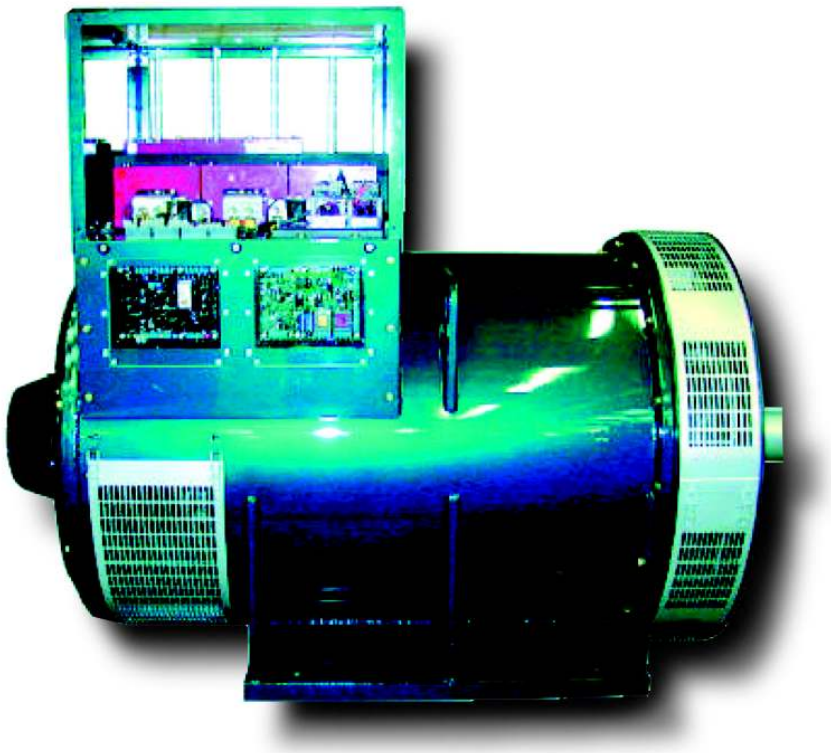
STAMFORD®

Product Guide

There for you ™

Cummins® Generator Technologies



Versatile, robust and reliable brushless ac generators up to 2750kVA

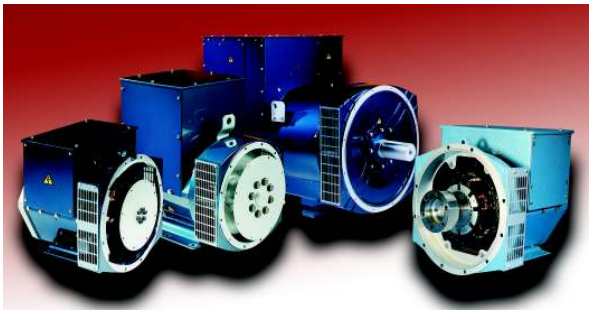
Brushless ac generators up to 2750 kVA

Internationally renowned for built-in quality, reliability, and innovation, STAMFORD ac generators from Cummins Generator Technologies set the industry standard, with a range extending from 5 to 2750 kVA, suitable for all ac generator set configurations. The STAMFORD range supplies ac generators for industrial, marine/offshore, commercial, construction, rental, combined heat and power, parallel operation, peak shaving, telecommunications, mining, and other standby or continuous power applications. STAMFORD brushless ac generators are available with a choice of SAE adaptors to ensure easy coupling to a wide range of prime movers. STAMFORD also offers bespoke ranges designed for direct mounting on major engine ranges.

BC-Range	UC-Range	HC-Range	P-Range
5 kVA – 40 kVA	**40 kVA – 250 kVA**	**250 kVA –1438 kVA**	**1260 kVA – 2750 kVA**
2-pole or 4-pol configuration	4-pole configuration	4-pole or 6-pole configuration	4-pole or 6-pole configuration
A broad range of single and three phase voltages are available from a 12 wire reconnectable winding. **BCI184 can be fitted with an auxiliary winding for applications where a sustained short circuit is required.** **The BCM (marine) generator has an auxiliary winding as standard.**	**A broad range of single and three phase voltages are available from a 12 wire reconnectable winding.** **A permanent magnet generator (PMG) is available as an option to sustain a short circuit.**	**A broad range of single and three phase voltages are available from a 12 wire reconnectable winding upto 800kVA.** **The HC6 (upto 1000kVA) gives a range of voltages from a standard 6 wire winding. A 12 wire winding is offered on the HC6 as an option.** **A permanent magnet generator (PMG) is fitted as standard.**	**A broad range of single and three phase voltages are available from a 6 wire reconnectable winding.** **A permanent magnet generator (PMG) is fitted as standard.**

For more information on our AVK range of larger generators 4- to 18-poles from 2000kVA to 30,000kVA, please contact our AVK office - Tel: +49 (0) 610 350390 or Fax: +49 (0) 610 3503940 or visit our website: www.cumminsgeneratortechnologies.com

STAMFORD ac generators set an international standard for ruggedness and reliability. The range of ac generators includes 2-pole, 4-pole, and 6-pole ac generators at low voltages up to 690V.

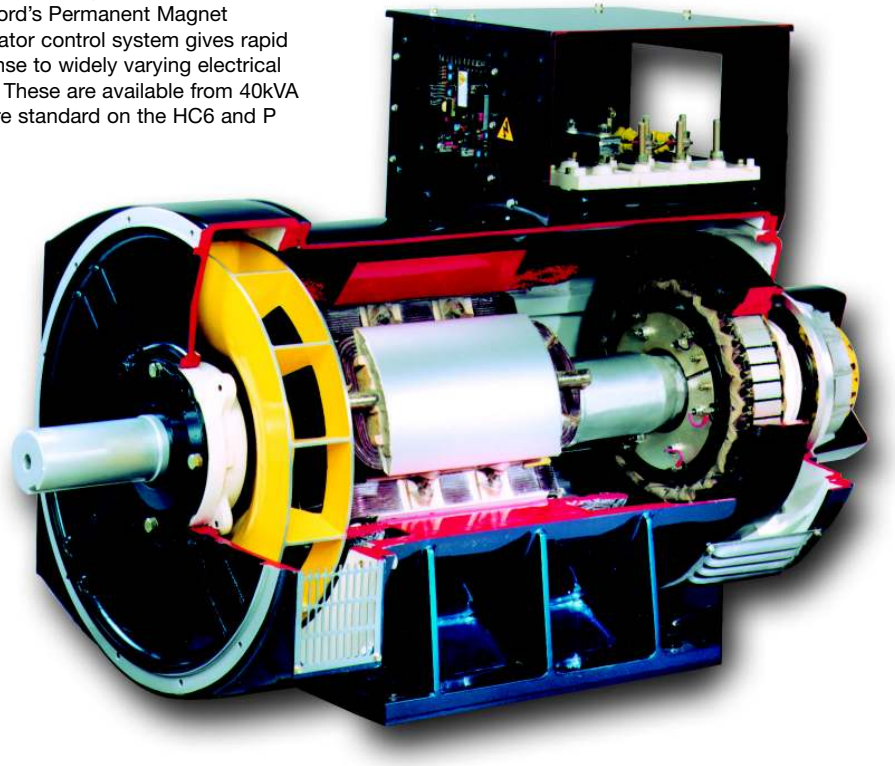


Versatile, robust and reliable ac generators

Winding Pitches
A 2/3 winding pitch is used for optimal performance.

AVR Controlled
Cummins Generator Technologies has over 30 years experience in producing the STAMFORD range of Automatic Voltage Regulators for the ultimate in reliability and control.

Permanent Magnet Excitation
Stamford's Permanent Magnet Generator control system gives rapid response to widely varying electrical loads. These are available from 40kVA and are standard on the HC6 and P range.



Easy Installation
Terminal boxes are supplied with removable panels for ease of wiring and glanding.

Dynamically Balanced Rotors
All rotors are balanced to a minimum of ISO 1940/1 (BS 6861: Part 1), Grade 2.5 minimum operating vibration. Two bearing ac generators are balanced with a half key.

BC PRODUCT RANGE

BCI 16

- A range of 2 and 4 pole, single or 2 bearing AVR controlled generators
- Engine adaptors to SAE 4, 5, & 6, and coupling disks to SAE 6½, 7½, 8, 10 & 11½ are offered
- 12 wire reconnectable for a wide range of voltages (single or three phase), or 4 wire dedicated single phase
- Voltages available range up to 600v
- IP23 enclosure protection is standard

Industrial Class "H" Continuous Ratings (kVA)			
		50 Hz	60Hz
3 phase	2 pole	12.5 - 25.0	15.6 - 31.3
3 phase	4 pole	8.1 - 16.0	9.6 - 20.0
Dedicated single phase	2 pole	8.4 - 16.8	10.0 - 20.6
Dedicated single phase	4 pole	5.4 - 10.8	6.4 - 13.5

Marine version of this range are not offered

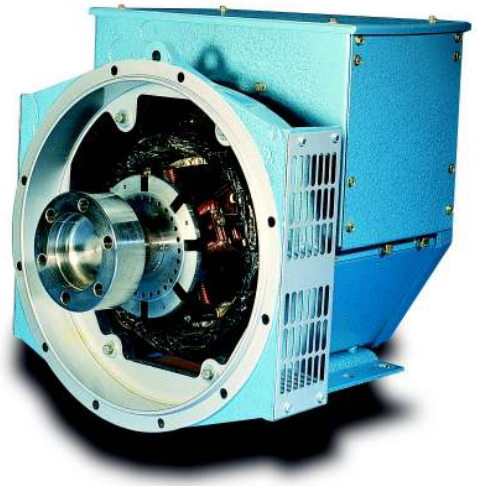
BCI/BCM 18

- A range of 2 and 4 pole, single or two bearing AVR controlled generators
- Engine adaptors to SAE 2, 3, 4, and 5, and coupling disks to SAE 6½, 7½, 8, 10 & 11½ are offered
- 12 wire reconnectable for a wide range of voltages (single or three phase), or 4 wire dedicated single phase. An auxiliary wound version of BCI 18 is available for applications where sustained short circuit is required
- The auxiliary wound version is standard on marine (BCM 18) generators
- Voltages available range up to 690v Industrial/480v Marine
- IP23 enclosure protection is standard

Industrial Class "H" Continuous Ratings (kVA)			
		50 Hz	60Hz
3 phase	2 pole	28.0 - 37.5	35.0 - 46.9
3 phase	4 pole	22.5 - 42.5	30.0 - 50.0
Dedicated single phase	2 pole	20.0 - 25.0	22.7 - 28.4
Dedicated single phase	4 pole	15.0 - 28.0	18.4 - 35.0
Marine Class "F" Continuous Ratings (kVA)			
Auxiliary wound	4 pole	15.0 - 32.6	19.3 - 38.7

BC PRODUCT RANGE

BCLI 16/18



- A range of 4 pole, single bearing AVR controlled generators, designed specifically for application to the Lister Petter TS and TR engine ranges
- The fanless rotor and special coupling hub are designed for mounting to the TS/TR engine ranges, using the engine cooling system to cool the generator
- Windings offered include 12 wire reconnectable (for single or three phase), 4 wire dedicated single phase, and an auxiliary wound version of BCLI 18 for applications where sustained short circuit is required
- Voltages available range up to 690V
- IP23 enclosure protection is standard

Industrial Class "H" Continuous Ratings (kVA)

		50 Hz	60Hz
3 phase	4 pole	7.5 - 25.0	9.4 - 30.0
Dedicated single phase	4 pole	5.4 - 16.9	6.9 - 21.0

BCAI 16

- A range of 2 and 4 pole, single or two bearing AVR controlled generators, designed specifically for application to the Lister Petter Alpha (LPA & LPW) engine range
- Engine adaptors to suit the standard light flywheel Alpha engine or the "G Build" variant with SAE 5/7½ coupling, or alternatively the heavy flywheel engine, are offered
- 12 wire reconnectable for a wide range of voltages (single or three phase), or 4 wire dedicated single phase
- Voltages available range up to 690v
- IP23 enclosure protection is standard

Industrial Class "H" Continuous Ratings (kVA)

		50 Hz	60Hz
3 phase	2 pole	12.0 - 40.0	14.7 - 50.0
3 phase	4 pole	8.1 - 30.0	9.6 - 35.6
Dedicated single phase	2 pole	8.4 - 27.0	10.0 - 33.5
Dedicated single phase	4 pole	5.4 - 20.0	6.4 - 24.0

TRANSFORMER CONTROLLED

- A range of 4 pole, single or two bearing transformer controlled generators designed for very high motor starting loads (450% for up to 7 seconds) where fine voltage regulation is less critical
- Engine adaptors to SAE 2, 3 4, 5 & 6, and coupling discs to SAE 6½, 7½, 8, 10 and 11½. are offered on the BCI versions
- Dedicated adaptors for Lister Petter Alpha and TS/TR engine ranges are available on the BCAI & BCLI
- Windings are specific to output voltage (single or three phase)
- Voltages available up to 480v
- IP23 enclosure protection is standard

Industrial Continuous Ratings (kVA)			
		50 Hz	60Hz
BCI 16 - 3 phase	4 pole	6.3 - 12.5	7.8 - 15.6
BCI 18 - 3 phase	4 pole	17.5 - 25.0	21.9 - 31.3
BCAI 16 - 3 phase	4 pole	6.3 - 23.8	7.8 - 28.5
BCLI 16 - 3 phase	4 pole	6.3 - 12.5	7.8 - 15.6
BCLI 18 - 3 phase	4 pole	17.5 - 20.0	21.9 - 25.0
BCI 16 - 1 phase	4 pole	4.0 - 8.1	5.0 - 10.0
BCI 18 - 1 phase	4 pole	11.5 - 16.8	14.4 - 21.0
BCAI 16 - 1 phase	4 pole	4.0 - 15.9	5.0 - 19.9
BCLI 16 - 1 phase	4 pole	4.0 - 8.1	5.0 - 10.0
BCLI 18 - 1 phase	4 pole	11.5 - 13.5	14.4 - 16.9

UCI 22

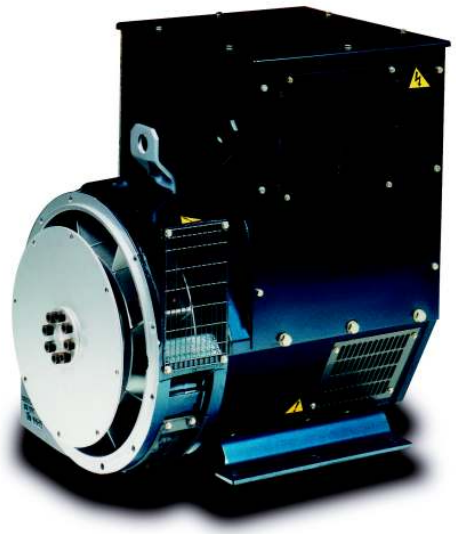
- A range of 4 pole, single or two bearing transformer controlled generators designed for very high motor starting loads (450% for up to 7 seconds) where fine voltage regulation is less critical
- Engine adaptors to SAE 1,2,3 & 4 and coupling discs to SAE 8, 10, 11½ & 14 are offered on UCI 22 generators
- Windings are specific to output voltage (singe or three phase)
- Voltages available range up to 480v Industrial and Marine
- IP23 enclosure protection is standard

Industrial Class “H” Continuous Ratings (kVA)			
		50 Hz	60Hz
UCI 22 - 3 phase	4 pole	30.0 - 65.0	37.5 - 81.0
UCI 22 - 1 phase	4 pole	20.0 - 43.5	25.0 - 54.4

UC PRODUCT RANGE

UCI/UCM 22

- UCI/UCM 22 is a range of 4 pole, single or two bearing AVR controlled generators
- Engine adaptors to SAE 1,2,3 & 4 and coupling discs to SAE 8, 10, 11 & 14 are offered for UCI /UCM 22.
- 12 wire reconnectable for a wide range of voltages (single or three phase), or 4 wire dedicated single phase
- Voltages available range up to 690v
- IP23 enclosure protection is standard

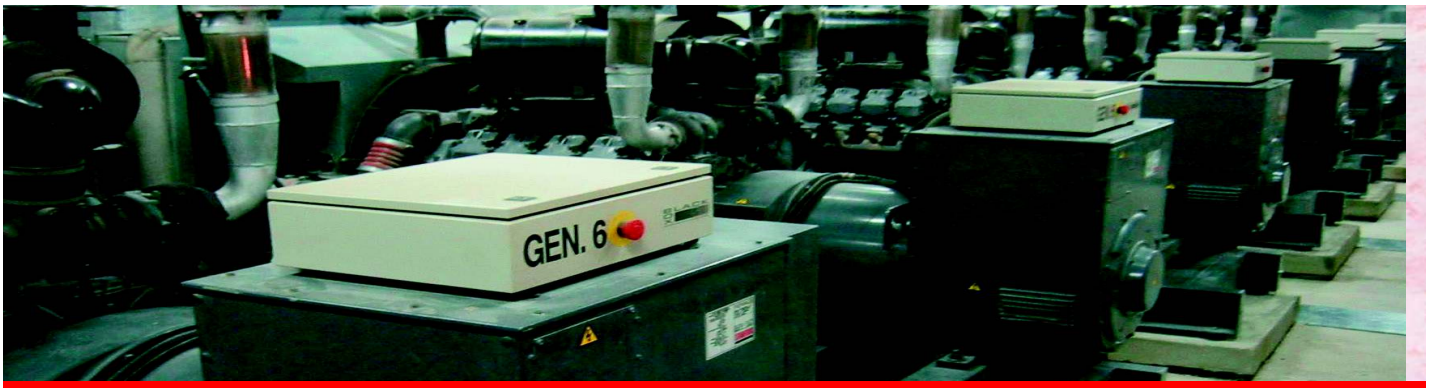


Industrial Class "H" Continuous Ratings (kVA)			
		50 Hz	60Hz
UCI 22 - 3 phase	4 pole	42.5 - 85.0	52.5 - 103.8
Marine Class "F" Continuous Ratings (kVA)			
UCM 22 - 3 phase	4 pole	35.0 - 65.0	43.1 - 81.3

UCI/UCM 27 & UCDI 27

- UCI/UCM 27 is a range of 4 pole, single or two bearing AVR controlled generators
- Engine adaptors to SAE1, 2 & 3 and coupling discs to SAE 10, 11½ & 14 are offered for UCI/UCM 27
- UCDI 27 higher output option, dedicated to SAE 2/11½ or 1/14 adaptor/disc combinations
- Windings offered are 12 wire reconnectable (for single or three phase)
- Voltages available range up to 690V
- IP23 enclosure protection is standard

Industrial Class "H" Continuous Ratings (kVA)			
		50 Hz	60Hz
UCI 27 - 3 phase	4 pole	100.0 - 200.0	112.5 - 255.0
UCDI 27 - 3 phase	4 pole	230.0 - 250.0	300.0 - 312.5
Marine Class "F" Continuous Ratings (kVA)			
UCM 27 - 3 phase	4 pole	77.5 - 170.0	90.0 - 218.8



HC GENERATOR RANGE

HCI/HCM4

- HCI/HCM 4 is a range of 4 pole, single or two bearing AVR controlled generators
- Engine adaptors to SAE 0, ½, 1, 2 & 3 and coupling discs to SAE 11½, 14 & 18 are offered for HC/HCM 4
- Windings offered are 12 wire reconnectable
- Voltages available range up to 690v
- IP23 enclosure protection is standard

Industrial Class "H" Continuous Ratings (kVA)			
		50 Hz	60Hz
HCI 4 - 3 phase	4 pole	250 - 400	285 - 500
Marine Class "F" Continuous Ratings (kVA)			
HCM 4 - 3 phase	4 pole	200 - 310	269 - 425

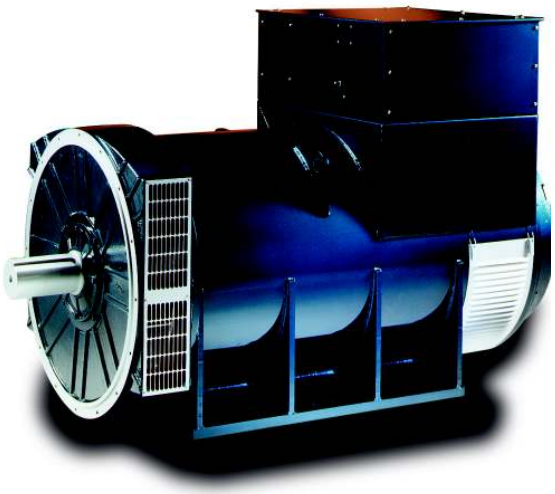
HCI/HCM 5 & HCKI 5

- HCI/HCM 5 is a range of 4 pole, single or two bearing AVR controlled generators
- Engine adaptors to SAE 00, 0, ½, 1, 2 & 3 and coupling discs to SAE 14,18 & 21 are offered for HC/HCM 5
- HCKI 5 is a higher output alternative to HCI 5, dedicated to single bearing SAE ½/14 or 0/18 adaptor/disc coupling options
- Windings offered are 12 wire reconnectable
- Voltages available range up to 690v
- IP23 enclosure protection is standard

Industrial Class "H" Continuous Ratings (kVA)			
		50 Hz	60Hz
HCI 5 - 3 phase	4 pole	450 - 670	500 - 825
HCKI 5 - 3 phase	4 pole	450 - 675	500 - 843
Marine Class "F" Continuous Ratings (kVA)			
HCM 5 - 3 phase	4 pole	365 - 540	410 - 663

HC GENERATOR RANGE

HCI/HCM 6
4 POLE



- HCI/HCM 6 is a range of 4 pole, single or two bearing AVR controlled generators
- Engine adaptors to SAE 00, 0, ½, and coupling discs to SAE 14,18 & 21 are offered for HC/HCM 634
- Windings offered are 6 wire as standard, a 12 wire alternative is available as an option - refer to factory for details
- Voltages available range up to 690v
- IP23 enclosure protection is standard

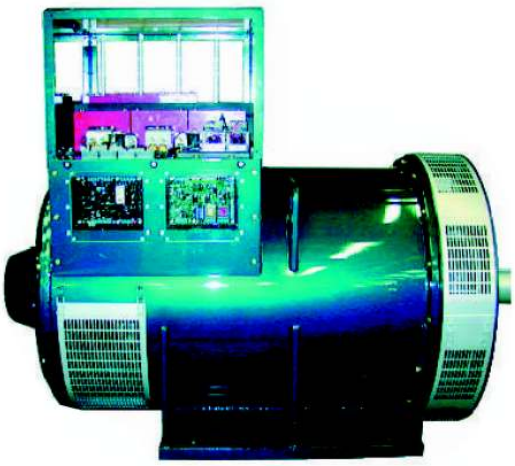
Industrial Class "H" Continuous Ratings (kVA)			
		50 Hz	60Hz
HCI 634	4 pole	800 - 1130	875 - 1450
Marine Class "F" Continuous Ratings (kVA)			
HCM 634	4 pole	650 - 920	875 - 1275

HCI/HCM 6
6 POLE

- HCI/HCM 636 are ranges of 6 pole, single or 2 bearing AVR controlled generators
- Engine adaptors to SAE 00, 0, and ½, and coupling discs to SAE 14,18 & 21 are offered for HCI/HCM 636
- Windings offered are 6 wire reconnectable
- Voltages available range up to 690v
- IP23 enclosure protection is standard

Industrial Class "H" Continuous Ratings (kVA)			
		50 Hz	60Hz
HCI 636	6 pole	280 - 570	350 - 713
Marine Class "F" Continuous Ratings (kVA)			
HCM 636	6 pole	250 - 505	294 - 625

P7 PRODUCT RANGE



P7
4 POLE

- PI7 is a range of 4 pole, single or 2 bearing AVR controlled generators
- Engine adaptors to SAE 00, 0, and ½, and coupling discs to SAE 14,18 & 21 are offered for PI/PM 734
- Windings offered are 6 wire reconnectable
- Voltages available range up to 690v
- IP23 enclosure protection is standard

Industrial Class "H" Continuous Ratings (kVA)			
		50 Hz	60Hz
PI 734	4 pole	1225 - 2200	1500 - 2750
Marine Class "F" Continuous Ratings (kVA)			
PM 734	4 pole	1130 - 1985	1330 - 2480

PI/PM 7
6 POLE

- PI7 is a range of 6 pole, single or two bearing AVR controlled generators
- Engine adaptors to SAE 00 and 0, and coupling discs to SAE 14,18, 21 & 24 are offered for PI/PM 736
- Windings offered are 6 wire
- Voltages available range up to 690v
- IP23 enclosure protection is standard

Industrial Class "H" Continuous Ratings (kVA)			
		50 Hz	60Hz
PI 736	6 pole	700 - 1355	815 - 1625
Marine Class "F" Continuous Ratings (kVA)			
PM 736	6 pole	500 - 850	710 - 1200

AUTOMATIC VOLTAGE REGULATORS
PERMANENT MAGNET GENERATOR TYPE

STAMFORD Automatic Voltage Regulators are designed and built to achieve maximum performance from the STAMFORD range of brushless ac generators. Self excited and separately excited with shaft mounted Permanent Magnet Generator (PMG) types are available, with a choice of specifications. All AVR's are encapsulated to provide protection against moisture, salt and sand in the atmosphere, and mounted on anti-vibration mounts for mechanical protection from engine vibrations.

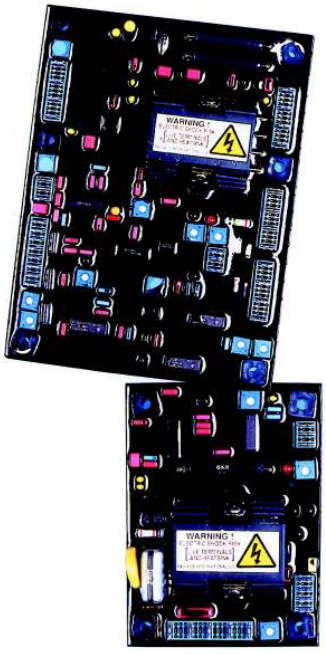
SELF EXCITED AUTOMATIC VOLTAGE REGULATORS ("S" PREFIX)

STAMFORD AVR's for self excited generators receive their power direct from the generator output terminals, and control generator output voltage through continual automatic adjustment of the main rotor field strength.

SX460

The SX460 is the standard AVR offered with generators in the lower power bands, achieving voltage regulation in the order of ±1.0*%. A feature of this (and all STAMFORD AVR's) is that output voltage is reduced with speed below the normal operating level, to assist the engine or prime mover to recover after sudden application of a heavy load.

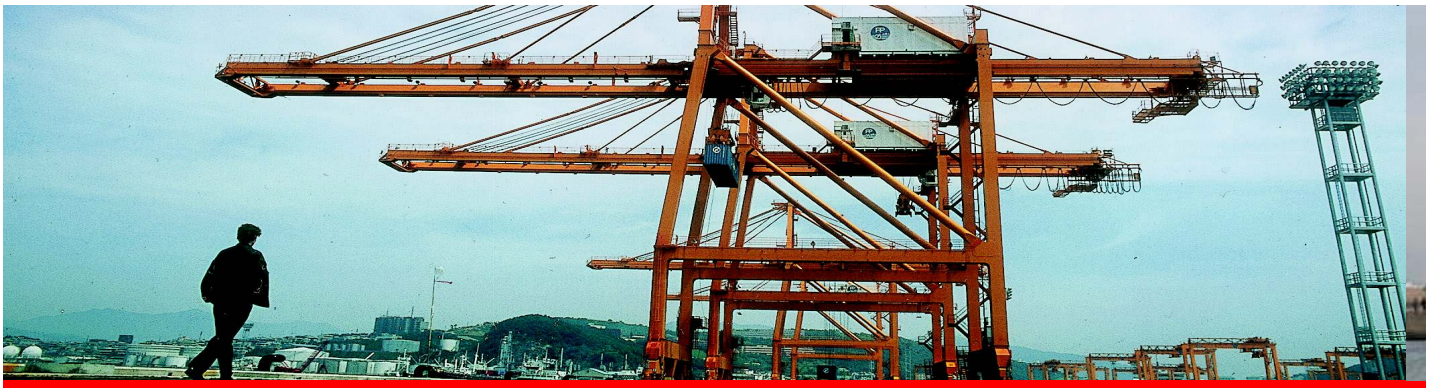
This is an ideal choice for applications where a generator is set to be run in a stand-alone application where no specialist requirements exist.



AS440

The AS440 has all the features of the SX460, additionally achieving voltage regulation of ±1.0%*. A current transformer can be supplied with the AS440 to provide quadrature voltage droop for parallel operation. A power factor controller can be fitted for parallel operation with the mains utility.This AVR will also work with an auxiliary winding to support a short circuit. A three phase sensing unit can be used in conjunction

*With 4% engine governing.



PERMANENT MAGNET GENERATOR TYPE AUTOMATIC VOLTAGE REGULATOR ("M" PREFIX)

For the ultimate in control, an AVR designed to operate with the STAMFORD Permanent Magnet Generator (PMG) system is often specified. In this design, the AVR receives its power from a separate source in the form of a small PMG, mounted on the end of the main generator shaft. The advantage of this is the AVR power source is not affected by sudden loads applied to the generator, hence the excitation remains at full strength, providing superior motor starting and short circuit performance.

MX341

The MX341 achieves voltage regulation of ±1.0%*, through the use of the PMG system. Protection against sustained over-excitation is standard on this AVR, as is a special engine relief load acceptance feature which enables full load to be applied in a single step.

*With 4% engine governing

MX321

The MX321 has all the features of the MX341, additionally achieving voltage regulation of 0.5%* with 3 phase RMS sensing, built in overvoltage protection and optional short circuit current level adjustment.

The combination of PMG providing an isolated power source and the MX321's RMS sensing makes an ideal arrangement for supplying the non-linear loads such as supplies for computers or variable speed motors etc.

PRODUCT FEATURES SUMMARY

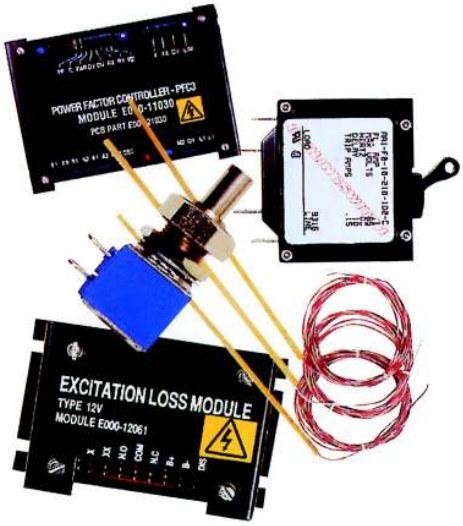
STAMFORD ac generators can be configured to meet practically every application requirement. This summary chart shows the main features of the product ranges.

LOW VOLTAGE	PHASE 1	PHASE 3	POLES 2	POLES 4	POLES 6	BEARINGS 1	BEARINGS 2	STANDARD AVR	AVR OPTIONS	TRANSFORMER CONTROL OPTION
BCI 16	●	●	●	●		●	●	SX460	●	
BCI 18	●	●	●	●		●	●	SX460	SA465 ● SX421**	● AS440
BCAI 16	●	●	●	●		●	●	SX460	SA465	AS440
BCLI 16	●	●	●	●		●	●	SX460	SA465	AS440
UCI 22/UCI UCD 27	●	●		●		●	●	SX460	MX341 MX321	AS440 ● UC22 only AS440
UCM 22/27	●			●		●	●	MX341	MX321	
HCI4/HCI/HCKI 5	●			●		●	●	AS440	MX341 SX421	
HCM 4/5	●			●		●	●	MX341	MX321	
HCI 6		●		●	●	●	●	MX321		
HCM 6		●		●	●	●	●	MX321		
PI 7		●		●	●	●	●	MX341	MX321	
PM 7		●		●	●	●	●	MX341	MX321	

A three phase sensing unit can be added to the AS440 AVR.

**Supplied loose

ACCESSORIES



CURRENT SENSING KIT

Assists the AVR to achieve accurate voltage regulation when supplying loads at the end of long cable runs.

SEPARATE VOLTAGE TRIMMER

Provides remote fine adjustment of the generator output voltage.

PARALLELLING KIT

- Quadrature Droop

Provides a drooping characteristic, when parallelling generators, ensuring the load is shared in proportion to the generator outputs. Not available on the SX460.

RFI SUPPRESSOR KIT

Reduces the radiated RFI signal from the generator to enable compliance with various high level E.M.C. standards.

EXCITATION LOSS MODULE

Detects loss of excitation, not easily detectable by other means, when generators are running in parallel. This unit switches a single pole change over contact which can be incorporated into an external protection system.

MANUAL VOLTAGE REGULATOR

Controls the generator output voltage manually under emergency conditions. This must be in conjunction with the PMG type control system.

FREQUENCY DETECTION MODULE

Senses frequency, and hence rotational speed, can be used to disengage the starter when engine fires, and to shut down the engine in event of overspeed.

POWER FACTOR CONTROLLER

Controls and maintains a required power factor condition whilst running in parallel with a mains supply. This unit also incorporates a voltage matching facility for use with basic automatic synchronising equipment.

ALTERNATOR PROTECTION MODULE

Detects overload conditions by measuring voltage discrepancies in the generator phase voltages. On fault detection, the until switches a change over contact; this could be incorporated to trip a circuit breaker, stop the engine, or de-excite the generator.

DIODE FAILURE DETECTOR

On detection of a failed rotating diode this module switches a change over contact. This could either trigger an alarm or automatically shut down the set.

EXCITATION CIRCUIT BREAKER

Circuit breaker which is tripped by a signal from the MX321 or SX421 AVR overvoltage detection circuit.

DUAL AVR SYSTEM

Used for manual switching between two AVR's where the specification calls for the provision of a back-up AVR.

GLOBAL SUPPORT

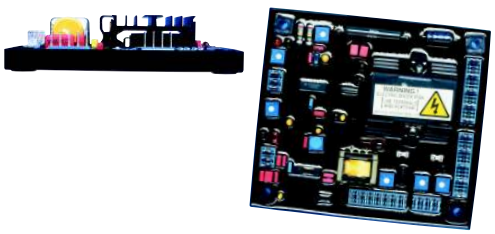
TECHNICAL SUPPORT AND AFTER SALES SERVICE

STAMFORD ac generators rarely draw attention to themselves. While they may be seen in some of the harshest environments in the world - the facts remain that their performance and dependability are unsurpassed. Years of experience in design and manufacture sees to that. But, when help is needed, it is readily available..... anywhere in the world.

It starts with specification and installation, with assistance and advice to provide precisely the right generator that the job demands. It continues through commissioning and into after-sales, service and support.

STAMFORD Service Engineers are experienced professionals with extensive training in electrical, electronic and mechanical skills. They in turn, are supported by a worldwide spares and service network. Our global service offers:

- 24 hour response to service emergencies - 7 days a week every day of the year (+44 1780 484732)
- Commissioning of generators on site
- Onsite bearing maintenance and bearing condition monitoring
- Onsite insulation integrity checks
- AVR and accessories set up on site
- Trained engineers available locally speaking local language



PARTS SUPPORT

Cummins Generator Technologies parts distribution network offers exceptional customer service. We support our generators for a minimum of 10 years from the date of manufacture.

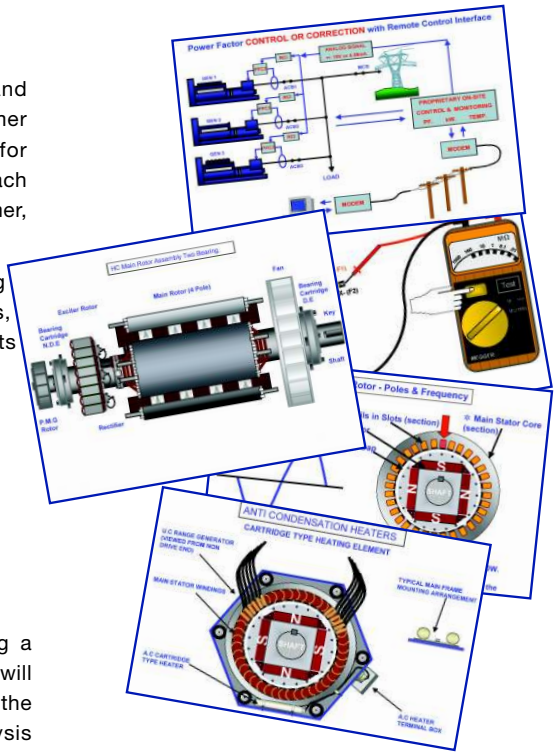
A large central parts inventory is maintained at the Cummins Generator Technologies Parts Distribution Centre in the UK. Service parts are stocked extensively by our subsidiary companies and authorised parts stockists worldwide to ensure prompt local availability of key parts.

GLOBAL SUPPORT

PRODUCT TRAINING

Product familiarity will ensure maximum productivity and optimum use. Cummins Generator Technologies Customer Support Department offers product training courses for engineers, sales operators, service and support staff. Each course is individually tailored to suit the needs of the customer, the gen-set builder and the end user.

Product familiarisation courses, with a choice of training modules, including generator control systems, applications, trouble shooting, maintenance or other specific requirements are also available.



VIBRATION ANALYSIS

Cummins Generator Technologies pride themselves on having a durable, reliable product. Vibration Analysis Technology will ensure builders and end users have an optimal solution to the generator set design and installation. Vibration Analysis Technology will assist both the gen-set builder and end users in proving the validity of the generator set during the prototype stages as well as solving end users vibration issues. This technology is a key for customers to improve the innovation and reliability of new and current product designs.

Vibration Analysis Technology from Cummins Generator Technologies provides a competitive advantage.

QUALITY

Quality performance depends on quality design, quality components and quality assembly. With STAMFORD ac generators, quality is built-in from the start and carries through to an international network of after-sales support.

STAMFORD ac generators meet the standards of all certificating bodies and are manufactured in an ISO 9001 environment.

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