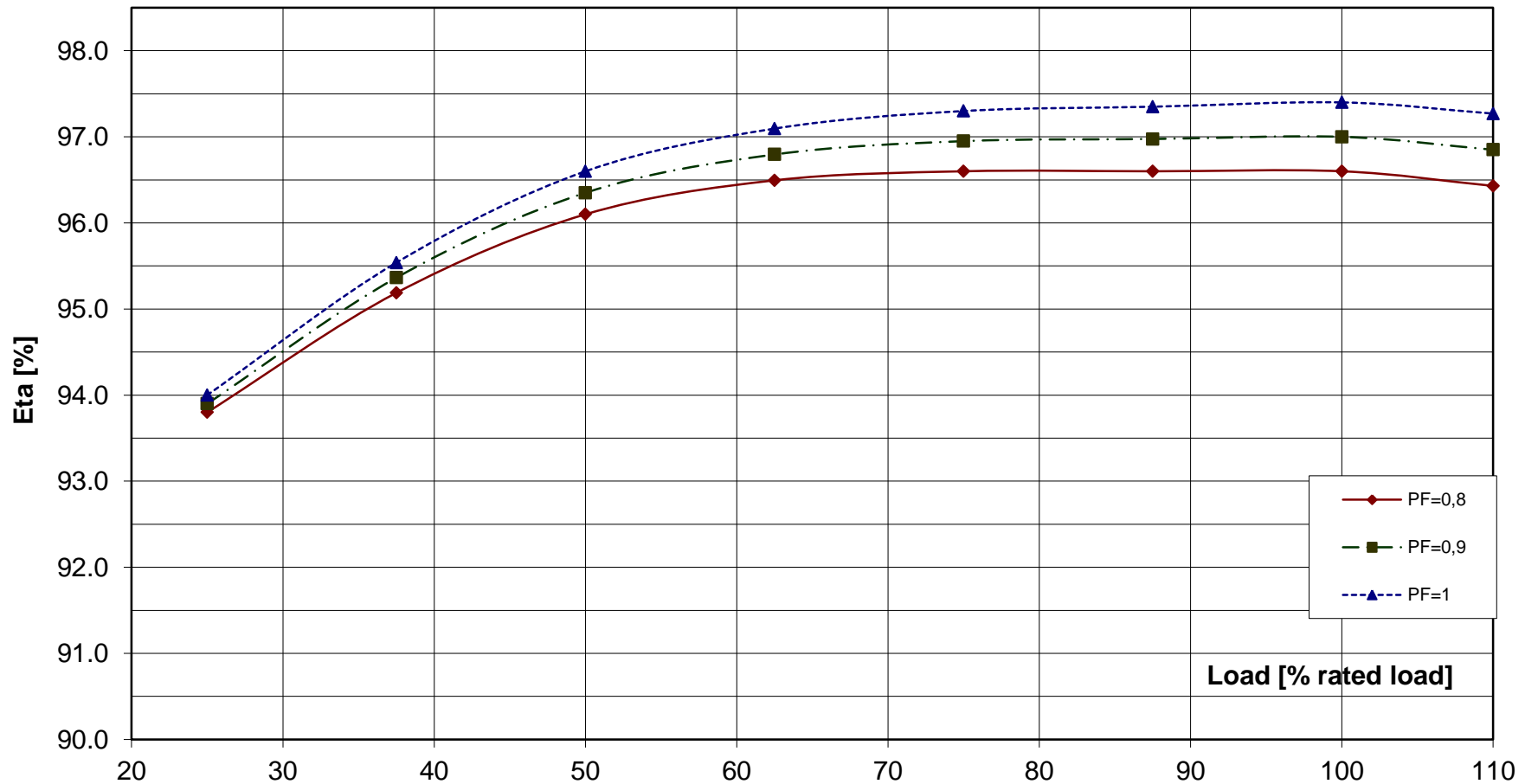
**Load application:**

max. load application: 2845 kVA (corresponds to 51,72 % from 5500 kVA) for Power factor 0.4 15% transient voltage drop	Power: 5500 kVA Power factor: 0.8 transient voltage drop: -22.5 %
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**Remarks:**

<b>Alternator :</b>	<b>DIG 150 m/6</b>			
Rated output [kVA]	5500	Rated power factor:	0.8	Rated voltage [kV]: 13.8
Rated frequency [Hz]	60	Rated speed [rpm]	1200	

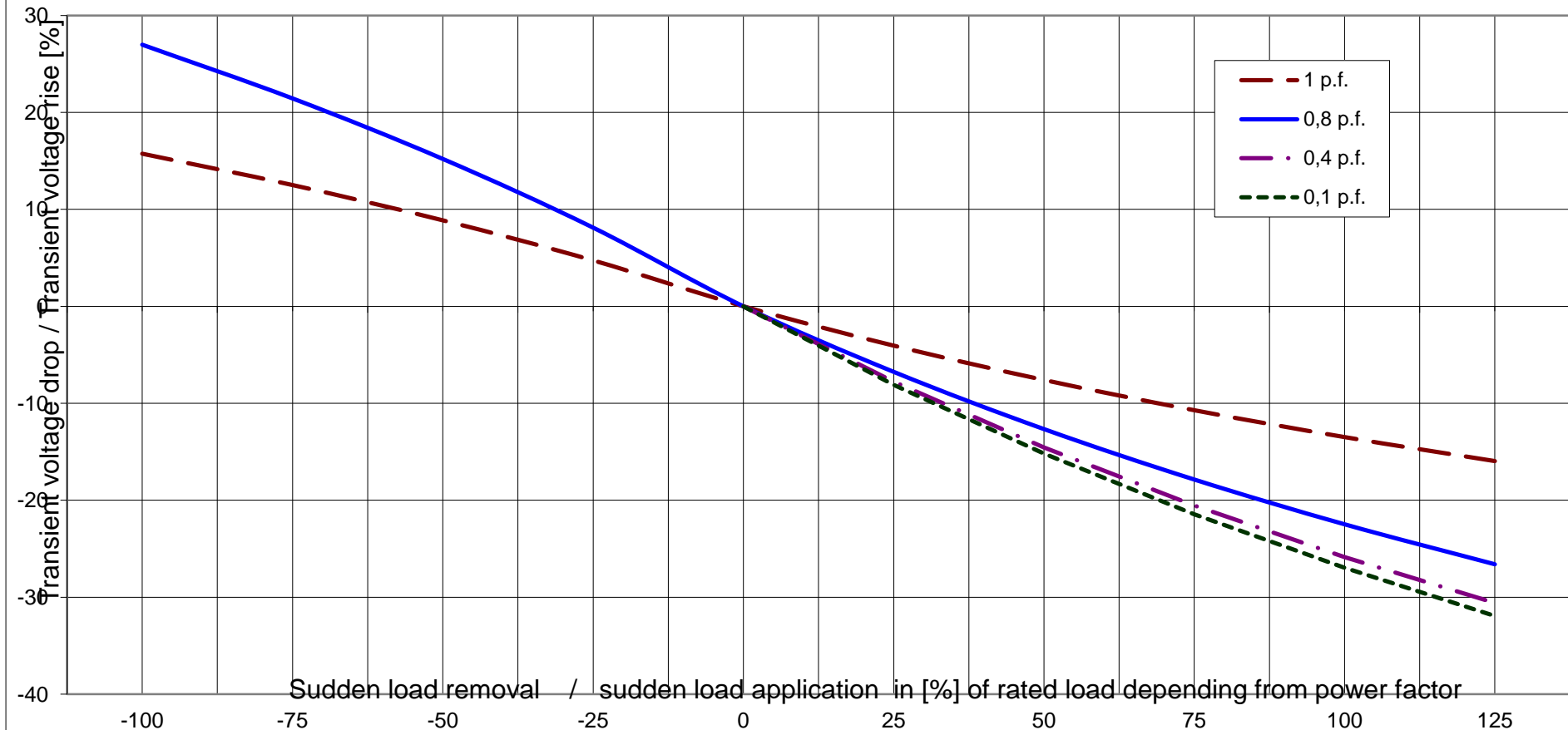
### Wirkungsgrad-Kennlinie - Efficiency Curve



**Alternator : DIG 150 m/6**

Rated output [kVA]	5500	Rated power factor:	0.8	Rated voltage [kV]:	13.8
Rated frequency [Hz]	60	Rated speed [rpm]	1200		

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





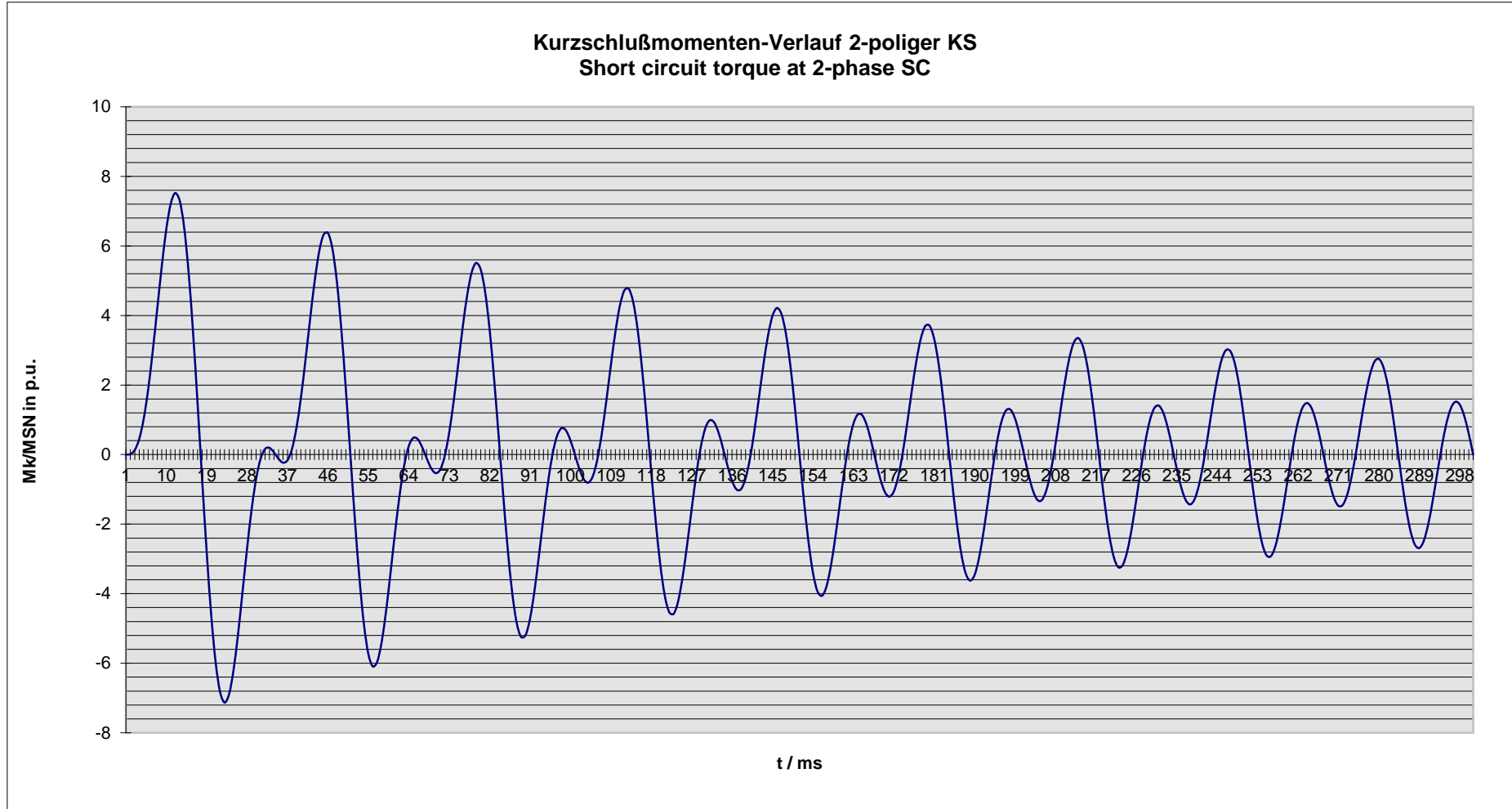
Technisches Datenblatt - Diagramme  
Technical data sheet - Diagrams

ING-FCD-0112

Alternator : **DIG 150 m/6**

Rated output [kVA]	5500	Rated power factor:	0.8	Rated voltage [kV]: 13.8
Rated frequency [Hz]	60	Rated speed [rpm]	1200	MSN related to kVA: 43.77 KNm

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



**Nenndaten / nominal data**

DIG 150 m/6

Leistung  $S_N$ : **5500 kVA**

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

Rating

p.f.

Spannung  $U_N$ : **13.80 kV**

Strom  $I_N$ : **230 A**

Voltage

Current

Frequenz  $f$ : **60 Hz**

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

Frequency

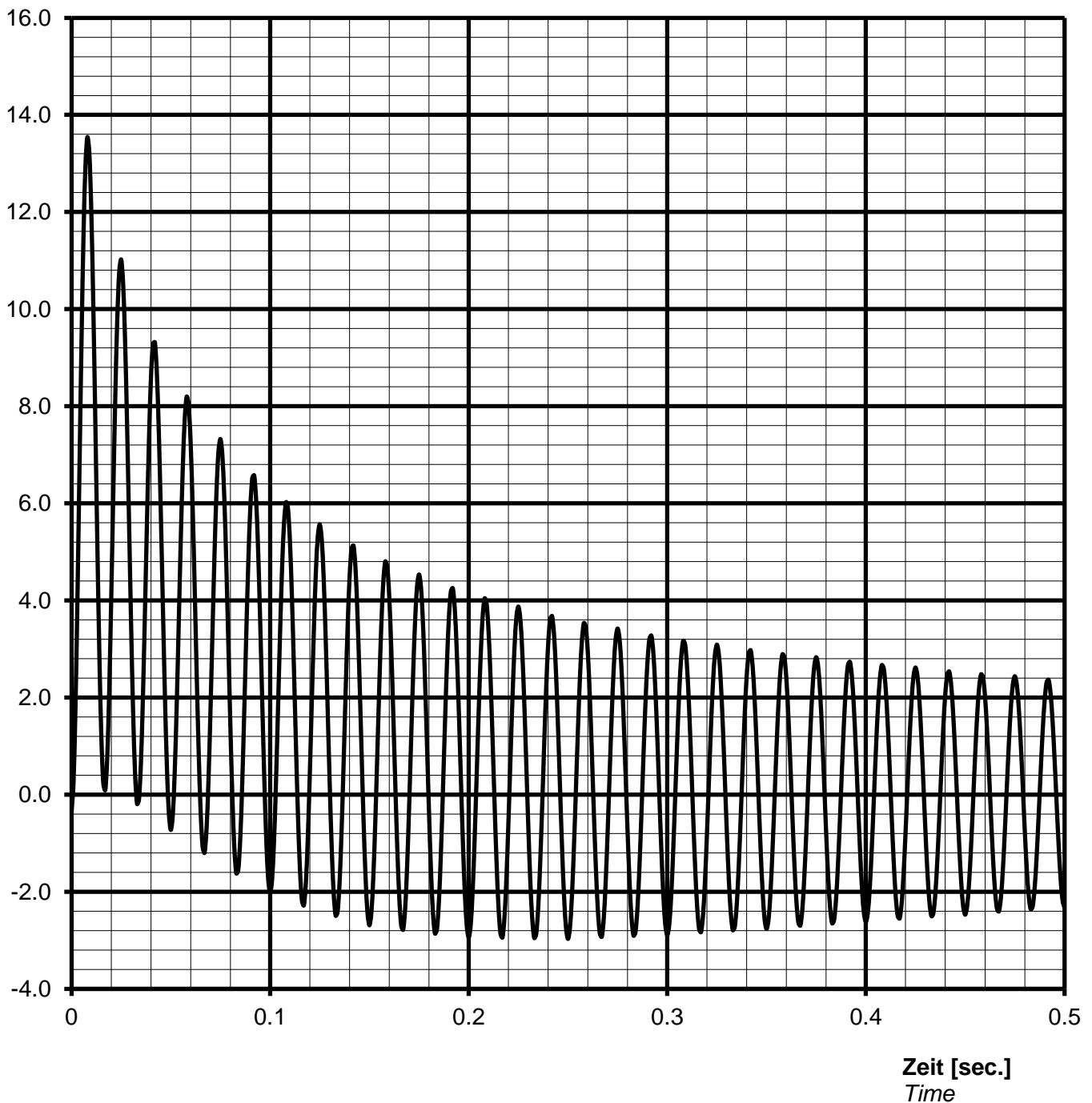
Speed

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**  $I_{\text{peak}} =$  **3116 A** or **13.54 p.u.**

#### Nennwerten / nominal data

DIG 150 m/6

Leistung  $S_N$ : **5500** kVA

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

Rating

p.f.

Spannung  $U_N$ : **13.80** kV

Strom  $I_N$ : **230** 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

#### Nennwerten / nominal data

DIG 150 m/6

Rating  $S_N$ : **5500 kVA**

*p.f.* **0.80**

*Bemessungsleistung*

Leistungsfaktor  $\cos \varphi$ :

Nominal voltage  $U_N$ : **13.80 kV**

Nominal current  $I_N$ : **230 A**

*Bemessungsspannung*

*Bemessungsstrom*

Frequency  $f_N$ : **60 Hz**

Speed  $n$ : **1200 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

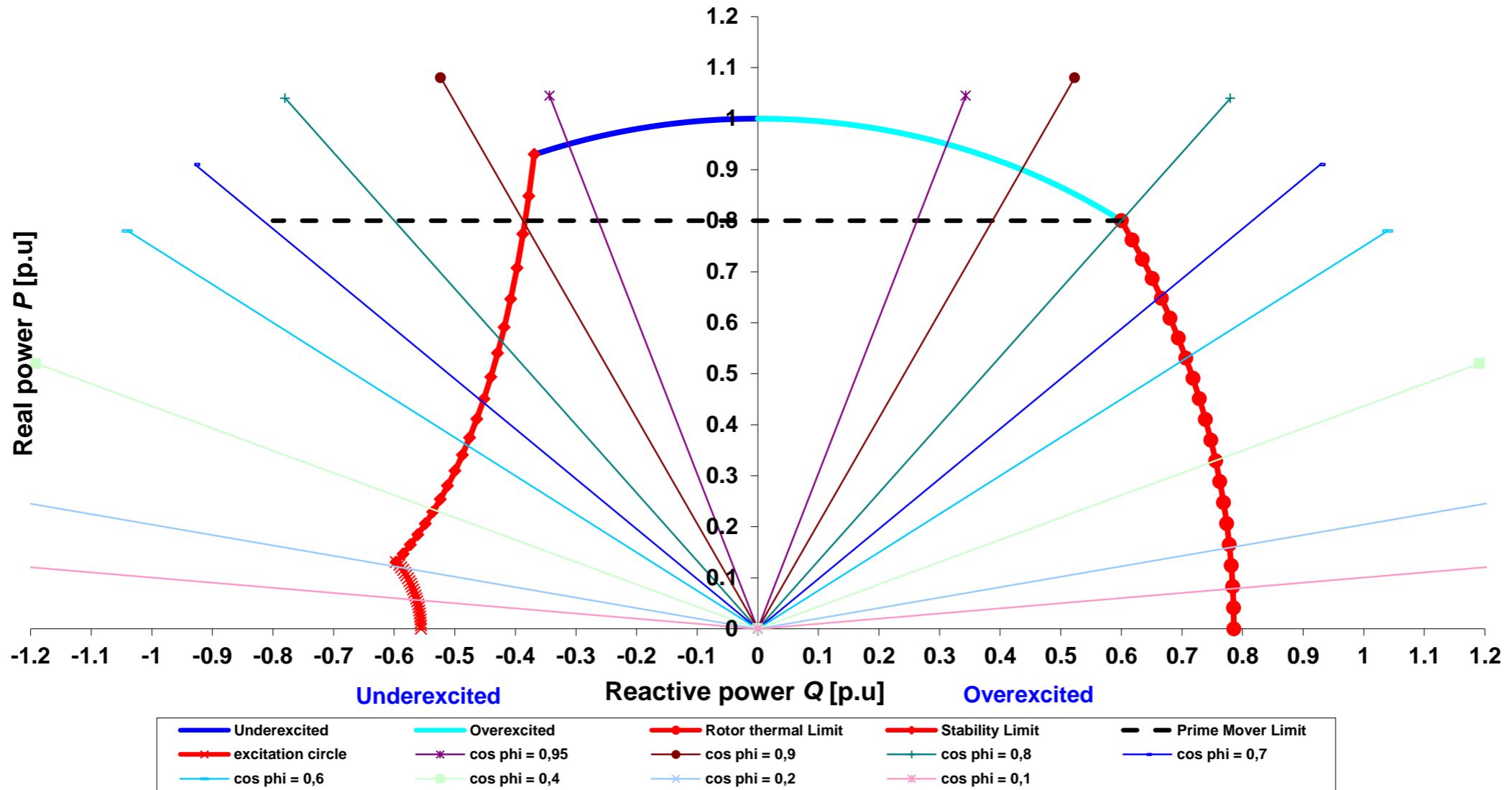
TYPE

DIG 150 m/6

Projekt:

Order Nr.:

### Capability (P-Q) Diagram



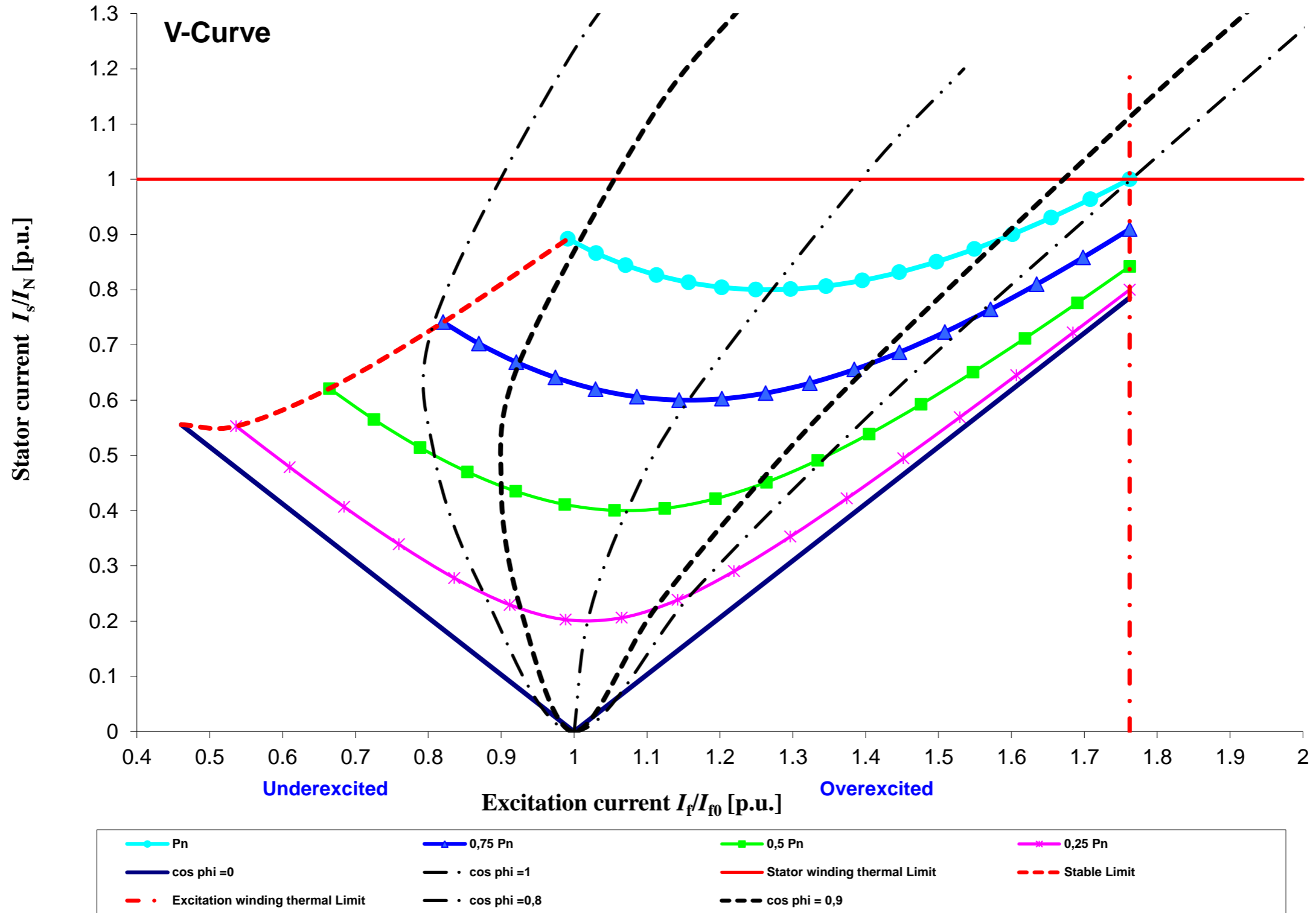
Cummins Generator Technologies

Datum / date:

17/10/2013



TYPE	DIG 150 m/6	Projekt:		Order Nr.:	
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Cummins Generator Technologies	Datum / date:	
	17/10/2013	