



## Technical Data Sheet for AvK-Alternators

FM 7.3-5

Date:	09/10/13	Customer:	GENERIC DATASHEET only
Project No.:		AvK Reference:	dig142d_4_60_4160

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

<b>Generator data:</b>					
Generator:	DIG 142 d/4	Poles:	4	Standards: IEC 60034	
Rated power:	4658 kVA	3726 kWe	3836 kWm		
Power factor:	0.80				
Power at pf 1,0	3748 kVA	3748 kWe	3836 kWm		
Rated voltage:	4.16 kV				
Speed:	1800 1/min				
Frequency:	60 Hz		Voltage range / frequency range:		
Rated current:	646.5 A		Zone A according IEC 60034-1 (dU = +/-5%, df = +/-2%)		
Winding pitch:	ca. 5/6				
Insulation class:	Stator: Class F	Rotor: Class F	Temperature rise:	F	
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.:	5.0 m³/s	Cooling water quantity:	n/a
Moment of inertia (I):	165 kgm²	Weight:	9850 Kg	Losses (environment):	110 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	96,99	97,13	96,98	96,35	94,02
Power factor 0.9	97,29	97,42	97,2	96,5	94,14
Power factor 1.0	97,59	97,7	97,41	96,64	94,26

<b>Reactances and time constants</b>											
	unsaturated		saturated			unsaturated		saturated			
$X_d$	2.44	2.20	p.u.	$X_q$	1.22	1.20	p.u.	$T_{d0'}$	3.6 s	$T_{d0''}$	0.02813 s
$X_d'$	0.211	0.211	p.u.	$X_q'$	1.22	1.20	p.u.	$T_{d'}$	0.31 s	$T_{q0'}$	0.4 s
$X_d''$	0.165	0.150	p.u.	$X_q''$	0.165	0.165	p.u.	$T_{d''}$	0.02 s	$T_{q0''}$	0.29576 s
$X_2$	0.174	0.158	p.u.	$X_0$	0.050	0.045	p.u.	$T_a$	0.12 s	$T_{q'}$	0.4 s
$X_{1s}$	n.a.	0.090	p.u.							$T_{q''}$	0.04 s
Short circuit ratio saturated: 0.46					$Z_n$ 3.715 Ohm						

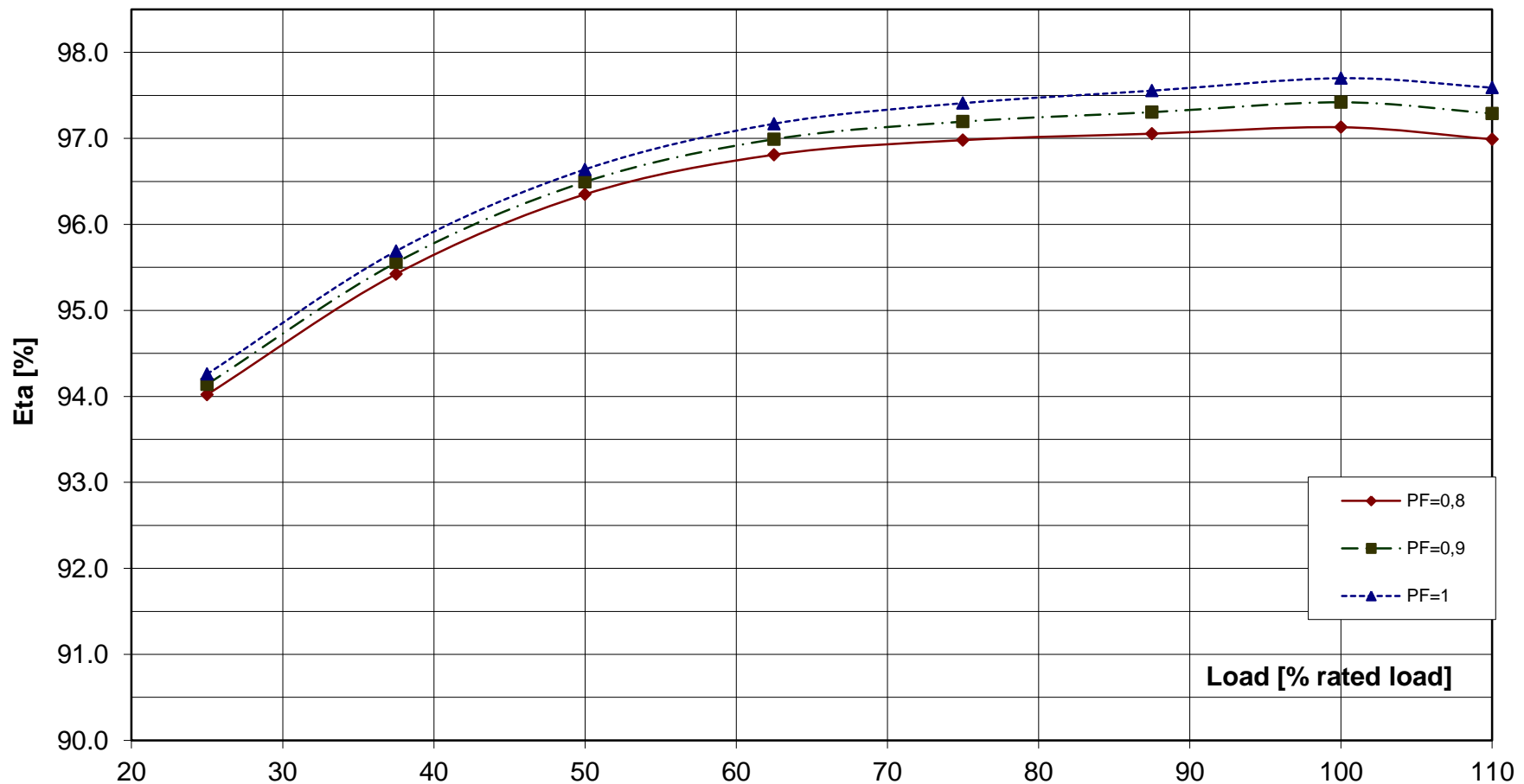
<b>Short circuit data:</b>		
Initial short circuit current (3-phase):	$I_k''$	4310 A
Max. peak current (3-phase):	$I_s$	10971 A
Sustained short circuit current:	$I_k$	1939 A
		Minimum 3 x rated current for max.10 s
Initial short circuit torque:	$M_{k2}$	214.2 kNm
	$M_{k3}$	128.5 kNm
Max. faulty synchron moment:	$M_f$	460.5 kNm
Rated kVA torque:	$M_{SN}$	24.71 kNm
Rated torque	$M_N$	19.77 kNm
Shaft torque	$M_{Sh}$	20.35 kNm

<b>Load application:</b>	
max. load application: 3311 kVA (corresponds to 71,09 % from 4658 kVA) for Power factor 0.4 15% transient voltage drop	Power: 4658 kVA Power factor: 0.8 transient voltage drop: -17.4 %

**Remarks:**

<b>Alternator :</b>	<b>DIG 142 d/4</b>			
Rated output [kVA]	4658	Rated power factor:	0.8	Rated voltage [kV]: 4.16
Rated frequency [Hz]	60	Rated speed [rpm]	1800	

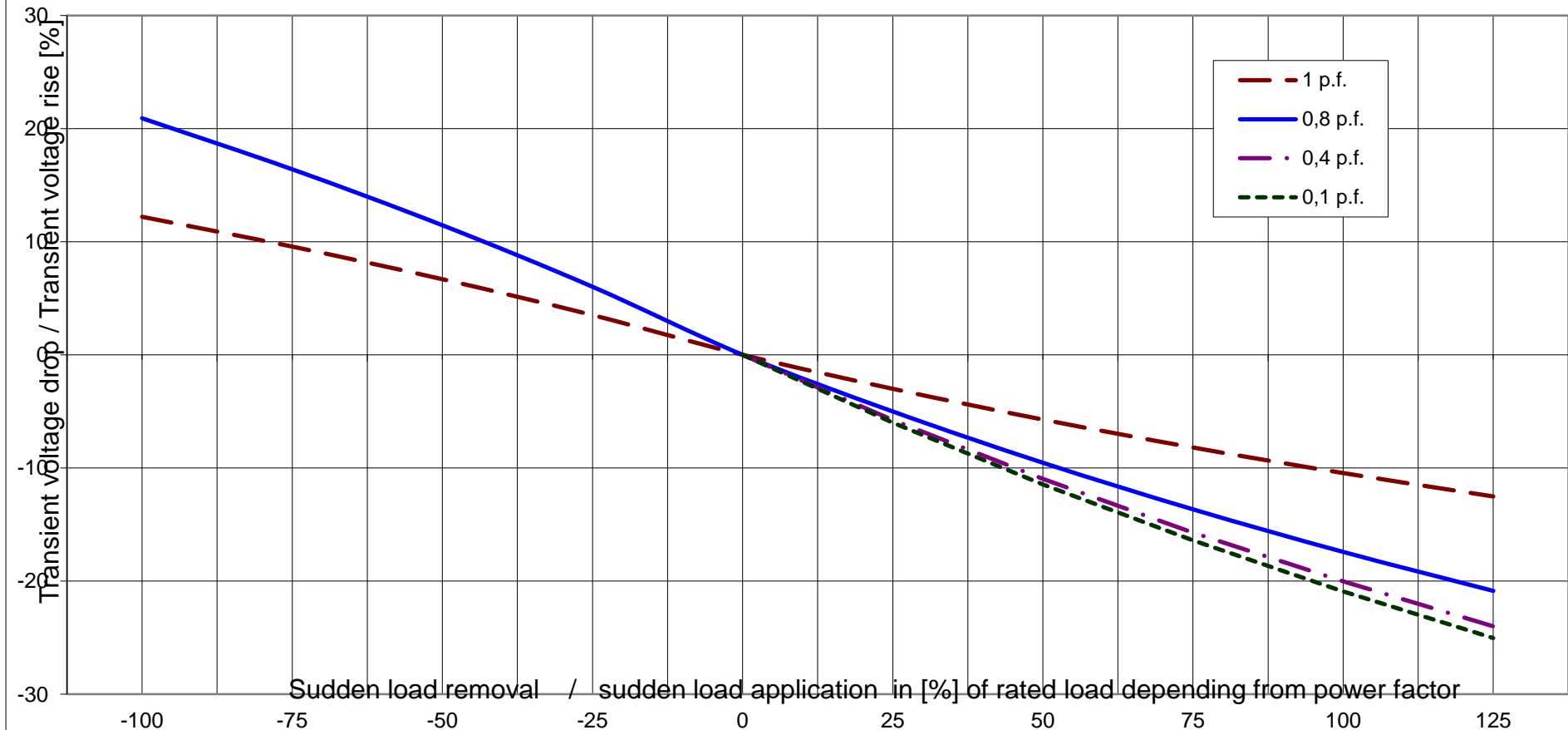
### Wirkungsgrad-Kennlinie - Efficiency Curve



**Alternator : DIG 142 d/4**

Rated output [kVA]	4658	Rated power factor:	0.8	Rated voltage [kV]:	4.16
Rated frequency [Hz]	60	Rated speed [rpm]	1800		

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



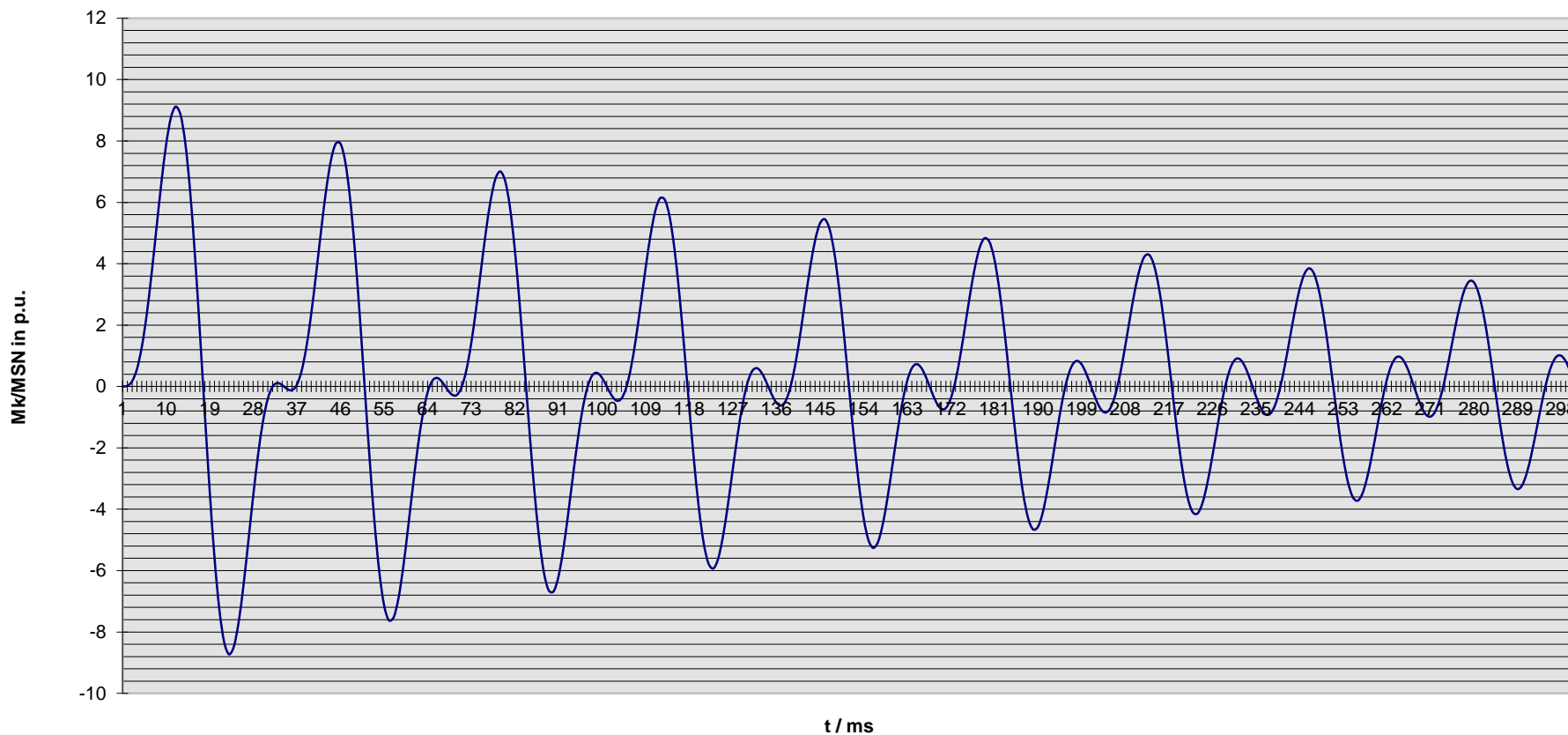


Technisches Datenblatt - Diagramme  
Technical data sheet - Diagrams

ING-FCD-0112

<b>Alternator :</b>	<b>DIG 142 d/4</b>			
Rated output [kVA]	4658	Rated power factor:	0.8	Rated voltage [kV]: 4.16
Rated frequency [Hz]	60	Rated speed [rpm]	1800	MSN related to kVA: 24.71 KNm

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



**Nenndaten / nominal data**

DIG 142 d/4

Leistung  $S_N$ : **4658** kVA

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

*Rating*

*p.f.*

Spannung  $U_N$ : **4.16** kV

Strom  $I_N$ : **646** A

*Voltage*

*Current*

Frequenz  $f$ : **60** Hz

Drehzahl  $n$ : **1,800** min<sup>-1</sup>

*Frequency*

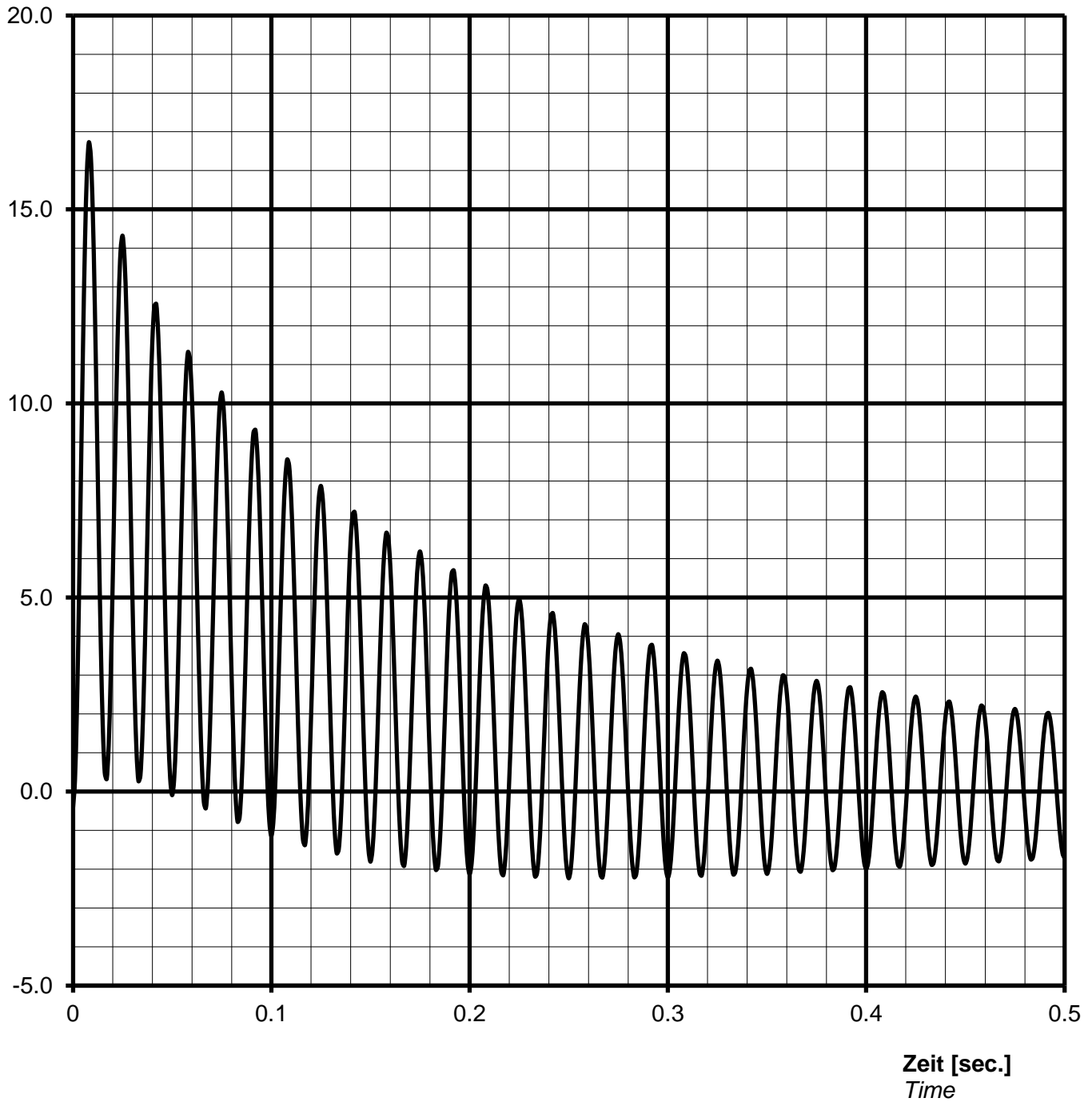
*Speed*

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**  $I_{\text{peak}} =$  **10814 A** or **16.73 p.u.**

#### Nennwerten / nominal data

DIG 142 d/4

Leistung  $S_N$ : **4658 kVA**

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

Rating

p.f.

Spannung  $U_N$ : **4.16 kV**

Strom  $I_N$ : **646 A**

Voltage

Current

Frequenz f: **60 Hz**

Drehzahl n: **1800 min<sup>-1</sup>**

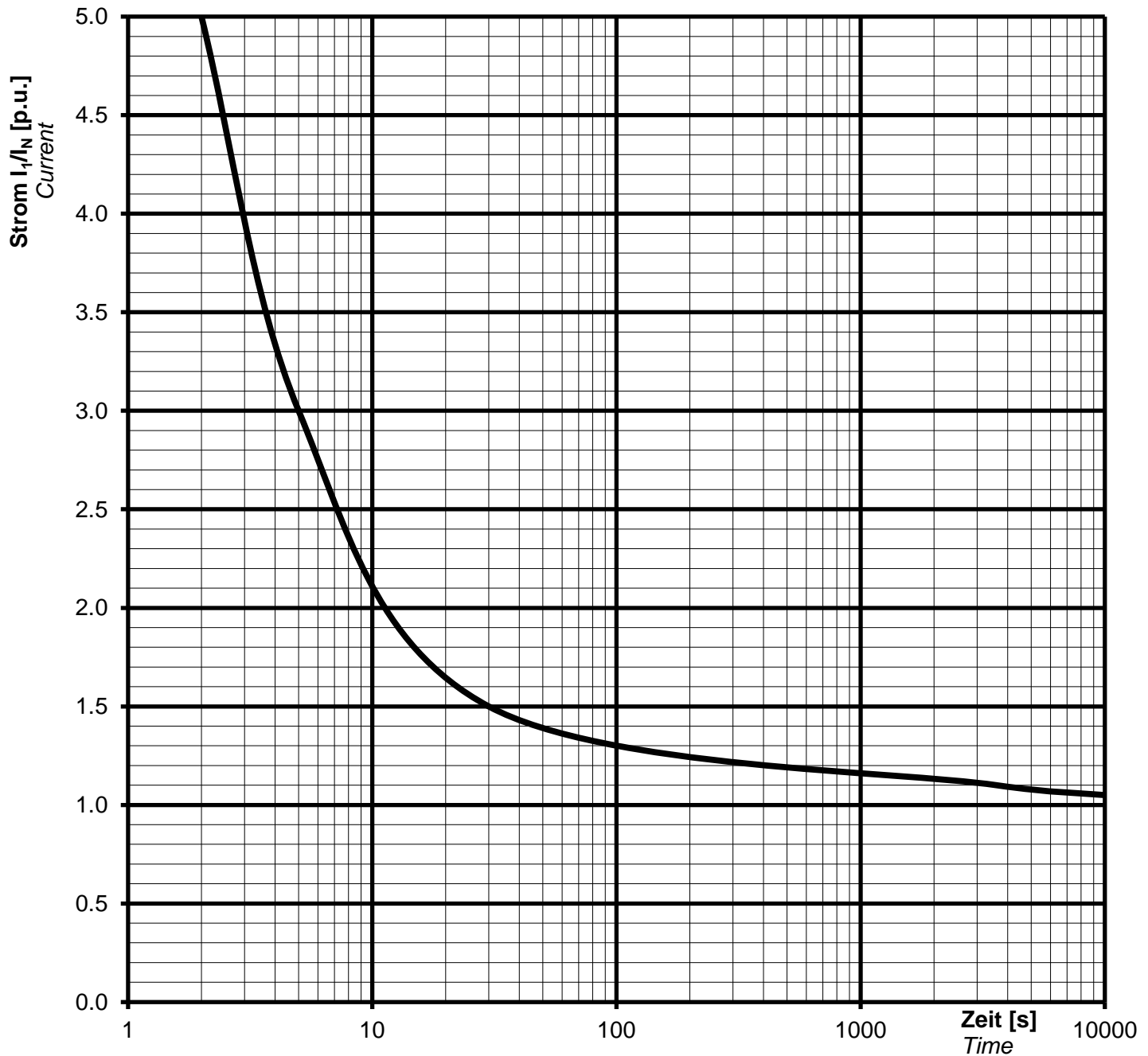
Frequency

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

DIG 142 d/4

Rating  $S_N$ : **4658 kVA**

*p.f.* **0.80**

*Bemessungsleistung*

Leistungsfaktor  $\cos \varphi$ :

Nominal voltage  $U_N$ : **4.16 kV**

Nominal current  $I_N$ : **646 A**

*Bemessungsspannung*

*Bemessungsstrom*

Frequency  $f_N$ : **60 Hz**

Speed  $n$ : **1800 min<sup>-1</sup>**

*Frequenz*

*Drehzahl*

Protection: **IP23**

*Schutzart*

#### Inverse current or unbalanced negative sequence current



Remarks / Notizen:

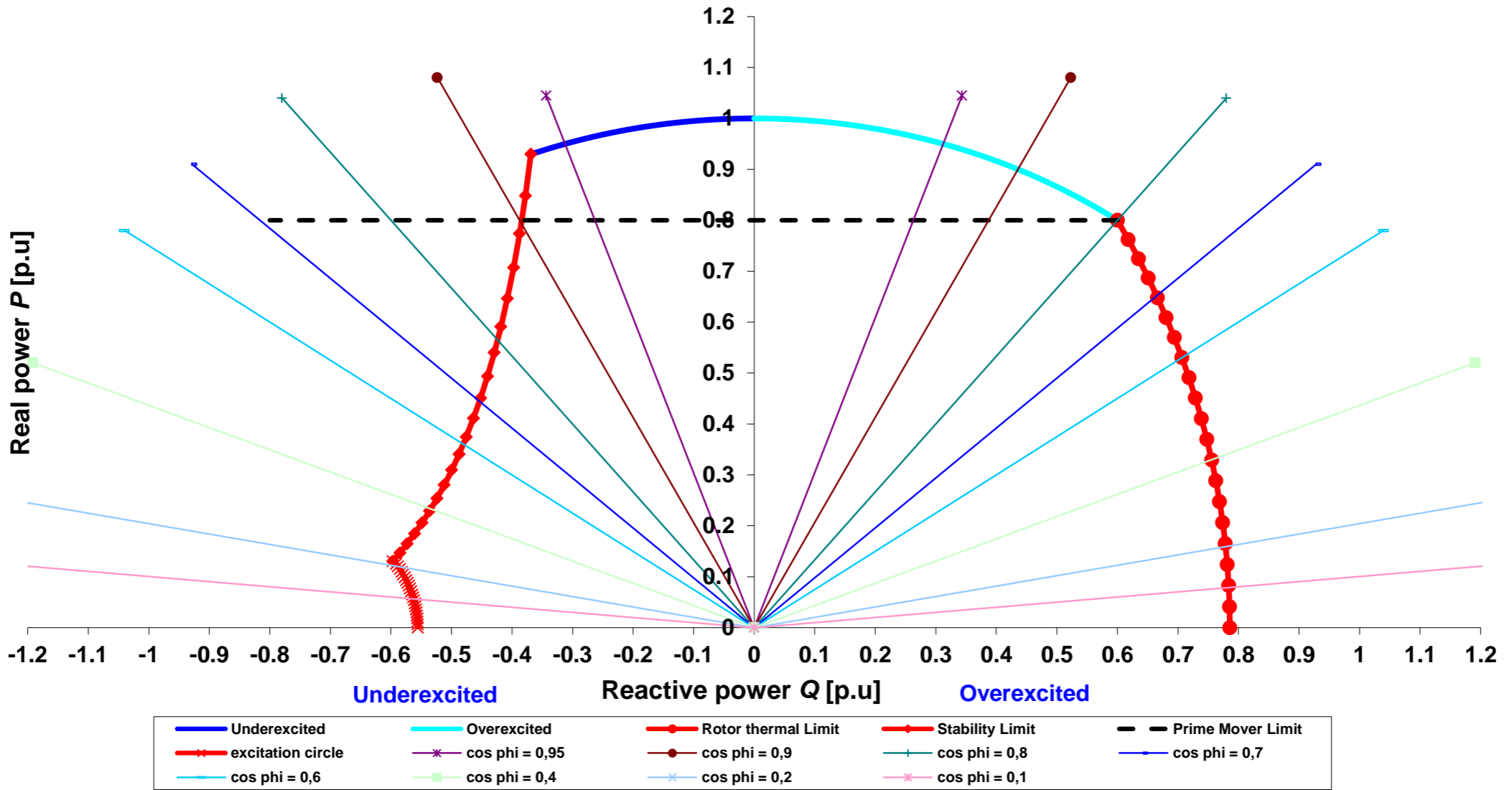
TYPE

DIG 142 d/4

Projekt:

Order Nr.:

**Capability (P-Q) Diagram**





TYPE

DIG 142 d/4

Projekt:

Order Nr.:

