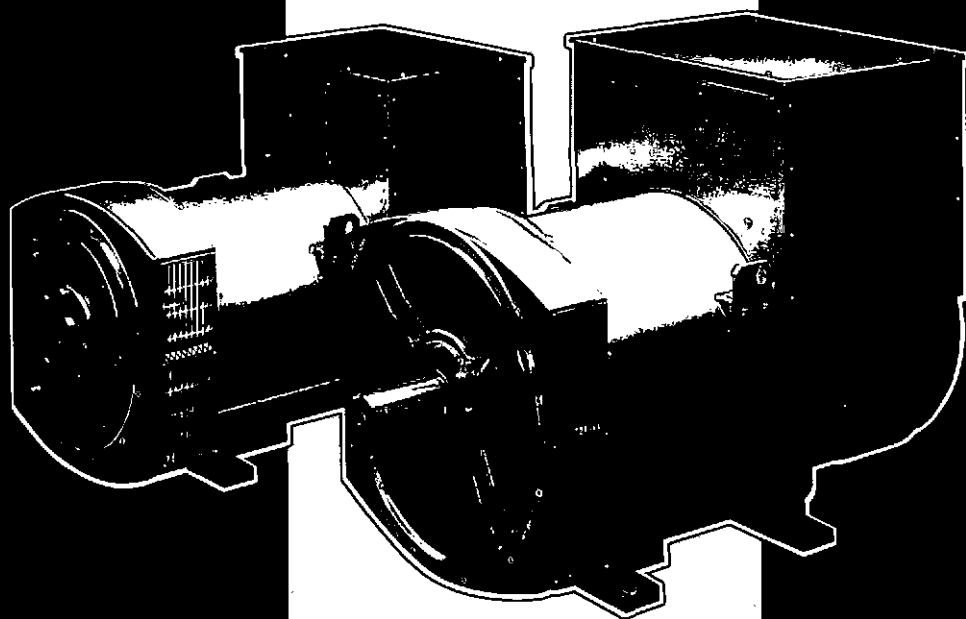


HC4&5



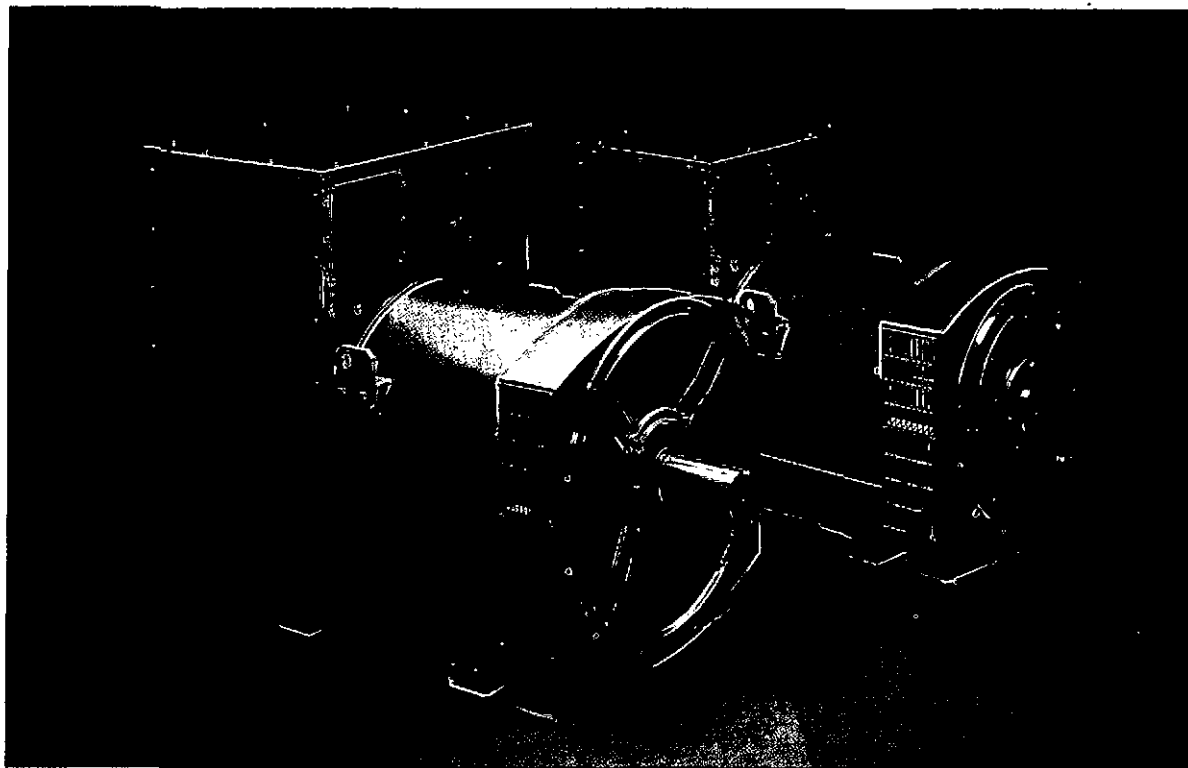
STAMFORD

AC GENERATORS FROM
NEWAGE INTERNATIONAL

HC4&5

STAMFORD

Setting the standard in AC generator technology



Newage International's long experience in generator manufacture, together with the most advanced design, production and testing facilities in the world, ensure that the Stamford range of brushless ac generators sets an international standard for ruggedness and reliability.

The full Stamford range covers ratings from 5kVA to 2,500kVA to meet the most demanding needs for industrial, marine, commercial, construction, mining or telecommunications, in fact all applications for prime or standby power generation.

Stamford HC4 and HC5 generators provide a range of ratings from 250kVA to 650kVA (50Hz) and 275kVA to 825kVA (60Hz) for industrial and marine applications.

They are available with Newage's famous Permanent Magnet Generator (PMG) excitation system, for the ultimate in reliability, response and stability. Newage's own world-beating Automatic Voltage Regulators, designed and produced specifically for the Stamford range of ac generators, are standard.

SPECIAL FEATURES OF THE HC4 & 5

- ★ Optional Permanent Magnet Generator (PMG) system provides constant excitation under all conditions.
- ★ Easy paralleling with mains or other generators. Standard 2/3 pitch windings avoid excessive neutral currents.
- ★ Dynamically balanced rotors, with sealed-for-life ball bearings and single or two-bearing construction.
- ★ Simple installation and maintenance, with easy access to terminals, rotating diodes and coupling bolts.
- ★ Wide range of flange adaptors and single-bearing disc couplings.
- ★ Built to conform with all leading industrial and marine standards.

SPECIFICATIONS AND OPTIONS

STANDARDS

HC4 and HC5 industrial generators meet the requirements of BS5000, VDE0530, UTE5100, NEMA MG1-22, CEMA, IEC34, CSA22.2 and AS1359.

Marine generators may be certified to Lloyds, DnV, Bureau Veritas, ABS, Germanischer-Lloyd or RINA.

Other standards and certifications can be considered on request.

EXCITATION SYSTEMS

SX440 AVR

With this self-excited system the main stator provides power via the automatic voltage regulator (AVR) to the exciter stator. The high efficiency semiconductors of the AVR ensure positive build up from initial low levels of residual voltage.

The exciter rotor output is fed to the main rotor through a three phase full wave bridge rectifier. The rectifier is protected by a surge suppressor against surges caused, for example, by short circuit or out-of-phase paralleling. The SX440 will support a range of electronic accessories, including a 'droop' Current Transformer (CT) to permit parallel operation with other ac generators.

If 3 phase sensing is required with the self excited system, the SX421 AVR must be used.

SX421 AVR

This AVR also operates in a self excited system. It combines all the features of the SX440 with additionally, three phase rms sensing for improved regulation ($\pm 0.5\%$) and performance. Over voltage protection is also built in, together with an engine relief load acceptance feature.

MX341 AVR

This sophisticated AVR is incorporated into the Stamford permanent magnet generator (PMG) system, and is fitted as standard to marine generators and as an option on industrial generators.

The PMG provides power via the AVR to the main exciter, giving a source of constant excitation power independent of generator output. The main exciter output is then fed to the main rotor, through a full wave bridge, protected by a surge suppressor. The AVR has in-built protection against sustained over-excitation, caused by internal or external faults. This de-excites the machine after a minimum of 5 seconds.

The two phase average voltage sensed MX341 provides voltage regulation of $\pm 1.0\%$. If three phase sensing is required with the PMG system the MX321 AVR must be used. We recommend three phase sensing for applications with greatly unbalanced or highly non linear loads. An engine relief load acceptance feature can enable full load to be applied to the generator in a single step.

MX 321 AVR

The most sophisticated of all our AVRs combines all the features of the MX341 with, additionally, three phase rms sensing, for improved regulation ($\pm 0.5\%$) and performance.

Over voltage protection is built-in and short circuit current level adjustment is an optional facility.

INSULATION / IMPREGNATION

The insulation system is Class 'H'.

All wound components are impregnated with materials and processes designed specifically to provide protection against the harsh environments encountered in generator applications. Varnishes and resins are selected and developed to provide the high build required for static windings and the high mechanical strength required for rotating components.

WINDINGS & ELECTRICAL PERFORMANCE

All generator stators are wound to 2/3 pitch. This eliminates triplen (3rd, 9th, 15th...) harmonics on the voltage waveform and is found to be the optimum design for trouble-free supply of non linear loads. The 2/3 pitch design avoids excessive neutral currents, sometimes seen with higher winding pitches, when in parallel with the mains.

A fully connected damper winding reduces oscillations during paralleling. This winding, with the 2/3 pitch and carefully selected pole and tooth designs, ensures very low waveform distortion.

TELEPHONE INTERFERENCE

THF (as defined by BS4999 Part 40) is better than 2%. TIF (as defined by ASA C50.12) is better than 50.

RADIO INTERFERENCE

The absence of brushgear and the high quality AVR ensure low levels of interference with radio transmissions. Additional RFI suppression may be supplied if required.

TERMINALS & TERMINAL BOX

Standard generators are three phase reconnectable with 12 ends brought out to the terminals, which are mounted from the frame at the non-drive end of the generator. A sheet steel terminal box contains the AVR and provides ample space for customers' wiring and gland arrangements. It has removable panels for easy access.

ENCLOSURE

IP22 (NEMA 1) is standard for all industrial generators. Protection to IP23 (60° from the vertical) is available as an option at reduced ratings (5% derate). IP23 is standard on marine generators.

Inlet air filters are available as an option on all generators, at reduced ratings (5% derate).

SHAFT AND KEYS

All generator rotors are dynamically balanced to better than BS6861: Part 1 Grade 2.5 for minimum vibration in operation. Two bearing generators are balanced with a half key.

ADAPTORS AND COUPLINGS

The HC4 and HC5 are available in single or two-bearing construction. For HC4 single bearing construction adaptors may be specified to SAE 0, $\frac{1}{2}$ & 1: Disc couplings to SAE 11.5, 14 & 18.

For HC5 single bearing construction adaptors may be specified to SAE 00, 0 & $\frac{1}{2}$: Disc couplings to SAE 14, 18 & 21.

Two bearing HC4 adaptors may be specified to SAE 0, $\frac{1}{2}$ & 1 and HC5 to SAE 00, 0, $\frac{1}{2}$ & 1.

QUALITY ASSURANCE

Generators are manufactured using production procedures having a quality assurance level to BS5750 Part 2 (ISO 9002).

FURTHER REFERENCES

SX440 AVR Technical Specification Sheet 5512

SX421 AVR Technical Specification Sheet 5516

MX341 AVR Technical Specification Sheet 5513

MX321 AVR Technical Specification Sheet 5514

Full Technical Data Sheets

HC4: 6401-6404

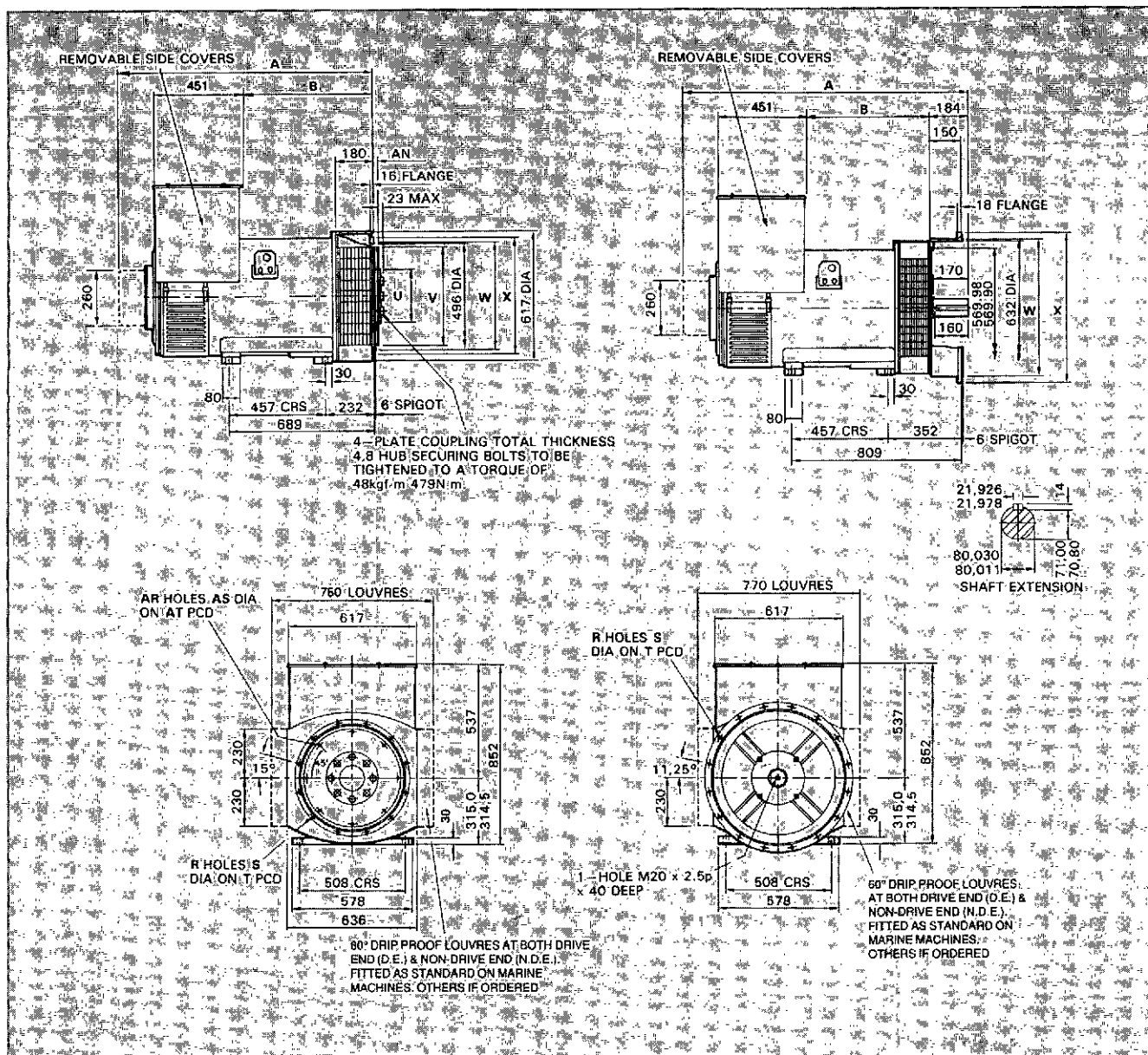
HC5: 6501-6504

Note: Continuous development of our products entitles us to change specification details without notice. Therefore they must not be regarded as binding.

HC4

SINGLE BEARING

TWO BEARING



DIMENSIONS		
S.A.E No	AN	AS
HC434/444C	1207	584
HC434/444D	1207	584
HC434/444E	1207	584
HC434/444F	1297	674

DISC COUPLINGS		
S.A.E No	AN	AS
HC434/444C	1207	584
HC434/444D	1207	584
HC434/444E	1207	584
HC434/444F	1297	674

FLANGE ADAPTORS		
S.A.E No	AN	AS
HC434/444C	1207	584
HC434/444D	1207	584
HC434/444E	1207	584
HC434/444F	1297	674

SHIPPING DETAILS		
S.A.E No	AN	AS
HC434/444C	1207	584
HC434/444D	1207	584
HC434/444E	1207	584
HC434/444F	1297	674

DIMENSIONS		
S.A.E No	AN	AS
HC434/444C	1361	554
HC434/444D	1361	554
HC434/444E	1361	554
HC434/444F	1451	699

FLANGE ADAPTORS		
S.A.E No	AN	AS
HC434/444C	1361	554
HC434/444D	1361	554
HC434/444E	1361	554
HC434/444F	1451	699

SHIPPING DETAILS		
S.A.E No	AN	AS
HC434/444C	1361	554
HC434/444D	1361	554
HC434/444E	1361	554
HC434/444F	1451	699

NOTES:

1. "A" Dimension is given for HC434 (ie with PMG). For HC444 (without PMG) subtract 107mm.
2. Shipping Details are given for HC434 (ie with PMG). For HC444 (without PMG) subtract 15kg from all weights and 14cm from case length.

Illustrations and weights are approximate only.
If in any doubt please refer to factory for General Arrangement drawings.

RATINGS INDUSTRIAL

		50Hz								60Hz									
Voltages		Class H (125°C)				Class F (105°C)				Class H (125°C)				Class F (105°C)					
Series Star (Wye)		380	400	415	440	380	400	415	440	416	440	460	480	600	416	440	460	480	600
Parallel Star (Wye)		190	200	208	220	190	200	208	220	208	220	230	240	300	208	220	230	240	300
Series Delta		220	230	240	254	220	230	240	254	240	254	266	277	346	240	254	266	277	346

HC4C	kVA	250	250	260	260	220	225	230	230	275	288	300	313	313	263	269	275	281	281
	kW	200	200	208	208	176	180	184	184	220	230	240	250	250	210	215	220	225	225
	Eff%	92.0	92.4	92.7	92.9	92.5	92.8	93.0	93.2	92.2	92.5	92.7	92.8	92.8	94.0	92.8	93.0	93.2	93.2
	kW Input	217	216	224	224	190	194	198	197	239	249	259	269	269	223	232	237	241	241

HC4D	kVA	275	275	280	280	250	250	255	255	313	325	344	356	356	288	300	313	325	325
	kW	220	220	224	224	200	200	204	204	250	260	275	285	285	230	240	250	260	260
	Eff%	92.6	92.9	93.1	93.4	92.8	93.1	93.2	93.6	92.6	92.9	93.0	93.2	93.2	92.8	93.0	93.2	93.4	93.4
	kW Input	238	237	241	240	216	215	219	218	270	280	296	306	306	248	258	268	278	278

HC4E	kVA	325	325	335	335	300	300	305	305	381	394	406	419	419	350	363	375	381	381
	kW	260	260	268	268	240	240	244	244	305	315	325	335	335	280	290	300	305	305
	Eff%	93.0	93.0	93.4	93.7	93.2	93.4	93.6	93.9	92.8	93.1	93.4	93.5	93.5	93.1	93.2	93.5	93.8	93.8
	kW Input	280	279	287	286	258	257	261	260	329	338	348	358	358	301	311	321	325	325

HC4F	kVA	380	380	390	380	350	350	350	350	438	450	463	475	475	400	413	438	438	438
	kW	304	304	312	304	280	280	280	280	350	360	370	380	380	320	330	350	350	350
	Eff%	92.6	93.0	93.1	93.5	92.8	93.2	93.4	93.5	92.7	93.0	93.2	93.4	93.4	93.0	93.2	93.2	93.6	93.6
	kW Input	328	327	335	325	302	300	300	299	378	387	397	407	407	344	354	376	374	374

RATINGS MARINE

		50Hz								60Hz									
Voltages		Class F (90°C)				Class B (70°C)				Class F (90°C)				Class B (70°C)					
Series Star (Wye)		380	400	415	440	380	400	415	440	416	440	460	480	600	416	440	460	480	600
Parallel Star (Wye)		190	200	208	220	190	200	208	220	208	220	230	240	300	208	220	230	240	300
Series Delta		220	230	240	254	220	230	240	254	240	254	266	277	346	240	254	266	277	346

MHC4C	kVA	200	200	210	210	175	175	185	185	231	238	250	256	256	200	205	220	225	225
	kW	160	160	168	168	140	140	148	148	185	190	200	205	205	160	164	176	180	180
	Eff%	92.8	93.1	93.2	93.4	93.2	93.4	93.5	93.7	92.8	93.1	93.3	93.4	93.4	93.2	93.4	93.5	93.6	93.6
	kW Input	172	172	180	180	150	150	158	158	199	204	214	219	219	172	176	188	192	192

MHC4D	kVA	225	225	230	230	195	195	200	200	256	269	281	294	294	225	235	248	258	258
	kW	180	180	184	184	156	156	160	160	205	215	225	235	235	180	188	198	206	206
	Eff%	93.2	93.5	93.6	93.8	93.5	93.7	93.8	93.9	93.2	93.4	93.6	93.6	93.6	93.4	93.6	93.8	94.0	94.0
	kW Input	193	193	197	196	167	167	171	170	220	230	240	251	251	193	201	211	219	219

MHC4E	kVA	270	270	275	275	238	238	240	240	313	325	338	344	344	275	285	295	303	303
	kW	216	216	220	220	190	190	192	192	250	260	270	275	275	220	228	236	242	242
	Eff%	93.6	93.8	93.8	94.0	93.8	94.0	94.1	94.3	93.5	93.7	93.8	94.0	94.0	93.8	94.0	94.0	94.2	94.2
	kW Input	231	230	235	234	203	202	204	204	267	277	288	293	293	235	243	251	257	257

MHC4F	kVA	300	300	310	310	263	263	273	273	363	380	381	394	394	319	330	335	344	344
	kW	240	240	248	248	210	210	218	218	290	304	305	315	315	255	264	268	275	275
	Eff%	93.3	93.5	93.6	93.8	93.6	93.8	93.9	94.0	93.3	93.6	93.6	93.8	93.8	93.6	93.8	93.8	93.9	93.9
	kW Input	257	257	265	264	224	224	232	232	311	325	326	336	336	272	281	286	293	293

GENERAL NOTES

All Industrial ratings are 3 phase based on 40°C ambient temperature and 1000m altitude.

Marine ratings are based on 50°C ambient unrestricted use.

All generators are 4 Pole.

All voltages listed are available from a single broad-range winding except 600V, 60Hz which requires a different winding.

Other voltages will be considered on request.

TWO BEARING



Illustrations and weights are approximate only.
If in any doubt please refer to factory for General Arrangement drawings.

RATINGS INDUSTRIAL

50Hz

Voltages	Class H (125°C)				Class F (105°C)			
Series Star (Wye)	380	400	415	440	380	400	415	440
Parallel Star (Wye)	190	200	208	220	190	200	208	220
Series Delta	220	230	240	254	220	230	240	254

HC5C	kVA	450	450	465	465	400	400	415	415
	kW	360	360	372	372	320	320	332	332
	Eff%	93.8	94.1	94.2	94.5	94.1	94.4	94.5	94.7
	kW Input	384	383	395	394	340	339	351	351

HC5D	kVA	505	510	530	530	450	465	480	480
	kW	404	408	424	424	360	372	384	384
	Eff%	94.1	94.4	94.5	94.7	94.2	94.6	94.6	94.9
	kW Input	429	432	449	448	382	393	406	405

HC5E	kVA	575	585	600	600	525	540	550	550
	kW	460	468	480	480	420	432	440	440
	Eff%	94.6	94.8	94.9	95.1	94.8	95.0	95.0	95.2
	kW Input	486	494	506	505	443	455	463	462

HC5F	kVA	630	630	650	650	575	575	600	600
	kW	504	504	520	520	460	460	480	480
	Eff%	94.7	95.0	95.1	95.3	94.9	95.2	95.2	95.4
	kW Input	532	531	547	546	485	483	504	503

60Hz

Class H (125°C)					Class F (105°C)				
416	440	460	480	600	416	440	460	480	600
208	220	230	240	300	208	220	230	240	300
240	254	266	277	346	240	254	266	277	346

	kVA	575	550	581	594	563	481	500	531	538	506
	kW	420	440	465	475	450	385	400	425	430	405
	Eff%	93.7	93.9	94.0	94.2	94.2	93.8	94.2	94.2	94.4	94.4
	kW Input	448	469	495	504	478	410	425	451	456	429

	kVA	575	594	625	644	644	519	538	563	588	588
	kW	460	475	500	515	515	415	430	450	470	470
	Eff%	94.0	94.3	94.4	94.6	94.6	94.3	94.5	94.6	94.8	94.8
	kW Input	489	504	530	544	544	440	455	476	496	496

	kVA	681	713	731	750	719	625	650	663	675	650
	kW	545	570	585	600	575	500	520	530	540	520
	Eff%	94.4	94.6	94.8	94.9	94.9	94.6	94.9	95.0	95.1	95.1
	kW Input	577	603	617	632	606	529	548	558	568	547

	kVA	738	775	800	825	825	688	719	731	750	750
	kW	590	620	640	660	660	550	575	585	600	600
	Eff%	94.6	94.8	94.9	95.1	95.1	95.2	95.0	95.1	95.2	95.2
	kW Input	624	654	674	694	694	578	605	615	630	630

RATINGS MARINE

50Hz

Voltages	Class F (90°C)				Class B (70°C)			
Series Star (Wye)	380	400	415	440	380	400	415	440
Parallel Star (Wye)	190	200	208	220	190	200	208	220
Series Delta	220	230	240	254	220	230	240	254

MHC5C	kVA	365	370	380	380	320	325	334	334
	kW	292	296	304	304	256	260	267	267
	Eff%	94.4	94.5	94.7	94.9	94.6	94.8	94.9	94.9
	kW Input	309	313	321	320	271	274	281	281

MHC5D	kVA	405	415	430	430	356	365	378	378
	kW	324	332	344	344	285	292	302	302
	Eff%	94.6	94.8	94.9	95.0	94.8	94.9	95.0	95.1
	kW Input	342	350	362	362	301	308	318	318

MHC5E	kVA	475	490	505	505	418	430	440	440
	kW	380	392	404	404	334	334	352	352
	Eff%	94.9	95.2	95.2	95.3	95.1	95.3	95.3	95.4
	kW Input	400	412	424	424	351	361	369	369

MHC5F	kVA	505	525	540	540	440	455	470	470
	kW	404	420	432	432	352	364	376	376
	Eff%	95.1	95.3	95.3	95.4	95.3	95.4	95.4	95.4
	kW Input	425	441	453	453	369	382	394	394

60Hz

Class F (90°C)					Class B (70°C)				
416	440	460	480	600	416	440	460	480	600
208	220	230	240	300	208	220	230	240	300
240	254	266	277	346	240	254	266	277	346

	kVA	431	450	475	481	450	378	395	418	423	390
	kW	345	360	380	385	360	302	318	334	338	312
	Eff%	94.3	94.4	94.5	94.7	94.7	94.4	94.6	94.7	94.8	95.0
	kW Input	366	381	402	407	380	320	334	353	357	328

	kVA	463	488	506	531	531	405	428	445	468	468
	kW	370	390	405	425	425	324	342	356	374	374
	Eff%	94.5	94.7	94.8	94.9	94.9	94.8	94.9	95.0	95.0	95.0
	kW Input	392	412	427	448	448	342	360	375	394	394

	kVA	563	588	584	606	581	495	515	523	533	510
	kW	450	470	475	485	465	395	412	418	426	408
	Eff%	94.8	95.0	95.1	95.2	95.2	95.0	95.2	95.2	95.4	95.3
	kW Input	475	495	499	509	488	417	433	439	447	428

	kVA	619	644	656	663	663	544	565	578	583	583
	kW	495	515	525	530	530	435	452	462	466	466
	Eff%	95.0	95.2	95.2	95.3	95.3	95.1	95.3	95.3	95.4	95.4
	kW Input	521	541	551	556	556	458	474	485	489	489

GENERAL NOTES

All Industrial ratings are 3 phase based on 40°C ambient temperature and 1000m altitude.

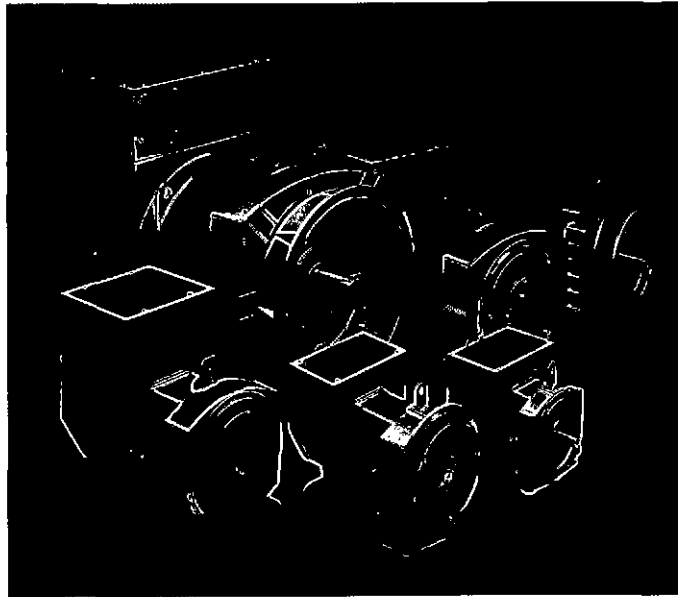
Marine ratings are based on 50°C ambient unrestricted use.

All generators are 4 Pole.

All voltages listed are available from a single broad-range winding except 600V, 60Hz which requires a different winding.

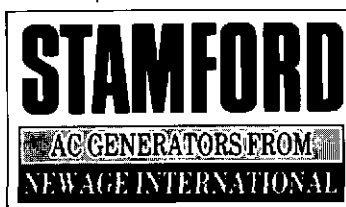
Other voltages will be considered on request.

The Stamford range



First for performance First for dependability

Stamford AC generators rarely draw attention to themselves. While they may be seen in all the worst places in the world - in remote mining installations or at sea withstanding the ravages of salt, sand and spray - the fact remains that their performance and dependability are unsurpassed. Years of experience in design and manufacture sees to that. When help is needed, however, it is readily available... anywhere in the world. It starts with specification and installation, with assistance and advice to provide precisely the generator the job demands. It continues through commissioning and into after-sales. Newage service engineers are experienced professionals with extensive training in electrical, electronic and mechanical skills. They, in their turn, are supported by a worldwide spares and service network. In fact, with field support and service available in almost every country in the world Newage International is...truly international.



Please note: Continuous development of our products entitles us to change specification details without notice. Therefore they must not be regarded as binding.

Newage Limited, PO Box 103, 3 Independence Court, Folcroft Industrial Park, Folcroft, Pennsylvania 19032 USA.

Telephone: (215) 534 9500. Telex: 845276. Fax: (215) 534 0505.