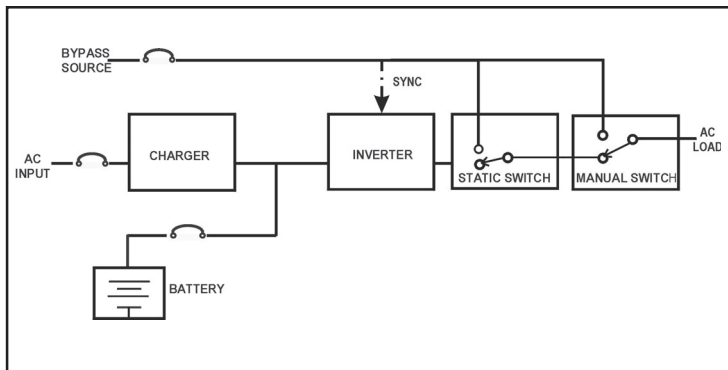


# Total UPS System 3-50 kVA Single Phase Output

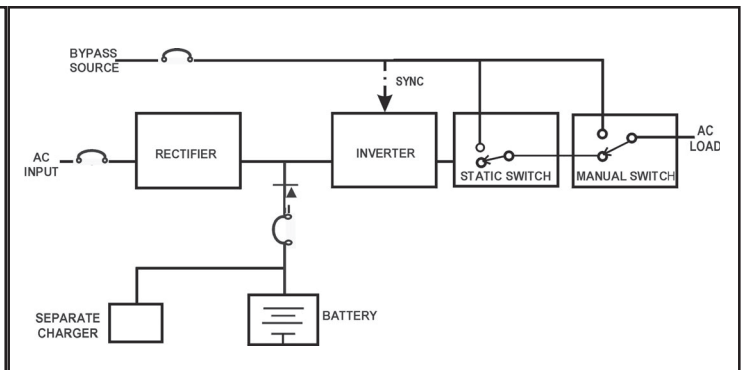


- ◆ High reliability—exceeds 140,000 hrs. (16 yrs.) MTBF
- ◆ Industrial grade – built to operate in extreme environments, (VPI) vacuum impregnated magnetics with 200°C epoxy insulation
- ◆ Low audible noise
- ◆ High efficiency transistor bridge
- ◆ Long life LED indicators, front panel accessibility
- ◆ Harmonic filtering for Distributed Control Systems
- ◆ Unique crest factor circuitry provides full capacity for non-linear loads
- ◆ Optional remote status panel
- ◆ All components are front accessible-no side or back clearance required
- ◆ Integral system event recording for diagnostics (logs last 100 events)
- ◆ Lighted Mimic Panel Display
- ◆ Microprocessor based alarms
- ◆ RS232 Communications Interface accessible through door front
- ◆ Optional Rectifier blocking diode to use the SE *Plus* with existing station battery and battery charger

The SE *Plus* UPS Systems are true on-line ferroresonant systems which provide regulated, clean, continuous power for critical AC loads. Each system integrates the Battery Charger, Inverter, Static Switch, and a Manual Bypass Switch in a single package.



**On-Line UPS Block Diagram  
Float System**



**On-Line UPS Block Diagram  
Optional Rectifier System**

Specifications subject to change without notice.

## Optional Features

### Circuit Breakers:

AC Input  
Battery Input  
Bypass Source Input

### Meters:

AC Inverter Output Voltmeter  
AC Output Ammeter  
Inverter Output Frequency Meter  
DC Output Ammeter  
DC Output Voltmeter

### Indicators & Alarms\*:

Battery Supplying Load  
Bypass Source Failure  
In Sync (Pilot Light)  
Fan Failure  
Low DC Voltage  
Static Switch Transfer (Alarm)  
Battery Breaker Open

### Cabinet:

NEMA-1 (IP-20)

### Indicators & Alarms\*:

(Not to exceed 12)  
High DC Voltage  
High DC Disconnect  
Negative/Positive to Ground (counts as 2)  
Latching Alarms  
Lamp Test Pushbutton  
Over Temperature  
AC Available to Charger  
Charger Failure  
Bypass Source Low Voltage  
Bypass Source High Voltage  
Low AC Output  
High AC Output  
UPS Summary  
AC Power Failure  
Out of Sync  
Fuse Blown Alarms  
Audible Alarm  
Inverter Failure  
Low DC Disconnect  
MBS Position Indicator (counts as 2)

### Meters: (Not to exceed 5)

AC Input Voltmeter (qty.-2)  
System Output Voltmeter  
Bypass Input Voltmeter  
Battery Input Voltmeter  
Battery Zero Center Ammeter

### Cabinet Options:

Top-Mounted Dripshield (IP-31)  
Fungus/Moisture Spray

### Circuit Breakers:

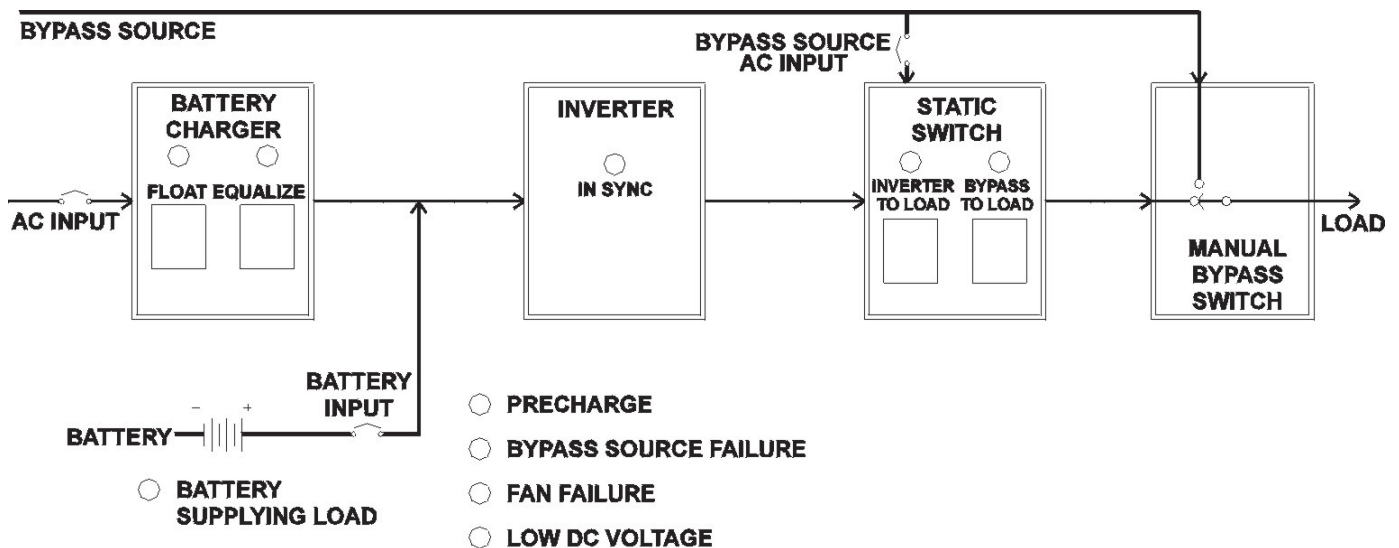
Inverter Output (Non-automatic)  
AC Output (Static Switch)  
DC Output (Charger)

### Rectifier System:

Blocking Diode Added  
Float & Equalizer Controls & Lights Removed  
Equalize Timer Removed  
DC Voltage set at 2.33 volts per battery cell

\* Note : Alarm supplied with one SPDT contact rated for 3 Amps at 120 VAC/28VDC

Consult factory for additional options.



**Lighted Mimic Panel Block Diagram**

## Battery Charger

### AC Input

|            |   |
|------------|---|
| Voltages:  | 208, 220, 240, 380, 415 & 480<br>VAC/3-phase, 3 wire    |
| Range:     | +10, -10% ( +10, -15% without<br>discharging batteries) |
| Frequency: | 50 or 60 Hz $\pm 5\%$                                   |

### DC Output

|                   |  |
|-------------------|--|
| Float Voltage:    | 110 VDC, 220 VDC nominal<br>130 VDC, 260 VDC nominal<br>$\pm 5\%$ adjustment |
| Equalize Voltage: | 140 VDC, 280 VDC<br>$\pm 5\%$ adjustment                                     |
| Regulation;       | $\pm 0.5\%$ float $\pm 0.7\%$ equalize<br>( $\pm 10\%$ AC Input)             |
| Ripple Voltage:   | <2% RMS with batteries   |
| Equalize Timer:   | 0-100 hours, manual start,<br>auto-reset                                     |
| Capacity:         | Sized to Recharge the battery<br>in 8-10 times the discharge rate            |

### Inverter

#### DC Input

|        |            |
|--------|------------|
| Range: | -19% - +8% |
|--------|------------|

#### AC Output

|                      |                                       |
|----------------------|---------------------------------------|
| Sizes:               | 3-50kVA                               |
| Voltages:            | 120, 220 VAC, 1-phase, 2 wire*        |
| Regulation:          | $\pm 2\%$                             |
| Frequency:           | 50 or 60 Hz $\pm 0.1\%$               |
| Sync Range:          | $\pm 0.5$ HZ                          |
| Load Power Factor:   | 0.8 to 1.0 (Harmonic<br>Power Factor) |
| Harmonic Distortion: | <5% THD                               |
| Overload Capacity:   | 500% for 1 cycle, 120%<br>continuous  |
| Crest Factor:        | 3:1 at full load                      |

### Conversion Efficiencies

|                 |  |
|-----------------|--|
| Charger AC-DC:  | 110/130VDC: 91-94%<br>220/260VDC: 91-94% |
| Inverter DC-AC: | 110/130VDC: 83-88%<br>220/260VDC: 84-88% |

\*110/220 & 120/240 VAC 3 wire output are available  
Consult factory

## Environmental

|  |                             |
|--|-----------------------------|
| Ambient Temp.:   | 0°C to 40°C (50°C optional) |
| Relative Humidity:   | 0-95% non-condensing        |
| Operating Altitude:  | 0 to 2500 meters (8200 ft.) |
| Audible Noise:   | 65-72dB(A) at 1.5 meters    |
| Addition of drip shield may increase the noise<br>by 1-3dB (A) |                             |

## Cable Entry

Bottom (front) via removable plate (one per bay)  
Top or side entry, consult factory

## Controls (Push-button & Indicator)

Inverter to Load Push-button  
Bypass to Load Push-button  
Float Voltage Potentiometer  
Equalize Potentiometer  
Precharge Push-button (20 kVA and above)

## Static Switch

|   |  |
|---|--|
| Normal Source:                                    | Inverter Output  |
| Alternate Source:                                 | Bypass Supply  |
| Voltage:  | Bypass Supply voltage must<br>match the inverter output<br>voltage   |
| Transfer Time:                                    | Zero (make-before-break in<br>both directions)   |
| Transfer Criteria:<br>(from inverter to bypass)   | 1. Inverter Bridge Failure<br>2. Load Overcurrent<br>3. Low Inverter Voltage<br>4. Manual Push-button<br>Operation |
| Retransfer Criteria:<br>(from bypass to inverter) | 1. Inverter in Sync<br>2. Auto Retransfer Defeat<br>Switch Off   |
| Overcurrent Transfer:                             | 120% of rated full load current  |
| Overload Capacity:                                | 1000% for 1 cycle  |

## Manual Bypass Switch

(optional Remote Bypass Switch available)\*\*

|                    |   |
|--------------------|---|
| Switch Style:      | 600 VAC, rotary drum,<br>make-before-break<br>switching |
| Transfer Time:     | Zero  |
| Transfer Criteria: | The inverter must be in<br>sync with the bypass         |

\*\*Internal Manual Bypass Switch is normally removed when a  
Remote Bypass Switch is selected

# General Specifications

**SE** *Plus*

## 110,130 VDC LINK

| Model     | kVA | kW  | 3Ø AC Input/Frequency <sup>1</sup> |        |        |        | Inverter DC-AC Efficiency | UPS Cabinet Style | Heat Loss (Watts) | Circuit Breaker Ampacity |        |        |        |         |          |              | Weight <sup>2</sup> Lbs. (Kg) |     |             |
|-----------|-----|-----|------------------------------------|--------|--------|--------|---------------------------|-------------------|-------------------|--------------------------|--------|--------|--------|---------|----------|--------------|-------------------------------|-----|-------------|
|           |     |     | AC Amperes/Phase                   |        |        |        |                           |                   |                   | Main AC Input            |        |        |        | DC Link | Bat-tery | Bypass Input |                               |     |             |
|           |     |     | 208/60                             | 480/60 | 380/50 | 415/50 |                           |                   |                   | 208/60                   | 480/60 | 380/50 | 415/50 |         |          | 120          |                               | 220 |             |
| SE3003U-* | 3   | 3   | 23                                 | 10     | 13     | 11     | 83                        | E                 | 972               | 30                       | 15     | 15     | 15     | 110     | 130      | 150          | 35                            | 20  | 1025 (466)  |
| SE3005U-* | 5   | 5   | 28                                 | 12     | 16     | 14     | 85                        | E                 | 1464              | 35                       | 15     | 20     | 25     | 110     | 100      | 70           | 60                            | 30  | 1075 (489)  |
| SE3007U-* | 7.5 | 7.5 | 43                                 | 18     | 23     | 21     | 85                        | E                 | 2196              | 60                       | 25     | 30     | 35     | 110     | 125      | 100          | 80                            | 45  | 1250 (568)  |
| SE3010U-* | 10  | 10  | 56                                 | 24     | 31     | 28     | 85                        | E                 | 2788              | 70                       | 30     | 40     | 40     | 110     | 175      | 125          | 125                           | 60  | 1450 (659)  |
| SE3015U-* | 15  | 15  | 84                                 | 36     | 46     | 42     | 86                        | F                 | 3755              | 125                      | 50     | 60     | 60     | 130     | 200      | 200          | 175                           | 90  | 1850 (841)  |
| SE3020U-* | 20  | 20  | 112                                | 48     | 61     | 56     | 86                        | F                 | 5006              | 150                      | 60     | 80     | 80     | 110     | 350      | 250          | 225                           | 125 | 2150 (977)  |
| SE3030U-* | 30  | 30  | 166                                | 72     | 91     | 83     | 87                        | H                 | 6684              | 225                      | 90     | 125    | 125    | 110     | 500      | 400          | 350                           | 175 | 3300 (1490) |
| SE3040U-* | 40  | 40  | 221                                | 96     | 121    | 111    | 88                        | GH                | 8356              | 300                      | 125    | 150    | 150    | 130     | 600      | 500          | 450                           | 250 | 4400 (2000) |
| SE3050U-* | 50  | 50  | 276                                | 120    | 151    | 138    | 88                        | GH                | 10445             | 400                      | 150    | 175    | 175    | 110     | 600      | 600          | 600                           | 300 | 4900 (2227) |

## 220,260 VDC LINK

|           |     |     |     |     |     |     |    |    |       |     |     |     |     |     |     |     |     |     |             |
|-----------|-----|-----|-----|-----|-----|-----|----|----|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------------|
| SE6003U-* | 3   | 3   | 23  | 10  | 12  | 11  | 84 | E  | 925   | 30  | 15  | 20  | 20  | 220 | 35  | 25  | 35  | 20  | 1025 (466)  |
| SE6005U-* | 5   | 5   | 34  | 15  | 19  | 17  | 87 | E  | 1316  | 50  | 20  | 25  | 25  | 220 | 40  | 40  | 60  | 30  | 1075 (489)  |
| SE6007U-* | 7.5 | 7.5 | 46  | 20  | 25  | 23  | 88 | E  | 1866  | 60  | 25  | 35  | 35  | 220 | 70  | 50  | 80  | 45  | 1250 (568)  |
| SE6010U-* | 10  | 10  | 56  | 24  | 31  | 28  | 88 | E  | 2352  | 70  | 30  | 40  | 40  | 220 | 80  | 70  | 125 | 60  | 1450 (659)  |
| SE6015U-* | 15  | 15  | 84  | 36  | 46  | 42  | 88 | F  | 3328  | 125 | 50  | 60  | 60  | 220 | 125 | 100 | 175 | 90  | 1850 (841)  |
| SE6020U-* | 20  | 20  | 112 | 48  | 61  | 56  | 88 | F  | 4438  | 150 | 60  | 80  | 80  | 220 | 175 | 125 | 225 | 125 | 2150 (977)  |
| SE6030U-* | 30  | 30  | 166 | 72  | 91  | 83  | 88 | H  | 6267  | 225 | 90  | 125 | 125 | 220 | 225 | 200 | 350 | 175 | 3300 (1490) |
| SE6040U-* | 40  | 40  | 221 | 96  | 121 | 111 | 88 | GH | 8356  | 300 | 125 | 150 | 150 | 220 | 350 | 250 | 450 | 225 | 4400 (2000) |
| SE6050U-* | 50  | 50  | 276 | 120 | 151 | 138 | 88 | GH | 10445 | 350 | 150 | 200 | 200 | 220 | 400 | 350 | 600 | 300 | 4900 (2227) |

<sup>1</sup>At Nominal Line & Current Limit, <sup>2</sup> Weight of 60Hz units, 50Hz 7% more

\*A complete UPS model number includes the AC input voltage, DC bus (link) voltage), AC output voltage, and system frequency. To "build" a model number, use the "code" in the matrix shown below.

Model Number: SE3030U-XX-YY-ZZ-AA

where  
 XX=AC Input Voltage  
 YY=DC Bus Voltage  
 ZZ=AC Output Voltage  
 AA=System Frequency

| AC Input Volts | Code | DC Bus Volts | Code | AC Output Volts | Code | Freq | Code |
|----------------|------|--------------|------|-----------------|------|------|------|
| 480            | 48   | 130          | 13   | 120             | 12   | 60Hz | 60   |
| 220            | 22   | 260          | 26   | 120/240 **      | 24   | 50Hz | 50   |
| 380            | 38   | 110          | 11   | 220             | 22   |      |      |
| 415            | 41   | 220          | 22   |                 |      |      |      |
| 208            | 20   |              |      |                 |      |      |      |

\*\* Note: For 120/240 volt output, also place a "2" before the "SE".

Example: A 30 kVA UPS with 415 VAC input voltage; 260 VDC bus, 220 VAC output voltage, 50 Hz: Model No. SE3030U-41-26-22-50. If voltage code is not listed...place a "C" after the "U". Example: Model No. SE3030UC.

Consult your local  
**Solidstate Controls representative**  
 or the factory if you have any questions.



The Columbus, Ohio facility  
 is ISO 9001 Certified

World Headquarters  
 875 Dearborn Drive - Columbus, OH 43085  
 Phone: 1-614-846-7500 1-800-635-7300  
 Fax: 1-614-885-3990

Latin American/South American Headquarters  
 Olive 1954 2000 Rosario, Argentina  
 Phone: +54-341-455-3332  
 Fax: +54-341-454-0142

Asia Pacific Headquarters  
 AMETEK Singapore Office  
 Solidstate Controls  
 43 Chang South Ave 2 #04-01  
 Singapore 488164  
 Phone: 65-6484-2388 Fax: 65-6481-6588

Mexico Office  
 Calle Lago Meru  
 No. 32 3rd Floor  
 Mexico City, Mexico 11520 D.F.  
 Phone: +52-55-250-1232  
 Fax: +52-55-250-7981

Visit our websites:  
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### Cabinet Dimensions\*\*\*

| Cabinet Style   | Inches (mm)  |   |              |   |              |
|-----------------|--------------|---|--------------|---|--------------|
|                 | H            | x | W            | x | D            |
| E               | 78<br>(1981) | x | 29<br>x 737  | x | 32<br>x 813) |
| F               | 78<br>(1981) | x | 56<br>x 1422 | x | 32<br>x 813) |
| G               | 85<br>(2159) | x | 29<br>x 1422 | x | 36<br>x 914) |
| H               | 85<br>(2159) | x | 56<br>x 2159 | x | 36<br>x 914) |
| <sup>3</sup> GH | 85<br>(2159) | x | 85<br>x 2159 | x | 36<br>x 914) |

<sup>3</sup>Note: the GH cabinet style is made up of G & H sections

\*\*\*Certain optional features and/or combinations may require larger cabinets. Contact factory