

Performance and core specifications

4-pole alternators for continuous or standby diesel generator sets in buildings, hospitals, airports, telecoms and industry.

40–100 kVA

50 Hz continuous

4 POLES

1500 / 1800 rpm

50 / 60 Hz

B31 / B32 winding

IP23

Class H insulation

EXCITATION AND DYNAMIC PERFORMANCE

Transistor-based AVR regulation (SX460). Self-excitation has no sustained short-circuit capability; optional PMG supplies 3 times nominal current for 10 seconds.

At 60% rated current and PF 0.4: transient voltage dip <15%; recovery from a 15% dip <1.5 s.

Parallel operation with alternators or mains requires suitable AVR and current transformers.

Overload capability follows NEMA.

WINDING AND POWER QUALITY

Standard B31 / B32 windings operate at 50 or 60 Hz. Single-phase reconnection or dedicated windings are available. Operating PF: 0.8–1.0; derating is required below 0.8.

THD 2.5% at no-load or linear load per IEC; TIF <50 per NEMA.

MECHANICAL CONSTRUCTION

Single- or double-bearing configurations with engine adaptors and coupling discs. Rotors balanced to ISO 1940; double-bearing rotors use half-key balancing. Sealed-for-life bearings; steel frame with cast-iron or steel housings and flanges, depending on model.

Class H insulation; winding protection accepts up to 95% relative humidity. Additional coatings are available for harsh environments. Accessible terminal box accommodates AVR, reconnection, CTs and optional modules.

Bidirectional operation is stated in the source; its general-parameter table specifies clockwise rotation. Maximum overspeed: 2250 rpm, or $1.25 \times$ rated speed at 60 Hz.

STANDARDS

GB 755, BS 5000, IEC 60034, VDE 0530, CSA C22.2-100 and NEMA MG-1.22. Design, manufacture and marking under ISO 9001.

General parameters and efficiency

Parameter	Value	Parameter	Value
Ambient temperature	40°C	Temperature rise	125K
Short-circuit current multiple	/	Altitude	1000 m
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	2250 rpm
Phases	3	Power factor	0.8
Protection grade	IP23	Number of poles	4
TIF	<50	Frequency	50/60 Hz
AVR model	SX460	THF	<2%
THD	2.5%		

MOMENT OF INERTIA AND FULL LOAD EFFICIENCY

Model	Inertia J kg·m ²	50 Hz / 400 V Efficiency %	60 Hz / 440 V Efficiency %
KR224B	0.342	88.3	89.9
KR224C	0.387	88.8	90.1
KR224D	0.394	89.3	90.8
KR224DS	0.476	89.5	90.7
KR224ES	0.496	90.0	91.3
KR224E	0.525	90.0	91.2
KR224FS	0.570	91.2	92.3
KR224F	0.619	91.4	92.5
KR224G	0.655	91.4	92.7
KR224H	0.734	91.5	92.6
KR224K	0.769	91.5	92.4

Inertia values apply to single-bearing units. Efficiency values are at 100% load.

50 Hz electrical ratings

1500 rpm • Standard winding: 3-phase, power factor 0.8.

Continuous: 125K rise / 40°C ambient.

Standby: 163K rise / 27°C ambient.

Model	Unit	Continuous				Standby			
		380V	400V	415V	440V	380V	400V	415V	440V
KR224B	kVA	40	40	40	38	45	45	45	42
	kW	32	32	32	30	36	36	36	33
KR224C	kVA	43	43	43	40	48	48	48	44
	kW	34	34	34	32	38	38	38	36
KR224D	kVA	50	50	50	48	56	56	56	52
	kW	40	40	40	38	45	45	45	42
KR224DS	kVA	56	56	56	53	63	63	63	59
	kW	45	45	45	43	50	50	50	47
KR224ES	kVA	63	63	63	59	70	70	70	65
	kW	50	50	50	48	56	56	56	52
KR224E	kVA	68	68	68	64	76	76	76	71
	kW	54	54	54	51	60	60	60	56
KR224FS	kVA	73	73	73	69	81	81	81	76
	kW	58	58	58	55	65	65	65	61
KR224F	kVA	80	80	80	76	90	90	90	84
	kW	64	64	64	61	72	72	72	67
KR224G	kVA	85	85	85	81	95	95	95	89
	kW	68	68	68	65	76	76	76	71
KR224H	kVA	94	94	94	89	105	105	105	98
	kW	75	75	75	71	84	84	84	78
KR224K	kVA	100	100	100	95	112	112	112	105
	kW	80	80	80	76	90	90	90	84

WINDING CONNECTION VOLTAGES

Connection	Voltage options
Star Y	380V / 400V / 415V / 440V
Delta Δ	220V / 230V / 240V
Parallel star YY	220V (Y = 440 V)

Only 12-wire alternators can realise these connections. For other voltages, consult the factory.

60 Hz electrical ratings

1800 rpm • Standard winding: 3-phase, power factor 0.8.

Continuous: 125K rise / 40°C ambient.

Standby: 163K rise / 27°C ambient.

Model	Unit	Continuous				Standby			
		416V	440V	460V	480V	416V	440V	460V	480V
KR224B	kVA	43	46	48	48	47	51	53	53
	kW	34	37	38	38	38	40	42	42
KR224C	kVA	46	49	51	51	50	54	56	56
	kW	37	39	41	41	40	43	45	45
KR224D	kVA	54	58	60	60	59	63	66	66
	kW	43	46	48	48	47	51	53	53
KR224DS	kVA	60	65	68	68	67	71	74	74
	kW	48	52	54	54	53	57	59	59
KR224ES	kVA	67	72	75	75	74	79	83	83
	kW	54	58	60	60	59	63	66	66
KR224E	kVA	73	78	81	81	80	85	89	89
	kW	58	62	65	65	64	68	71	71
KR224FS	kVA	78	83	87	87	86	92	96	96
	kW	62	67	70	70	69	73	77	77
KR224F	kVA	86	92	96	96	95	101	106	106
	kW	69	74	77	77	76	81	84	84
KR224G	kVA	91	98	102	102	101	108	112	112
	kW	73	78	82	82	80	86	90	90
KR224H	kVA	101	108	113	113	111	119	124	124
	kW	81	86	90	90	89	95	99	99
KR224K	kVA	108	115	120	120	118	127	132	132
	kW	86	92	96	96	95	101	106	106

WINDING CONNECTION VOLTAGES

Connection	Voltage options
Star Y	416V / 440V / 460V / 480V
Delta Δ	240V (Y = 416 V)
Parallel star YY	208V / 220V / 230V / 240V

Only 12-wire alternators can realise these connections. For other voltages, consult the factory.

Reactance and time constants

Reactance in %; time constants in ms. Kcc is the short-circuit ratio.

50 HZ AT 400 V

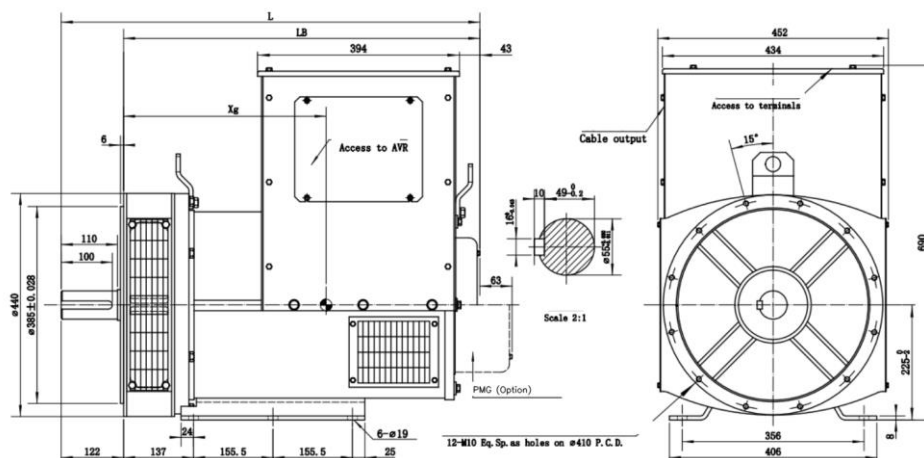
Model	Kcc	Xd	X'd	X''d	Xq	X''q	X2	X0	T'd	T''d	T'do	Ta
KR224B	0.33	301	20.4	12.2	189	17.2	10.47	1.15	80	10	3275	13
KR224C	0.35	289	19.3	11.6	182	16.4	10.04	1.04	73	9	3040	15
KR224D	0.35	290	18.7	11.2	182	16.2	10.02	0.94	66	8	2849	19
KR224DS	0.34	292	18.5	11.1	183	16.2	10.09	0.88	62	8	2703	22
KR224ES	0.36	279	17.3	10.4	175	15.2	9.59	0.78	54	7	2428	26
KR224E	0.36	280	17.2	10.3	176	15.2	9.64	0.75	52	6	2342	28
KR224FS	0.35	282	17.1	10.3	176	15.1	9.68	0.71	49	6	2233	32
KR224F	0.35	285	17.1	10.3	178	15.1	9.77	0.68	46	6	2145	36
KR224G	0.37	271	16.1	9.7	169	14.2	9.28	0.62	42	5	1943	41
KR224H	0.37	270	15.9	9.5	169	14.0	9.23	0.58	38	5	1807	45
KR224K	0.36	274	16.0	9.6	171	14.1	9.37	0.57	37	5	1759	49

60 HZ AT 440 V

Model	Kcc	Xd	X'd	X''d	Xq	X''q	X2	X0	T'd	T''d	T'do	Ta
KR224B	0.28	358	24.3	14.6	225	20.5	12.46	1.37	79	8	3897	13
KR224C	0.35	282	18.8	11.3	177	15.9	9.79	1.02	59	7	2963	13
KR224D	0.29	345	22.3	13.4	216	19.3	11.92	1.12	66	8	3390	18
KR224DS	0.29	351	22.2	13.3	220	19.4	12.10	1.05	61	8	3240	22
KR224ES	0.30	332	20.6	12.4	208	18.1	11.42	0.92	54	7	2889	25
KR224E	0.30	334	20.5	12.3	209	18.0	11.47	0.89	51	6	2787	28
KR224FS	0.30	336	20.4	12.2	210	18.0	11.52	0.84	48	6	2657	31
KR224F	0.29	339	20.4	12.2	212	18.0	11.63	0.81	46	6	2553	36
KR224G	0.31	322	19.2	11.5	202	16.9	11.04	0.74	41	5	2313	40
KR224H	0.31	323	19.0	11.4	202	16.7	11.03	0.70	38	5	2160	45
KR224K	0.31	326	19.1	11.5	204	16.8	11.15	0.68	37	5	2094	49

SYMBOL DEFINITIONS

Code	Parameter	Code	Parameter
Kcc	Short circuit ratio	X2	Negative sequence saturation reactance
Xd	Direct axis synchronous unsaturated reactance	X0	Zero sequence unsaturated reactance
X'd	Direct Axis Transient Saturation Reactance	T'd	Short-circuit transient time constant
X''d	Direct Axis Subtransient Saturation Reactance	T''d	Subtransient time constant
Xq	Quadrature axis Synchronous Unsaturated Reactance	T'do	Open circuit time constant
X''q	Quadrature Subtransient Saturation Reactance	Ta	Armature time constant



Model	L	LB	Xg mm
KR224B	729	607	263
KR224C	729	607	263
KR224D	729	607	273
KR224DS	729	607	273
KR224ES	819	697	292
KR224E	819	697	292
KR224FS	819	697	298
KR224F	864	742	306
KR224G	864	742	313
KR224H	864	742	323
KR224K	-	-	-

Model	Weight kg	Package L × W × H mm
KR224B	218	810*560*830
KR224C	225	810*560*830
KR224D	238	810*560*830
KR224DS	249	905*560*830
KR224ES	265	905*560*830
KR224E	275	905*560*830
KR224FS	287	905*560*830
KR224F	300	945*560*830
KR224G	314	945*560*830
KR224H	334	995*560*830
KR224K	-	-