

# DATASHEET ALTERNATOR

Alternator ref. KH04974T  
Alternator type KH04974TO4D



## -GENERAL CHARACTERISTICS-

Voltage Type (V) 400/230      Altitude (m) 0-1000  
Number of Phase Three phase      AVR Regulation Yes  
Number of pole 4      Indication of protection IP23

Capacity for maintaining short circuit at 3 In for 10 s Yes  
Winding type Standard

### Efficiency & Power

Frequency (Hz) 50 Hz      Nominal voltage (V) 400

	Class H				Class F	Class B
	125°C/ 40°C continuous	130°C/ 25°C standby	150°C/ 40°C standby	163°C/ 27°C standby	105°C/ 40°C continuous	80°C/ 40°C continuous
Nominal Rating(Kva)	2200	2222	2310	2420	2004.2	1694
Nominal Rating(KW)	1760	1777.6	1848	1936	1603.4	1355.2
Efficiency 100%	96	95.9	95.9	95.8	96.3	96.6

## -ELECTRICAL CHARACTERISTICS-

Voltage regulation at established rating (+/- %) 0.5  
Insulation class H  
T° class (H/125°), continuous 40°C H / 125°K  
T° class (H/163°C), standby 27°C H / 163°K  
Wave form : NEMA=TIF <50  
Unbalanced load acceptance ratio (%) 8  
Number of wires 6  
Total Harmonic Distortion in no-load DHT (%) <3.5  
Wave form : CEI=FHT <2  
Total Harmonic Distortion, on linear load DHT (%) <3.5  
Technology Brushless  
L-L Harmonic Maximum - Single (%) 3  
Deviation Factor (%) 2  
Shaft Current  
Main Stator Capacitance to ground (mfd) 0.0003

### Reactances

Direct axis synchro reactance unsaturated (Xd) (%) 375.8  
Direct axis transient reactance saturated (X'd) (%) 29.7  
Direct axis subtransient reactance saturated (X''d) (%) 15.5  
Quadra axis synchro reactance unsaturated (Xq) (%) 199.8  
Quadra axis subtransient reactance saturated (X''q) (%) 15.99  
Zero sequence reactance unsaturated (Xo) (%) 2.59  
Negative sequence reactance saturated (X2) (%) 15.73

### Short circuit ratio

Short circuit ratio (Kcc) 0.354  
Subtransient time constant (T''d) (ms) 14.376

3.351412E+10-G

The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever

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Short circuit transient time constant (T'd) (ms)	228.29
Open circuit time constant (T'do) (ms)	2513.68
Subtransient time constant (T''q) (ms)	19.6
Leakage stator reactance (Xa)(%)	12.84
Stator Resistance (Ra)(%)	1.153
Armature time constant (Ta) (ms)	28.843
No load excitation current (io) (A)	1.21
Full load excitation current (ic) (A)	4.41
Full load excitation voltage (uc) (V)	46.7
Heat rejection (W)	73938.72
No load losses (W)	17367.48
Stator resistance (for 20°C ambient) (Ω)	0.00084
Rotor resistance (for 20°C ambient) (Ω)	0.37909
Exciter resistance - stator/inductor (for 20° ambient) (Ω)	8.708
Exciter resistance - rotor/armature (for 20° ambient) (Ω)	0.01
Recovery time (Delta U = 20% transient) (ms)	500
Engine start (Delta U = 20% perm. or 30% trans.) (kVA)	1827.57
Transient dip (4/4 load) - PF : 0,8 AR (%)	20.26

## Additional electrical characteristics-

Winding X1, X2 auxiliary resistance (for 20° ambient) (Ω)	0.104
Auxiliary winding X1, X2 excitation voltage at no load (V)	100.3
Auxiliary winding X1, X2 excitation voltage on load (V)	100.3
Winding Z1, Z2 auxiliary resistance (for 20° ambient) (Ω)	0.188
Auxiliary winding Z1, Z2 excitation voltage at no load (V)	0
Auxiliary winding Z1, Z2 excitation voltage on load (V)	0

## -MECHANICAL CHARACTERISTICS-

Number of bearing	1
Overspeed (rpm)	2250
Coupling	Direct

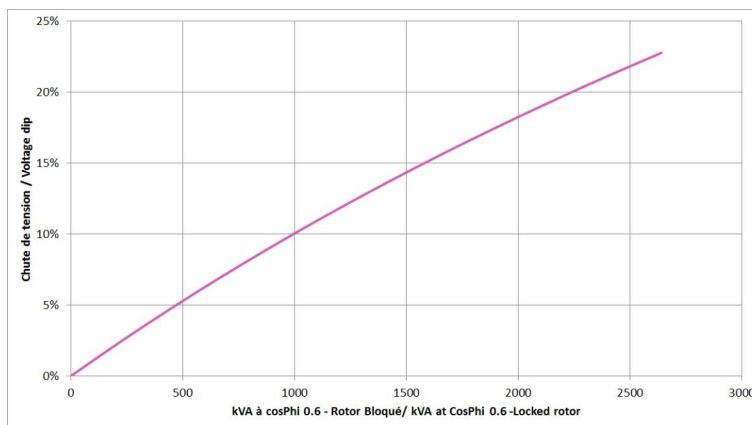
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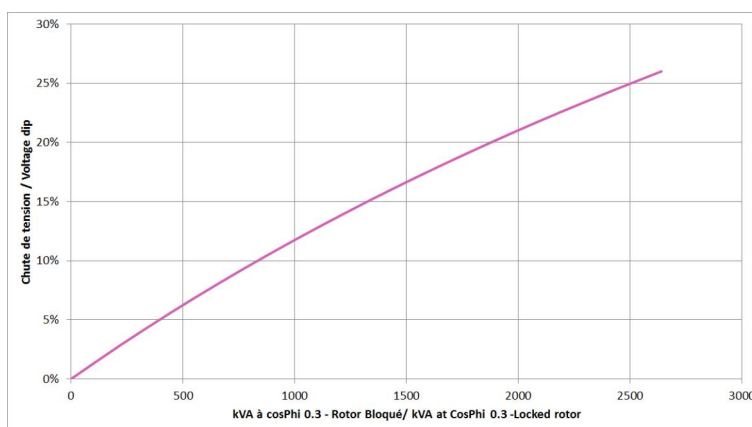


## -TECHNICAL CURVES-

### Motor starting curve locked rotor (0,6PF)



### Motor starting curve locked rotor (0,3PF)

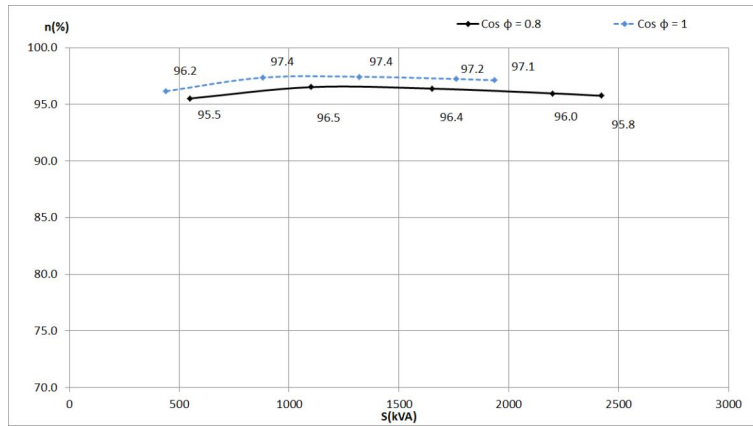


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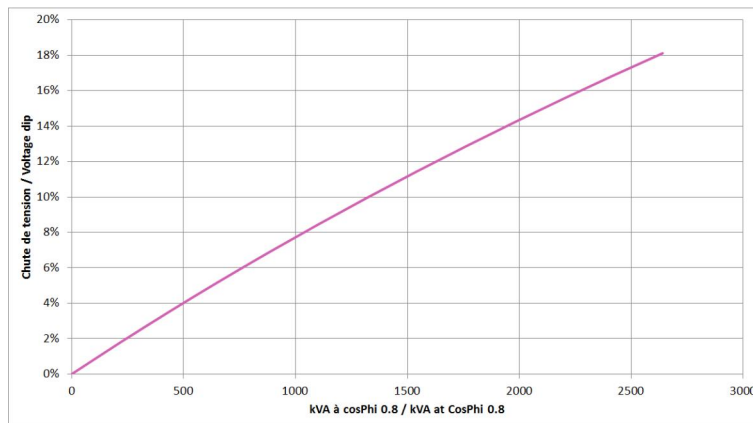
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## Efficiencies curve (by excitation system)



## Loading curve (by excitation system)



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## Short circuit curve at no load and rated speed

### Influence due to connection

Curves shown are for star (Y) connection

For other connections, use the following multiplication factors :

- Series delta : current value x 1.732
- Parallel star : current value x 2

### Influence due to short-circuit

Curves are based on a three-phase short-circuit. For the other types of short-circuit, use the following multiplication factors :

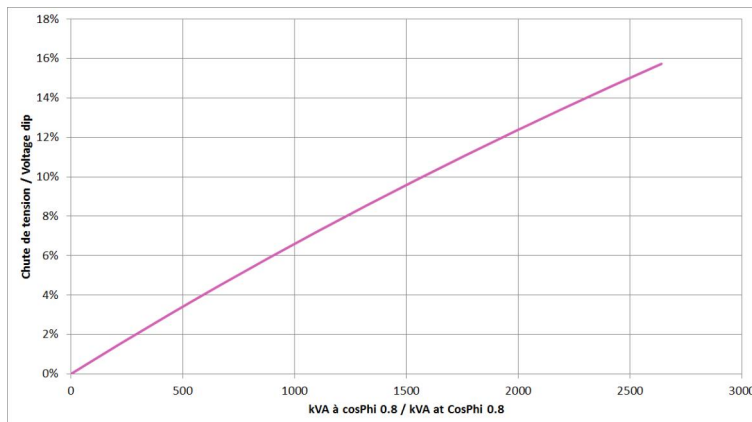
(\*) Capacity for maintaining short circuit at  $3 I_n$  for 10 s = YES

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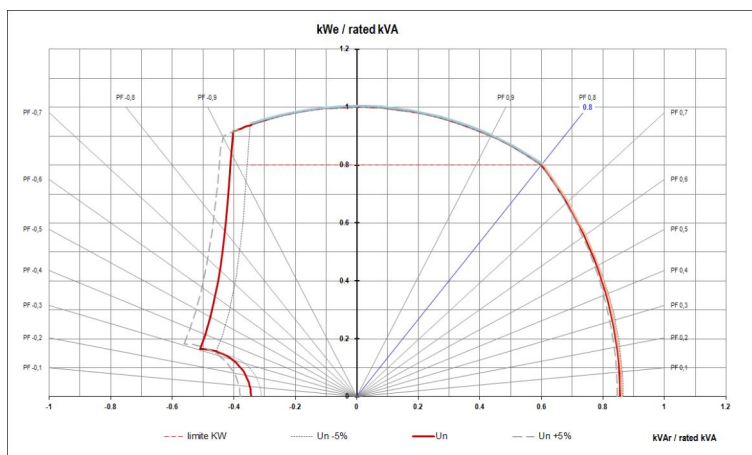
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## Rejection curve (by excitation system)



## Capability curve (PQ diagram)



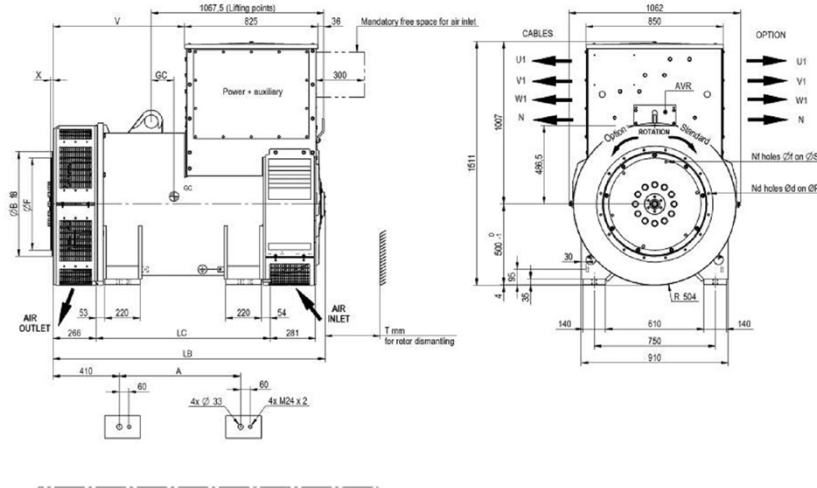
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## DIMENSIONS-

### Overall dimension drawing (Single bearing)



Type	Flange/ Flexplates	ØB (mm)	Nd	Ød (mm)	ØP (mm)	ØF (mm)	Nf	Øf (mm)	ØS (mm)	Offset X	A (mm)	LC (mm)	LB (mm)	V (mm)	GC (mm)	Weight (kg)	(n
KH04404	SAE 0/18	647.7	16	14	679.5	571.5	6	18	542.9	15.8	750	1077	1683	814	166	3769	14
KH04404	SAE 00/18	787.4	16	14	850.9	571.5	6	18	542.9	15.8	750	1077	1683	814	173	3736	14
KH04404	SAE 00/21	787.4	16	14	850.9	673.1	12	18	641.3	0	750	1077	1683	814	173	3737	14
KH04404	SAE 00/24	787.4	16	14	850.9	733.4	12	21	692.1	0	750	1077	1683	814	172	3749	14
KH04406	SAE 0/18	647.7	16	14	679.5	571.5	6	18	542.9	15.8	750	1077	1683	814	166	3769	14
KH04406	SAE 00/18	787.4	16	14	850.9	571.5	6	18	542.9	15.8	750	1077	1683	814	173	3736	14
KH04406	SAE 00/21	787.4	16	14	850.9	673.1	12	18	641.3	0	750	1077	1683	814	173	3737	14
KH04406	SAE 00/24	787.4	16	14	850.9	733.4	12	21	692.1	0	750	1077	1683	814	172	3749	14
KH04974	SAE 0/18	647.7	16	14	679.5	571.5	6	18	542.9	15.8	750	1077	1683	814	186	4021	14
KH04974	SAE 00/18	787.4	16	14	850.9	571.5	6	18	542.9	15.8	750	1077	1683	814	192	3988	14
KH04974	SAE 00/21	787.4	16	14	850.9	673.1	12	18	641.3	0	750	1077	1683	814	192	3989	14
KH04974	SAE 00/24	787.4	16	14	850.9	733.4	12	21	692.1	0	750	1077	1683	814	191	4001	14
KH04976	SAE 0/18	647.7	16	14	679.5	571.5	6	18	542.9	15.8	750	1077	1683	814	186	4021	14
KH04976	SAE 00/18	787.4	16	14	850.9	571.5	6	18	542.9	15.8	750	1077	1683	814	192	3988	14
KH04976	SAE 00/21	787.4	16	14	850.9	673.1	12	18	641.3	0	750	1077	1683	814	192	3989	14
KH04976	SAE 00/24	787.4	16	14	850.9	733.4	12	21	692.1	0	750	1077	1683	814	191	4001	14
KH05794	SAE 0/18	647.7	16	14	679.5	571.5	6	18	542.9	15.8	950	1277	1883	1014	56	4467	14
KH05794	SAE 00/18	787.4	16	14	850.9	571.5	6	18	542.9	15.8	950	1277	1883	1014	62	4434	14
KH05794	SAE 00/21	787.4	16	14	850.9	673.1	12	18	641.3	0	950	1277	1883	1014	62	4435	14
KH05794	SAE 00/24	787.4	16	14	850.9	733.4	12	21	692.1	0	950	1277	1883	1014	61	4447	14
KH06521	SAE 0/18	647.7	16	14	679.5	571.5	6	18	542.9	15.8	950	1277	1883	1014	101	4657	14
KH06521	SAE 00/18	787.4	16	14	850.9	571.5	6	18	542.9	15.8	950	1277	1883	1014	107	4624	14
KH06521	SAE 00/21	787.4	16	14	850.9	673.1	12	18	641.3	0	950	1277	1883	1014	107	4625	14
KH06521	SAE 00/24	787.4	16	14	850.9	733.4	12	21	692.1	0	950	1277	1883	1014	106	4637	14

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Overall dimension drawing (Two bearings)



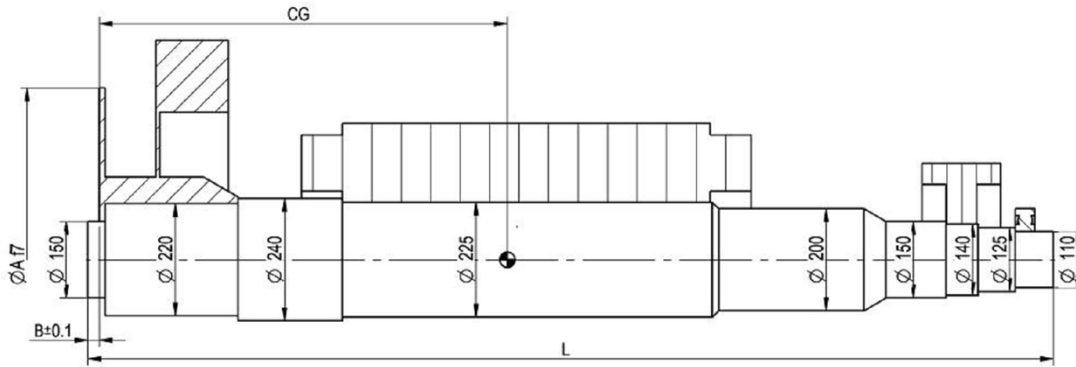
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## -TORSIONAL ANALYSIS DATA-

Rotation part drawing for torsional vibration calculation (Single bearing)



Type	SAE	ØA (mm)	B (mm)	L (mm)	CG (mm)	Weight (kg)	MR2 (kg.m <sup>2</sup> )
KH04405 KH04404	18	571.5	6	1689	702.6	1470	44.3
KH04405 KH04404	21	673.1	22	1689	686	1472	45
KH04407 KH04406	18	571.5	6	1689	702.6	1470	44.3
KH04407 KH04406	21	673.1	22	1689	686	1472	45
KH04975 KH04974	18	571.5	6	1689	724.7	1510	45.9
KH04975 KH04974	21	673.1	22	1689	708.1	1512	46.6
KH04977 KH04976	18	571.5	6	1689	724.7	1510	45.9
KH04977 KH04976	21	673.1	22	1689	708.1	1512	46.6
KH05795 KH05794	18	571.5	6	1889	792.2	1691	50.9
KH05795 KH05794	21	673.1	22	1889	775.6	1693	51.6
KH06521 KH06521	18	571.5	6	1889	818.9	1806	54.1
KH06521 KH06521	21	673.1	22	1889	802.2	1808	55
KH06933 KH06932	18	571.5	6	1889	842.9	1877	57.6
KH06933 KH06932	21	673.1	22	1889	826.2	1879	58.3

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Rotation part drawing for torsional vibration calculation (Two bearings)