ENETRA
energy transition

BRUSHLESS ASYNCHRONOUS ALTERNATORS

ETA184 SERIES

(50/60Hz, 4 Pole, 20.0KVA up to 42.5KVA with AVR)

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Application & 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 various applications.

Alternators are in compliance 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

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.

Overload Acceptance
4 pole alternators can be overloaded according to NEMA.

Frequency
The standard winding (B31) is suitable both for 50Hz and 60Hz.

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...).

Single-phase Operation
184 series 4 pole alternators can be connected for single phase use.

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

Electrical Data

Insulation class	H
Wires	3Phase - 6 wires
Excitation system	Brushless
Voltage regulator type	AVR SX460
Voltage regulation accuracy	+/- 1%

Short circuit distortion	300%
Total harmonic distortion	<5% (at no or linear load)
Telephone harmonic factor	<2%
Winding pitch	2/3
Power factor (cose)	0.8 / 1.0

Mechanical Features

Bearings
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. Sealed for life bearings.

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

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

Insulation & Protection
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.

Direction of Rotation
Clockwise, but can operate in both directions.

Terminal Box & 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.

Enclosure
Standard enclosure is IP23.

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Ratings & Efficiencies

Excitation	Ratings										Efficiency	Inertia
	Cont. 125K/40°C				St. By 163K/27°C				Cont. 125K/40°C		50Hz, 400V at 100% Load	1-Bearing - J
50Hz / 1500rpm	3 Phase				3 Phase				1 Phase			
Voltage (Y)	380	400	415	440	380	400	415	440	220/230/240			
Voltage (▲)	220	230	240		220	230	240		cosϴ			
Voltage (YY)				220				220	0.8	1.0		
Type	KVA / kW				KVA / kW				KVA / kW		%	Kgm²
ETA184A1	20.0	20.0	20.0	19.0	22.4	22.4	22.4	20.9	13.6	16.0	83.7	0.137
	16.0	16.0	16.0	15.2	17.9	17.9	17.9	16.7	10.9	16.0		
ETA184B1	22.5	22.5	22.5	21.4	25.0	25.0	25.0	23.5	15.3	18.0	84.2	0.155
	18.0	18.0	18.0	17.0	20.0	20.0	20.0	18.8	12.0	18.0		
ETA184C2	25.0	25.0	25.0	23.8	28.0	28.0	28.0	26.0	17.0	20.0	85.2	0.165
	20.0	20.0	20.0	19.0	22.4	22.4	22.4	20.9	13.6	20.0		
ETA184D2	27.5	27.5	27.5	26.0	30.8	30.8	30.8	28.7	18.7	22.0	85.8	0.184
	22.0	22.0	22.0	21.0	24.6	24.6	24.6	23.0	15.0	22.0		
ETA184E3	31.0	31.0	31.0	30.0	35.0	35.0	35.0	32.7	21.3	25.0	86.2	0.211
	25.0	25.0	25.0	24.0	28.0	28.0	28.0	26.1	17.0	25.0		
ETA184F4	35.0	35.0	35.0	33.3	39.2	39.2	39.2	36.6	23.8	28.0	86.7	0.246
	28.0	28.0	28.0	26.6	31.4	31.4	31.4	29.3	19.0	28.0		
ETA184G4	37.5	37.5	37.5	35.6	42.0	42.0	42.0	39.0	25.5	30.0	87.1	0.256
	30.0	30.0	30.0	28.5	33.6	33.6	33.6	31.4	20.4	30.0		
ETA184H5	40.0	40.0	40.0	38.0	44.8	44.8	44.8	41.8	27.0	32.0	87.6	0.266
	32.0	32.0	32.0	30.0	35.8	35.8	35.8	33.4	21.8	32.0		
ETA184K5	42.5	42.5	42.5	40.0	47.6	47.6	47.6	44.4	29.0	34.0	88.0	0.280
	34.0	34.0	34.0	32.0	38.0	38.0	38.0	35.5	23.0	34.0		
60Hz / 1800rpm	3 Phase				3 Phase				1 Phase		60Hz, 440V at 100% Load	1-Bearing - J
Voltage (Y)	416	440	460	480	416	440	460	480	220/230/240			
Voltage (▲)	240				240				cosϴ			
Voltage (YY)	208	220	230	240	208	220	230	240	0.8	1.0		
Type	KVA / kW				KVA / kW				KVA / kW		%	Kgm²
ETA184A1	21.5	23.0	24.0	24.0	23.7	25.3	26.4	26.4	15.3	18.0	84.7	0.137
	17.2	18.4	19.2	19.2	18.9	20.0	21.1	21.1	12.2	18.0		
ETA184B1	24.2	25.9	27.0	27.0	26.6	28.5	29.7	29.7	17.2	20.0	85.2	0.155
	19.4	20.7	21.6	21.6	21.3	22.8	23.8	23.8	13.8	20.0		
ETA184C2	26.9	28.8	30.0	30.0	29.6	31.6	33.0	33.0	19.0	23.0	85.9	0.165
	21.5	23.0	24.0	24.0	23.7	25.3	26.4	26.4	15.0	23.0		
ETA184D2	29.6	31.6	33.0	33.0	32.5	34.8	36.3	36.3	21.0	25.0	86.7	0.184
	23.7	25.3	26.4	26.4	26.0	27.8	29.0	29.0	17.0	25.0		
ETA184E3	33.6	35.9	37.5	37.5	37.0	39.5	41.3	41.3	24.0	28.0	86.9	0.211
	27.0	28.8	30.0	30.0	29.6	31.6	33.0	33.0	19.0	28.0		
ETA184F4	37.6	40.3	42.0	42.0	41.4	44.3	46.2	46.2	26.8	32.0	87.3	0.246
	30.0	32.2	33.6	33.6	33.1	35.4	37.0	37.0	21.4	32.0		
ETA184G4	40.3	43.1	45.0	45.0	44.3	47.4	49.5	49.5	28.7	34.0	87.7	0.256
	32.3	34.5	36.0	36.0	35.5	38.0	39.6	39.6	23.0	34.0		
ETA184H5	43.0	46.0	48.0	48.0	47.3	50.6	52.8	52.8	30.6	36.0	88.2	0.266
	34.4	36.8	38.4	38.4	37.8	40.5	42.2	42.2	24.5	36.0		
ETA184K5	45.7	48.9	51.0	51.0	50.0	53.8	56.1	56.1	33.0	38.0	88.4	0.280
	36.6	39.1	40.8	40.8	40.0	43.0	44.9	44.9	26.0	38.0		

1. Enetra reserve the right to change the specifications of their products without notice as ongoing process of development.
2. Consult Enetra for further information.
3. Only 12 wire alternator can be realized, for other voltages please consult Enetra.
4. **General Parameters:** Cooling method: IC01 | THD=2.5% | TIF<50 | Altitude: 1,000m | Temperature Rise: 125K | Ambient Temperature: 40°C

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Reactance & Time Constant

Type	Rating (50Hz) Cont./125K/ 40°C/0.8/400V	Reactance								Time Constant			
		Kcc	Xd	X'd	X"d	Xq	X"q	X2	X0	T'd	T"d	T'do	Ta
	KVA	%	%	%	%	%	%	%	%	ms	ms	ms	ms
ETA184A1	20.0	0.45	221.0	17.2	10.5	126.0	11.1	1.08	0.71	10.0	13.0	555.0	13.2
ETA184B1	22.5	0.45	221.0	17.0	10.2	126.0	10.8	1.05	0.66	10.0	12.0	523.0	15.2
ETA184C2	25.0	0.42	239.0	18.1	10.7	136.0	11.4	1.11	0.68	10.0	12.2	536.0	18.2
ETA184D2	27.5	0.46	217.0	16.3	9.6	124.0	10.1	0.99	0.58	8.0	10.4	461.0	20.0
ETA184E3	31.0	0.44	229.0	16.9	9.8	130.0	10.3	1.01	0.57	8.0	9.9	446.0	24.0
ETA184F4	35.0	0.44	227.0	16.6	9.5	129.0	10.1	0.98	0.53	7.0	9.0	411.0	26.0
ETA184G4	37.5	0.42	239.0	17.4	9.9	135.0	10.5	1.02	0.54	7.0	9.1	419.0	31.0
ETA184H5	40.0	0.45	225.0	16.2	9.2	127.0	9.7	0.95	0.49	6.0	8.1	372.0	33.0
ETA184K5	42.5	0.45	221.0	15.9	9.0	125.0	9.5	0.92	0.46	6.0	7.5	348.0	35.8

Type	Rating (60Hz) Cont./125K/ 40°C/0.8/440V	Reactance								Time Constant			
		Kcc	Xd	X'd	X"d	Xq	X"q	X2	X0	T'd	T"d	T'do	Ta
	KVA	%	%	%	%	%	%	%	%	ms	ms	ms	ms
ETA184A1	21.5	0.38	263.0	20.5	12.5	150.0	13.3	1.29	0.09	10.0	12.9	661.0	13.2
ETA184B1	242	0.38	263.0	20.2	12.1	150.0	12.9	1.25	0.79	10.0	11.9	622.0	15.2
ETA184C2	26.9	0.35	285.0	21.6	12.8	16.0	12.8	1.32	0.08	10.0	12.1	337.0	17.2
ETA184D2	29.6	0.39	259.0	19.4	11.4	147.0	12.1	1.17	0.69	8.0	10.3	549.0	19.9
ETA184E3	33.6	0.37	272.0	20.1	11.7	155.0	12.3	1.2	0.67	8.0	9.8	531.0	22.8
ETA184F4	37.6	0.37	271.0	19.8	11.3	154.0	12.0	1.17	0.63	7.0	8.9	489.0	26.2
ETA184G4	40.3	0.35	284.0	20.7	11.8	16.0	12.5	1.21	0.64	7.0	9.1	498.0	29.0
ETA184H5	43.0	0.37	267.0	19.3	10.9	152.0	11.6	1.13	0.58	6.0	8.0	443.0	31.8
ETA184K5	48.9	0.38	263.0	18.9	10.7	149.0	11.3	1.10	0.55	6.0	7.4	414.0	33.8

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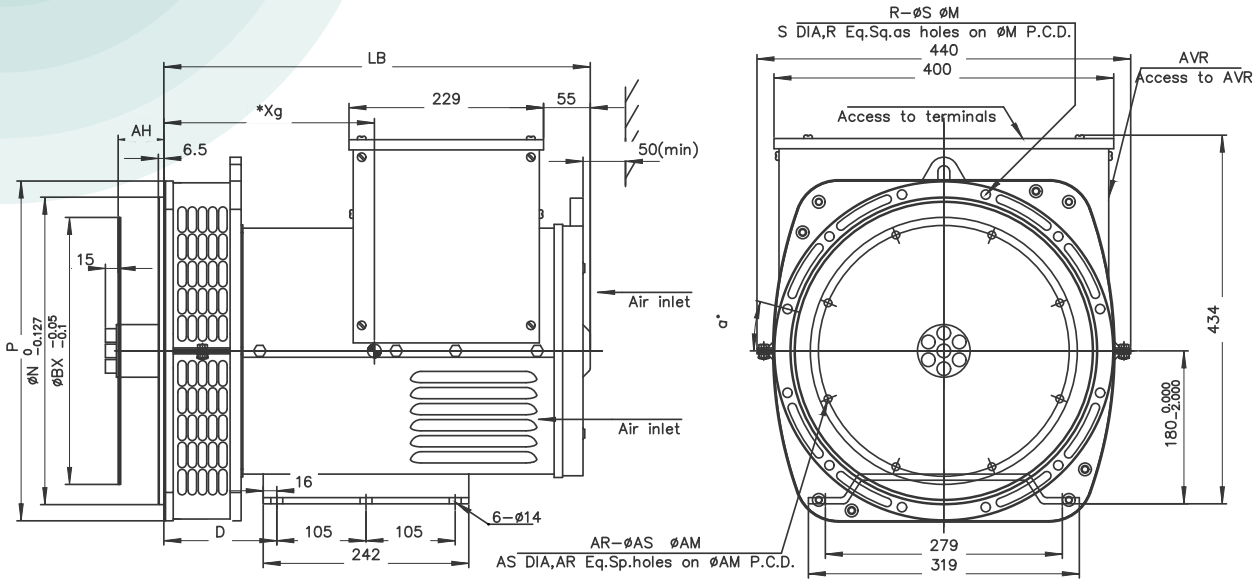
Dimensions & Weights



Dimensions & Weights								
	LB			Xg	Weight	Package		
	SAE2	SAE3	SAE4&5	mm	Kg	Length (mm)	Width (mm)	Height (mm)
ETA184A1	478.0	451.0	438.5	177.0	112.0	677.0	504.0	620.0
ETA184B1	478.0	451.0	438.5	185.0	119.0	677.0	504.0	620.0
ETA184C2	508.0	481.0	468.5	192.0	124.0	677.0	504.0	620.0
ETA184D2	508.0	481.0	468.0	200.0	131.0	677.0	504.0	620.0
ETA184E3	533.0	506.0	493.5	212.0	143.0	677.0	504.0	620.0
ETA184F4	573.0	546.0	533.5	225.0	158.0	747.0	504.0	620.0
ETA184G4	573.0	546.0	533.5	230.0	163.0	747.0	504.0	620.0
ETA184H5	613.0	586.0	573.5	240.0	172.0	747.0	504.0	620.0
ETA184K5	613.0	586.0	573.5	250.0	181.0	747.0	504.0	620.0

Flange (mm)							
SAE #	P	N	M	R-øS	W	D	a°
2	490.0	447.675	446.725	12-ø11	6.0	172	15.0°
3	440.0	409.575	428.625	8-ø11	6.0	145	15.0°
4	400.0	361.95	381.0	8-ø11	5.0	133	15.0°
5	400.0	314.325	333.375	8-ø11	5.0	133	22.5°

Coupling Disc (mm)				
SAE #	BX	AM	AR-øAS	AH
6.5	215.900	200.025	6-ø9	30.2
7.5	241.300	222.250	8-ø9	30.2
8	263.525	244.475	6-ø11	62.0
10	314.325	295.275	8-ø11	53.8
11.5	352.425	333.375	8-ø11	39.6