

**Business-Critical Continuity™**  
for Renewable Energy

**Harnessing Solar Power for greener earth and better tomorrow**



**Liebert ESU**

1 to 100 kW OFF Grid Solar Inverter

**&**

**Liebert EEU**

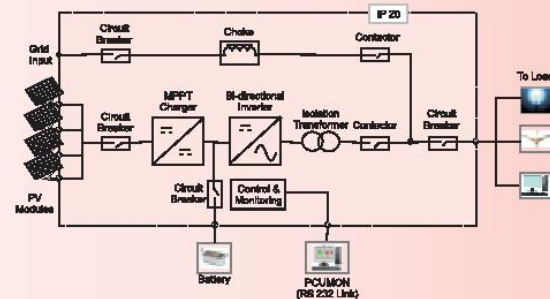
1 to 250 kW Grid Connect Solar Inverter



## Liebert ESU (Energy Storage Unit)

### Features:

- Micro processor based design
- Bi-directional Solar Inverter with MPPT charge controller
- High Efficiency & Reliability
- 20 years design life. Tropicalised design
- Hybrid inverter Operation with Wind / DG
- Inbuilt LCD display
- Sophisticated local & remote monitoring system (Optional)
- Built in output isolation transformer
- Compliance to test standards
- Sharing of Solar Power & Grid Power

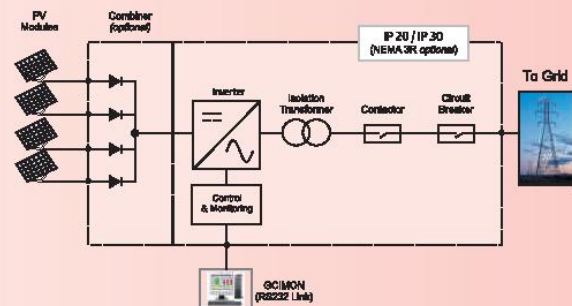


Liebert ESU is single / three phase output, bi-directional inverter system. ESU operates in parallel with the grid utility. Solar Photovoltaic panels convert solar energy into electrical energy as DC power. This DC power is used to charge the batteries through a charge controller and also used for the load through Inverter. Additional energy is exported to the grid.

## Liebert EEU (Energy Export Unit)

### Features:

- Micro processor / DSP based MPPT Design
- High efficiency & Reliability
- 20 years design life. Tropicalised design
- Inbuilt LCD display
- Sophisticated local & remote monitoring system (Optional)
- Built in output isolation transformer up to 100 kW
- Compliance to test standards



Liebert EEU is single / three phase output inverter, with Grid interactive feature. Solar Photovoltaic panels convert solar energy into electrical energy as DC power. This DC power becomes input for the EEU inverter. The inverter converts it into conventional AC power, and with its state of the art Grid synchronization design, this AC power is fed to the supply grid.



## Specifications: Liebert ESU: 1-10 kW, 1 Phase

| PARAMETERS                           | SPECIFICATIONS                                          |     |     |                 |     |     |                                   |
|--------------------------------------|---------------------------------------------------------|-----|-----|-----------------|-----|-----|-----------------------------------|
|                                      | 1kW                                                     | 2kW | 3kW | 4kW             | 5kW | 6kW | 10kW                              |
| INVERTER MODEL                       | Liebert ESU 010 - Bidirectional, TRUE SINE WAVE         |     |     |                 |     |     |                                   |
| INPUT - Array Input                  | 40V to 88 VDC                                           |     |     | 80V to 176 VDC  |     |     | 100 - 220 VDC                     |
| Max. open circuit voltage            | 88 VDC                                                  |     |     | 176 VDC         |     |     | 220 VDC                           |
| MPPT voltage range                   | 44 to 79 VDC                                            |     |     | 88 to 158 VDC   |     |     | 110 to 198 VDC                    |
| CHARGER CONTROLLER                   | MPPT                                                    |     |     |                 |     |     |                                   |
| BATTERY                              |                                                         |     |     |                 |     |     |                                   |
| Voltage                              | 48 VDC                                                  |     |     | 96 VDC          |     |     | 120 VDC                           |
| Max. Grid Charging Current           | 14A                                                     | 27A | 41A | 27A             | 34A | 41A | 74A                               |
| Type                                 | SMF / Lead Acid Wet Cell                                |     |     |                 |     |     |                                   |
| OUTPUT                               |                                                         |     |     |                 |     |     |                                   |
| Power Capacity                       | 1kW                                                     | 2kW | 3kW | 4kW             | 5kW | 6kW | 10kW                              |
| Load Power Factor                    | 0.8 Lag to Unity                                        |     |     |                 |     |     |                                   |
| Voltage / Frequency                  | 230 Vac, Single Phase, 50 HZ (+/-0.5%) Stand alone mode |     |     |                 |     |     |                                   |
| Regulation                           | +/-2%                                                   |     |     |                 |     |     |                                   |
| Voltage Distortion                   | <3% at Linear load                                      |     |     |                 |     |     | <2% at linear load                |
| Grid tracking voltage / frequency    | 230 V, Single phase (+/-10%), 50 Hz (+/-3 Hz)           |     |     |                 |     |     |                                   |
| Over Load                            | 125% for 4 Minutes and 150% for 1 Minute                |     |     |                 |     |     | 125% for 10 Mins & 150% for 1 Min |
| Peak Efficiency <sup>(1)</sup>       | 83%                                                     | 85% | 85% | 88%             | 89% | 90% | 91%                               |
| OPERATING MODES                      | 1. Stand alone 2. Grid Interactive 3. Off line          |     |     |                 |     |     | Stand alone<br>Grid Interactive   |
| ENVIRONMENTAL                        |                                                         |     |     |                 |     |     |                                   |
| Operating Temperature <sup>(2)</sup> | 0 to 45°C                                               |     |     |                 |     |     |                                   |
| Storage Temperature                  | -10 to +55°C                                            |     |     |                 |     |     |                                   |
| Relative Humidity                    | Up to 95% RH Non Condensing                             |     |     |                 |     |     |                                   |
| Acoustics Noise <sup>(3)</sup>       | <60 dB                                                  |     |     |                 |     |     | <62 dB                            |
| Altitude <sup>(4)</sup>              | <1 000 meter above Sea Level                            |     |     |                 |     |     |                                   |
| MECHANICAL                           |                                                         |     |     |                 |     |     |                                   |
| IP                                   | IP 20                                                   |     |     |                 |     |     |                                   |
| Cooling                              | Forced Cool                                             |     |     |                 |     |     |                                   |
| Dimensions W x D x H                 | 225 x 650 x 600                                         |     |     | 250 x 650 x 700 |     |     | 400 x 800 x 1000                  |
| Weight In kg. (approx.)              | 50                                                      | 55  | 60  | 77              | 83  | 90  | 240                               |
| LCD DISPLAY                          | Inbuilt                                                 |     |     |                 |     |     |                                   |
| MONITORING (Optional)                | RS 232 (PCUMON) / Ethernet connectivity                 |     |     |                 |     |     | RS 232 (PCUMON)                   |
| STANDARD                             | IEC 62040 - 3                                           |     |     |                 |     |     |                                   |

## Specifications: Liebert ESU: 10-100 kW, 3 Phase

| PARAMETERS                           | SPECIFICATIONS                                                    |                  |         |                   |                    |
|--------------------------------------|-------------------------------------------------------------------|------------------|---------|-------------------|--------------------|
|                                      | 10kW                                                              | 20kW             | 30kW    | 50kW              | 100kW              |
| INVERTER MODEL                       | Liebert ESU 030 - Bidirectional, TRUE SINE WAVE                   |                  |         |                   |                    |
| INPUT - Array Input                  | 100 - 220 VDC                                                     | 200 - 440 VDC    |         |                   |                    |
| Max. open crcuit voltage             | 220 VDC                                                           | 440 VDC          |         |                   |                    |
| MPPT voltage range                   | 110 to 198 VDC                                                    | 220 to 396 VDC   |         |                   |                    |
| CHARGER CONTROLLER                   | MPPT                                                              |                  |         |                   |                    |
| BATTERY                              |                                                                   |                  |         |                   |                    |
| Voltage                              | 120VDC                                                            | 240VDC           |         |                   |                    |
| Max. Grid Charging Current           | 74A                                                               | 74A              | 111A    | 185A              | 370A               |
| Type                                 | SMF / Lead Acid Wet Cell                                          |                  |         |                   |                    |
| OUTPUT                               |                                                                   |                  |         |                   |                    |
| Power Capacity                       | 10kW                                                              | 20kW             | 30kW    | 50kW              | 100kW              |
| Voltage / Frequency                  | 415 Vac, Three Phase, 50 HZ (+/- 3HZ) - Stand alone mode          |                  |         |                   |                    |
| Load Power Factor                    | 0.6 Lag to Unity                                                  |                  |         |                   |                    |
| Regulation                           | +/- 2%                                                            |                  |         |                   |                    |
| Voltage Distortion                   | <2% at Linear load & <5% at Non Linear Load                       |                  |         |                   |                    |
| Grid tracking voltage / frequency    | 415 V, Three phase (+/- 10%), 50 Hz (+/- 3 Hz)                    |                  |         |                   |                    |
| Over Load                            | 125% for 10 Minutes and 150% for 1 Minute                         |                  |         |                   |                    |
| Peak Efficiency <sup>(1)</sup>       | 91%                                                               | 91%              | 92%     | 93%               | 93%                |
| OPERATING MODES                      | 1. Stand alone   2. Grid Interactive   3. Off line                |                  |         |                   |                    |
| ENVIRONMENTAL                        |                                                                   |                  |         |                   |                    |
| Operating Temperature <sup>(2)</sup> | 0 - 45°C                                                          | 0 - 50°C         |         |                   |                    |
| Storage Temperature                  | -10 to +55°C                                                      |                  |         |                   |                    |
| Relative Humidity                    | Upto 95% RH Non Condensing                                        |                  |         |                   |                    |
| Acoustics Noise <sup>(3)</sup>       | < 62 dB                                                           | < 62 dB          | < 62 dB | < 68 dB           | < 72 dB            |
| Altitude <sup>(4)</sup>              | < 1 000 meter above Sea Level                                     |                  |         |                   |                    |
| MECHANICAL                           |                                                                   |                  |         |                   |                    |
| IP                                   | IP 20                                                             |                  |         |                   |                    |
| Cooling                              | Forced Cool                                                       |                  |         |                   |                    |
| Dimensions W x D x H in mm           | 400 x 800 x 1000                                                  | 550 x 900 x 1200 |         | 1000 x 900 x 1750 | 1200 x 1000 x 1900 |
| Weight In kg. (approx.)              | 250                                                               | 400              |         | 800               | 1115               |
| LCD DISPLAY                          | Inbuilt                                                           |                  |         |                   |                    |
| MONITORING (Optional)                | GSM/GPRS / GSM/Internet / Static IP / CSD / Ethernet Connectivity |                  |         |                   |                    |
| STANDARD                             | IEC 62040 - 3                                                     |                  |         |                   |                    |



## Specifications: Liebert EEU: 1-6 kW, 1 Phase

| PARAMETERS                           | SPECIFICATIONS                          |       |        |        |        |      |
|--------------------------------------|-----------------------------------------|-------|--------|--------|--------|------|
|                                      | 1kW                                     | 2kW   | 3kW    | 4kW    | 5kW    | 6kW  |
| <b>INVERTER MODEL</b>                | Liebert EEU 010 - TRUE SINE WAVE        |       |        |        |        |      |
| <b>INPUT - Array Input</b>           | 40V to 88 VDC                           |       |        |        |        |      |
| Max. open circuit voltage            | 88 VDC                                  |       |        |        |        |      |
| MPPT voltage range                   | 44 to 79 VDC                            |       |        |        |        |      |
| <b>CONTROLLER</b>                    | MPPT                                    |       |        |        |        |      |
| <b>OUTPUT</b>                        |                                         |       |        |        |        |      |
| Power Capacity                       | 1kW                                     | 2kW   | 3kW    | 4kW    | 5kW    | 6kW  |
| Voltage / Frequency                  | 230 Vac, Single Phase, 50 HZ            |       |        |        |        |      |
| Line Power Factor                    | > 0.98                                  |       |        |        |        |      |
| Grid Tracking Range                  | +10% to -20%, +/- 3HZ                   |       |        |        |        |      |
| Current Distortion                   | < 5 %                                   |       |        |        |        |      |
| Output Current Limit                 | 4.3 A                                   | 8.7 A | 13.0 A | 17.4 A | 21.7 A | 26 A |
| Peak Efficiency <sup>(1)</sup>       | 83%                                     | 85%   | 85%    | 88%    | 89%    | 89%  |
| <b>ENVIRONMENTAL</b>                 |                                         |       |        |        |        |      |
| Operating Temperature <sup>(2)</sup> | 0 to 45°C                               |       |        |        |        |      |
| Storage Temperature                  | -10 to +55°C                            |       |        |        |        |      |
| Relative Humidity                    | Up to 95% RH Non Condensing             |       |        |        |        |      |
| Acoustics Noise <sup>(3)</sup>       | < 55 dB                                 |       |        |        |        |      |
| Altitude <sup>(4)</sup>              | < 1000 meter above Sea Level            |       |        |        |        |      |
| <b>MECHANICAL</b>                    |                                         |       |        |        |        |      |
| IP                                   | IP 20                                   |       |        |        |        |      |
| Cooling                              | Forced Cool                             |       |        |        |        |      |
| Dimensions W x D x H in mm           | 225 x 650 x 600                         |       |        |        |        |      |
| Weight in kg. (approx.)              | 45                                      | 50    | 55     | 72     | 78     | 85   |
| <b>LCD DISPLAY</b>                   | Inbuilt                                 |       |        |        |        |      |
| <b>MONITORING (Optional)</b>         | RS 232 (PCUMON) / Ethernet connectivity |       |        |        |        |      |
| <b>STANDARD</b>                      | IEC 62040 - 3                           |       |        |        |        |      |

## Specifications: Liebert EEU: 10-250 kW, 3 Phase

| PARAMETERS                           | SPECIFICATIONS                                                                   |                          |                   |                                                                      |
|--------------------------------------|----------------------------------------------------------------------------------|--------------------------|-------------------|----------------------------------------------------------------------|
|                                      | 10kW                                                                             | 30kW                     | 100kW             | 250kW (TXR LESS)                                                     |
| <b>INVERTER MODEL</b>                | Liebert EEU 030 - TRUE SINE WAVE                                                 |                          |                   |                                                                      |
| <b>INPUT</b>                         |                                                                                  |                          |                   |                                                                      |
| Array Voltage Range                  | 110 V to 220 VDC                                                                 | 400 to 700 V DC          | 220 to 440 V DC   | 440 to 880 VDC                                                       |
| Max. open circuit voltage            | 220 VDC                                                                          | 700 V DC                 | 440 V DC          | 880 V DC                                                             |
| MPPT voltage range                   | 140 to 180 VDC                                                                   | 420 to 600 V DC          | 280 to 360 V DC   | 450 to 820 VDC                                                       |
| <b>CONTROLLER</b>                    | MPPT                                                                             |                          |                   |                                                                      |
| <b>OUTPUT</b>                        |                                                                                  |                          |                   |                                                                      |
| Power Capacity                       | 10kW                                                                             | 30kW                     | 100kW             | 250kW                                                                |
| Voltage / Frequency                  | 415 Vac, 3 Ph, 3 Wire, 50 / 60 Hz (optional)                                     |                          |                   |                                                                      |
| Line Power Factor                    | ≥ 0.99                                                                           |                          |                   |                                                                      |
| Grid Tracking Range                  | +10% to -20%, ± 3 HZ                                                             |                          |                   |                                                                      |
| Current Distortion                   | < 5%                                                                             |                          |                   |                                                                      |
| Output Current Limit                 | 13.9 A per Phase                                                                 | 44 A per Phase           | 139.2 A per Phase | 460 A per Phase                                                      |
| Peak Efficiency <sup>(1)</sup>       | 91%                                                                              | 93%                      | 94%               | 98% efficiency for transformer less EEU<br>With XMR EEU is available |
| <b>ENVIRONMENTAL</b>                 |                                                                                  |                          |                   |                                                                      |
| Operating Temperature <sup>(2)</sup> | 0 - 45°C                                                                         | 0 - 50°C                 | 0 - 50°C          | 0 - 50°C                                                             |
| Storage Temperature                  | -10 to 55°C                                                                      |                          |                   |                                                                      |
| Relative Humidity                    | Up to 95% (Non-Condensing)                                                       |                          |                   |                                                                      |
| Acoustics Noise <sup>(3)</sup>       | < 60 dB                                                                          | < 65 dB                  | < 72 dB           | < 75 dB                                                              |
| Altitude <sup>(4)</sup>              | < 1000 meter above Sea Level                                                     |                          |                   |                                                                      |
| <b>MECHANICAL</b>                    |                                                                                  |                          |                   |                                                                      |
| IP                                   | IP 20                                                                            | IP 30 (NEMA 3R optional) | IP 31             | IP 31                                                                |
| Cooling                              | Forced Cool                                                                      |                          |                   |                                                                      |
| Dimensions W x D x H in mm           | 400 x 800 x 1000                                                                 | 800 x 700 x 1550         | 1200 x 900 x 2050 | 1200 x 900 x 2050                                                    |
| Weight in kg. (approx.)              | 250                                                                              | 375                      | 915               | 915                                                                  |
| <b>LCD DISPLAY</b>                   | Inbuilt                                                                          |                          |                   |                                                                      |
| <b>MONITORING (Optional)</b>         | RS 232 (CCIMON) / Ethernet Connectivity / MODBUS                                 |                          |                   |                                                                      |
| <b>STANDARDS</b>                     | EMC-IEC 62040, IEC 61000-6-2, 4, Safety - IEEE 519, 929, 1547, UL 1741, ERG 83/1 |                          |                   |                                                                      |

### Notes:

- 1) For tolerances see IEC / EN 60146-1-1
- 2) Extended temperature range is available upto 50°C. For 55°C, please contact technical support
- 3) Acoustic noise measured @ 1 meter as per ISO 3746.
- 4) For higher altitude complies with IEC / EN 62040-3



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Solar Inverters, Stabilizers, Isolation  
Transformers & Batteries.