



KAL184 Series

Fujian Kwise Generator Co., Ltd.

16kW - 34 kW

Application and Standard

The 4-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 in compliance with 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 10 seconds.

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.

Single-phase operation: 184 series 4 pole alternators can be connected for single phase use. 184 series alternators can be supplied with a dedicated single phase winding (D51/D61).

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.



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Enclosure: Standard enclosure is IP23.

Direction of rotation: 184 series can operate in both directions.

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.

Overs peed: The maximum overspeed 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°C	Temperature rise	125K	Short circuit current multiple	/
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	SX460	THF	<2%	THD	2.5%



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Electrical parameters

50Hz/1500RPM		Standard Winding / Power Factor 0.8								Special winding	
Duty type/Temperature rise/Ambient		Cont./125K/40°C				Standby/163K/27°C				Cont./125K/40°C	
Phase		3-Phases				3-Phases				1-Phase	
Voltage	Y	380V	400V	415V	440V	380V	400V	415V	440V	220V/230V/240V	
	Δ	220V	230V	240V		220V	230V	240V		功率因素	
	YY				220V				220V	0.8	1.0
KAL184A1	kVA	20	20	20	19	22.4	22.4	22.4	20.9	13.6	16
	kW	16	16	16	15.2	17.9	17.9	17.9	16.7	10.9	16
KAL184B1	kVA	22.5	22.5	22.5	21.4	25	25	25	23.5	15.3	18
	kW	18	18	18	17	20	20	20	18.8	12	18
KAL184C2	kVA	25	25	25	23.8	28	28	28	26	17	20
	kW	20	20	20	19	22.4	22.4	22.4	20.9	13.6	20
KAL184D2	kVA	27.5	27.5	27.5	26	30.8	30.8	30.8	28.7	18.7	22
	kW	22	22	22	21	24.6	24.6	24.6	23.0	15	22
KAL184E3	kVA	31	31	31	30	35	35	35	32.7	21.3	25
	kW	25	25	25	24	28	28	28	26.1	17	25
KAL184F4	kVA	35	35	35	33.3	39.2	39.2	39.2	36.6	23.8	28
	kW	28	28	28	26.6	31.4	31.4	31.4	29.3	19	28
KAL184G4	kVA	37.5	37.5	37.5	35.6	42	42	42	39	25.5	30
	kW	30	30	30	28.5	33.6	33.6	33.6	31.4	20.4	30
KAL184H5	kVA	40	40	40	38	44.8	44.8	44.8	41.8	27	32
	kW	32	32	32	30	35.8	35.8	35.8	33.4	21.8	32
KAL184K5	kVA	42.5	42.5	42.5	40	47.6	47.6	47.6	44.4	29	34
	kW	34	34	34	32	38	38	38	35.5	23	34

* Only 12-wire alternator can be realized, other voltages please consult the factory.



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Electrical parameters

60Hz/1800RPM		Standard Winding / Power Factor 0.8								Special winding	
Duty type/Temperature rise/Ambient		Cont./125K/40°C				Standby/163K/27°C				Cont./125K/40°C	
Phase		3-Phases				3-Phases				1-Phase	
Voltage	Y	416V	440V	460V	480V	416V	440V	460V	480V	220V/230V/240V	
	Δ	240V				240V				功率因素	
	YY	208V	220V	230V	240V	208V	220V	230V	240V	0.8	1.0
KAL184A1	kVA	21.5	23.0	24.0	24.0	23.7	25.3	26.4	26.4	15.3	18
	kW	17.2	18.4	19.2	19.2	18.9	20	21.1	21.1	12.2	18
KAL184B1	kVA	24.2	25.9	27.0	27.0	26.6	28.5	29.7	29.7	17.2	20
	kW	19.4	20.7	21.6	21.6	21.3	22.8	23.8	23.8	13.8	20
KAL184C2	kVA	26.9	28.8	30.0	30.0	29.6	31.6	33.0	33.0	19	23
	kW	21.5	23.0	24.0	24.0	23.7	25.3	26.4	26.4	15	23
KAL184D2	kVA	29.6	31.6	33.0	33.0	32.5	34.8	36.3	36.3	21	25
	kW	23.7	25.3	26.4	26.4	26	27.8	29.0	29.0	17	25
KAL184E3	kVA	33.6	35.9	37.5	37.5	37	39.5	41.3	41.3	24	28
	kW	27	28.8	30.0	30.0	29.6	31.6	33.0	33.0	19	28
KAL184F4	kVA	37.6	40.3	42.0	42.0	41.4	44.3	46.2	46.2	26.8	32
	kW	30	32.2	33.6	33.6	33.1	35.4	37.0	37.0	21.4	32
KAL184G4	kVA	40.3	43.1	45.0	45.0	44.3	47.4	49.5	49.5	28.7	34
	kW	32.3	34.5	36.0	36.0	35.5	38	39.6	39.6	23	34
KAL184H5	kVA	43	46.0	48.0	48.0	47.3	50.6	52.8	52.8	30.6	36
	kW	34.4	36.8	38.4	38.4	37.8	40.5	42.2	42.2	24.5	36
KAL184K5	kVA	45.7	48.9	51.0	51.0	50	53.8	56.1	56.1	33	38
	kW	36.6	39.1	40.8	40.8	40	43	44.9	44.9	26	38

* Only 12-wire alternator can be realized, other voltages please consult the factory.

Moment of Inertia & Efficiency

Model	KAL184	A1	B1	C2	D2	E3	F4	G4	H5	K5
Inertia (1-Bearing) J	kgm ²	0.137	0.155	0.165	0.184	0.211	0.246	0.256	0.266	0.280
50Hz400V Efficiency (100% load)	%	83.7	84.2	85.2	85.8	86.2	86.7	87.1	87.6	88.0
60Hz440V Efficiency (100% load)	%	84.7	85.2	85.9	86.7	86.9	87.3	87.7	88.2	88.4



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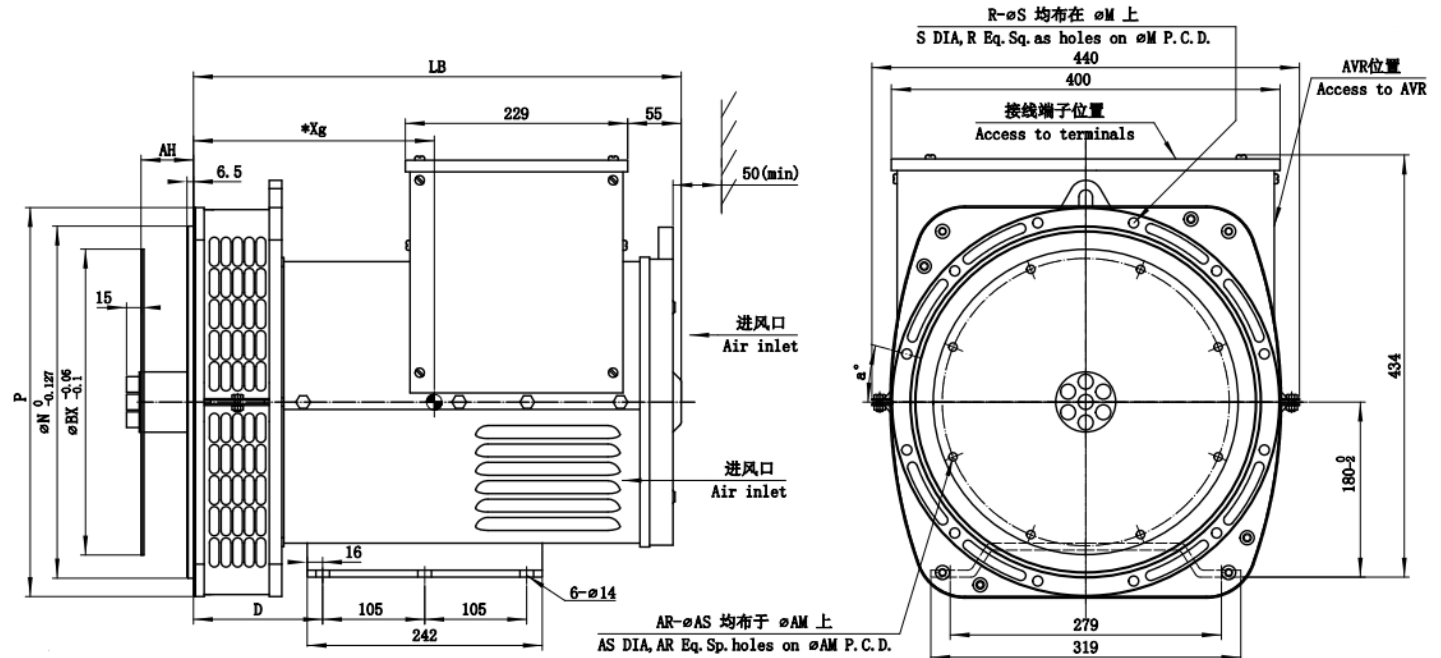
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Reactance (%) - Time Constant (ms)

50Hz @ 400V	KAL184	A1	B1	C2	D2	E3	F4	G4	H5	K5
Short circuit ratio	Kcc	0.45	0.45	0.42	0.46	0.44	0.44	0.42	0.45	0.45
Direct axis synchronous unsaturated reactance	Xd	221	221	239	217	229	227	239	225	221
Direct Axis Transient Saturation Reactance	X'd	17.2	17.0	18.1	16.3	16.9	16.6	17.4	16.2	15.9
Direct Axis Subtransient Saturation Reactance	X''d	10.5	10.2	10.7	9.6	9.8	9.5	9.9	9.2	9.0
Quadrature axis Synchronous Unsaturated Reactance	Xq	126	126	136	124	130	129	135	127	125
Quadrature Subtransient Saturation Reactance	X''q	11.1	10.8	11.4	10.1	10.3	10.1	10.5	9.7	9.5
Negative sequence saturation reactance	X2	1.08	1.05	1.11	0.99	1.01	0.98	1.02	0.95	0.92
Zero sequence unsaturated reactance	X0	0.71	0.66	0.68	0.58	0.57	0.53	0.54	0.49	0.46
Short-circuit transient time constant	T'd	10	10	10	8	8	7	7	6	6
Subtransient time constant	T''d	13.0	12.0	12.2	10.4	9.9	9.0	9.1	8.1	7.5
Open circuit time constant	T'do	555	523	536	461	446	411	419	372	348
Armature time constant	Ta	13.2	15.2	18.2	20.0	24.0	26.0	31.0	33.0	35.8

60Hz @ 440V	KAL184	A1	B1	C2	D2	E3	F4	G4	H5	K5
Short circuit ratio	Kcc	0.38	0.38	0.35	0.39	0.37	0.37	0.35	0.37	0.38
Direct axis synchronous unsaturated reactance	Xd	263	263	285	259	272	271	284	267	263
Direct Axis Transient Saturation Reactance	X'd	20.5	20.2	21.6	19.4	20.1	19.8	20.7	19.3	18.9
Direct Axis Subtransient Saturation Reactance	X''d	12.5	12.1	12.8	11.4	11.7	11.3	11.8	10.9	10.7
Quadrature axis Synchronous Unsaturated Reactance	Xq	150	150	16	147	155	154	16	152	149
Quadrature Subtransient Saturation Reactance	X''q	13.3	12.9	12.8	12.1	12.3	12.0	12.5	11.6	11.3
Negative sequence saturation reactance	X2	1.29	1.25	1.32	1.17	1.20	1.17	1.21	1.13	1.10
Zero sequence unsaturated reactance	X0	0.09	0.79	0.08	0.69	0.67	0.63	0.64	0.58	0.55
Short-circuit transient time constant	T'd	10	10	10	8	8	7	7	6	6
Subtransient time constant	T''d	12.9	11.9	12.1	10.3	9.8	8.9	9.1	8.0	7.4
Open circuit time constant	T'do	661	622	337	549	531	489	498	443	414
Armature time constant	Ta	13.2	15.2	17.2	19.9	22.8	26.2	29.0	31.8	33.8

Outline Drawing (Single Bearing)



Dimension(mm)

TYPE	LB			*Xg	Weight	Package
	SAE2	SAE3	SAE4&5			
	mm	mm	mm	mm	kg	L x W x H(mm)
KAL184A1	478	451	438.5	177	112	677*504*620
KAL184B1	478	451	438.5	185	119	677*504*620
KAL184C2	508	481	468.5	192	124	677*504*620
KAL184D2	508	481	468.5	200	131	677*504*620
KAL184E3	533	506	493.5	212	143	677*504*620
KAL184F4	573	546	533.5	225	158	747*504*620
KAL184G4	573	546	533.5	230	163	747*504*620
KAL184H5	613	586	573.5	240	172	747*504*620
KAL184K5	613	586	573.5	250	181	747*504*620

Flange (mm)

S.A.E	P	N	M	R-øS	W	D	a°
#2	490	447.675	466.725	12-ø11	6	172	15°
#3	440	409.575	428.625	8-ø11	6	145	15°
#4	400	361.95	381	8-ø11	5	133	15°
#5	400	314.325	333.375	8-ø11	5	133	22.5°

Coupling Disc (mm)

S.A.E	BX	AM	AR-øAS	AH
#6.5	215.9	200.025	6-ø9	30.2
#7.5	241.3	222.25	8-ø9	30.2
#8	263.525	244.475	6-ø11	62
#10	314.325	295.275	8-ø11	53.8
#11.5	352.425	333.375	8-ø11	39.6

Outline Drawing (Double Bearing)



Dimension (mm)									
TYPE	L	LB	LC	D	E	F	*Xg	Weight	Package
	mm	mm	mm	mm	mm	mm	mm	kg	L x W x H(mm)
KAL184A1	562	472	229	90	82	77	233	112	737*504*620
KAL184B1	642	552	229	90	82	77	247	122	737*504*620
KAL184C2	642	552	229	90	82	77	263	125	737*504*620
KAL184D2	642	552	229	90	82	77	273	131	737*504*620
KAL184E3	642	552	229	90	82	77	293	141	737*504*620
KAL184F4	702	612	274	118	110	100	307	161	807*504*620
KAL184G4	702	612	274	118	110	100	313	166	807*504*620
KAL184H5	702	612	274	118	110	100	320	174	807*504*620
KAL184K5	702	612	274	118	110	100	313	182	807*504*620