

**Technical Data Sheet for AvK-Alternators**

FM 7.3-5

Date:	09/01/14	Customer:	GENERIC DATASHEET only
Project No.:		AvK Reference:	dig156o_10_50_6300_A048N158

**Object data:**

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

**Generator data:**

Generator:	DIG 156 o/10	Poles:	10	Standards:	IEC 60034
Rated power:	5000 kVA	4000 kWe	4137 kWm		
Power factor:	0.80				
Power at pf 1,0	4038 kVA	4038 kWe	4137 kWm		
Rated voltage:	6.3 kV				
Speed:	600 1/min				
Frequency:	50 Hz			Voltage range / frequency range:	
Rated current:	458.2 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.:	4.0 m³/s	Cooling water quantity:	n/a
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Moment of inertia (I):	1200 kgm²	Weight:	21000 Kg	Losses (environment):	137 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	96,54	96,7	96,6	96,4	94,6
Power factor 0.9	97,01	97,15	97,05	96,7	94,8
Power factor 1.0	97,48	97,6	97,5	97	95

**Reactances and time constants**

	unsaturated	saturated		unsaturated	saturated				
$X_d$	1.60	1.44 p.u.	$X_q$	0.80	0.78 p.u.	$T_{d0'}$	2.45 s	$T_{d0''}$	0.03851 s
$X_d'$	0.285	0.285 p.u.	$X_q'$	0.80	0.78 p.u.	$T_{d'}$	0.44 s	$T_{q0'}$	0.5 s
$X_d''$	0.204	0.185 p.u.	$X_q''$	0.204	0.204 p.u.	$T_{d''}$	0.025 s	$T_{q0''}$	0.19608 s
$X_2$	0.213	0.194 p.u.	$X_0$	0.062	0.056 p.u.	$T_a$	0.08 s	$T_{q'}$	0.5 s
$X_{1s}$	n.a.	0.111 p.u.						$T_{q''}$	0.05 s

Short circuit ratio saturated: 0.69	$Z_n$ 7.938 Ohm
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**Short circuit data:**

Initial short circuit current (3-phase):	$I_k''$	2477 A	
Max. peak current (3-phase):	$I_s$	6305 A	
Sustained short circuit current:	$I_k$	1375 A	Minimum 3 x rated current for max.10 s
Initial short circuit torque:	$M_{k2}$	559.2 kNm	
	$M_{k3}$	335.5 kNm	
Max. faulty synchron moment:	$M_f$	1202.3 kNm	
Rated kVA torque:	$M_{SN}$	79.58 kNm	
Rated torque	$M_N$	63.66 kNm	
Shaft torque	$M_{Sh}$	65.83 kNm	

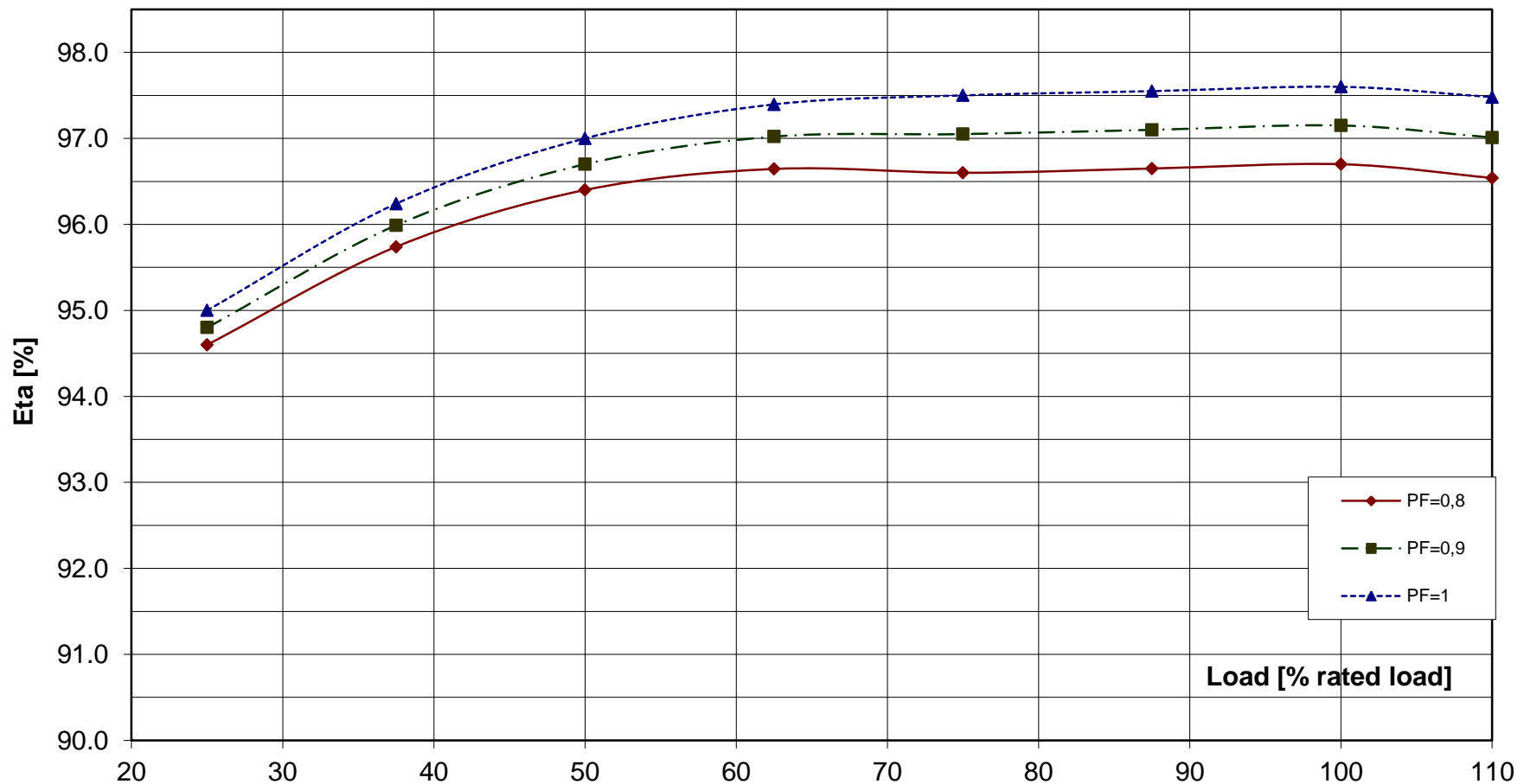
**Load application:**

max. load application: 2632 kVA (corresponds to 52,63 % from 5000 kVA) for Power factor 0.4 15% transient voltage drop	Power: 5000 kVA Power factor: 0.8 transient voltage drop: -22.2 %
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**Remarks:**

<b>Alternator :</b>	<b>DIG 156 o/10</b>			
Rated output [kVA]	5000	Rated power factor:	0.8	Rated voltage [kV]: 6.3
Rated frequency [Hz]	50	Rated speed [rpm]	600	

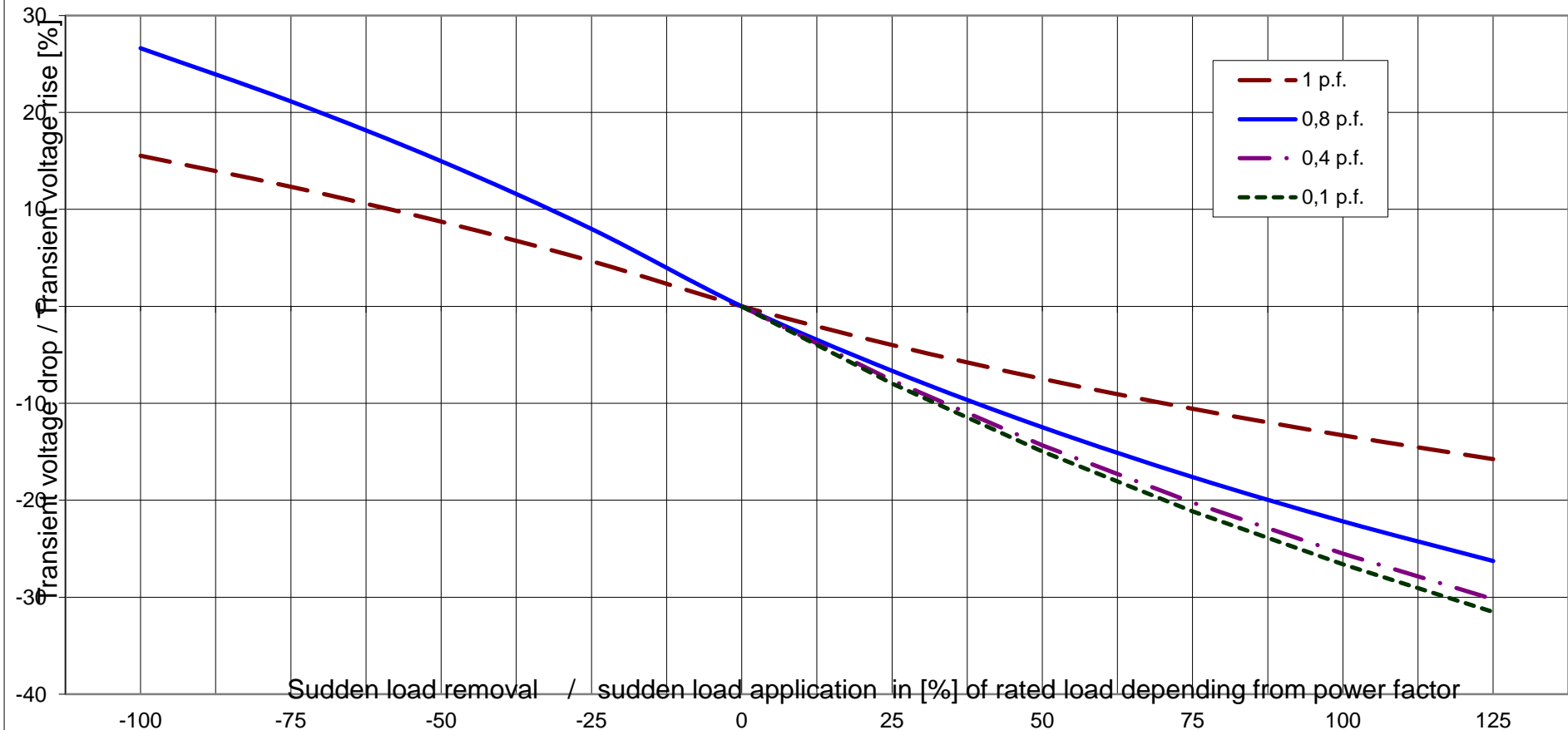
### Wirkungsgrad-Kennlinie - Efficiency Curve



**Alternator : DIG 156 o/10**

Rated output [kVA]	5000	Rated power factor:	0.8	Rated voltage [kV]:	6.3
Rated frequency [Hz]	50	Rated speed [rpm]	600		

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



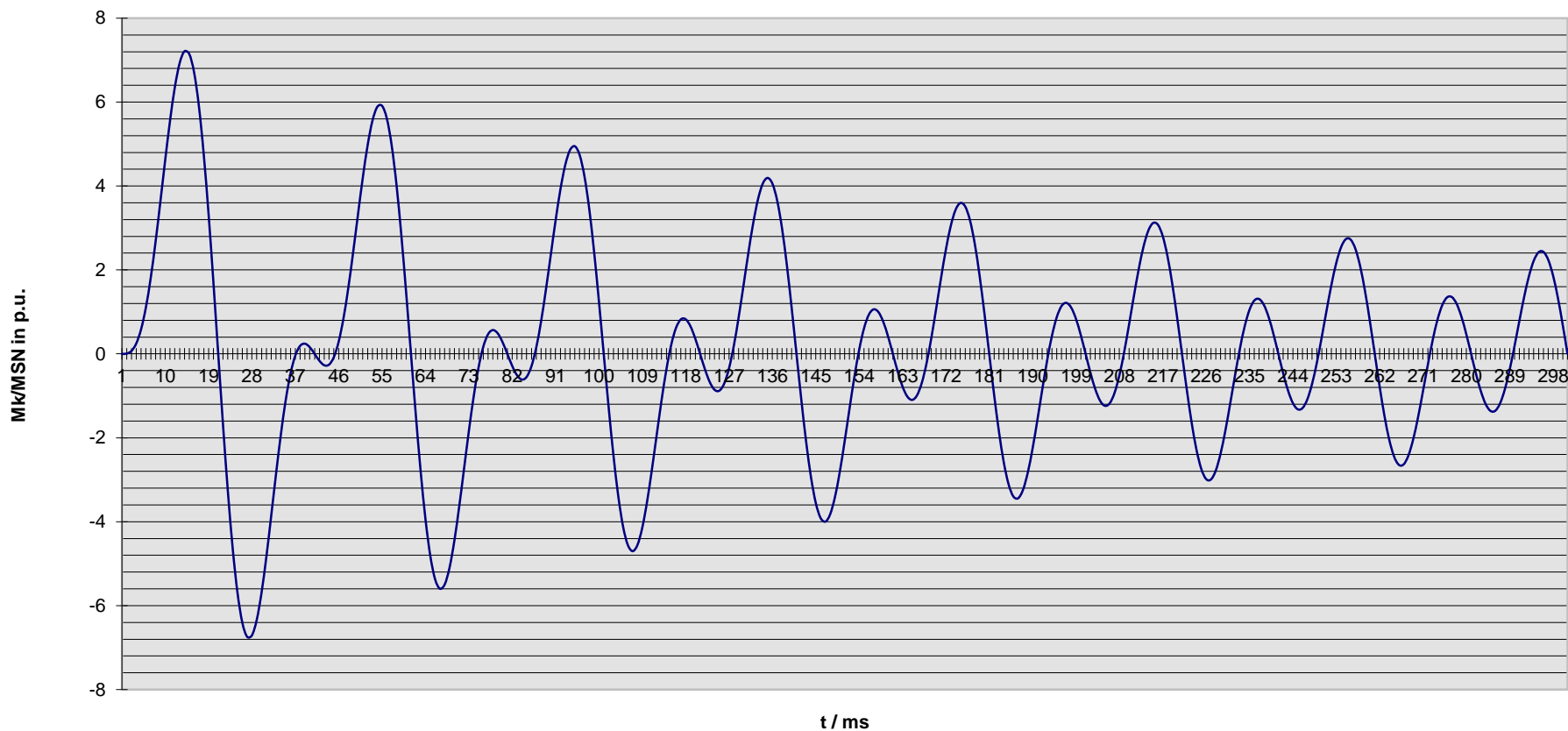


Technisches Datenblatt - Diagramme  
Technical data sheet - Diagrams

ING-FCD-0112

<b>Alternator :</b>	<b>DIG 156 o/10</b>			
Rated output [kVA]	5000	Rated power factor:	0.8	Rated voltage [kV]: 6.3
Rated frequency [Hz]	50	Rated speed [rpm]	600	MSN related to kVA: 79.58 KNm

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



#### Nenn Daten / nominal data

DIG 156 o/10

Leistung  $S_N$ : **5000** kVA

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

Rating

p.f.

Spannung  $U_N$ : **6.30** kV

Strom  $I_N$ : **458** A

Voltage

Current

Frequenz  $f$ : **50** Hz

Drehzahl  $n$ : **600** min<sup>-1</sup>

Frequency

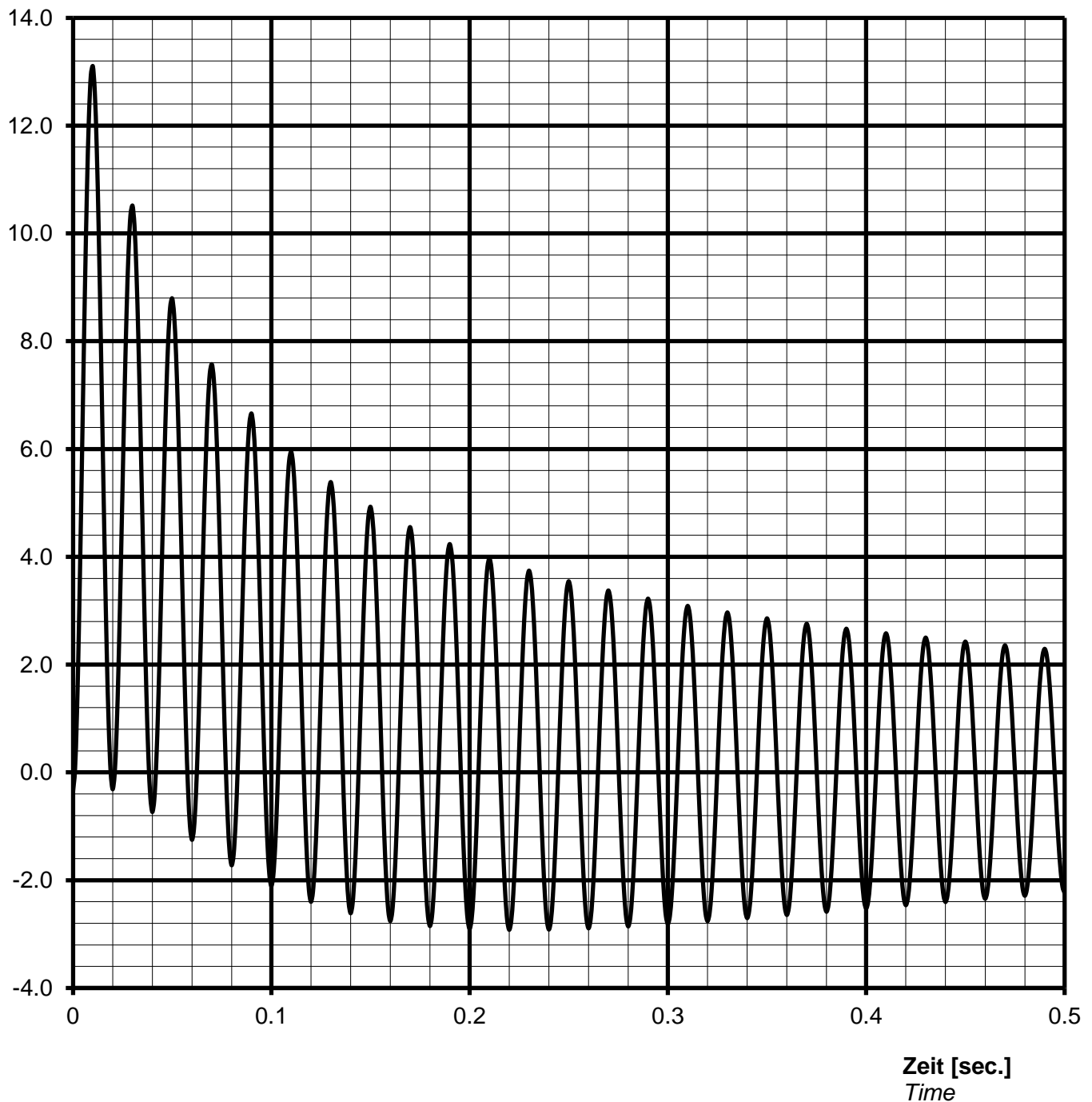
Speed

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

$I_{\text{speak}} =$  **6004** A or **13.10** p.u.

**Nenn Daten / nominal data**

**DIG 156 o/10**

Leistung  $S_N$ : **5000** kVA

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

Rating

p.f.

Spannung  $U_N$ : **6.30** kV

Strom  $I_N$ : **458** A

Voltage

Current

Frequenz f: **50** Hz

Drehzahl n: **600** min<sup>-1</sup>

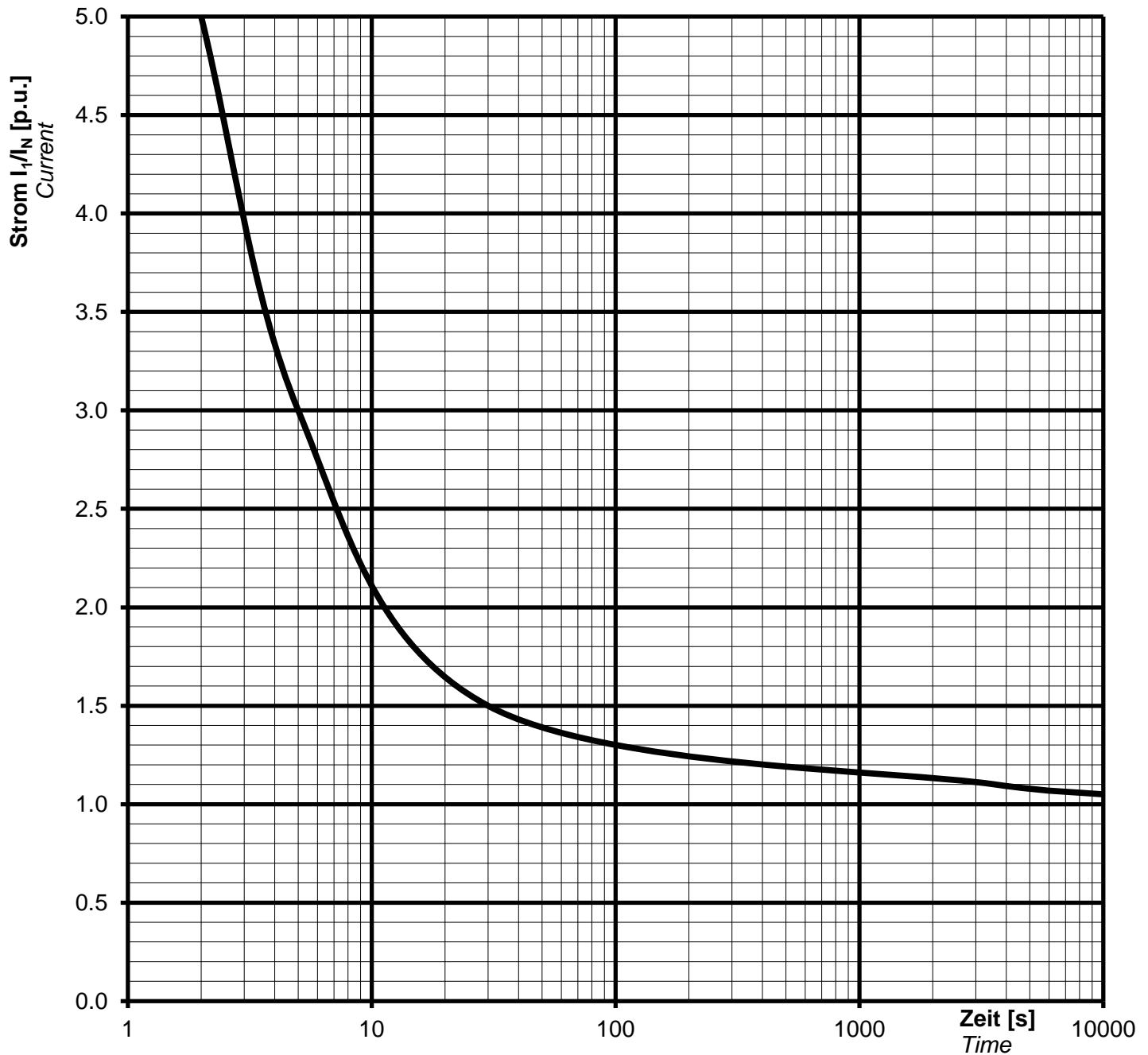
Frequency

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 156 o/10

Rating  $S_N$ : **5000 kVA**

*p.f.* **0.80**

*Bemessungsleistung*

Leistungsfaktor  $\cos \varphi$ :

Nominal voltage  $U_N$ : **6.30 kV**

Nominal current  $I_N$ : **458 A**

*Bemessungsspannung*

*Bemessungsstrom*

Frequency  $f_N$ : **50 Hz**

Speed  $n$ : **600 min<sup>-1</sup>**

*Frequenz*

*Drehzahl*

Protection: **IP23**

*Schutzart*

#### Inverse current or unbalanced negative sequence current



Remarks / Notizen:

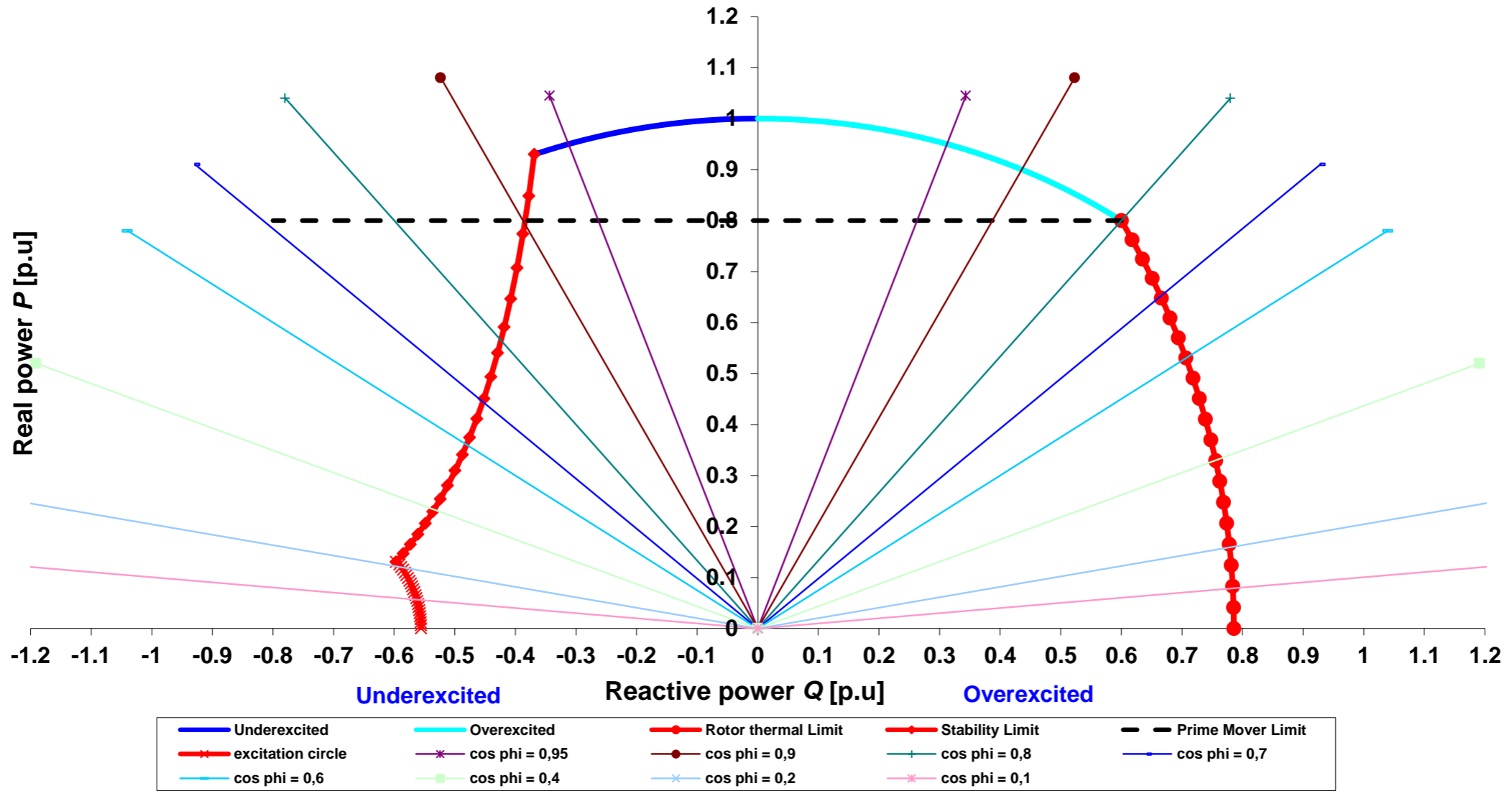
TYPE

DIG 156 o/10

Projekt:

Order Nr.:

**Capability (P-Q) Diagram**





TYPE

DIG 156 o/10

Projekt:

Order Nr.:

