

ALTERNATORS
ALXION STK
for Wind Turbines



ALXION
Automatique
& Productique

**PM Brushless Alternators
for Direct Drive**

ALXION

Automatique & Productique

STK permanent magnets frameless alternators for Direct Drive

The range of STK Permanent Magnet frameless alternators addresses the applications of Wind Turbine generators in low and medium power needing the highest power-to-weight ratio in Direct Drive without gear for matching cost-effective solutions.

The range of permanent magnet frameless alternators STK includes 6 sizes from 145 mm up to 800 mm available in four different lengths per size and two standard rated speeds.



Main characteristics:

- ➔ STK frameless alternator consists of one stator and one rotor to be integrated in user's mechanics
- ➔ Rated power from 200 W up to 95 kW depending on size and rated speeds.
- ➔ Rated speeds from 80 RPM up to 1500 RPM.
- ➔ Six overall diameters from 145 mm up to 795 mm.
- ➔ Internal diameter from 56 mm up to 630 mm.
- ➔ Standard rated voltage at rated speed and rated load of 230V phase to phase

Assets:

- ➔ No speed multiplier, no gear
- ➔ No maintenance
- ➔ Highest power-to-weight ratio in Direct Drive
- ➔ High efficiency even at low speed
- ➔ Simplification of mechanical design
- ➔ Easy mechanical interface
- ➔ Cost optimization

STK frameless alternators equip wind turbines with relatively low power which supply lighthouses, beacons, houses, farms, plants watering networks, buildings ...

Usually, this type of wind turbines were equipped with asynchronous generators requiring to multiply the speed of rotor blades in order to produce the desired electrical power. Permanent magnets alternators such as ALXION STK are very compact compared to asynchronous generators, and allow a very simplified mechanical integration thanks to their direct driving of rotor blades. Furthermore, the efficiency with permanent magnets synchronous alternators is higher than the one resulting from asynchronous generators.

Wind turbine applications are growing considerably and will increase their growth in the next years due to the international incentive plans for substituting soft renewable energies to fossil energies: the cost of 1 kilowatt per hour produced by wind energy is the cheapest among the soft energies.

We recommend to download the specific application note :
« ALXION STK PERMANENT MAGNETS FRAMELESS ALTERNATORS FOR DIRECT DRIVE OF WIND TURBINES »
(available on our website)

For all detailed specifications related to integration and environment, please ask for our « handbooks for integration »

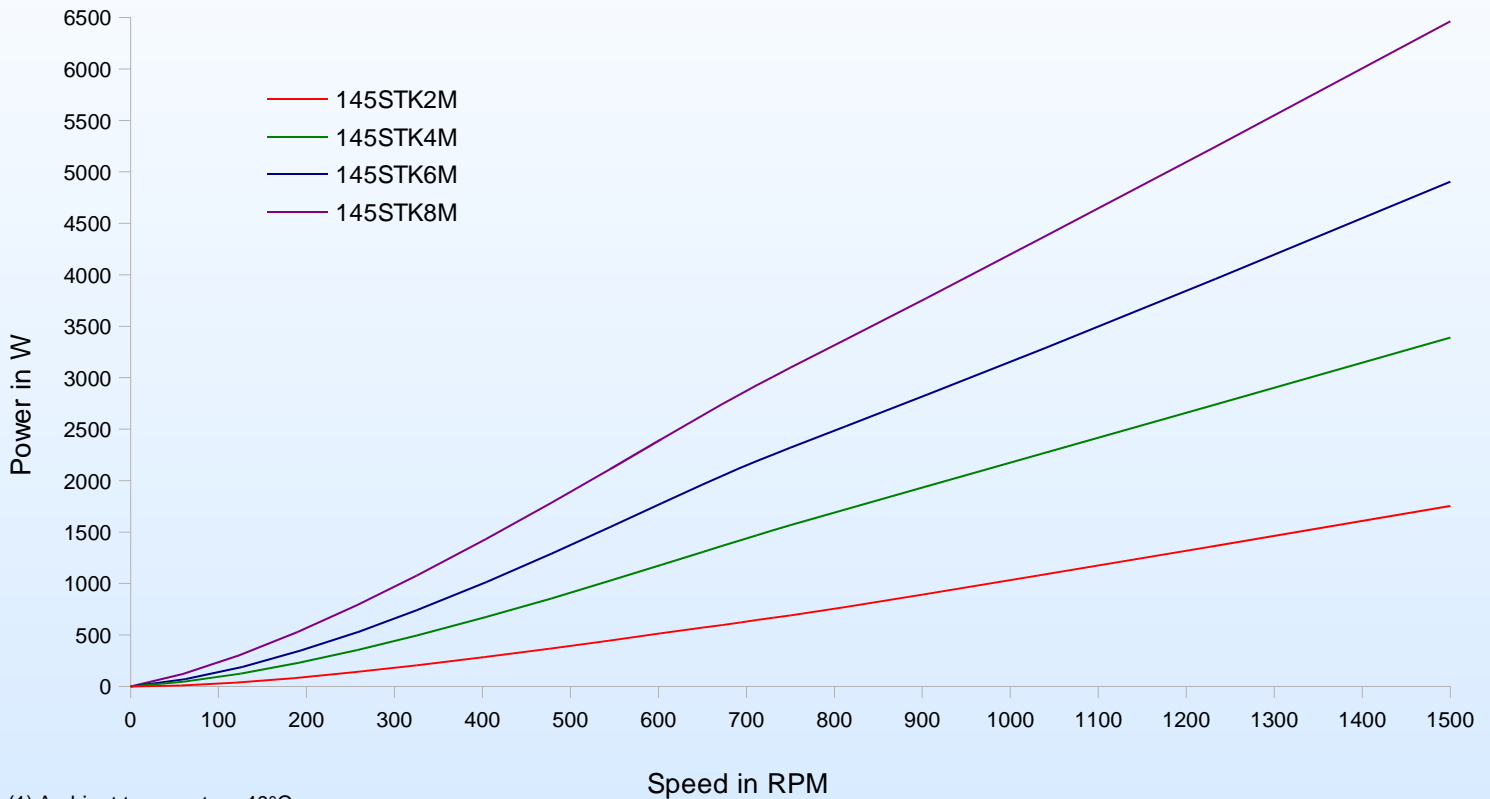
TECHNICAL CHARACTERISTICS

145 STK ALTERNATORS

See also the curves of Voltage, Torque, Efficiency vs Speed

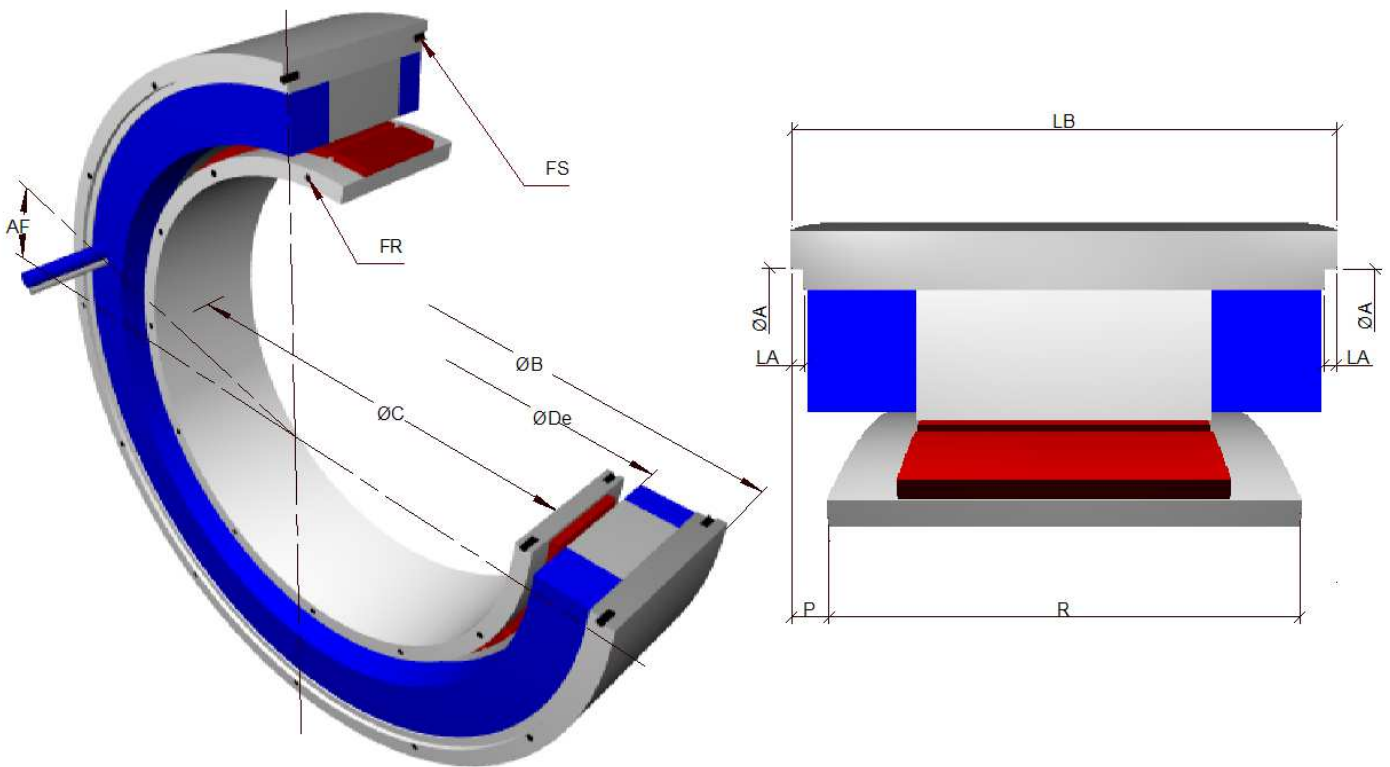
			145STK2M		145STK4M		145STK6M		145STK8M	
Rated speed		Rpm	650	1500	650	1500	650	1500	650	1500
Rated Power at Rated speed	Rated power (1)(2)	W	571	1752	1307	3389	1962	4904	2633	6462
	Input torque at rated speed(1)(2)	N.m	11.2	13.9	25.4	25.2	36	35.9	47.8	47
	Efficiency at rated power (1)(2)	%	75	81	76	86	81	87	81	88
	Current at rated power (1)	Amps	1.4	4.3	3.2	8	4.8	13	6.4	16
	Voltage at rated power (1)(2)(3)	V	244	250	243	260	246	231	249	248
Rated Power at Half speed	Rated Power at half speed (1)(2)	W	204	690	493	1566	739	2319	1075	3097
	Input torque at half speed (1)(2)	N.m	8.9	11.5	20.7	25.4	28.8	36	43.5	47.8
	Efficiency at half speed (1)(2)	%	68	77	70	78	76	82	73	83
Number of poles (number of pairs of poles)			12 (6)							
Cogging torque		N.m	0.2		0.4		0.6		0.8	
Phase resistance at 20°C		Ohm	19.8	4.53	8.6	1.4	4.11	0.59	3.18	0.51
Phase inductance (5)		mH	105	24	60	10	34	4.9	25.8	4.1
Voltage at no load (back emf) at 20°C (4)		V	365	393	390	367	357	312	361	334
Rotor inertia		10 ⁻³ Kg.m ²	1.28		2.24		3.19		4.14	
Weight		Kg	6.2		10.4		14.5		18.7	
Power cable square section (6)		mm ²	4x1.5		4x1.5		4x1.5		4x1.5	
Power cable diameter		mm	Ø8.6		Ø8.6		Ø8.6		Ø8.6	

Alternator 145STK Power - Speed



- (1) Ambient temperature 40°C
Wind speed 10 m/s cooling the housing
Winding temperature rise < 100°C
Stator housing in contact with the ambient air or integral on all its peripheral area with a metallic armature in contact with the ambient air
Stator housing secured on a metallic frame getting an area equal to twice the cross section of the housing
- (2) Operation in sine wave mode with unity power factor
- (3) Line to line voltage. Voltage level may be adapted according to the application; please contact us
- (4) Line to line voltage, alternator at no load, rated speed and at 20°C
- (5) For current at rated power
- (6) For currents lower than 53 Amps, one cable
For currents over 53 Amps, four single wires output (highlighted in the table)

ALTERNATORS 145 STK



		145STK1M	145STK2M	145STK3M	145STK4M	145STK5M	145STK6M	145STK7M	145STK8M
Housing internal centering diameter	A H8	130	130	130	130	130	130	130	130
Angle wire output / tapped holes	AF	22°30'	22°30'	22°30'	22°30'	22°30'	22°30'	22°30'	22°30'
Housing external centering diameter	B Ø	145	145	145	145	145	145	145	145
Rotoric internal centering diameter	C H7	56	56	56	56	56	56	56	56
Housing internal diameter	De	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5
Rotoric fixation holes	FR	8xM5 sur Ø63	8xM5 sur Ø63	8xM5 sur Ø63	8xM5 sur Ø63	8xM5 sur Ø63	8xM5 sur Ø63	8xM5 sur Ø63	8xM5 sur Ø63
Housing fixation holes	FS	8xM5 sur Ø136	8xM5 sur Ø136	8xM5 sur Ø136	8xM5 sur Ø136	8xM5 sur Ø136	8xM5 sur Ø136	8xM5 sur Ø136	8xM5 sur Ø136
Depth of housing internal centering diameter	LA	2	2	2	2	2	2	2	2
Housing length	LB ±0.15	92	119	146	173	200	227	254	281
Alignment rotor / housing	P ± 0.1	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5
Maximum rotoric contact diameter	Pmax	75	75	75	75	75	75	75	75
Rotor length	R +0.15	59	86	113	140	167	194	221	248

INTEGRATION :

- ✓ The cables are made of PU, class 6, foreseen for cable-bearing chains, 2 mt standard length, copper square section according rated current.
- ✓ Rotor / housing alignment (P) has to be executed within +/- 0.1 mm. Optionally, we can supply a mounting tool for achieving that alignment in case of assembly without possibility of accurate alignment.
- ✓ Thermal device cable consists of a shielded pair 2x2x0.25mm² section, 7mm external diameter.
- ✓ (De) represents:
 - 1- The maximum diameter passing inside the housing.
 - 2- The maximum diameter necessary for rotor assembly.
- ✓ (Pmax) diameter for pieces in contact with the rotor must never be exceeded.
- ✓ Tapped holes on each side of rotor and housing are angularly aligned.
- ✓ Cable positioning (AF) is theoretical. Leave a free room with a +/- 10 arc degrees tolerance around that position, on a 50 mm height from the housing side, for avoiding to force the cables at the alternator output.
- ✓ When designing the assembly, take care to insure a perfect contact between housing and user's bore for avoiding thermal problems.
- ✓ For housing mounting, use either external centering diameter (B) or internal centering diameters (A).
- ✓ For execution tolerances (perpendicularity, concentricity...), please consult us.

A full integration handbook can be supplied to our customers upon request
 For further information or specific request about our alternators, feel free to contact us.

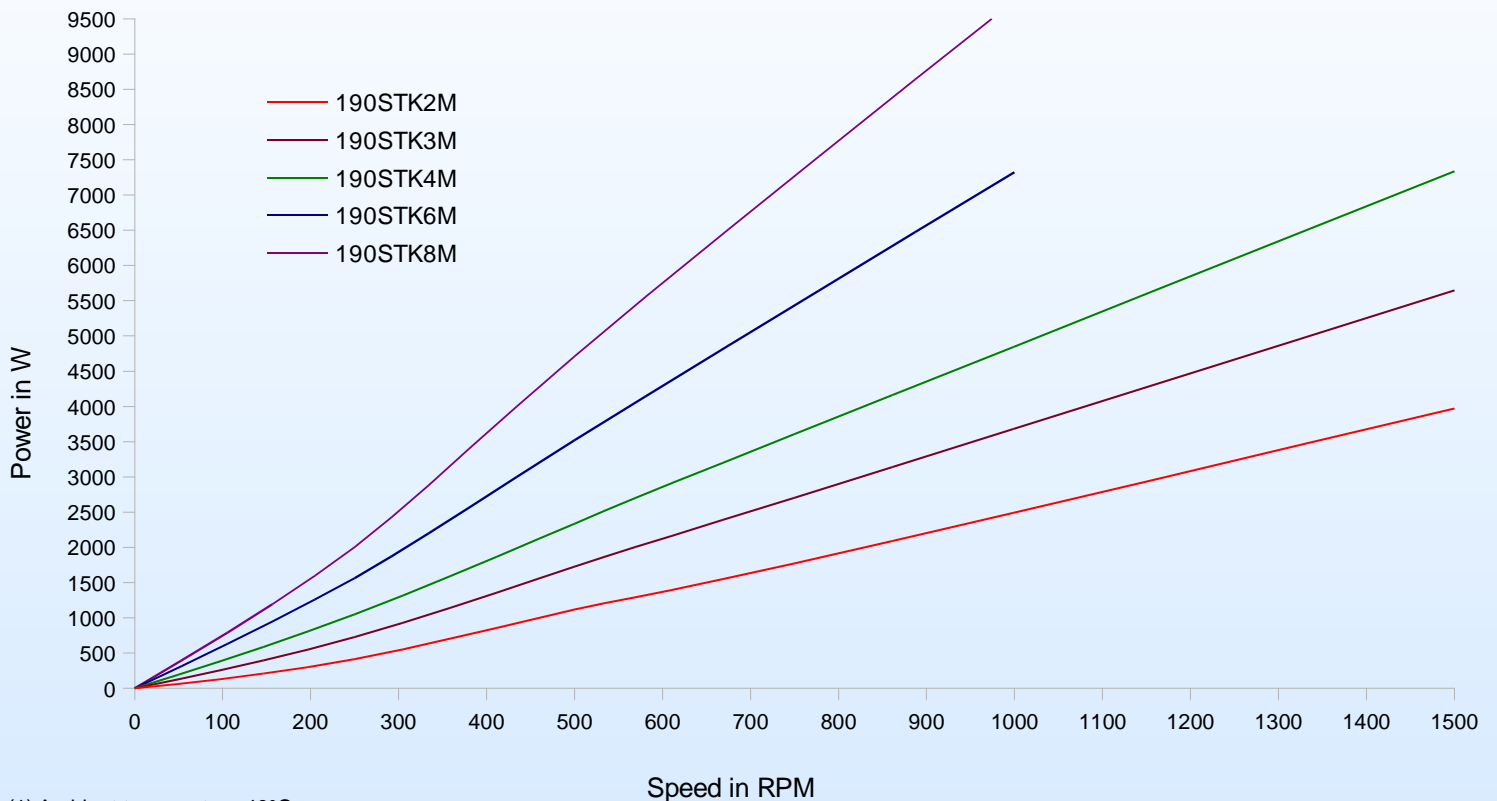
TECHNICAL CHARACTERISTICS

190 STK ALTERNATORS

See also the curves of Voltage, Torque, Efficiency vs Speed

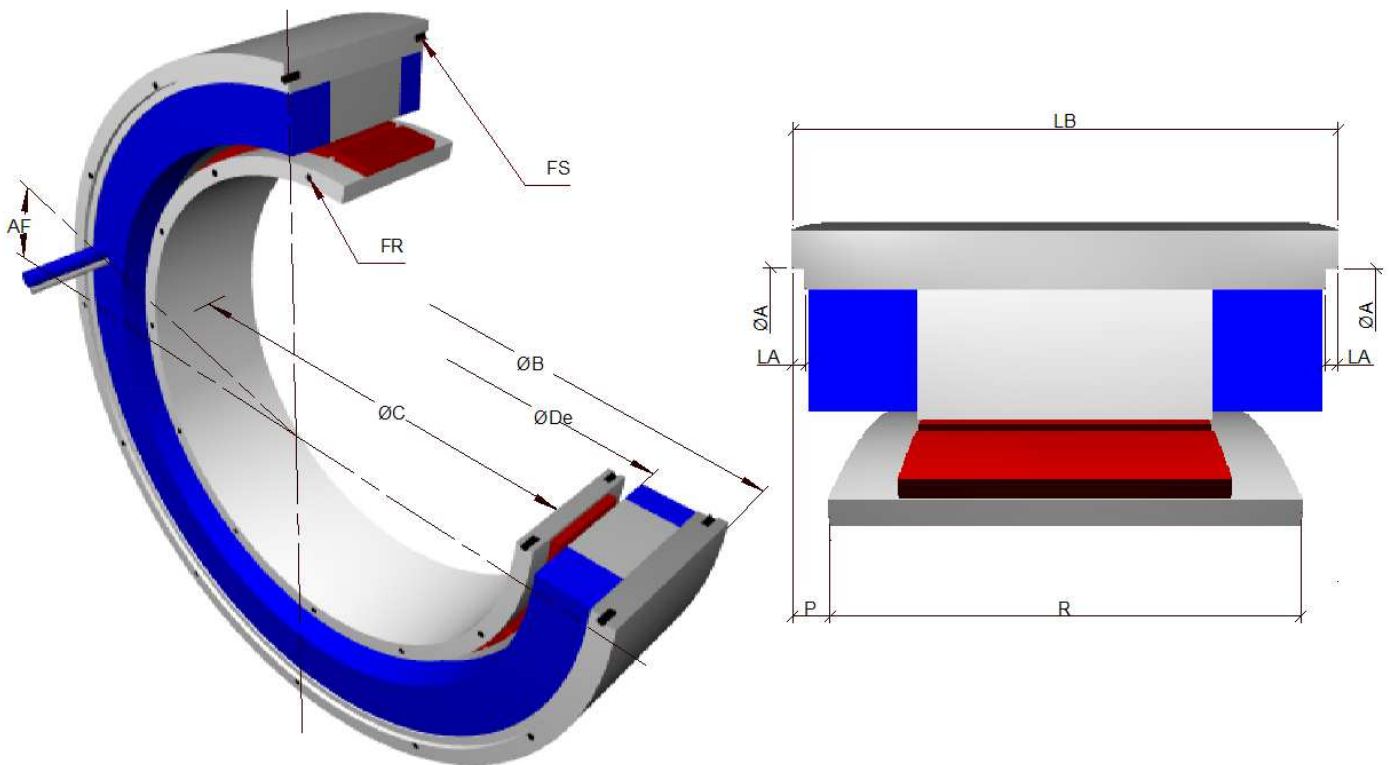
			190STK2M		190STK3M		190STK4M		190STK6M		190STK8M	
Rated speed			500	1500	500	1500	500	1500	500	1000	500	1000
Rated Power at Rated speed	Rated power (1)(2)	W	1118	3972	1726	5650	2337	7339	3519	7325	4713	9757
	Input torque at rated speed(1)(2)	N.m	27.2	30.9	41	41	54.3	53.1	80.7	79.9	107.3	106.1
	Efficiency at rated power (1)(2)	%	79	85	81	87	83	88	84	87	84	88
	Current at rated power (1)	Amps	2.8	11.1	3,7	16,3	5.7	19.5	8.6	17.8	11.4	25.6
	Voltage at rated power (1)(2)(3)	V	244	229	284	214	249	234	251	253	252	235
Rated Power at Half speed	Rated Power at half speed (1)(2)	W	416	1773	730	2706	1051	3608	1565	3519	2005	4713
	Input torque at half speed (1)(2)	N.m	21.8	31	41	41	54.4	53.8	81.5	80.7	98.2	107.3
	Efficiency at half speed (1)(2)	%	73	83	68	85	71	86	74	84	78	84
Number of poles (number of pairs of poles)			12 (6)									
Cogging torque		N.m	0.5		0.7		0.9		1.3		1.7	
Phase resistance at 20°C		Ohm	8.82	0.84	5.81	0.36	3.03	0.27	1.82	0.44	1.23	0.24
Phase inductance (5)		mH	83.8	8.3	74	4	40.8	3.5	25	6.3	20.4	4.1
Voltage at no load (back emf) at 20°C (4)		V	357	334	404	289	352	308	357	337	352	313
Rotor inertia		10 ⁻³ Kg.m ²	4.12		5.81		7.5		10.88		14.26	
Weight		Kg	13		17.5		22		31		40	
Power cable square section (6)		mm ²	4x1.5		4x1.5		4x1.5	4x2.5	4x1.5	4x2.5	4x1.5	4x4
Power cable diameter		mm	Ø8.6		Ø8.6		Ø8.6	Ø10.8	Ø8.6	Ø10.8	Ø8.6	Ø12.2

Alternator 190STK Power - Speed



- (1) Ambient temperature 40°C
Wind speed 10 m/s cooling the housing
Winding temperature rise < 100°C
Stator housing in contact with the ambient air or integral on all its peripheral area with a metallic armature in contact with the ambient air
Stator housing secured on a metallic frame getting an area equal to twice the cross section of the housing
- (2) Operation in sine wave mode with unity power factor
- (3) Line to line voltage. Voltage level may be adapted according to the application; please contact us
- (4) Line to line voltage, alternator at no load, rated speed and at 20°C
- (5) For current at rated power
- (6) For currents lower than 53 Amps, one cable
For currents over 53 Amps, four single wires output (highlighted in the table)

ALTERNATORS 190 STK



		190STK1M	190STK2M	190STK3M	190STK4M	190STK5M	190STK6M	190STK7M	190STK8M
Housing internal centering diameter	A H8	172	172	172	172	172	172	172	172
Angle wire output / tapped holes	AF	22°30'	22°30'	22°30'	22°30'	22°30'	22°30'	22°30'	22°30'
Housing external centering diameter	B Ø	190	190	190	190	190	190	190	190
Rotoric internal centering diameter	C H7	72	72	72	72	72	72	72	72
Housing internal diameter	De	98	98	98	98	98	98	98	98
Rotoric fixation holes	FR	8xM5 sur Ø80	8xM5 sur Ø80	8xM5 sur Ø80	8xM5 sur Ø80	8xM5 sur Ø80	8xM5 sur Ø80	8xM5 sur Ø80	8xM5 sur Ø80
Housing fixation holes	FS	8xM5 sur Ø180	8xM5 sur Ø180	8xM5 sur Ø180	8xM5 sur Ø180	8xM5 sur Ø180	8xM5 sur Ø180	8xM5 sur Ø180	8xM5 sur Ø180
Depth of housing internal centering diameter	LA	2	2	2	2	2	2	2	2
Housing length	LB ±0.15	103.75	140	176.25	212.5	248.75	285	321.25	357.5
Alignment rotor / housing	P ± 0.1	23	23	23	23	23	23	23	23
Maximum rotoric contact diameter	Pmax	94	94	94	94	94	94	94	94
Rotor length	R +0.15	68.25	104.5	140.75	177	213.25	249.5	285.75	322

INTEGRATION :

- ✓ The cables are made of PU, class 6, foreseen for cable-bearing chains, 2 mt standard length, copper square section according rated current.
- ✓ Rotor / housing alignment (P) has to be executed within +/- 0.1 mm. Optionally, we can supply a mounting tool for achieving that alignment in case of assembly without possibility of accurate alignment.
- ✓ Thermal device cable consists of a shielded pair 2x2x0.25mm² section, 7mm external diameter.
- ✓ (De) represents:
 - 1- The maximum diameter passing inside the housing.
 - 2- The maximum diameter necessary for rotor assembly.
- ✓ (Pmax) diameter for pieces in contact with the rotor must never be exceeded.
- ✓ Tapped holes on each side of rotor and housing are angularly aligned.
- ✓ Cable positioning (AF) is theoretical. Leave a free room with a +/- 10 arc degrees tolerance around that position, on a 50 mm height from the housing side, for avoiding to force the cables at the alternator output.
- ✓ When designing the assembly, take care to insure a perfect contact between housing and user's bore for avoiding thermal problems.
- ✓ For housing mounting, use either external centering diameter (B) or internal centering diameters (A).
- ✓ For execution tolerances (perpendicularity, concentricity...), please consult us.

A full integration handbook can be supplied to our customers upon request
 For further information or specific request about our alternators, feel free to contact us.

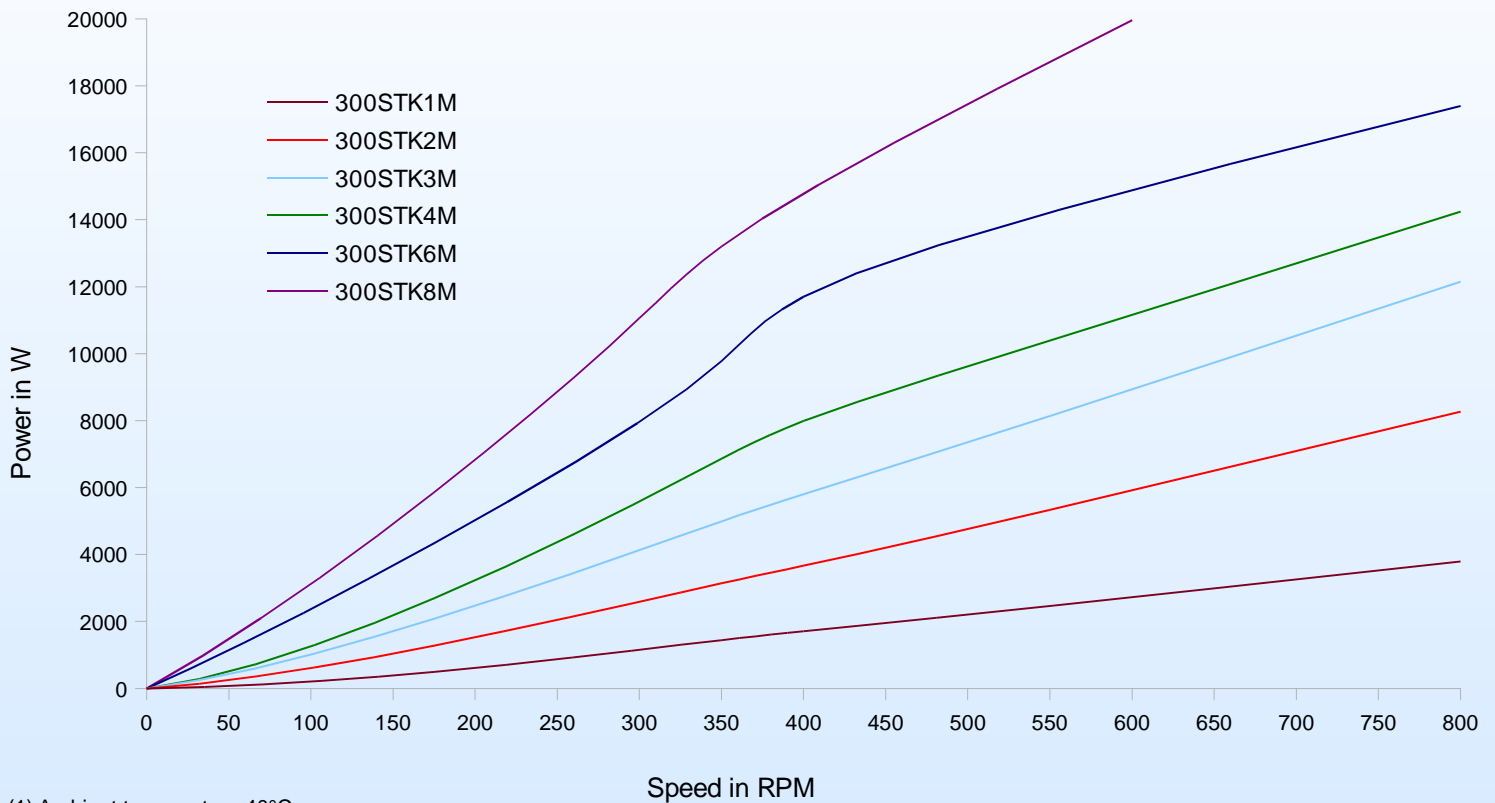
TECHNICAL CHARACTERISTICS

300 STK ALTERNATORS

See also the curves of Voltage, Torque, Efficiency vs Speed

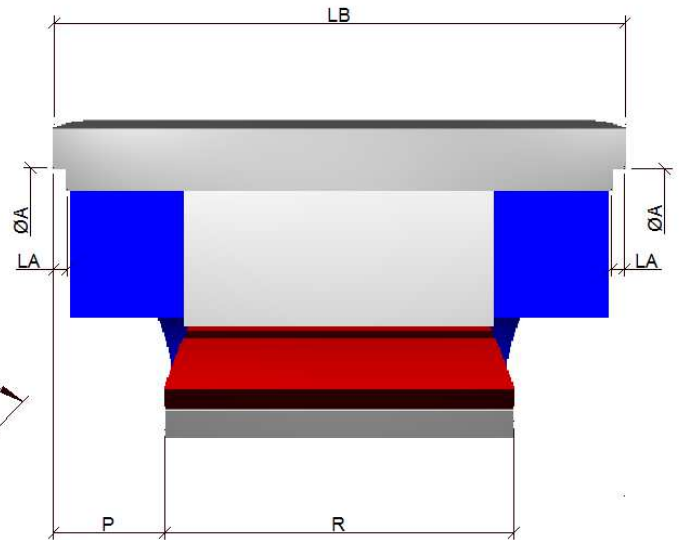
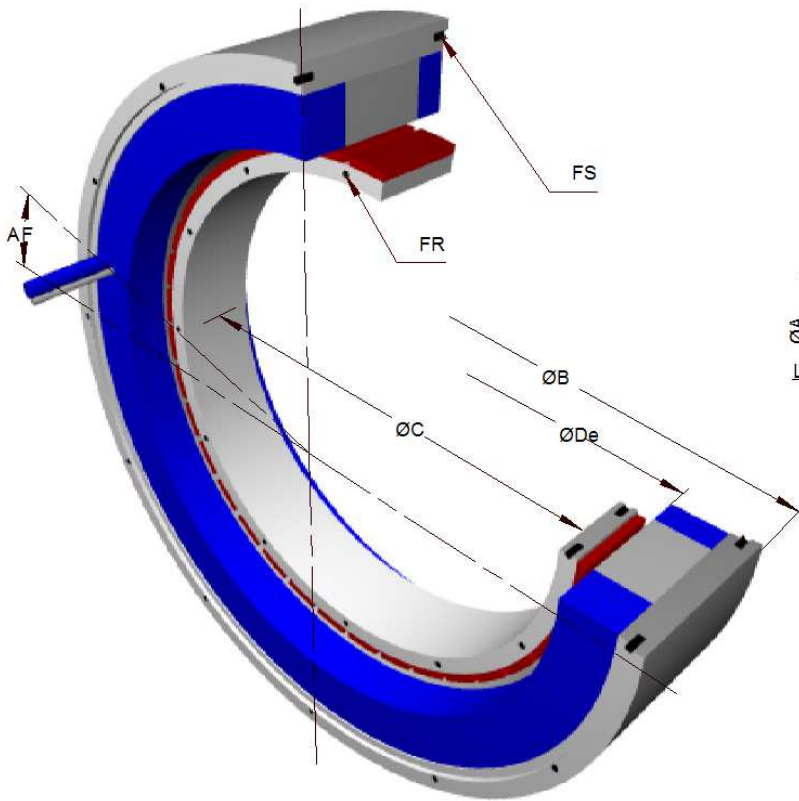
			300STK1M		300STK2M		300STK3M		300STK4M		300STK6M		300STK8M	
Rated speed			350	800	350	800	350	800	350	800	350	800	350	600
Rated Power at Rated speed	Rated power (1)(2)	W	1444	3793	3141	8270	4990	12150	6858	14240	9782	17399	13201	19965
	Input torque at rated speed(1)(2)	N.m	52.5	52.4	104	111	162	160	225	187	310	226	415	348
	Efficiency at rated power (1)(2)	%	75	87	82	89	83	90	84	92	87	92	87	92
	Current at rated power (1)	Amps	3.7	9.9	7.3	19.2	12.1	27.1	16.8	34.2	23.6	42.9	30.4	50
	Voltage at rated power (1)(2)(3)	V	232	230	255	258	239	261	242	251	247	247	258	240
Rated Power at Half speed	Rated Power at half speed (1)(2)	W	496	1706	1276	3665	2080	5800	2688	7985	4333	11700	5853	11058
	Input torque at half speed (1)(2)	N.m	40.5	52.4	99	104.5	161	162	186	225	310	309	415	414
	Efficiency at half speed (1)(2)	%	67	78	71	84	70	85	78	85	77	88	77	85
Number of poles (number of pairs of poles)			24 (12)											
Cogging torque			0.5		1		1.5		2		3		4	
Phase resistance at 20°C			8.75	1.24	2.87	0.51	1.36	0.21	0.97	0.15	0.53	0.08	0.4	0.1
Phase inductance (5)			33.4	4.8	17.3	3	10.1	1.52	8.1	1.25	5.2	0.75	4.1	1.03
Voltage at no load (back emf) at 20°C (4)			329	284	335	316	311	316	323	289	311	277	323	277
Rotor inertia			26.4		52.7		39.6		105.5		158.2		211	
Weight			11.5		18		24.5		31		44		57	
Power cable square section (6)			4x1.5		4x1.5 4x2.5		4x1.5 4x4		4x1.5 4x6		4x4 4x10		4x4 4x10	
Power cable diameter			Ø8.6		Ø8.6 Ø10.8		Ø8.6 Ø12.2		Ø8.6 Ø14		Ø12.2 Ø17.6		Ø12.2 Ø17.6	

Alternator 300STK Power - Speed



- (1) Ambient temperature 40°C
Wind speed 10 m/s cooling the housing
Winding temperature rise < 100°C
Stator housing in contact with the ambient air or integral on all its peripheral area with a metallic armature in contact with the ambient air
Stator housing secured on a metallic frame getting an area equal to twice the cross section of the housing
- (2) Operation in sine wave mode with unity power factor
- (3) Line to line voltage. Voltage level may be adapted according to the application; please contact us
- (4) Line to line voltage, alternator at no load, rated speed and at 20°C
- (5) For current at rated power
- (6) For currents lower than 53 Amps, one cable
For currents over 53 Amps, four single wires output (highlighted in the table)

ALTERNATORS 300 STK



		300STK1M	300STK2M	300STK3M	300STK4M	300STK5M	300STK6M	300STK7M	300STK8M
Housing internal centering diameter	A H8	282	282	282	282	282	282	282	282
Angle wire output / tapped holes	AF	15°	15°	15°	15°	15°	15°	15°	15°
Housing external centering diameter	B Ø	303	303	303	303	303	303	303	303
Rotoric internal centering diameter	C H7	190	190	190	190	190	190	190	190
Housing internal diameter	De	228	228	228	228	228	228	228	228
Rotoric fixation holes	FR	12xM5 sur Ø199	12xM5 sur Ø199	12xM5 sur Ø199	12xM5 sur Ø199	12xM5 sur Ø199	12xM5 sur Ø199	12xM5 sur Ø199	12xM5 sur Ø199
Housing fixation holes	FS	12xM5 sur Ø290	12xM5 sur Ø290	12xM5 sur Ø290	12xM5 sur Ø290	12xM5 sur Ø290	12xM5 sur Ø290	12xM5 sur Ø290	12xM5 sur Ø290
Depth of housing internal centering diameter	LA	3	3	3	3	3	3	3	3
Housing length	LB ±0.15	87.5 (117.5)	115 (145)	142.5 (172.5)	170 (200)	197.5 (227.5)	225 (255)	252.5 (282.5)	280 (310)
Alignment rotor / housing	P ± 0.1	34.5 (64.5)	34.5 (64.5)	34.5 (64.5)	34.5 (64.5)	34.5 (64.5)	34.5 (64.5)	34.5 (64.5)	34.5 (64.5)
Maximum rotoric contact diameter	Pmax	213	213	213	213	213	213	213	213
Rotor length	R +0.15	27.5	55	82.5	110	137.5	165	192.5	220

INTEGRATION :

- ✓ The cables are made of PU, class 6, foreseen for cable-bearing chains, 2 mt standard length, copper square section according rated current.
- ✓ Rotor / housing alignment (P) has to be executed within +/- 0.1 mm. Optionally, we can supply a mounting tool for achieving that alignment in case of assembly without possibility of accurate alignment.
- ✓ Thermal device cable consists of a shielded pair 2x2x0.25mm² section, 7mm external diameter.
- ✓ (De) represents:
 - 1- The maximum diameter passing inside the housing.
 - 2- The maximum diameter necessary for rotor assembly.
- ✓ (Pmax) diameter for pieces in contact with the rotor must never be exceeded.
- ✓ Tapped holes on each side of rotor and housing are angularly aligned.
- ✓ Cable positioning (AF) is theoretical. Leave a free room with a +/- 10 arc degrees tolerance around that position, on a 50 mm height from the housing side, for avoiding to force the cables at the alternator output.
- ✓ When designing the assembly, take care to insure a perfect contact between housing and user's bore for avoiding thermal problems.
- ✓ For housing mounting, use either external centering diameter (B) or internal centering diameters (A).
- ✓ For execution tolerances (perpendicularity, concentricity...), please consult us.
- ✓ In red in the table : P, LB, J4 and E3 are 30mm higher when the rated current is greater than 38 amps for class 6 shielded cable output.
We also propose an output with unshielded wires that is not requiring an increase of length. (contact us for square section)

A full integration handbook can be supplied to our customers upon request
For further information or specific request about our alternators, feel free to contact us.

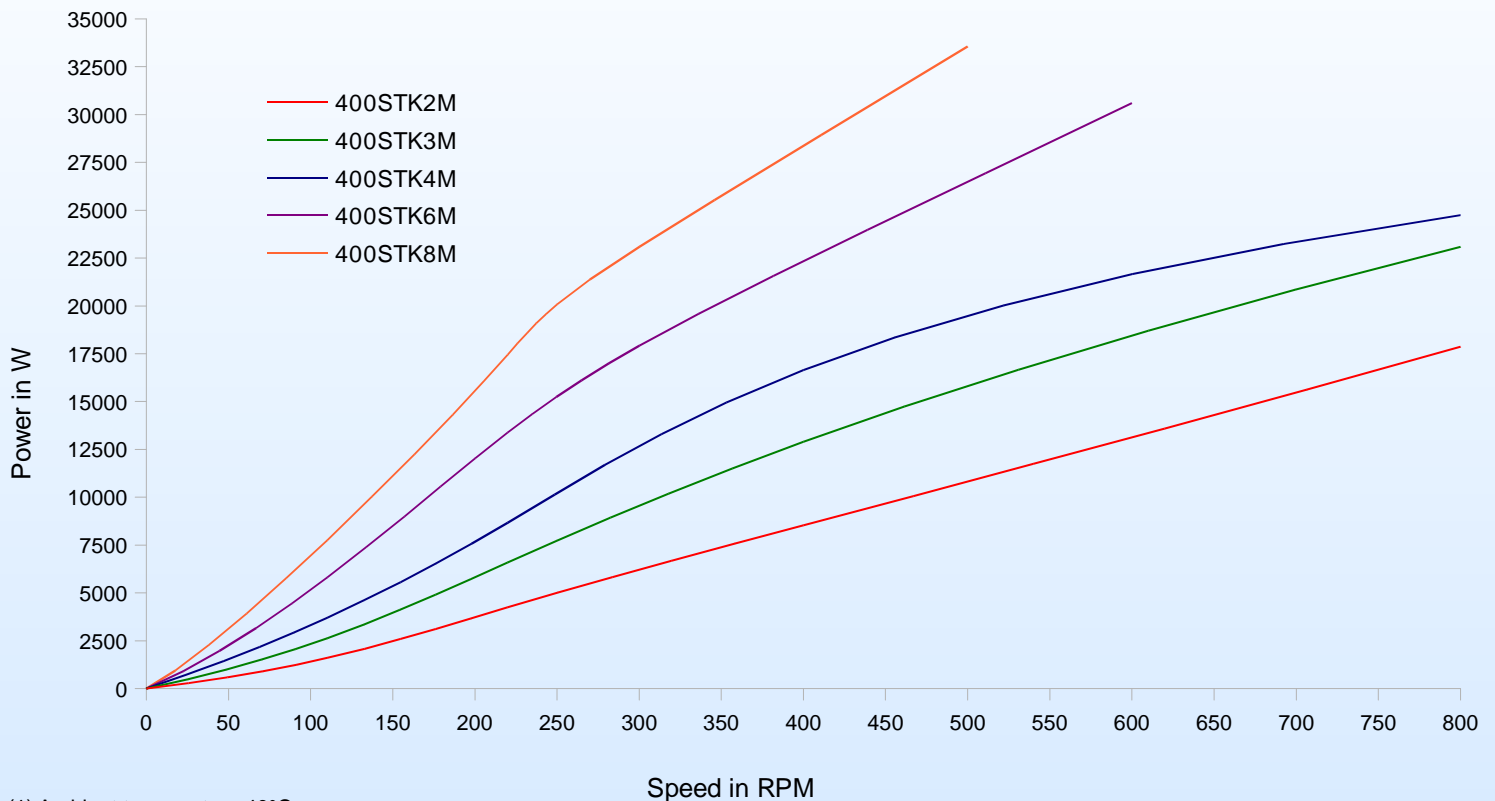
TECHNICAL CHARACTERISTICS

400 STK ALTERNATORS

See also the curves of Voltage, Torque, Efficiency vs Speed

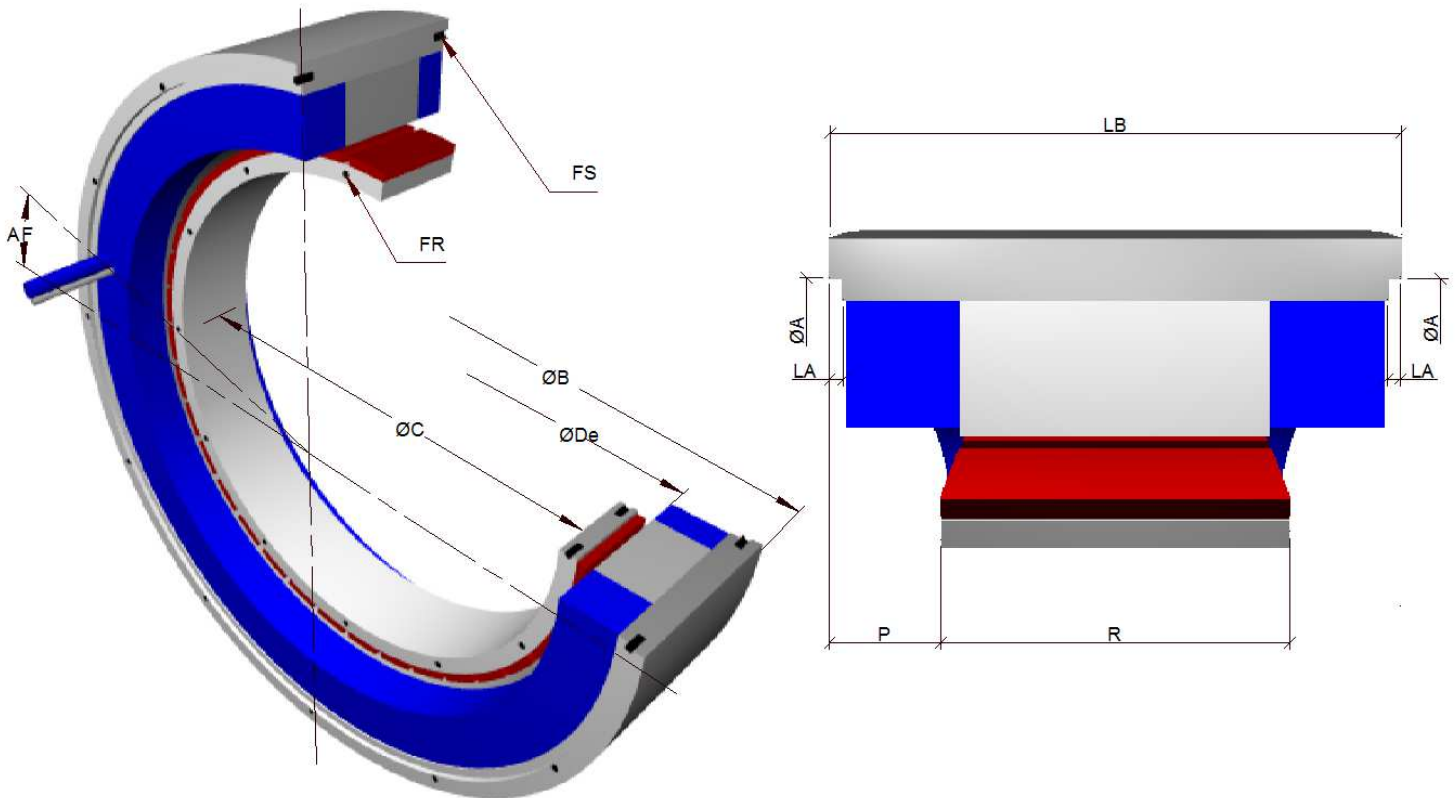
		400STK2M		400STK3M		400STK4M		400STK6M		400STK8M			
Rated speed		Rpm		220	800	220	800	220	800	220	600	220	500
Rated Power at Rated speed	Rated power (1)(2)	W		4251	17874	6594	23082	8673	24737	13377	30588	17457	33552
	Input torque at rated speed(1)(2)	N.m		235	234	347	297	444	317	677	523	869	688
	Efficiency at rated power (1)(2)	%		79	92	83	93	85	93	86	93	87	93
	Current at rated power (1)	Amps		10.2	42	15.7	55.2	21	62.3	32.4	80.7	41.3	79.3
	Voltage at rated power (1)(2)(3)	V		246	253	247	250	244	240	243	227	249	253
Rated Power at Half speed	Rated Power at half speed (1)(2)	W		1605	8531	2630	12890	3702	16648	5804	17913	7755	20081
	Input torque at half speed (1)(2)	N.m		204	235	312	346	443	441	679	636	869	855
	Efficiency at half speed (1)(2)	%		69	87	74	89	73	91	74	90	77	88
Number of poles (number of pairs of poles)		24 (12)											
Cogging torque		N.m		2		3		4		6		8	
Phase resistance at 20°C		Ohm		2.48	0.15	1.24	0.07	0.74	0.04	0.42	0.04	0.29	0.05
Phase inductance (5)		mH		21	1.24	12.7	0.7	8.7	0.47	5.8	0.52	4.34	0.69
Voltage at no load (back emf) at 20°C (4)		V		346	305	330	285	314	266	314	257	314	285
Rotor inertia		10 ⁻³ Kg.m ²		163		245		325		488		650	
Weight		Kg		35		46		58		81		104	
Power cable square section (6)		mm ²		4x1.5	4x10	4x1.5	<u>4x10</u>	4x4	<u>4x10</u>	4x6	<u>4x16</u>	4x10	<u>4x16</u>
Power cable diameter		mm		Ø8.6	Ø17.6	Ø8.6	4x Ø9.5	Ø12.2	4x Ø9.5	Ø14	4x Ø11	Ø17.6	4x Ø11

Alternator 400STK Power - Speed



- (1) Ambient temperature 40°C
Wind speed 10 m/s cooling the housing
Winding temperature rise < 100°C
Stator housing in contact with the ambient air or integral on all its peripheral area with a metallic armature in contact with the ambient air
Stator housing secured on a metallic frame getting an area equal to twice the cross section of the housing
- (2) Operation in sine wave mode with unity power factor
- (3) Line to line voltage. Voltage level may be adapted according to the application; please contact us
- (4) Line to line voltage, alternator at no load, rated speed and at 20°C
- (5) For current at rated power
- (6) For currents lower than 53 Amps, one cable
For currents over 53 Amps, four single wires output (highlighted in the table)

ALTERNATORS 400 STK



		400STK1M	400STK2M	400STK3M	400STK4M	400STK5M	400STK6M	400STK7M	400STK8M
Housing internal centering diameter	A H8	380	380	380	380	380	380	380	380
Angle wire output / tapped holes	AF	15°	15°	15°	15°	15°	15°	15°	15°
Housing external centering diameter	B B	404	404	404	404	404	404	404	404
Rotoric internal centering diameter	C H7	258	258	258	258	258	258	258	258
Housing internal diameter	De	306	306	306	306	306	306	306	306
Rotoric fixation holes	FR	12xM6 sur Ø268	12xM6 sur Ø268	12xM6 sur Ø268	12xM6 sur Ø268	12xM6 sur Ø268	12xM6 sur Ø268	12xM6 sur Ø268	12xM6 sur Ø268
Housing fixation holes	FS	12xM6 sur Ø390	12xM6 sur Ø390	12xM6 sur Ø390	12xM6 sur Ø390	12xM6 sur Ø390	12xM6 sur Ø390	12xM6 sur Ø390	12xM6 sur Ø390
Depth of housing internal centering diameter	LA	3	3	3	3	3	3	3	3
Housing length	LB ±0.15	100.5 (130.5)	128 (158)	155.5 (185.5)	183 (213)	210.5 (240.5)	238 (268)	265.5 (295.5)	293 (323)
Alignment rotor / housing	P ± 0.1	39 (69)	39 (69)	39 (69)	39 (69)	39 (69)	39 (69)	39 (69)	39 (69)
Maximum rotoric contact diameter	Pmax	287	287	287	287	287	287	287	287
Rotor length	R +0.15	27.5	55	82.5	110	137.5	165	192.5	220

INTEGRATION :

- ✓ The cables are made of PU, class 6, foreseen for cable-bearing chains, 2 mt standard length, copper square section according rated current.
- ✓ Rotor / housing alignment (P) has to be executed within +/- 0.1 mm. Optionally, we can supply a mounting tool for achieving that alignment in case of assembly without possibility of accurate alignment.
- ✓ Thermal device cable consists of a shielded pair 2x2x0.25mm² section, 7mm external diameter.
- ✓ (De) represents:
 - 1- The maximum diameter passing inside the housing.
 - 2- The maximum diameter necessary for rotor assembly.
- ✓ (Pmax) diameter for pieces in contact with the rotor must never be exceeded.
- ✓ Tapped holes on each side of rotor and housing are angularly aligned.
- ✓ Cable positioning (AF) is theoretical. Leave a free room with a +/- 10 arc degrees tolerance around that position, on a 50 mm height from the housing side, for avoiding to force the cables at the alternator output.
- ✓ When designing the assembly, take care to insure a perfect contact between housing and user's bore for avoiding thermal problems.
- ✓ For housing mounting, use either external centering diameter (B) or internal centering diameters (A).
- ✓ For execution tolerances (perpendicularity, concentricity...), please consult us.
- ✓ In **red** in the table : P, LB, J4 and E3 are 30mm higher when the rated current is greater than 53 amps for class 6 shielded cable output. We also propose an output with unshielded wires that is not requiring an increase of length. (contact us for square section)

A full integration handbook can be supplied to our customers upon request
 For further information or specific request about our alternators, feel free to contact us.

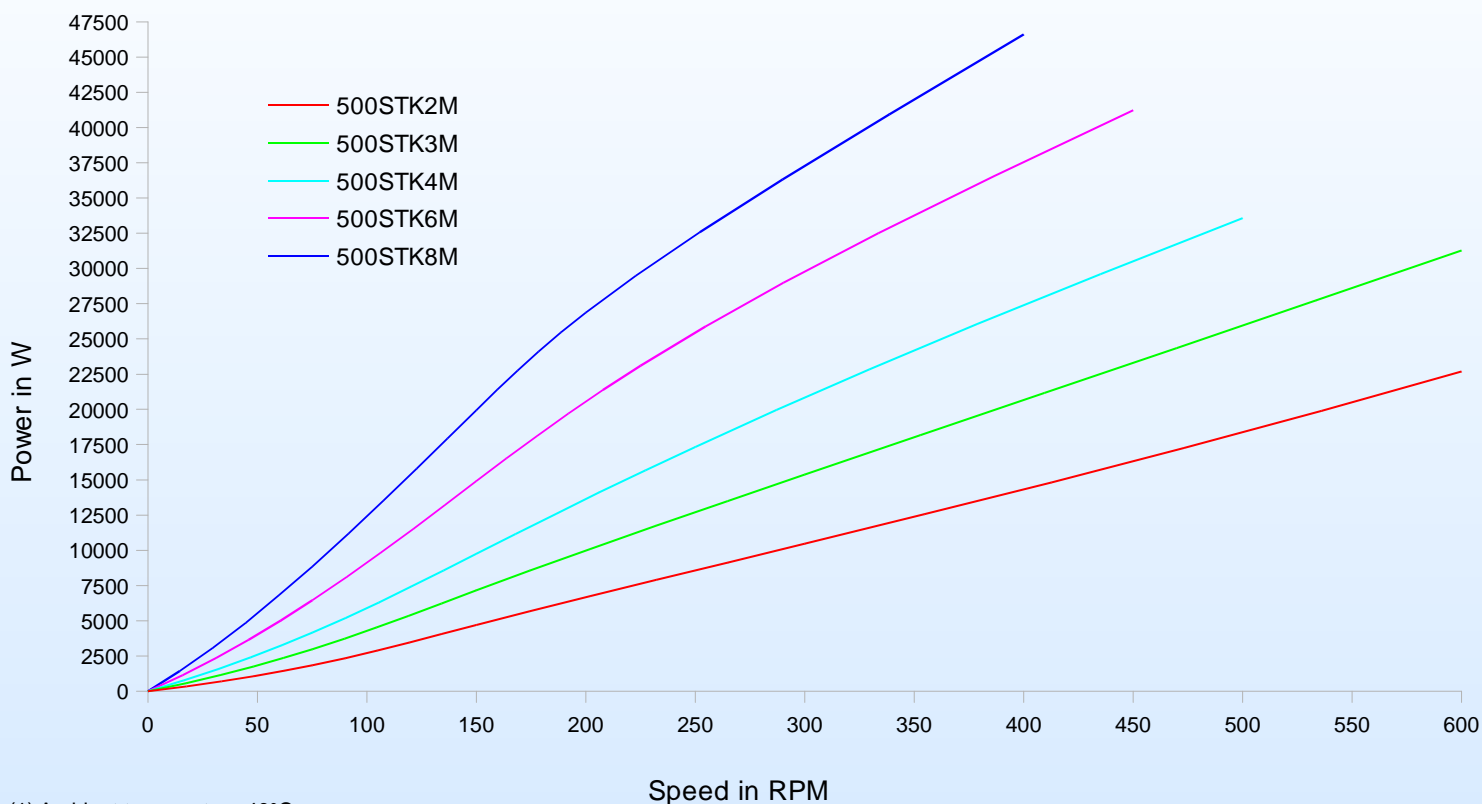
TECHNICAL CHARACTERISTICS

500 STK ALTERNATORS

See also the curves of Voltage, Torque, Efficiency vs Speed

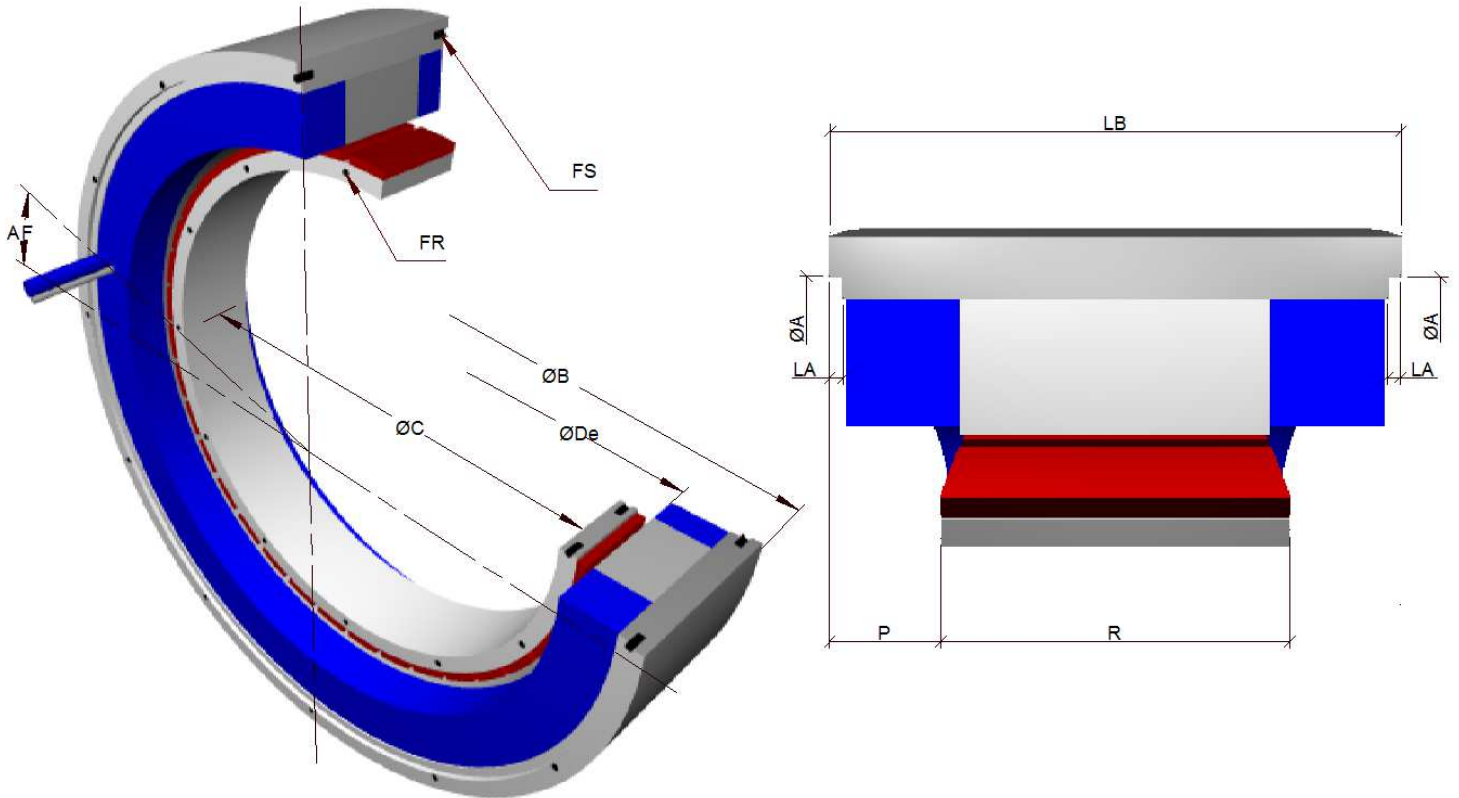
			500STK2M		500STK3M		500STK4M		500STK6M		500STK8M	
Rated speed			150	600	150	600	150	500	150	450	150	400
Rated Power at Rated speed	Rated power (1)(2)	W	4700	22701	7157	31276	9741	33573	14892	41219	19938	46616
	Input torque at rated speed(1)(2)	N.m	376	396	547	538	736	693	1100	941	1462	1197
	Efficiency at rated power (1)(2)	%	80	91	84	93	84	93	86	93	87	93
	Current at rated power (1)	Amps	11.7	50.7	17.9	83.3	23.1	80	36.3	107.5	46.2	102.5
	Voltage at rated power (1)(2)(3)	V	237	267	237	225	250	251	242	230	255	273
Rated Power at Half speed	Rated Power at half speed (1)(2)	W	1835	10465	2968	15372	4142	17333	6440	23100	8831	26874
	Input torque at half speed (1)(2)	N.m	365	380	546	545	735	744	1102	1096	1467	1434
	Efficiency at half speed (1)(2)	%	63	88	70	90	72	89	75	90	77	90
Number of poles (number of pairs of poles)			36 (18)									
Cogging torque			3.9		5.8		7.8		11.7		15.4	
Phase resistance at 20°C			2	0.13	1.03	0.05	0.71	0.05	0.38	0.03	0.30	0.04
Phase inductance (5)			14.7	0.93	8.9	0.41	7.4	0.55	4.5	0.37	3.7	0.49
Voltage at no load (back emf) at 20°C (4)			319	319	304	261	319	290	304	261	319	309
Rotor inertia			433		649		865		1296		1730	
Weight			43		58		73		103		133	
Power cable square section (6)			4x1.5	4x10	4x2.5	<u>4x16</u>	4x4	<u>4x16</u>	4x6	<u>4x25</u>	4x10	<u>4x25</u>
Power cable diameter			Ø8.6	Ø17.6	Ø10.8	4xØ11	Ø12.2	4xØ11	Ø14	4x Ø13.5	Ø17.6	4x Ø13.5

Alternator 500STK Power - Speed



- (1) Ambient temperature 40°C
Wind speed 10 m/s cooling the housing
Winding temperature rise < 100°C
Stator housing in contact with the ambient air or integral on all its peripheral area with a metallic armature in contact with the ambient air
Stator housing secured on a metallic frame getting an area equal to twice the cross section of the housing
- (2) Operation in sine wave mode with unity power factor
- (3) Line to line voltage. Voltage level may be adapted according to the application; please contact us
- (4) Line to line voltage, alternator at no load, rated speed and at 20°C
- (5) For current at rated power
- (6) For currents lower than 53 Amps, one cable
For currents over 53 Amps, four single wires output (highlighted in the table)

ALTERNATORS 500 STK



		500STK1M	500STK2M	500STK3M	500STK4M	500STK5M	500STK6M	500STK7M	500STK8M	500STK9M
Housing internal centering diameter	A H8	470	470	470	470	470	470	470	470	470
Angle wire output / tapped holes	AF	15°	15°	15°	15°	15°	15°	15°	15°	15°
Housing external centering diameter	B f8	502	502	502	502	502	502	502	502	502
Rotoric internal centering diameter	C H7	350	350	350	350	350	350	350	350	350
Housing internal diameter	De	403	403	403	403	403	403	403	403	403
Rotoric fixation holes	FR	12xM8 sur Ø364	12xM8 sur Ø364	12xM8 sur Ø364	12xM8 sur Ø364	12xM8 sur Ø364	12xM8 sur Ø364	12xM8 sur Ø364	12xM8 sur Ø364	12xM8 sur Ø364
Housing fixation holes	FS	12xM8 sur Ø482	12xM8 sur Ø482	12xM8 sur Ø482	12xM8 sur Ø482	12xM8 sur Ø482	12xM8 sur Ø482	12xM8 sur Ø482	12xM8 sur Ø482	12xM8 sur Ø482
Depth of housing internal centering diam	LA	3	3	3	3	3	3	3	3	3
Housing length	LB ±0.15	93 (133)	120.5 (160.5)	148 (188)	175.5 (215.5)	203 (243)	230.5 (270.5)	258 (298)	285.5 (325.5)	313 (353)
Alignment rotor / housing	P ± 0.1	37 (77)	37 (77)	37 (77)	37 (77)	37 (77)	37 (77)	37 (77)	37 (77)	37 (77)
Maximum rotoric contact diameter	Pmax	384	384	384	384	384	384	384	384	384
Rotor length	R +0.15	27.5	55	82.5	110	137.5	165	192.5	220	247.5

INTEGRATION :

- ✓ The cables are made of PU, class 6, foreseen for cable-bearing chains, 2 mt standard length, copper square section according rated current.
- ✓ Rotor / housing alignment (P) has to be executed within +/- 0.1 mm. Optionally, we can supply a mounting tool for achieving that alignment in case of assembly without possibility of accurate alignment.
- ✓ Thermal device cable consists of a shielded pair 2x2x0.25mm² section, 7mm external diameter.
- ✓ (De) represents:
 - 1- The maximum diameter passing inside the housing.
 - 2- The maximum diameter necessary for rotor assembly.
- ✓ (Pmax) diameter for pieces in contact with the rotor must never be exceeded.
- ✓ Tapped holes on each side of rotor and housing are angularly aligned.
- ✓ Cable positioning (AF) is theoretical. Leave a free room with a +/- 10 arc degrees tolerance around that position, on a 50 mm height from the housing side, for avoiding to force the cables at the alternator output.
- ✓ When designing the assembly, take care to insure a perfect contact between housing and user's bore for avoiding thermal problems.
- ✓ For housing mounting, use either external centering diameter (B) or internal centering diameters (A).
- ✓ For execution tolerances (perpendicularity, concentricity...), please consult us.
- ✓ In red in the table : P, LB, J4 and E3 are 40mm higher when the rated current is greater than 53 amps for class 6 shielded cable output.
We also propose an output with unshielded wires that is not requiring an increase of length. (contact us for square section)

A full integration handbook can be supplied to our customers upon request
For further information or specific request about our alternators, feel free to contact us.

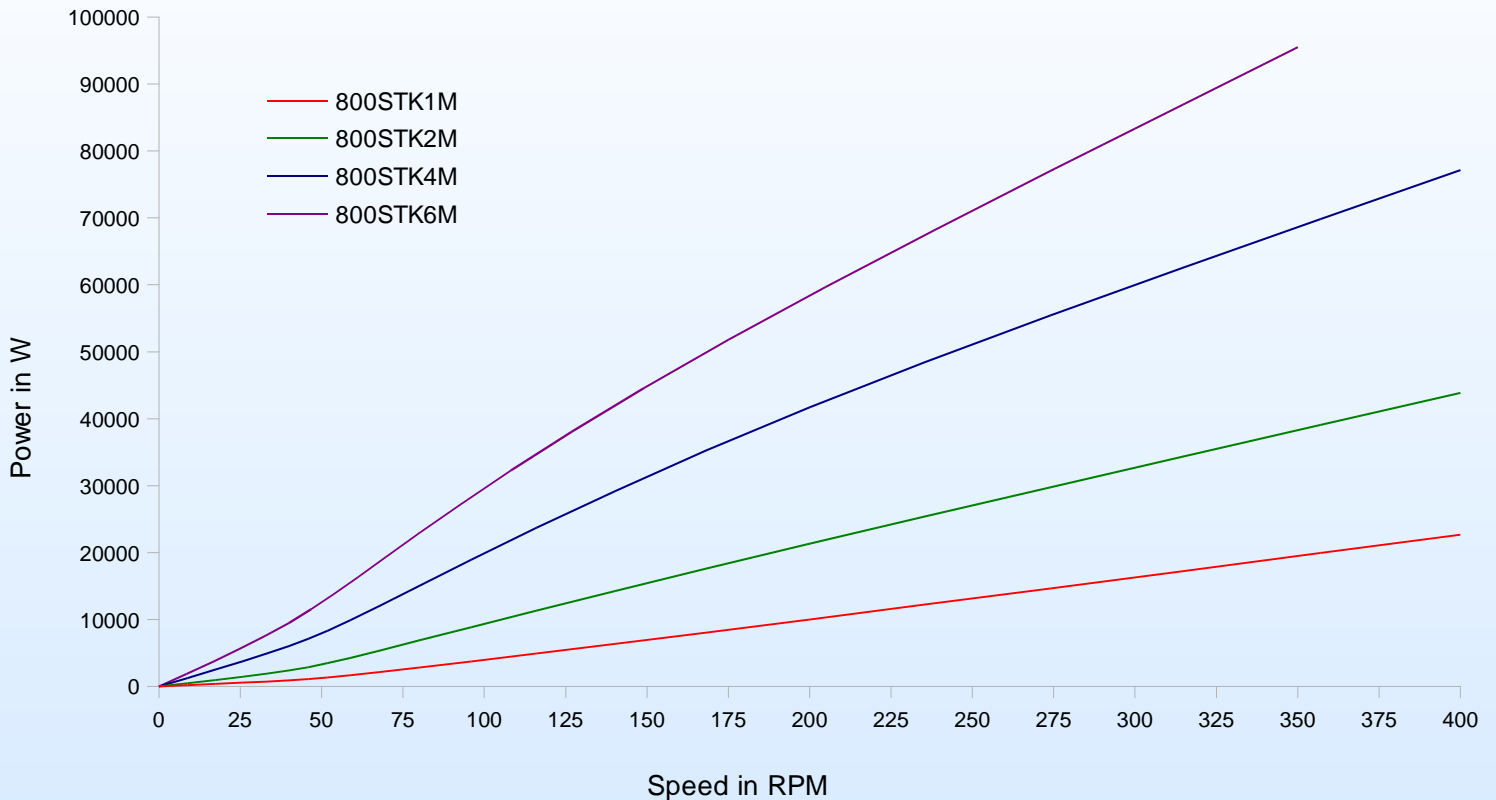
TECHNICAL CHARACTERISTICS

800 STK ALTERNATORS

See also the curves of Voltage, Torque, Efficiency vs Speed

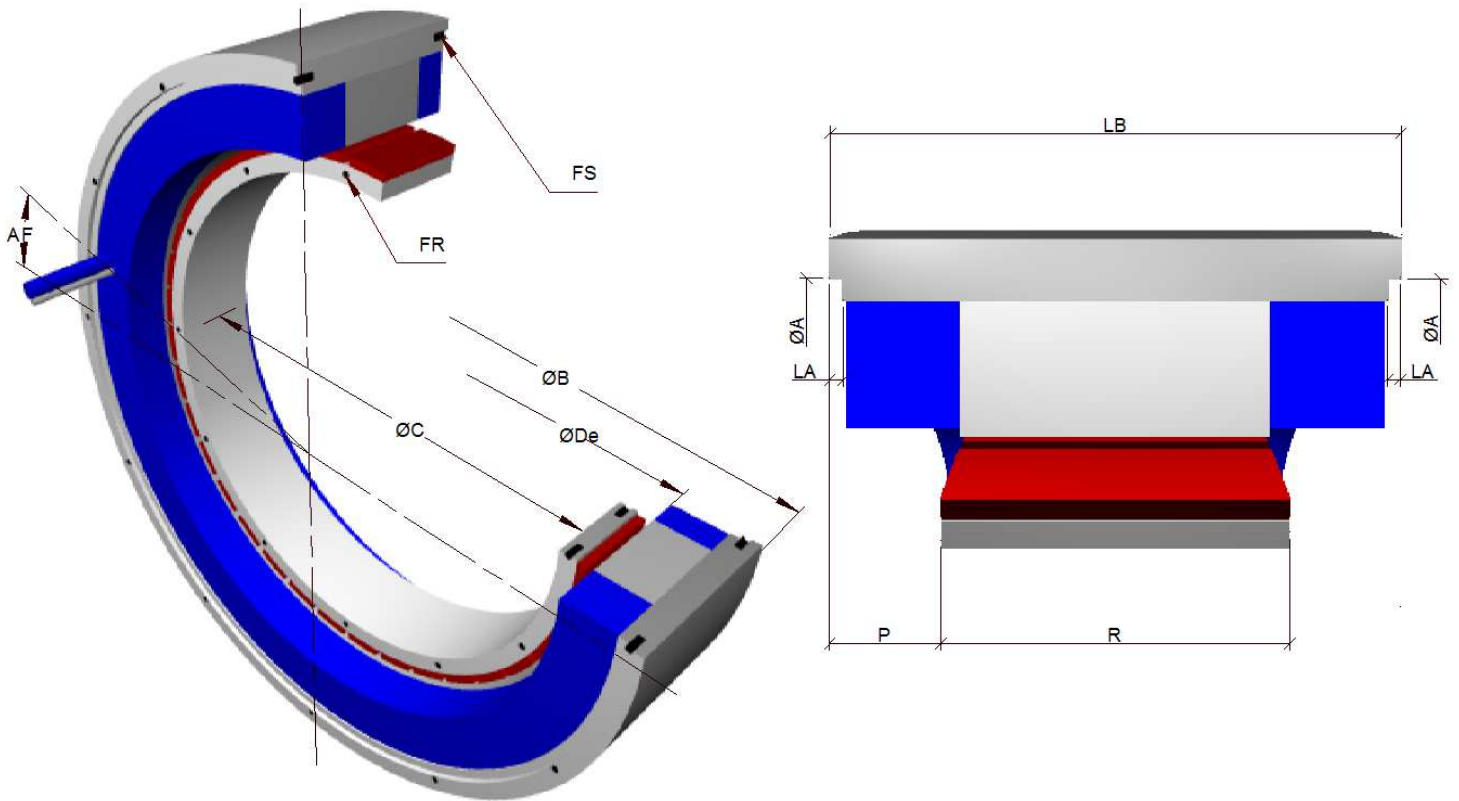
		800STK1M		800STK2M		800STK4M		800STK6M			
Rated speed		Rpm		80	400	80	400	80	400	80	350
Rated Power at Rated speed	Rated power (1)(2)	W	2823	22678	6860	43865	15029	77145	22884	95484	
	Input torque at rated speed(1)(2)	N.m	478	611	1049	1135	2196	1962	3259	2771	
	Efficiency at rated power (1)(2)	%	71	89	79	93	82	94	84	94	
	Current at rated power (1)	Amps	7.3	56.3	17	102.9	38.4	203	52.8	190	
	Voltage at rated power (1)(2)(3)	V	231	238	238	253	230	226	255	300	
Rated Power at Half speed	Rated Power at half speed (1)(2)	W	911	10009	2395	21318	6026	41694	9488	51789	
	Input torque at half speed (1)(2)	N.m	366	582	813	1161	2196	2188	3152	3084	
	Efficiency at half speed (1)(2)	%	60	82	71	88	68	91	72	92	
Number of poles (number of pairs of poles)		48 (24)									
Cogging torque		N.m	5.5		11		22		33		
Phase resistance at 20°C		Ohm	6.45	0.2	1.7	0.06	0.53	0.02	0.36	0.02	
Phase inductance (5)		mH	31	0.94	14.1	0.48	6.3	0.18	4.9	0.27	
Voltage at no load (back emf) at 20°C (4)		V	342	299	324	298	307	256	333	336	
Rotor inertia		10 ⁻³ Kg.m ²	1270		2540		5080		7620		
Weight		Kg	55		82		138		193		
Power cable square section (6)		mm ²	4x1.5	<u>4x10</u>	4x2.5	<u>4x25</u>	4x6	<u>4x70</u>	4x10	<u>4x50</u>	
Power cable diameter		mm	Ø8.6	<u>4xØ9.5</u>	Ø10.8	4x Ø13.5	Ø14	4x Ø20.1	Ø17.6	4x Ø17.1	

Alternator 800STK Power - Speed



- (1) Ambient temperature 40°C
Wind speed 10 m/s cooling the housing
Winding temperature rise < 100°C
Stator housing in contact with the ambient air or integral on all its peripheral area with a metallic armature in contact with the ambient air
Stator housing secured on a metallic frame getting an area equal to twice the cross section of the housing
- (2) Operation in sine wave mode with unity power factor
- (3) Line to line voltage. Voltage level may be adapted according to the application; please contact us
- (4) Line to line voltage, alternator at no load, rated speed and at 20°C
- (5) For current at rated power
- (6) For currents lower than 53 Amps, one cable
For currents over 53 Amps, four single wires output (highlighted in the table)

ALTERNATORS 800 STK



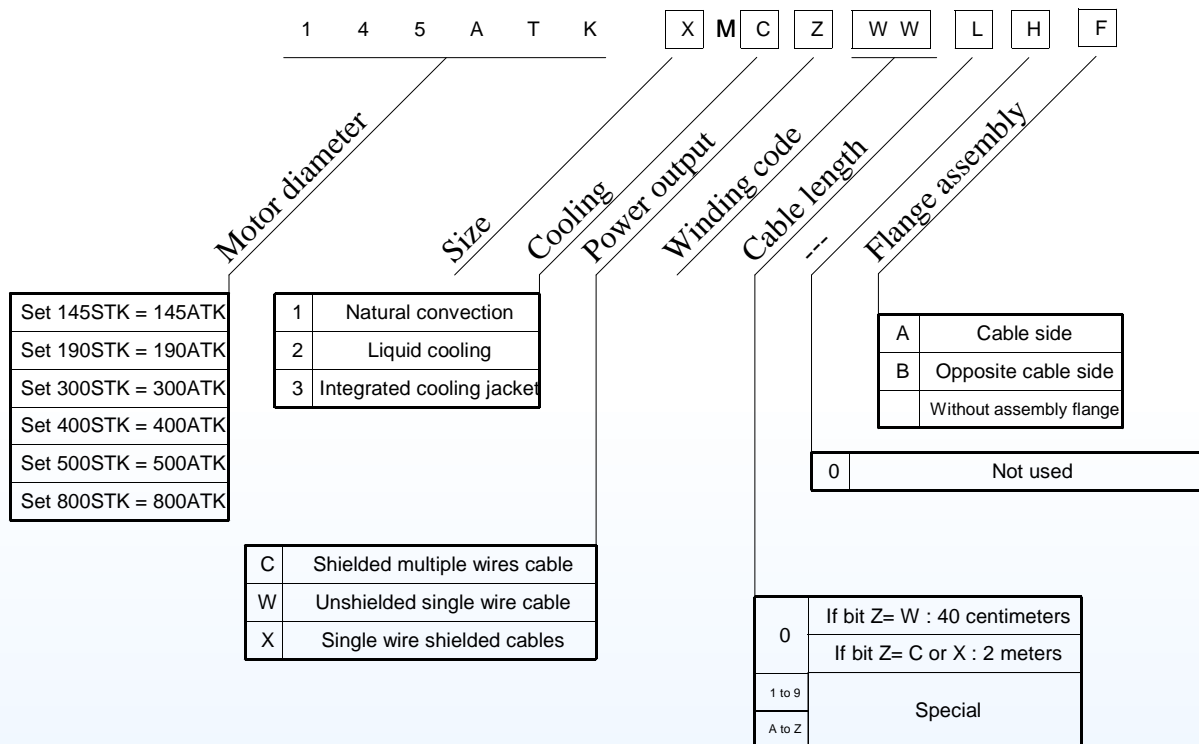
		800STK1M	800STK2M	800STK3M	800STK4M	800STK5M	800STK6M
Housing internal centering diameter	A H8	762	762	762	762	762	762
Angle wire output / tapped holes	AF	11.25	11.25	11.25	11.25	11.25	11.25
Housing external centering diameter	B Ø	795	795	795	795	795	795
Rotoric internal centering diameter	C H7	630	630	630	630	630	630
Housing internal diameter	De	689	689	689	689	689	689
Rotoric fixation holes	FR	16xM8 sur Ø645	16xM8 sur Ø645	16xM8 sur Ø645	16xM8 sur Ø645	16xM8 sur Ø645	16xM8 sur Ø645
Housing fixation holes	FS	16xM8 sur Ø774	16xM8 sur Ø774	16xM8 sur Ø774	16xM8 sur Ø774	16xM8 sur Ø774	16xM8 sur Ø774
Depth of housing internal centering diameter	LA	5	5	5	5	5	5
Housing length	LB ±0.15	112.5 (152.5)	140 (180)	167.5 (207.5)	195 (235)	222.5 (262.5)	250 (290)
Alignment rotor / housing	P ± 0.2	47 (87)	47 (87)	47 (87)	47 (87)	47 (87)	47 (87)
Maximum rotoric contact diameter	Pmax	666	666	666	666	666	666
Rotor length	R +0.15	27.5	55	82.5	110	137.5	165

INTEGRATION :

- ✓ The cables are made of PU, class 6, foreseen for cable-bearing chains, 2 mt standard length, copper square section according rated current.
- ✓ Rotor / housing alignment (P) has to be executed within +/- 0.2 mm. Optionally, we can supply a mounting tool for achieving that alignment in case of assembly without possibility of accurate alignment.
- ✓ Thermal device cable consists of a shielded pair 2x2x0.25mm² section, 7mm external diameter.
- ✓ (De) represents:
 - 1- The maximum diameter passing inside the housing.
 - 2- The maximum diameter necessary for rotor assembly.
- ✓ (Pmax) diameter for pieces in contact with the rotor must never be exceeded.
- ✓ Tapped holes on each side of rotor and housing are angularly aligned.
- ✓ Cable positioning (AF) is theoretical. Leave a free room with a +/- 10 arc degrees tolerance around that position, on a 50 mm height from the housing side, for avoiding to force the cables at the alternator output.
- ✓ When designing the assembly, take care to insure a perfect contact between housing and user's bore for avoiding thermal problems.
- ✓ For housing mounting, use either external centering diameter (B) or internal centering diameters (A).
- ✓ For execution tolerances (perpendicularity, concentricity...), please consult us.
- ✓ In **red** in the table : P, LB, J4 and E3 are 40mm higher when the nominal current is greater than 53 amps for class 6 shielded cable output. We also propose an output with unshielded wires that is not requiring an increase of length. (contact us for square section)

A full integration handbook can be supplied to our customers upon request
 For further information or specific request about our alternators, feel free to contact us.

CODIFICATION FOR STK ALTERNATORS



C: Cooling:

- 1: Natural convection:
Stator housing without cooling grooves (dimension and technical characteristics in this documentation)
- 2: Liquid cooling:
Stator housing with cooling grooves (contact us for dimensions or technical characteristics)
- 3: Integrated cooling jacket:
Stator with integrated cooling jacket (contact us for dimensions or technical characteristics)

W: Winding code:

- 01: Low speed in table of characteristics
- 02: High speed in table of characteristics
- XX: Special windings, contact us

L: Cable length:

1 to 9 and A to Z: Length and/or specific square section contact us.

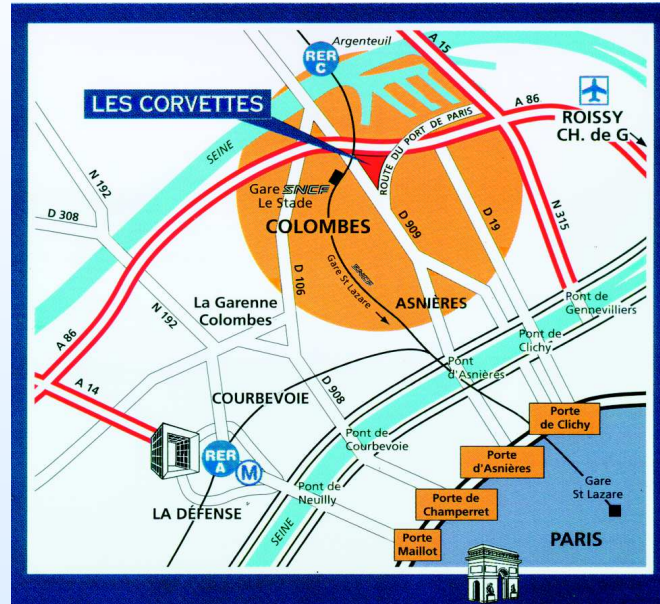
Join **ALXION** on its WEB site: <http://www.alxion.com>

Our site allows you to keep up with our products evolution, to download technical information or catalogues on your computer, to send us messages by e-mail.

Keep in touch with us: Surf on our bilingual site!



ACCESS TO OUR HEAD OFFICE



ALXION
Automatique
& Productique

Head Office: Parc Technologique "Les Fossés Jean"
142-176, Avenue de Stalingrad
F - 92712 COLOMBES Cedex
Phone: (33) 1 41 30 63 04
Fax: (33) 1 41 30 61 36
Web site: <http://www.alxion.com>