Servo Electronic Overview

AC Voltage Stabilisers
AC Power Conditioners

GENERAL COMMERCIAL & INDUSTRIAL PRODUCTS
SERVO ELECTRONIC
AC AUTOMATIC VOLTAGE STABILISERS
& POWER CONDITIONERS

This catalogue is presented as an overview of the SES, SESL & PCS ranges of indoor and outdoor Servo Electronic based Stabilisers and Power Conditioners - as designed and manufactured by Ashley-Edison UK.

Developed and produced under stringent ISO 9001 quality standards, our Servo Electronic ranges of single and three phase AC Voltage Stabilisers and Power Conditioners have proven to be our most popular power protection offerings. Capable of regulating the supply voltage to virtually any type of electrical or electronic equipment that suffers from supply line fluctuations, the latest generation of Servo Electronic protection solutions continues to lead the market by setting new higher performance levels, whilst always ensuring unparalleled reliability and versatility.

With over 25 years of unrivalled experience, gained in some of the world’s most challenging and demanding power environments, our Servo Electronic based stabilisers and power conditioners are able to handle the widest of input voltage windows (up to ±45%).

Now with extended range coverage, improved accuracy, the inclusion as standard of many advanced protection features (usually only available from others as additional expensive add-on options), the Ashley-Edison SES / SESL and PCS Series are widely held to be the finest ranges of affordable Quality AC Voltage Stabilisers & Power Conditioners.

GENERAL COMMERCIAL & INDUSTRIAL PRODUCTS
SERVO ELECTRONIC RANGES
IP20 / NEMA 1 Style Indoor & IP54 NEMA 3 Style Outdoor Models

SES
1 to 600 kVA
Single & Three Phase
AC Voltage Stabilisers

PCS
1 to 450 kVA
Single & Three Phase
AC Power Conditioners

SES-R
3 to 15 kVA
Single Phase Rack Mount
AC Voltage Stabilisers

SESL
200 to 1500 kVA
Three Phase
AC Voltage Stabilisers

OSES
IPS4 / NEMA 3 Style
3 to 1500 kVA
Single & Three Phase
AC Voltage Stabilisers & Power Conditioners

www.AshleyEdisonUK.com
QUALITY GUARANTEED

Designed in the UK, and built at our manufacturing plant in Taiwan utilising ISO 9000 accredited build processes, all our stabilisers and power conditioners are designed and built to comply with leading international standards.

Only by consistently delivering exceptional long-term performance and quality are we able to to endorse our product offerings with a “truly market leading” standard warranty of up to 3 Years.

ULTRA FAST CORRECTION TIMES

All our Servo Electronic based solutions offer exceptionally fast correction times. Stated in terms of the time taken to correct a 10% voltage variation to within 2.5% of the required output voltage we offer a correction time of 0.6 seconds.

Taking into account the time constant of power supplies, motors and other components making up the load, the speed of response is usually more than sufficient for 99% of all load types.

Our Servo Electronic stabilisers and conditioners are the most cost-effective and efficient method for ensuring a stable mains supply.

In situations where the load is particularly sensitive to even the smallest of voltage discrepancies and faster speeds of correction are necessary, such as extremely high precision hi-tech manufacturing processes or very sensitive laboratory testing instruments, our PEN and PCN ranges of Solid State Saturable Reactor based AC Voltage Stabilisers and Power Conditioners are available.

SOLID & ROBUST CONSTRUCTION

SES, SESL & PCS Series systems are housed in robust air-cooled IP20 (IEC/BS/EN 60529) / NEMA 1 floor standing steel cubicles, primarily intended for indoor use. These enclosures offer removable panels for ease of installation and servicing and, in addition, on all three phase models lockable front door access is provided. On larger systems eyebolts are provided to assist handling during transportation and positioning. As an option, drip proof cowls can be fitted to deliver IP21 compliance.

SES-R models are supplied in a standard 19” rack mount format.

OSES & OPCS Series systems are primarily intended for outdoor use, being housed in endurable IP54 (BS / EN 60529) / NEMA 3 free standing steel cubicles. For ease of installation and servicing all models offer removable panels, lockable front door access and, on larger systems, eyebolts to aid handling.

TRANSFORMER ASSEMBLIES

Our Servo Electronic designs are based on conventional, well proven and reliable technology. The fixed main power transformers, buck boost transformers and chokes have insulated copper windings (wire or strip according to current rating requirements) wound on laminated high permeability steel cores. The variable transformers are similarly wound with insulated copper windings on high permeability lengths of strip steel toroidal cores.

All transformer assemblies/windings manufactured, or used, conform to relevant BS / IEC specifications as appropriate.

OPERATING PRINCIPLE

Tried, Tested and Well Proven

Over the last 25 years our Servo Electronic ranges have been tried, tested and extensively proven in all corners of the world – including some of the harshest and most remote power environments on this planet.

From the blistering heat of Arabian Desert to the sub-zero temperatures and remoteness of the Caucasian mountains, our Servo Electronic Stabilisers and Conditioners can be found on duty offering protection to vital equipment where the supply must never be found wanting – not even for a single second!

Being able to accommodate an input voltage swing of in excess of 40%, whilst still delivering accuracy on the output of 1% or better, the Servo Electronic design principle comprises a transformer having its secondary winding connected between the mains supply and the load. The primary voltage is automatically controlled through a servo motor driven variable transformer, thereby ensuring a continuous, smooth and very stable output voltage.

A solid state Servo-Amplifier continuously monitors the output voltage of the stabiliser. Should, due to an incoming voltage or load current change, the output voltage deviate from the required value, the Amplifier sensor instructs the servo motor to rotate the brush-gear on the variable transformer to correct the output for the deviation. The speed of detection and actions of the servo system are exceptionally fast, with controlled motor deceleration to minimise any possibility of overshoot.

Over the years with advances in semi-conductor, motor and digital technologies, our development engineers have considerably enhanced the performance of the basic design principle. Our latest Servo Electronic generation of solutions deliver the most reliable, fastest acting, highly stable and most energy efficient operation seen in the market today.
INPUT VOLTAGE WINDOW OPTIONS & OUTPUT VOLTAGE ACCURACY

Our Servo Electronic Solutions are available in a large range of input voltage range / swing options.

VOLTAGE CHOICES AVAILABLE

High (H Series - International) and Low (L Series - US) voltage ranges are available, in single and three phase formats. In all models, the stabilised output voltage is pre-settable within limits.

Single Phase Voltage Configurations

Single Phase models are offered as standard 2 Wire (1 Phase + Neutral). For US applications 'Split Single Phase’ 3 Wire solutions are also available—see below.

Three Phase Voltage Configurations

Three Phase models are available as either 4 Wire or 3 Wire solutions.

CONFIGURATION | OUTPUT VOLTAGE ACCURACY | OUTPUT VOLTAGE SWING
--- | --- | ---
Single Phase

| Swing Model | NORMAL | EXTENDED |
--- | --- | ---
2 Wire H & L Series

| S15 | 1% ±15% | 3% -17% +18% | 5% -19% +21% |
| S20 | 1% ±20% | 3% -22% +23% | 5% -24% +26% |
| S25 | 1% ±25% | 3% -27% +28% | 5% -29% +31% |
| S30 | 1% ±30% | 3% -32% +33% | 5% -34% +36% |
| S35 | 1% ±35% | 3% -37% +38% | 5% -39% +41% |
| S40 | 1% ±40% | 3% -42% +43% | 5% -44% +46% |

Three Phase

| Swing Model | NORMAL | EXTENDED |
--- | --- | ---
4 Wire H & LY Series

| S10* | 0.5% ±0.5% | 3% -0.0% +0.0% | 5% -0.0% +0.0% |
| S15 | 0.5% ±15% | 3% -17% +18% | 5% -19% +21% |
| S20 | 0.5% ±20% | 3% -22% +23% | 5% -24% +26% |
| S25 | 0.5% ±25% | 3% -27% +28% | 5% -29% +31% |
| S30 | 0.5% ±30% | 3% -32% +33% | 5% -34% +36% |
| S35 | 0.5% ±35% | 3% -37% +38% | 5% -39% +41% |
| S40 | 0.5% ±40% | 3% -42% +43% | 5% -44% +46% |

Three Wire HD & LD Series

| Swing Model | NORMAL | EXTENDED |
--- | --- | ---
| S10* | 1% ±10% | 3% -12% +13% | 5% -14% +16% |
| S15 | 1% ±15% | 3% -17% +18% | 5% -19% +21% |
| S20 | 1% ±20% | 3% -22% +23% | 5% -24% +26% |
| S25 | 1% ±25% | 3% -27% +28% | 5% -29% +31% |
| S30 | 1% ±30% | 3% -32% +33% | 5% -34% +36% |
| S35 | 1% ±35% | 3% -37% +38% | 5% -39% +41% |
| S40 | 1% ±40% | 3% -42% +43% | 5% -44% +46% |

Wider input voltage swing models are available to special order. * = S10 option only available on SESL Range

In situations where there is a reasonably good mains supply, a stabiliser or power conditioner offering an input variation swing of ±15% (our S15 Models) will usually be more than acceptable, but in more remote locations, or countries where the national supply infrastructure is less developed, variations of ±20% or greater may need accommodation.

An output voltage to within ±1% / ±0.5% of the preset output voltage is the norm when specifying a Voltage Stabiliser. However, if a lower output voltage accuracy of ±5% can be accommodated by the load equipment, the input voltage window can be further widened proportionally. Given that the cost of the stabiliser / power conditioner is linked to the size of the input voltage range it has to handle, accepting a lower output voltage accuracy may prove to be a more cost efficient solution than simply opting for a larger standard swing model.
AVAILABLE FEATURES

Our Servo Electronic based stabilisers and power conditioners offer an unrivalled combination of features, providing exceptional performance and protection with great versatility and extremely high reliability.

Many features we incorporate as standard with our models are only available from others as expensive add-ons.

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<tr>
<th>FEATURES &amp; PROTECTION</th>
<th>Benefits</th>
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<tr>
<td>Automatic Voltage Stabilisation / Regulation</td>
<td>Step less automated regulation of the incoming voltage to deliver a highly accurate stable voltage for electronic and electrical load equipment.</td>
</tr>
<tr>
<td>Cost-Efficient Servo Electronic Design</td>
<td>Cost effective compact servo electronic based design delivering negligible waveform distortion and extremely low harmonic distortion (&lt;1%). Unaffected by load factor or supply frequency variations. With extremely high reliability (MTBF &gt;125,000 Hours), long-life expectancy and efficiency of 98%, or better, ensures low running costs and cost of ownership.</td>
</tr>
<tr>
<td>TVSS - Voltage Surge &amp; Spike Suppression Protection</td>
<td>Inbuilt protection against damaging voltage spikes and transients.</td>
</tr>
<tr>
<td>Independent Phase Balancing &amp; Control</td>
<td>On Three Phase systems each phase voltage remains stable, irrespective of load unbalance, even for situations where a 100% load imbalance may exist.</td>
</tr>
<tr>
<td>Inbuilt High Overload Capability</td>
<td>Ability to support electrical and electronic equipment with inherent initial high current draws on start up. Surge ratings – 10 x max current rating for 2 seconds, 3 x for 1 minute and 2 x for 5 minutes.</td>
</tr>
<tr>
<td>Soft-Switch On / Start Up Load Protection</td>
<td>At the moment of switch on, the voltage stabiliser / conditioner will provide a controlled lower output voltage that will then rise smoothly to the pre-set output voltage - thereby avoiding any momentary over voltage situations which could possibly damage the connected load.</td>
</tr>
<tr>
<td>Fault Tolerant Regulation Control</td>
<td>In the unlikely event of a phase control module failure, a parallel module will take over control with no loss in system capacity. Especially useful in extremely critical load applications.</td>
</tr>
<tr>
<td>Power Module Protection</td>
<td>Protection on the variable transformer power modules to safeguard against excessive wear on the brush gear. A unique feature that, in the absence of effective routine maintenance, greatly minimises the risk of power module malfunction.</td>
</tr>
<tr>
<td>Bypass Contol Switch</td>
<td>Ability to bypass the inbuilt electronic controls circuitry to provide power to the load via the power stacks. Useful emergency feature in the unlikely event of a system malfunction.</td>
</tr>
<tr>
<td>Extremely Low Maintenance</td>
<td>Offering an exceptionally low level of annual (or biennial) ongoing maintenance required, being deliverable by universally available skill sets held by most competent electricians.</td>
</tr>
<tr>
<td>Over / Low Voltage Protection</td>
<td>SES / PCS models - Ability to configure the voltage stabiliser / power conditioner, if required, to shutdown in the event of the incoming voltage supply going outside the normal input window. SESL models - notification, via a ‘no-volt’ interface facility, of any over or under voltage situations. Ideal for on-site building (BMS) or monitoring systems.</td>
</tr>
<tr>
<td>Phase Failure Protection</td>
<td>Any failure of phases on a three phase supply will be immediately detected and notified accordingly. SES / PCS models will automatically power down to protect the load side equipment.</td>
</tr>
<tr>
<td>Input Circuit Breaker</td>
<td>Delivers over current input protection – fitted as standard on all SES, SES-R and PCS models.</td>
</tr>
<tr>
<td>Enhanced Transient and Electrical Noise Attenuation</td>
<td>Through the inclusion of a shielded isolation transformer, provides enhanced spike and electrical noise (common &amp; normal interference) suppression and neutral ground bonding. Delivers what is commonly referred to as a “CLEAN” supply.</td>
</tr>
<tr>
<td>Output Circuit Breaker</td>
<td>Ensures over current output protection – available as an option on all systems.</td>
</tr>
<tr>
<td>Lightning Surge Protection</td>
<td>Protection against extremely high voltage surges and transients caused by lightning strikes on the supply line.</td>
</tr>
<tr>
<td>Inbuilt Full Manual Maintenance</td>
<td>‘Break Before Make’ bypass facility offering the ability to route the supply feed to bypass the stabiliser / conditioner. Useful when performing deep maintenance on the system, or in the highly unlikely event of a system malfunction.</td>
</tr>
<tr>
<td>International Standards Compliance</td>
<td>Designed, manufactured and supplied to comply with leading international standards (including CE conformity).</td>
</tr>
<tr>
<td>Up to 3 Years Standard Warranty</td>
<td>Market leading ‘No Quibble’ standard RTB warranty provision with 3 years / 36 months from date of shipment for indoor systems and 2 years / 24 Months for outdoor models.</td>
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**SYSTEM METERING & MONITORING**

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<th>Benefits</th>
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<tr>
<td>Front Panel Status Monitoring &amp; Metering</td>
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<tr>
<td>Remote Operational Status Monitoring</td>
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ASHLEY-EDISON (UK)
at your Service . . . .

In Telecommunications
TV, radio and telephone transmitters and relay stations, radar installations, navigational beacons etc, all need dependable power for reliable operation.

Many such facilities are in remote locations, supplied over long lines or even from their own generators. Ashley-Edison units are in service worldwide - with communication networks, even national security, depending on them.

In Computers
Computers and other electronic business systems are highly sensitive to power fluctuations. Even a brief voltage drop below design limits will upset logic circuits, bringing chaos to stored data, calculations etc.

So the fast response Ashley Edison Automatic Voltage Regulators (AVRs) are playing a major role in computer applications around the world.

In Industry
Many processes and production lines slow down and even stop as a result of power problems. With just a simple voltage drop welding equipment produces faulty welds, ovens and furnaces take far longer to heat up, electroplating processes lose their efficiency and today's microprocessor controlled machine tools develop faults. All reasons why industrial plants worldwide look to Ashley-Edison for the solution to their power problems.

FEATURES

H Models - 220 to 277V  L Models - 100 to 127V

VOLTAGE STABILISERS  CONDITIONERS

Range Series  SES  SES-R  PCS

Rating
H Models  1 - 100 kVA  1 - 15 kVA  1 - 60 kVA
L Models  1 - 40 kVA  3 - 10 kVA  1 - 30 kVA

Enclosure Type
19” Rack Mount  ✓  ✓  ✓
Ingress Protection Level
IP 20 / NEMA 1 (Indoor)  ✓  ✓  ✓
IP 21 (Indoor)  ○  ○  ○
IP 54 / NEMA 3 (Outdoor)  OSES  OPCS

Features & Protection

Automatic Voltage Stabilisation / Regulation  ✓  ✓  ✓
Cost – Efficient Servo Electronic Design  ✓  ✓  ✓
TVSS - Voltage Surge & Spike Suppression Protection  ✓  ✓  ✓
Inbuilt High Overload Capability  ✓  ✓  ✓
Soft-Switch On / Start Up Load Protection  ✓  ✓  ✓
Bypass Control Switch  ✓*  ✓*  ✓*
Extremely Low Maintenance  ✓  ✓  ✓
Over / Low Voltage Protection  ✓  ✓  ✓
Input Circuit Breaker  ✓  ✓  ✓
Enhanced Transient and Electrical Noise Attenuation  ✓  ✓  ✓
Output Circuit Breaker  ○  ○  ○
Lightning Surge Protection  ○  ○  ○
Inbuilt Full Manual Maintenance Bypass Facility  ○  ○  ○
International Standards Compliance  ✓  ✓  ✓
Standard Warranty - 3 Years / 36 Months  ✓  ✓  ✓

System Metering & Monitoring

Front Panel Status Monitoring & Metering  ✓*  ✓  ✓*
Over / Low Voltage NVC (No Volt Contacts)  ✓  ✓  ✓
Remote Operational Status Monitoring via NVC  ○  ○  ○
Comprehensive Digital Power Metering & Monitoring  ○  ○  ○

KEY ✓ Standard  ○ Optional  Add-On ✓* Metering and Bypass facility dependent on model rating

All ranges are covered by individual data sheets giving full specification. Ask for the copies you require or download the relevant information sheets from our web site.

Please Note – SE Voltage Stabilisers & Power Conditioners are not designed to support / protect voltage “back feed” applications, where energy is required to be also fed back into the utility supply.
ASHLEY-EDISON (UK) at your Service . . . . continued

In Refrigeration
When air-conditioning and refrigeration systems experience any form of power disturbance, even just a minor voltage fluctuation, impaired performance or often system shutdown is the end result.

With such problems being of common concern, Ashley-Edison stabilisers and power conditioners are regularly relied upon to guarantee the availability of a clean and regulated power source.

In Research
Electronic instruments play a major role in laboratory work and their measuring accuracy depends totally on the quality of power they receive. An abrupt voltage drop from a factory process starting up nearby perhaps can invalidate the results from a costly research programme.

Today many world research establishments depend on Ashley Edison for ensuring the quality of their power supply whether it be for a single instrument or an entire laboratory.

In Energy Efficiency
With world energy prices soaring and the global quest to reduce carbon emissions by electricity generators, many organisations are turning to Ashley-Edison to optimise their electricity usage.

Our VOLTSTREAM ranges of AC Automatic Voltage Optimisers (AVOs) are consistently delivering energy savings of between 10 to 20% on our customers’ electricity bills.

Want to Learn more about the Power Protection Solutions available from Ashley-Edison (UK)?
Check out - https://www.AshleyEdisonUK.com

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FEATURES

Three Phase Solutions

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<th>VOLTAGE STABILISERS</th>
<th>CONDITIONERS</th>
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<tr>
<td>Range Series</td>
<td>SES</td>
<td>SEL</td>
</tr>
<tr>
<td>Rating</td>
<td>H Models - 6 - 800 kVA</td>
<td>6 - 1500 kVA</td>
</tr>
<tr>
<td></td>
<td>L Models - 6 - 500 kVA</td>
<td>200 - 400 kVA</td>
</tr>
<tr>
<td>Enclosure Type</td>
<td>IP 20 / NEMA 1 (Indoor)</td>
<td>✓</td>
</tr>
<tr>
<td>Ingress Protection Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP 21 (Indoor)</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>IP 54 / NEMA 3 (Outdoor)</td>
<td>0SES</td>
<td>0PCS</td>
</tr>
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</table>

Features & Protection

- Automatic Voltage Stabilisation / Regulation ✓ ✓ ✓
- Cost – Efficient Servo Electronic Design ✓ ✓ ✓
- TVSS - Voltage Surge & Spike Suppression Protection ✓ ✓ ✓
- Independent Phase Balancing & Control ✓ ✓ ✓
- Inbuilt High Overload Capability ✓ ✓ ✓
- Soft-Swit On / Start Up Load Protection ✓ ✓ ✓
- Fault Tolerant Regulation Control ✓ ✓ ✓
- Power Module Protection ✓ ✓ ✓
- Control Bypass Switch ✓ ✓ ✓
- Extremely Low Maintenance ✓ ✓ ✓
- Over / Low Voltage Protection ✓ ✓ ✓
- Phase Failure Protection ✓ ✓ ✓
- Input Circuit Breaker ✓ ✓ ✓
- Enhanced Transient and Electrical Noise Attenuation ✓ ✓ ✓
- Output Circuit Breaker ✓ ✓ ✓
- Lightning Surge Protection ✓ ✓ ✓
- Inbuilt Full Manual Maintenance Bypass Facility ✓ ✓ ✓
- International Standards Compliance ✓ ✓ ✓
- Standard Warranty - 3 Years / 36 Months ✓ ✓ ✓

System Metering & Monitoring

- Front Panel Status Monitoring & Metering ✓ ✓ ✓
- Over / Low Voltage NVC (No Volt Contacts) ✓ ✓ ✓
- Remote Operational Status Monitoring via NVC ✓ ✓ ✓
- Comprehensive Digital Power Metering & Monitoring ✓ ✓ ✓

KEY ✓ Standard ○ Optional Add-On

All ranges are covered by individual data sheets giving full specification. Ask for the copies you require or download the relevant information sheets from our web site.

Please Note – SE Voltage Stabilisers & Power Conditioners are not designed to support / protect voltage “back feed” applications, where energy is required to be also fed back into the utility supply.
AVAILABILITY

We offer probably the best availability on AC Voltage Stabiliser & Power Conditioning solutions.

Many of our most popular ratings are readily available from stock at the factory or from one of our strategically located Service and Distribution Hubs. Where a solution is not readily available, due to our considerable investment in component inventory and fine-tuned accredited build processes, we are able to ensure very short lead times on deliveries – even for the largest of models!

CUSTOM BUILT SOLUTIONS

Ashley-Edison, with a strong and wide manufacturing base, is able to meet the requirements of customers from our own in-house professional resources.

Where bespoke / custom built solutions are required we are able to call upon our extensive portfolio of proven standard designs and tailor offerings to accommodate, without breaking the bank, most individual specific requirements.

OTHER SERVO ELECTRONIC BASED SOLUTIONS

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<th>AC Voltage Optimisers</th>
<th>VOLTTSTREAM</th>
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<tr>
<td>Single &amp; Three Phase 10 - 1000 kVA</td>
<td>Cutting Energy Costs by up to 20% and ensuring we all do our bit for the environment</td>
</tr>
<tr>
<td>Single &amp; Three Phase Indoor IP20 &amp; Outdoor IP54 Models</td>
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<tr>
<th>AC Constant Voltage Compensators</th>
<th>Cable Volt Drop Problems? Obtain HUGE savings on long cable runs</th>
</tr>
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<tbody>
<tr>
<td>Single &amp; Three Phase 3 - 750 kVA</td>
<td>Installations with long cable runs have an inherent problem of developing large voltage drops across their cables. To overcome this it is necessary to select and use larger sized electrical cables in order to reduce such voltage drops to acceptable levels.</td>
</tr>
<tr>
<td>Single &amp; Three Phase Indoor IP20 &amp; Outdoor IP54 Models</td>
<td></td>
</tr>
</tbody>
</table>

WANT TO KNOW MORE . . .

Want to learn more about our Servo Electronic AC Voltage Stabilisers and Power Conditioners? Please ask for copies of our . . .

Product Range Data Sheets

All ranges are covered by individual data sheets giving full specification. Ask for the copies you require or download the relevant information sheets from our web site.

DON’T BUY BLIND!

Voltage Stabilisers Buyers Guide with advice and guidance on selecting the most appropriate AC voltage stabiliser or power conditioner at cost-efficient prices.

NEED HELP SELECTING THE RIGHT MODEL FOR YOUR APPLICATION?

Check-out our Online Selection Tool at https://www.AshleyEdison.co