KAL404 Series

Fujian Kwise Generator Co., Ltd.

600kW - 1200 kW

Application and Standard

The4-pole generator is suitable for matching with a reciprocating internal combustion engine (commonly called a diesel engine) to form a generator set, which can be used as a fixed power supply or backup power supply for national defense, post and telecommunications, airports, hospitals, buildings, oil exploration，Industrial and mining enterprises and other departments.

Alternators are incompliance to the main domestic and international standards and regulations: GB755, BS5000, IEC60034, VDE0530, CSAC22.2-100, NEMAMG-1.22. Alternators' manufacturing, design and mark are carried out in the environment of ISO9001.

Electrical features

Automatic voltage regulators: Kwise 4 Pole Alternators are fitted with reliable and performant AVR, adapted to excitation systems, powered by transistors and fulfilling perfect regulation.

Short circuit capacity: Kwise propose two choices of excitation systems to meet different customer requirements:

A）Self-Excitation system, without short-circuit capacity.

B）PMG, with a short-circuit capacity of 3 times of the nominal current for 10seconds.

Transient features: Transient voltage dip for 60% rated current at 0.4 power factor is less than 15%. Recovery time for a 15% transient voltage dip is less than 1.5s.

Parallel operation: All 4 pole alternators can operate in parallel with other alternators or with the mains, when they are equipped with the appropriate devices (AVR, current transformer...).

Overload acceptance: 4 pole alternators can be overloaded according to NEMA.

Waveform: Total harmonic distortion(THD), at no load or linear load is less than 5% according to IEC. Telephone influence factor (TIF) according to NEMA is less than 50.

Frequency: 4 pole alternators may operate either 50Hz or 60Hz. The standard winding (B31, B32) is suitable both for 50Hz and 60Hz.

Power factor: 4 pole alternators are designed to operate between 0.8 and 1.0 power factor. A derating is necessary below 0.8 power factor (see derating table).

Mechanical features

Forms: 4 pole alternators can be provided in single bearing or double bearing configurations according to customer's requirements, as well as Engine adaptors and coupling discs which are fit for the major engines.

Balancing: All the rotors are dynamically balanced according to ISO1940. Double bearing rotors are balanced with a half key.

Insulation and protection: 4 pole alternators are class H insulated. The standard winding protection can accept up to 95% relative humidity and is suitable in the cabins. Specific added coatings can be proposed for harsh environments.

Enclosure: Standard enclosure is IP23.

Direction of rotation: 404 series is only suitable for clockwise operation (Viewed from the drive end).

Terminal box and connectors: 4 pole alternators have a terminal box which allows easy access for connection of AVR or reconnection. Current transformers or other optional modules can be fitted with in the box.

Bearings: Sealed for life bearings up to all Kwise 4 pole alternator.

Overspeed: The maximum over speed is 2250rpm for the 4 pole alternator (1.25 times the 60Hz rated speed).

Mechanical structure: Steel frame. Cast iron or steel housing and flanges depending on models.

General parameters

Ambient temperature	40℃	Temperature rise	125K	Short circuit current multiple	≧300%
Altitude	1000m	Voltage regulation	±1%	Cooling method	IC01
Insulation class	Class H	Exciter system	Brushless self-excitation	Direction of rotation	Clockwise
Duty type	S1	Winding pitch	2/3	Maximum speed	2250rpm
Phases	3	Power factor	0.8	Protection grade	IP23
Number of poles	4	TIF	<50	Frequency	50/60Hz
AVR model	KR440	THF	<2%	THD	1.2%~2.5%

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4 Poles

Kwise from the CASIC, to the world

Electrical parameters

50Hz/1500RPM		Standard Winding / Power Factor 0.8							
Duty type/Temperature rise/Ambient		Cont./125K/40℃				Standby/163K/27℃			
Phase		3-Phases				3-Phases			
Voltage	Y	380V	**400V**	415V	440V	380V	400V	415V	440V
	Δ	220V	**230V**	240V		220V	230V	240V	
KAL404A1	kVA	750	**750**	750	713	840	840	840	784
	kW	600	**600**	600	570	672	672	672	627
KAL404B1	kVA	800	**800**	800	760	896	896	896	836
	kW	640	**640**	640	608	717	717	717	669
KAL404C2	kVA	910	**910**	910	865	1019	1019	1019	951
	kW	728	**728**	728	692	815	815	815	761
KAL404D2	kVA	1000	**1000**	1000	950	1120	1120	1120	1045
	kW	800	**800**	800	760	896	896	896	836
KAL404E3	kVA	1125	**1125**	1125	1069	1260	1260	1260	1176
	kW	900	**900**	900	855	1008	1008	1008	941
KAL404F3	kVA	1250	**1250**	1250	1188	1400	1400	1400	1306
	kW	1000	**1000**	1000	950	1120	1120	1120	1045
KAL404G4	kVA	1375	**1375**	1375	1306	1540	1540	1540	1437
	kW	1100	**1100**	1100	1045	1232	1232	1232	1150
KAL404H4	kVA	1500	**1500**	1500	1425	1680	1680	1680	1568
	kW	1200	**1200**	1200	1140	1344	1344	1344	1254

*** Other voltages please consult the factory.**

KWISE

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4 Poles

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Electrical parameters

60Hz/1800RPM		Standard Winding / Power Factor 0.8							
Duty type/Temperature rise/Ambient		Cont./125K/40℃				Standby/163K/27℃			
Phase		3-Phases				3-Phases			
Voltage	Y	416V	**440V**	460V	480V	416V	440V	460V	480V
	Δ	240V				240V			
KAL404A1	kVA	806	**863**	900	900	887	949	990	990
	kW	645	**690**	720	720	710	759	792	792
KAL404B1	kVA	860	**920**	960	960	946	1012	1056	1056
	kW	688	**736**	768	768	757	810	845	845
KAL404C2	kVA	978	**1047**	1092	1092	1076	1151	1201	1201
	kW	783	**837**	874	874	861	921	961	961
KAL404D2	kVA	1075	**1150**	1200	1200	1183	1265	1320	1320
	kW	860	**920**	960	960	946	1012	1056	1056
KAL404E3	kVA	1209	**1294**	1350	1350	1330	1423	1485	1485
	kW	968	**1035**	1080	1080	1064	1139	1188	1188
KAL404F3	kVA	1344	**1438**	1500	1500	1478	1581	1650	1650
	kW	1075	**1150**	1200	1200	1183	1265	1320	1320
KAL404G4	kVA	1478	**1581**	1650	1650	1626	1739	1815	1815
	kW	1183	**1265**	1320	1320	1301	1392	1452	1452
KAL404H4	kVA	1613	**1725**	1800	1800	1774	1898	1980	1980
	kW	1290	**1380**	1440	1440	1419	1518	1584	1584

*** Other voltages please consult the factory.**

Moment of Inertia & Efficiency

Model	KAL404	A1	B1	C2	D2	E3	F3	G4	H4
Inertia (1-Bearing) J	kgm^2	16.445	16.837	18.283	19.945	22.724	27.481	31.031	31.956
50Hz400V Efficiency (100% load)	%	95.0	95.2	95.5	95.8	95.8	95.9	96.1	96.2
60Hz440V Efficiency (100% load)	%	95.1	95.4	95.5	95.9	95.9	96.0	96.0	96.2

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4 Poles

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Reactance (%) - Time Constant (ms)

50Hz @ 400V	KAL404	A1	B1	C2	D2	E3	F3	G4	H4
Short circuit ratio	Kcc	0.28	0.26	0.24	0.26	0.27	0.27	0.27	0.24
Direct axis synchronous unsaturated reactance	Xd	362	386	424	388	369	364	375	415
Direct Axis Transient Saturation Reactance	X'd	22.3	23.8	25.2	22.8	21.6	20.5	22.4	24.8
Direct Axis Subtransient Saturation Reactance	X"d	16.4	17.5	18.3	16.5	15.5	14.5	16.2	17.9
Quadrature axis Synchronous Unsaturated Reactance	Xq	226	241	264	242	230	226	234	259
Quadrature Subtransient Saturation Reactance	X"q	22.9	24.4	26.0	23.3	21.7	20.7	22.3	24.7
Negative sequence saturation reactance	X2	1.96	2.10	2.21	1.99	1.86	1.76	1.92	2.13
Zero sequence unsaturated reactance	X0	1.29	1.38	1.39	1.20	1.10	0.95	1.23	1.36
Short-circuit transient time constant	T'd	46	49	49	41	35	31	31	34
Subtransient time constant	T"d	6	6	6	5	4	4	4	4
Open circuit time constant	T'do	2075	2213	2283	1958	1664	1535	1433	1570
Armature time constant	Ta	125	146	181	192	233	255	401	439

60Hz @ 440V	KAL404	A1	B1	C2	D2	E3	F3	G4	H4
Short circuit ratio	Kcc	0.24	0.23	0.20	0.22	0.23	0.24	0.23	0.21
Direct axis synchronous unsaturated reactance	Xd	419	443	491	447	427	418	433	481
Direct Axis Transient Saturation Reactance	X'd	25.8	27.2	29.2	26.3	24.9	23.6	25.8	28.7
Direct Axis Subtransient Saturation Reactance	X"d	18.9	20.0	21.2	19.0	17.9	16.7	18.6	20.7
Quadrature axis Synchronous Unsaturated Reactance	Xq	261	276	306	278	266	260	270	299
Quadrature Subtransient Saturation Reactance	X"q	26.5	28.0	30.1	26.9	25.2	23.9	25.7	28.5
Negative sequence saturation reactance	X2	2.27	2.40	2.56	2.29	2.15	2.03	2.22	2.46
Zero sequence unsaturated reactance	X0	1.49	1.58	1.61	1.38	1.28	1.09	1.43	1.57
Short-circuit transient time constant	T'd	44	47	47	40	34	30	30	32
Subtransient time constant	T"d	6	6	6	5	4	4	4	4
Open circuit time constant	T'do	2400	2537	2645	2258	1925	1766	1653	1817
Armature time constant	Ta	121	139	175	185	224	245	317	423

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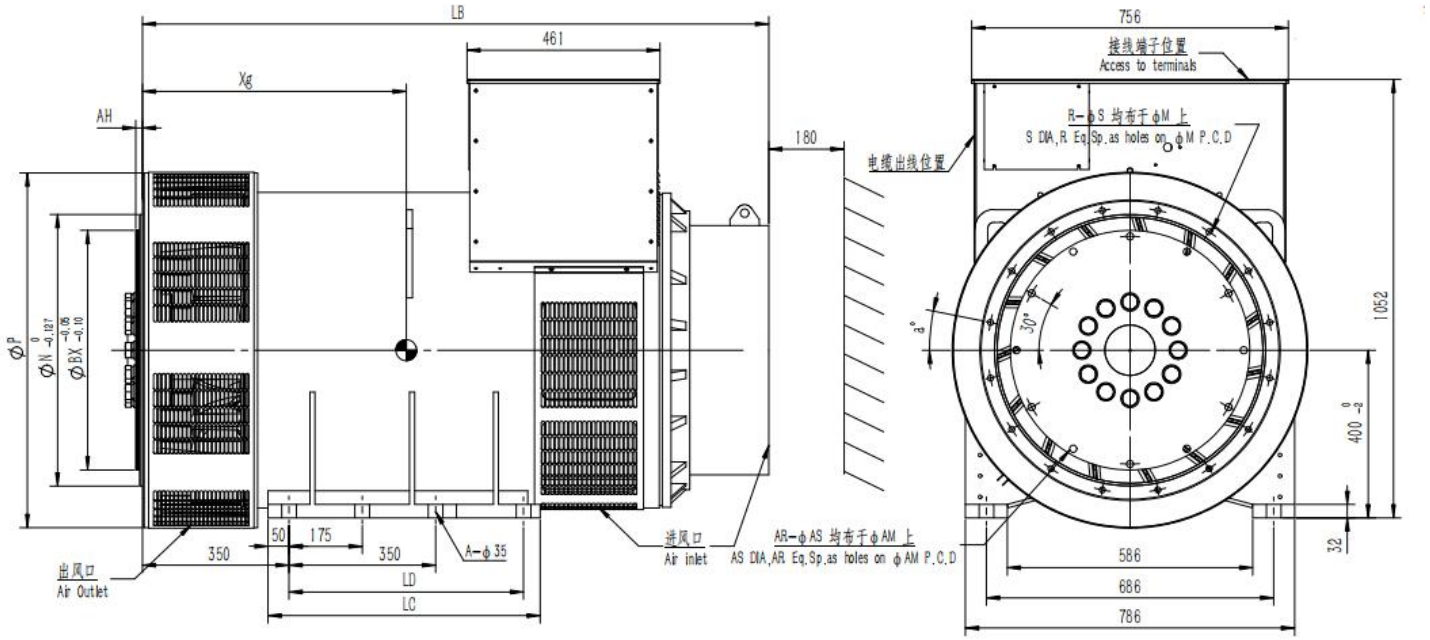
4 Poles

Kwise from the CASIC, to the world

Outline Drawing (Single Bearing)



Dimension(mm)	LB	LC	LD	A	*Xg	Weight	Package
Type	mm	mm	mm		mm	kg	L x W x H(mm)
KAL404A1	1266	450	/	6	545	1370	1590*1000*1250
KAL404B1	1266	450	/	6	545	1575	1590*1000*1250
KAL404C2	1351	450	/	6	565	1693	1680*1000*1250
KAL404D2	1351	450	/	6	588	1817	1680*1000*1250
KAL404E3	1491	650	560	8	630	2063	1820*1000*1250
KAL404F3	1491	650	560	8	658	2221	1820*1000*1250
KAL404G4	1586	650	560	8	700	2453	1910*1000*1250
KAL404H4	1586	650	560	8	705	2480	1910*1000*1250

Flange (mm)						
S.A.E	P	N	M	R-øS	W	a°
#00	914	787.4	850.9	16-ø14	6	11.25°
#0	846	647.7	679.45	12-ø14	6	11.25°
#1/2	846	584.2	619.1	12-ø14	6	15°
#1	846	511.2	530.2	12-ø14	6	15°

Coupling Disc (mm)				
S.A.E	BX	AM	AR-øAS	AH
#14	466.7	438.15	8-ø14	25.4
#18	571.5	542.925	12-ø17	15.7
#21	673.1	641.35	12-ø17	0
#24	733.3	692	12-ø21	0

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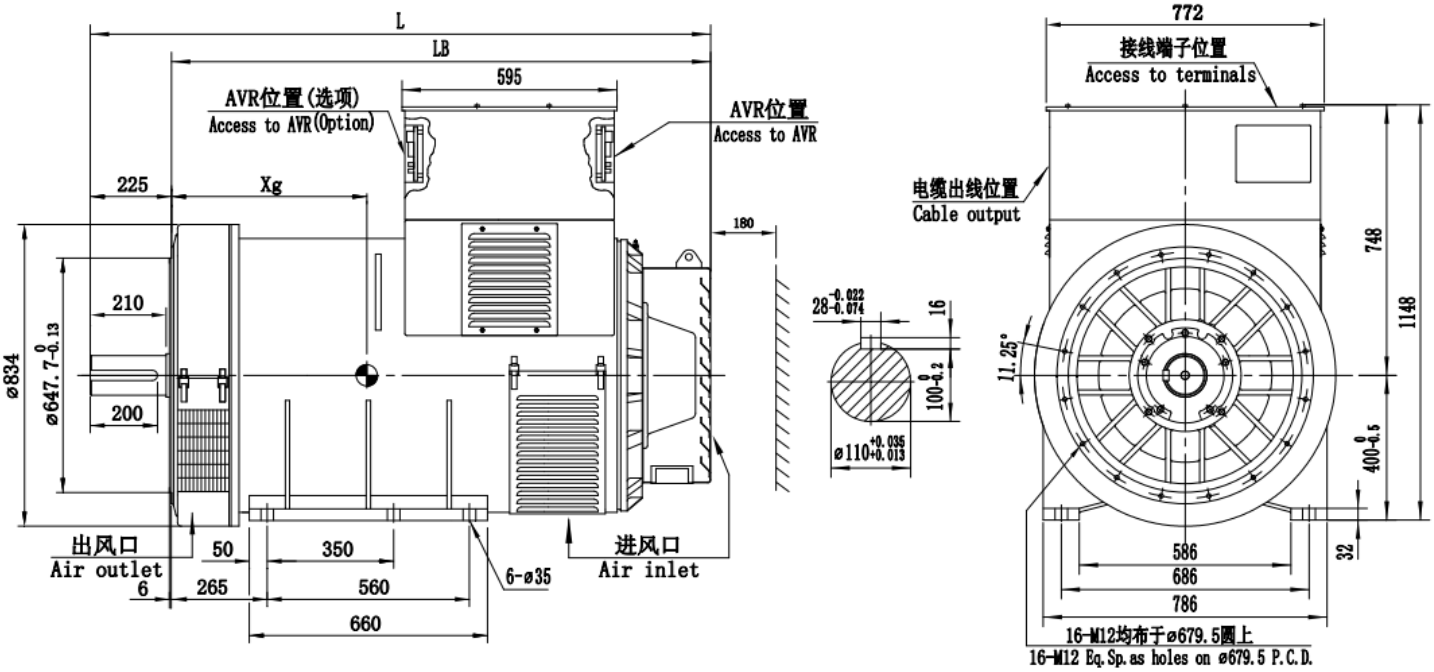
4 Poles

Kwise from the CASIC, to the world

Outline Drawing (Double Bearing)



Dimension (mm)					
TYPE	L	LB	*Xg	Weight	Package
	mm	mm	mm	kg	L x W x H(mm)
KAL404A1	1718	1493	587	1756	1760*1000*1230
KAL404B1	1718	1493	591	1787	1760*1000*1230
KAL404C2	1718	1493	597	1874	1850*1000*1230
KAL404D2	1718	1493	607	2050	1850*1000*1230
KAL404E3	1718	1493	625	2125	1990*1000*1230
KAL404F3	1904	1679	753	2241	1990*1000*1230
KAL404G4	1904	1679	788	2542	2080*1000*1230
KAL404H4	1904	1679	808	2632	2080*1000*1230