ESR

GENERAL COMMERCIAL & INDUSTRIAL PRODUCTS

ESR LY SERIES - THREE PHASE - 6 to 200 kVA

STATIC DIGITAL VOLTAGE REGULATION
highly efficient with exceptionally ultra fast speed of response – ideal for highly sensitive / mission critical loads and applications.

FEATURES
- Automatic Voltage Regulation
  Digitally controlled voltage stabilization
- Wide Range of Power Ratings
  Three Phase 6 to over 200 kVA
- Choice of Input Voltage Swing Ranges
  Input Swing - ±15% (S15), ±20% (S20), ±25% (S25), ±30% (S30), ±35% (S35) or ±40% (S40) - customer to specify.
- Precise Output Voltage Regulation
  Output Voltage Accuracy ±3% (±1% to ±5%)
- Transient Voltage Surge Suppression
  TVSS - Protects loads against harmful high-energy surges, transients and spikes.
- Solid State Design
  Electronic static design with no moving parts, delivering a virtually ‘Maintenance Free’ solution.

STATIC ELECTRONIC DIGITAL DESIGN
AC VOLTAGE STABILIZERS & REGULATORS
AC THREE PHASE - 6 TO 200 kVA

ENSURING AN EXTREMELY STABLE AC MAINS SUPPLY VOLTAGE
Suitable for most types of electrical and electronic equipment, Ashley-Edison’s ESR Electronic AC Voltage Stabilizers continuously monitor the incoming supply. Should the incoming voltage rise or drop, the Stabilizers will automatically control the output to ensure the voltage reaching the load equipment always remains constant at the requisite voltage.

Inbuilt spike protection ensures the load is continuously protected against harmful mains born high energy spikes and surges.

Ashley-Edison ESR Series AC Voltage Stabilizers offer -
- Ultra Fast Speed of Response
  Compact in size and quiet in operation, ESR Series AC Voltage Stabilizers deliver an unsurpassable speed of response making them ideal for highly sensitive loads.
- Static / Solid State Design
  ESR Series AC Voltage Stabilizers use solid state devices (SCRs) to select transformer taps to regulate the output. Unlike other similar solutions, ESR Stabilizers by nature of their design do not require the SCRs to carry the full load, just a fraction - thereby delivering far superior reliability to similar systems found on the market. With no moving parts, they are virtually ‘Maintenance Free’ solutions.
- Automatic Electronic Bypass
  Inbuilt as standard on all models, the automatic bypass maintains power to the load and unit functionality, except regulation, in the event of a problem.
- All Digital Controls
  All digital microprocessor control and operation ensures ESR AC Voltage Stabilizers provide the highest level of performance and accuracy. The standard LCD display provides information on the operational status and loading on the stabilizer, and enables the configuration of a number system parameters for more demanding applications where customization is required.

190/110V - 200/115V - 208/120V - 220/127V - 50 or 60Hz

- Independent Phase Control
  Independent phase voltage sensing and control to ensure the individual phase voltages remain stable - regardless of load unbalance.
- Inbuilt High Overload Capability
  Ideal for loads with an initial high current draw on start up.
- Over / Low Voltage Protection
  Ability to automatically shutdown the Voltage Stabiliser in the event of the input supply voltage going outside pre-set input voltage parameters.
- Phase Failure Protection
  Protection of the load in the event of phase failure.
- SPD Class II Surge Arrestors
  Protection against extremely high voltage surges and transients caused by lightning induced strikes on the utility supply line.
- Automatic Bypass Protection
  Fully automatic transfer to bypass in the event of a problem.
- Input & Output Protection with Manual Bypass
  Input Switch with Output Isolation and Manual Bypass facility, including mechanical interlocking to prevent inadvertent mis-operation.
- Digital LCD Monitoring Panel & RS/485 Interface
  Displaying real time operational status, key system readings and alarm events with RS/485 Interface ability for remote monitoring.
- Optional Accessories
  Input Isolation, IP54 / NEMA 3 Style Outdoor Enclosures & alternative Switching Arrangements.
- Compliance with International Standards
  Designed, manufactured and supplied to comply with leading international standards.

www.AshleyEdison.com
DIGITAL BUCK BOOST SCR DESIGN TOPOLOGY

Based on the extremely well proven Buck Boost design topology which underlines our SES & SESL AC Voltage Stabilizers, ESR Static Voltage Regulators utilise SCRs (Silicon Controlled Rectifiers) to select transformer taps to deliver a highly stable output voltage with an extremely fast correction time.

Unlike traditional Electronic SCR based solutions, the underlying Buck Boost topology ensures that the SCRs are not required to handle the full load current, but merely a fraction of the load current. By suitably sizing the ratings of the SCRs, ESR Stabilisers are able to deliver impressive overload current, but merely a fraction of the load current. By suitably sizing the Boost topology ensures that the SCRs are not required to handle the full current conditions and other malfunctions, current is or better.

The utilisation of the latest in microprocessor control and the inclusion as standard on all models of an input circuit breaker, ensures that the SCRs are fully protected against over-current conditions and other malfunctions, which historically have been viewed as the primary weakness of Electronic based SCR solutions.

VOLTAGE CHOICES AVAILABLE

4 WIRE SOLUTIONS
THREE PHASE WITH NEUTRAL (+ GROUND / EARTH)

LY SERIES
6 to 500 kVA

Low Voltage Models:
190/110V, 200/115V, 208/120V or 220/127V
Other voltages available on individual request / quotation.

H SERIES
6 to 3750 kVA

High Voltage Models:
380/220V, 400/230V or 415/240V
X488 Models - 440/254V, 460/265V or 480/277V
Other voltages available on individual request / quotation.

ESR LY SERIES - THREE PHASE - 6 to 200 kVA

LY SERIES INPUT VOLTAGE WINDOW OPTIONS

In situations where there is a reasonably good utility supply, a Stabilizer offering an input variation swing of ±15% (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 be needed to be accommodated by the Stabilizer.

Please Note – These Stabilizers are not designed to support / protect voltage “back feed” applications, where energy is required to be also fed back into the utility supply.

ESR LY SERIES - ESR-LY-3P-S* Input Voltage Windows & Output Accuracy

<table>
<thead>
<tr>
<th>Nominal Three Phase Voltage</th>
<th>L-L</th>
<th>L-N</th>
<th>L-L</th>
<th>L-N</th>
<th>L-L</th>
<th>L-N</th>
<th>L-L</th>
<th>L-N</th>
<th>L-L</th>
<th>L-N</th>
<th>L-L</th>
<th>L-N</th>
</tr>
</thead>
<tbody>
<tr>
<td>190V</td>
<td>162 to 219V</td>
<td>94 to 127V</td>
<td>190/110V ± 15%</td>
<td>152 to 228V</td>
<td>88 to 122V</td>
<td>190/110V ± 20%</td>
<td>143 to 247V</td>
<td>83 to 138V</td>
<td>190/110V ± 25%</td>
<td>133 to 247V</td>
<td>77 to 143V</td>
<td>190/110V ± 30%</td>
</tr>
<tr>
<td>L-N: 110V</td>
<td>170 to 230V</td>
<td>98 to 132V</td>
<td>200/115V ± 15%</td>
<td>160 to 240V</td>
<td>92 to 138V</td>
<td>200/115V ± 20%</td>
<td>150 to 250V</td>
<td>86 to 144V</td>
<td>200/115V ± 25%</td>
<td>140 to 260V</td>
<td>81 to 150V</td>
<td>200/115V ± 30%</td>
</tr>
<tr>
<td>200V</td>
<td>177 to 239V</td>
<td>102 to 138V</td>
<td>208/120V ± 15%</td>
<td>166 to 250V</td>
<td>96 to 144V</td>
<td>208/120V ± 20%</td>
<td>156 to 260V</td>
<td>90 to 150V</td>
<td>208/120V ± 25%</td>
<td>146 to 281V</td>
<td>84 to 156V</td>
<td>208/120V ± 30%</td>
</tr>
<tr>
<td>L-N: 120V</td>
<td>187 to 253V</td>
<td>104 to 152V</td>
<td>220/127V ± 15%</td>
<td>176 to 264V</td>
<td>102 to 152V</td>
<td>220/127V ± 20%</td>
<td>165 to 275V</td>
<td>95 to 159V</td>
<td>220/127V ± 25%</td>
<td>154 to 286V</td>
<td>89 to 169V</td>
<td>220/127V ± 30%</td>
</tr>
</tbody>
</table>

Also available as 3 Wire Solutions (No Neutral)
- ESR-LD3P & ESR-HD3P SERIES
DESIGNED FOR TODAY’S MODERN NEEDS

Voltage Regulators are designed to stabilize the voltage when it fluctuates, up or down.

They are essential whenever reliable power is needed or when normal operation of electrical or electronic equipment is disrupted by voltage variations.

In general when suppliers of today’s modern electrical and electronic equipment design their products they do so knowing that most electrical utilities around the world cannot provide or promise better than a ±5% output voltage accuracy of nominal and as such they design their equipment so it is able to operate efficiently within this range.

ESR Stabilizers are specifically designed to meet the requirements of today’s modern loads, being feature rich and virtually maintenance free static mains control solutions.

They ensure the availability of a constant voltage at a level that always meets the design requirements of the load equipment, even for the most challenging of power environments or site loads.

Configured for optimal energy efficiency and design life expectancy, ESR Stabilizers are supplied by default with the output voltage accuracy set for ±3%, being easily site-adjustable to deliver a more or less precise output voltage accuracy - as considered most appropriate for a particular site’s needs.

PRODUCT SELECTION TABLE

<table>
<thead>
<tr>
<th>ESR Models</th>
<th>Rating</th>
<th>Max Rating (Amps per Phase)</th>
<th>Dimensions</th>
<th>Weights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>kVA</td>
<td>@ 190V @ 200V @ 208V @ 220V</td>
<td>W x H x D (mm)</td>
<td>Kg</td>
</tr>
<tr>
<td>ESR-4LY-3P-T1-S*</td>
<td>6</td>
<td>18 17 16</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>ESR-10LY-3P-T1-S*</td>
<td>10</td>
<td>30 28 27</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>ESR-15LY-3P-T1-S*</td>
<td>15</td>
<td>45 43 41</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>ESR-20LY-3P-T1-S*</td>
<td>20</td>
<td>60 57 55</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>ESR-25LY-3P-T1-S*</td>
<td>25</td>
<td>75 72 69</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>ESR-30LY-3P-T1-S*</td>
<td>30</td>
<td>91 86 83</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td>ESR-35LY-3P-T1-S*</td>
<td>35</td>
<td>106 101 97</td>
<td>91</td>
<td></td>
</tr>
<tr>
<td>ESR-40LY-3P-T1-S*</td>
<td>40</td>
<td>121 115 111</td>
<td>104</td>
<td></td>
</tr>
<tr>
<td>ESR-45LY-3P-T1-S*</td>
<td>45</td>
<td>136 129 124</td>
<td>118</td>
<td></td>
</tr>
<tr>
<td>ESR-50LY-3P-T1-S*</td>
<td>50</td>
<td>151 144 138</td>
<td>131</td>
<td></td>
</tr>
<tr>
<td>ESR-55LY-3P-T1-S*</td>
<td>55</td>
<td>167 158 152</td>
<td>144</td>
<td></td>
</tr>
<tr>
<td>ESR-60LY-3P-T1-S*</td>
<td>60</td>
<td>182 173 166</td>
<td>157</td>
<td></td>
</tr>
<tr>
<td>ESR-75LY-3P-T1-S*</td>
<td>75</td>
<td>227 216 208</td>
<td>196</td>
<td></td>
</tr>
<tr>
<td>ESR-80LY-3P-T1-S*</td>
<td>80</td>
<td>243 230 222</td>
<td>209</td>
<td></td>
</tr>
<tr>
<td>ESR-90LY-3P-T1-S*</td>
<td>90</td>
<td>273 259 249</td>
<td>236</td>
<td></td>
</tr>
<tr>
<td>ESR-100LY-3P-T1-S*</td>
<td>100</td>
<td>303 288 277</td>
<td>262</td>
<td></td>
</tr>
<tr>
<td>ESR-120LY-3P-T1-S*</td>
<td>120</td>
<td>364 346 333</td>
<td>314</td>
<td></td>
</tr>
<tr>
<td>ESR-150LY-3P-T1-S*</td>
<td>150</td>
<td>456 432 416</td>
<td>393</td>
<td></td>
</tr>
<tr>
<td>ESR-180LY-3P-T1-S*</td>
<td>180</td>
<td>546 519 499</td>
<td>472</td>
<td></td>
</tr>
<tr>
<td>ESR-200LY-3P-T1-S*</td>
<td>200</td>
<td>607 577 555</td>
<td>524</td>
<td></td>
</tr>
</tbody>
</table>

Dimensions & Weights available on individual request.

Note: Optional Accessories added may affect dimensions – subject to confirmation.

TYPICAL APPLICATIONS

- Computers & Network Systems
- Medical Equipment
- Electronics Equipment
- Testing Equipment
- Laboratory Equipment
- POS Terminals
- Process Control Systems
- TV / Radio Broadcasting Stations
- Elevators
- Audio/Video Systems
- Security Systems
- Production Line
- CNC Equipment
- SMT Equipment

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**TECHNICAL SPECIFICATION**

**Technology:** Digital Buck Boost SCR design topology

<table>
<thead>
<tr>
<th>Input Voltage Swing Variant Options Available: (S*)</th>
<th>Model</th>
<th>Input Swing</th>
<th>Output Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S15</td>
<td>± 15%</td>
<td>± 3%</td>
</tr>
<tr>
<td></td>
<td>S20</td>
<td>± 20%</td>
<td>± 3%</td>
</tr>
<tr>
<td></td>
<td>S25</td>
<td>± 25%</td>
<td>± 3%</td>
</tr>
<tr>
<td></td>
<td>S30</td>
<td>± 30%</td>
<td>± 3%</td>
</tr>
<tr>
<td></td>
<td>S35</td>
<td>± 35%</td>
<td>± 3%</td>
</tr>
<tr>
<td></td>
<td>S40</td>
<td>± 40%</td>
<td>± 3%</td>
</tr>
</tbody>
</table>

Three Phase, 4 Wire (3 Phase + Neutral + G/E). Other swing options available to special quotation / order.

**Output Voltage:**
190/110V, 200/115V, 208/120V or 220/127V (Customer to specify), Three Phase, 4 Wire. The permissible input voltage swing is relative to the preset output voltage.

**Output Voltage Accuracy:** ±3% (Default) - adjustable from ±1% to ±5% (dependent on input swing - see above).

**Frequency:** 35 - 63Hz

**Correction Time:** Within 40 milliseconds

**Efficiency:** ≥98%

**Power Factor:** The Power Factor has no effect on performance providing the stabiliser is being used within its rated capacity

**Overload Capability:** 5 x max. current rating for 1 second
1.5 x max. current rating for 1 minute

**Surge Suppression:** TVSS - Protects loads against high-energy Spikes and Transient Voltages.

**Harmonic Distortion:** None introduced

**Independent Phase Control:** Maintains each phase voltage stable irrespective of load unbalance, even up to 100% load unbalance.

**Automatic Bypass:** Automatic transfer to bypass in the event of an overload or system problem.

**Start Up Protection:** Protection of the load equipment from damaging start up voltage surges.

**Environment:** Temperature range 0 to 45 °C. Derate by 2% for each additional °C Up to max 60 °C. Suitable for indoor tropical use 90% RH (non-condensing). Maximum altitude 4000m. Derate by 2.5% for each additional 500m.

**Audible Noise:** < 45 dB (at 1 metre)

**Construction:** Enclosures to IP20 (NEMA 1 Style) - BS EN 60529 (Option - Outdoor IP54 / NEMA 3)

**Paint Colour:** RAL 7032 (Pebble Grey - Epoxy Powder Coating)

**EMC Conformance:** Complies with BS EN 55022 and the relevant parts of the BS EN 61000 series of standards.

**CE Conformity:** CE Marked - being fully compliant with European Union Directives 2014/30/EU (The EMC Directive) and 2014/35/EU (The Low Voltage Directive).

**Standard Warranty:** Two Years / 24 Months from date of supply - with extendable option to 5 Years.

**Standard Features:** Input Switch / Breaker with Output Isolation and Manual Bypass, Phase Failure Protection, Automatic Electronic Bypass, Class II Lightning Surge Arrestors and LCD Display Panel with RS485 Interface

**SOLID & ROBUST CONSTRUCTION**

ESR Series Stabilizers are enclosed in robust floor standing air-cooled cubicles, being built upon a rigid framework construction and offering front door access and removable side panels for ease of installation and servicing.

Supplied as standard with bottom cable entry (top entry to specific order), ESR Stabilizers offer IP20 / NEMA 3 Style Ingress Protection and are supplied complete with an epoxy powder heavy duty Pebble Grey (RAL 7032) orange peel paint finish.

**ALSO AVAILABLE IN IP54 / NEMA 3 STYLE ENCLOSURES**

Suitable for external use, or more challenging internal environments.

**LCD DIGITAL DISPLAY PANEL**

Comprehensive LCD Digital Monitoring and Control Panel delivering intuitive control and monitoring of all the key system parameters.

**Real Time Display of:**
- Voltage: Individual & Average Output Phase Voltages
- Current: Individual & Average Phase Currents
- Operational Status: On AVR & On Bypass
- Alarm Conditions: Overload, Over-Voltage, Under-Voltage, Fuse Failure & Phase Failure

**Modifiable System Parameter Settings**
- Output Voltage: Over - Voltage
- Output Voltage Accuracy: Under - Voltage
- Correction Time: Over – Current Value
- Voltage Regulation Method

**RS-485 COMMUNICATION**

All ESR Voltage Stabilizers offer as standard a RS-485 communication facility which will enable the following information to be available for remote monitoring -

**Measurements:**
- Input Voltage: Phase to Phase & Phase to Neutral
- Output Voltage: Phase to Phase & Phase to Neutral
- Current: Phase Currents

**Status Indications:**
- Over Voltage
- Under Voltage
- Current Overload
- Fuse Blown

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### STANDARD ENCLOSURE TYPES

**CO2 to C06 Enclosures**
- Bottom Cable Entry

**Physical Size:**
- C02: 17.8"(W) x 32.7"(H) x 30.8"(D) inches
- C04: 28.8"(W) x 46.1"(H) x 30.8"(D) inches
- C06: 20.5"(W) x 51.2"(H) x 33.5"(D) inches

**C14 to C36 Enclosures**
- Bottom Cable Entry

**Physical Size:**
- C14: 41.4"(W) x 78.8"(H) x 27.6"(D) inches
- C15: 47.3"(W) x 78.8"(H) x 31.5"(D) inches
- C36: 59.1"(W) x 78.8"(H) x 47.3"(D) inches

**C02 to C06 Enclosures (Outdoor IP54 / NEMA 3 Style Enclosures - IP54 OPTION)**

### ADD-ON OPTIONS

Where required ESR Series AC Voltage Stabilizers can be supplied with the following additional accessories / add-on features.

- **Input Isolating Transformer (- PC)**
  - Through the integration of a shielded isolation transformer, provides enhanced spike & electrical noise (Common Mode: 120db @ 100kHz & Normal Mode Noise: 60db @ 100kHz) suppression and neutral ground bonding. Delivers what is commonly referred to as a 'CLEAN' supply. ESR Stabilizers supplied with the above option fitted are typically referred to as ‘Power Line Conditioners’.
  - To withstand harmonic content, Isolation Transformers utilised are available as an additional enhanced option with K-13 (-K13) or K-20 (-K20) factor ratings.

- **IP54 Ingress Protection (- IP54)**
  - Stabilizer presented in endurable IP54 (BS / EN 60529) / NEMA 3 free standing steel cubicles suitable for external use, or more challenging internal environments.

- **AquaStop (- AS)**
  - PCB protective coating offering protection against damp and moisture ingress.

- **Additional Digital Metering (-ADM)**
  - Additional Digital Metering for Input Voltage and Frequency

- **Alternative Switch Arrangements (-T2 or -T3)**
  - Alternative Input, Output and Bypass Switching arrangements - details available on request.

- **4 Pole Switches / Breakers (-FP)**
  - As standard ESR Stabilisers utilise 3 Pole Switches / Breakers. As an option 4 Pole alternatives can be supplied.

- **eSpec Upgrade (-eSP)**
  - While we endeavour to keep production costs to a minimum by sourcing top specification components from around the globe we realise that some clients have a requirement for their own designated protection devices. Accordingly we are able to offer our eSpec Pack Upgrade package which offers the client the short circuit and overcurrent protection components from their preferred leading European or American manufacturers.

**NB:** The inclusion of the above add-on options may increase enclosure sizings and weights - subject to confirmation at time of ordering.

### 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.

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