



**Submersibles and Electric**



**Infinite Solar Pumping Energy**

**Solar Stainless Steel Submersible Bore well Pumps**

## INTRODUCTION

Existence of human life in remote locations & rural areas depends largely on the availability of clean water to people, livestock and crops. Farmers in remote locations & rural parts of the world can only become prosperous if there is availability of clean water for their farms, homes and livestock. In many parts of the world there is a shortage of reliable power for homes and irrigation of fields where **SEI LSZ** series of Solar Submersible Pumping systems can make a remarkable contribution.

The **LSZ** Solar Submersible Pumping system offered by **SEI** is a state-of-the-art high technology product designed to provide a green and energy efficient solution for a reliable water supply where there is no access of clean water & electricity.

The LSZ are available from 0.5 to 20 hp (0.37 to 15 kW) for AC power supply and from 0.5 to 2 hp (0.37 to 1.5 kW) for DC power supply.

The LSZ Solar Submersible Pumping system comprises of the following equipment.

- ➔ Solar stainless steel submersible bore well pump
- ➔ Solar photovoltaic panels with mounting structure
- ➔ Automatic controller for the solar pump
- ➔ Cables and accessories.

## APPLICATIONS

- ➔ Flood irrigation of small fields
- ➔ Drip irrigation for farms
- ➔ Cattle watering
- ➔ Water supply for small villages, schools, hospitals and homes.

## FEATURES AND BENEFITS

- ➔ Highly energy efficient submersible solar water pump with energy efficient inverter duty motor.
- ➔ High efficiency solar photovoltaic panels with a service life of minimum 20 years.
- ➔ Robust design Galvanized steel mounting structure for long life.
- ➔ High technology automatic controller with dynamic MPPT (Maximum Power Point Tracking) control method.
- ➔ The controller offers complete protection against under and over voltage and dry run protection for the pump.
- ➔ Highly efficient controller with a conversion efficiency of 98%.
- ➔ The controller is tropicalized to operate satisfactorily with an ambient temperature of up to 122°F (50°C).
- ➔ Virtually no maintenance cost.
- ➔ Environmentally friendly air and noise pollution free solution.

### RANGE OF PERFORMANCE

- ➔ Maximum flow : 38300 US gallons/day (145 m<sup>3</sup>/day)
- ➔ Maximum head: 1795 feet (547 metres)
- ➔ Rating : 0.5 hp to 20 hp (0.37 kW to 15 kW)

### OPERATING CONDITIONS

- ➔ Ambient temperature : +122°F (+50°C)
- ➔ Liquid temperature range: +32°F to +176°F (0°C to +80°C)
- ➔ Water pH : 6.5 - 8
- ➔ Sand content : 25 g/m<sup>3</sup>

## TYPE KEYS

| LSZ                                                           | A005                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1A        | 09                | 0.7k                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type range                                                    | Motor type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Pump type | Nos. of impellers | Total solar panel Watt                                                                                                                                                                                                                                                                                                                               |
| LSZ = Solar stainless steel submersible bore well pump series | A005 = 0.5 hp (0.37 kW) AC<br>A007 = 0.75 hp (0.55 kW) AC<br>A010 = 1.0 hp (0.75 kW) AC<br>A015 = 1.5 hp (1.10 kW) AC<br>A020 = 2.0 hp (1.50 kW) AC<br>A030 = 3.0 hp (2.20 kW) AC<br>A050 = 5.0 hp (3.70 kW) AC<br>A075 = 7.5 hp (5.50 kW) AC<br>A100 = 10 hp (7.50 kW) AC<br>A150 = 15 hp (11.0 kW) AC<br>A200 = 20 hp (15.0 kW) AC<br>D005 = 0.5 hp (0.37 kW) DC<br>D007 = 0.75 hp (0.55 kW) DC<br>D010 = 1.0 hp (0.75 kW) DC<br>D015 = 1.5 hp (1.10 kW) DC<br>D020 = 2.0 hp (1.50 kW) DC |           |                   | 0.7k = 700 Watt solar panel<br>1k = 1000 Watt solar panel<br>1.2k = 1200 Watt solar panel<br>1.62k = 1620 Watt solar panel<br>1.8k = 1800 Watt solar panel<br>3k = 3000 Watt solar panel<br>4.8k = 4800 Watt solar panel<br>7k = 7000 Watt solar panel<br>9k = 9000 Watt solar panel<br>13k = 13000 Watt solar panel<br>17k = 17000 Watt solar panel |



## MINIMUM COST OF OWNERSHIP

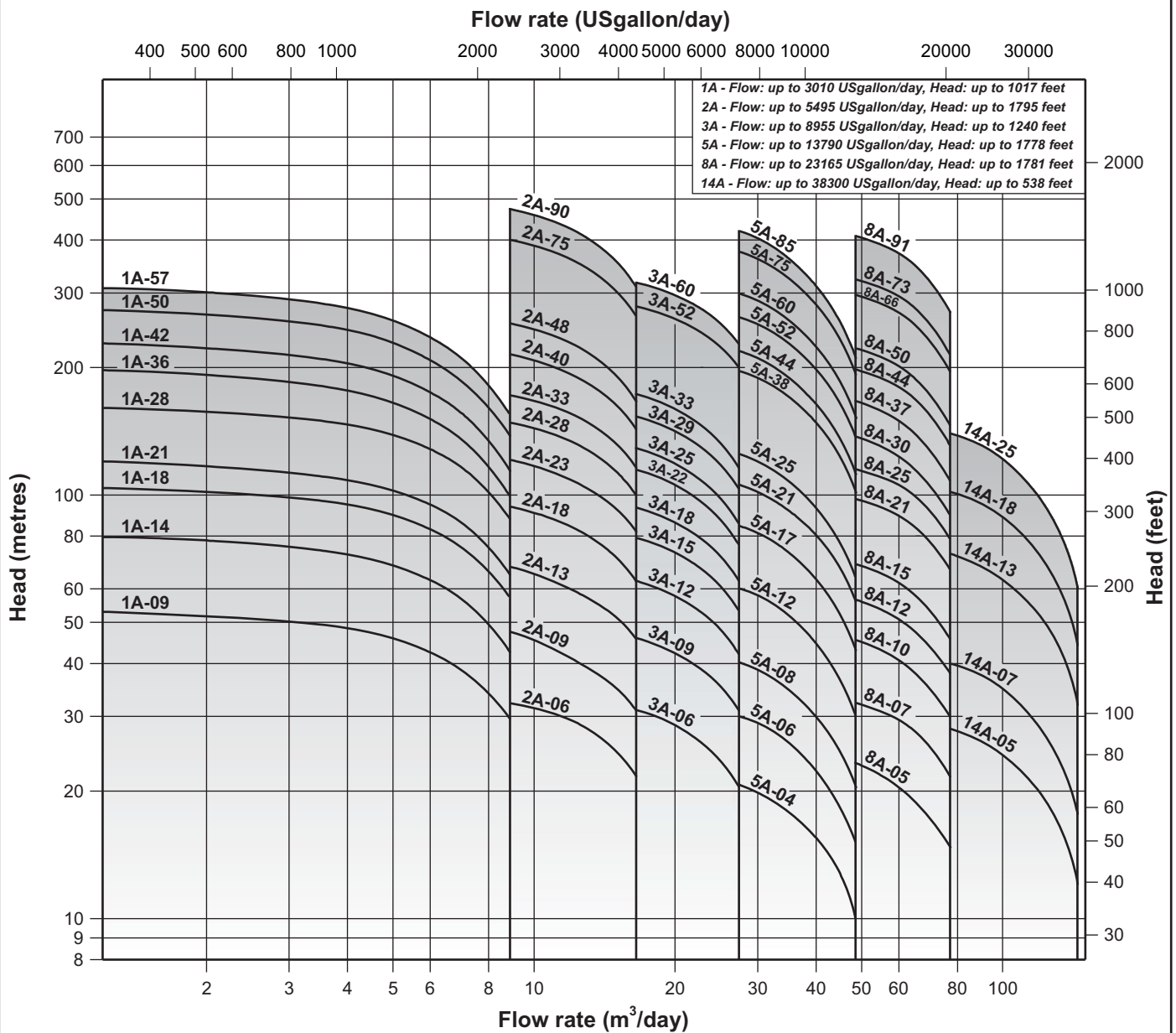
Very often investment decisions for pumps are based only on the purchase cost of the pump. This initial purchase cost is a fraction of owning and operating a pump over its entire life span. The initial cost for diesel engine driven pumps is just 5% of the total life cycle cost with operation (energy) and maintenance cost contributing to 85% and 10% respectively.

Solar water pumping systems when compared to diesel engine driven pump sets are much higher in the initial purchase cost but over the life cycle of the solar pumping system they provide significant financial savings in terms of operation (energy) and maintenance costs. Typically when solar pumps are compared with diesel engine pumps they offer a breakeven in costs within 4 to 8 years depending on site conditions, installations cost, and model specification. After the breakeven, the solar pumping systems provide significant cost savings to the owners.

## TECHNICAL DATA

| Model                | Pump power |      | Pump type | Nos. of stages | Minimum Solar panel total Watt | Flow range    |                     | Head range  |           | Discharge size |    |
|----------------------|------------|------|-----------|----------------|--------------------------------|---------------|---------------------|-------------|-----------|----------------|----|
|                      | HP         | kW   |           |                |                                | USgallon/day  | m <sup>3</sup> /day | Feet        | Mtrs.     | Inch           | mm |
| LSZ-A005-1A-09-0.7k  | 0.5        | 0.37 | 1A        | 09             | 700                            | 1585 - 2378   | 6 - 9               | 141 - 98    | 43 - 30   | 1¼"            | 32 |
| LSZ-A005-1A-14-0.7k  | 0.5        | 0.37 | 1A        | 14             | 700                            | 1585 - 2378   | 6 - 9               | 207 - 141   | 63 - 43   | 1¼"            | 32 |
| LSZ-A007-1A-18-1k    | 0.75       | 0.55 | 1A        | 18             | 1000                           | 1585 - 2378   | 6 - 9               | 276 - 187   | 84 - 57   | 1¼"            | 32 |
| LSZ-A007-1A-21-1k    | 0.75       | 0.55 | 1A        | 21             | 1000                           | 1585 - 2378   | 6 - 9               | 315 - 213   | 96 - 65   | 1¼"            | 32 |
| LSZ-A010-1A-28-1.2k  | 1          | 0.75 | 1A        | 28             | 1200                           | 1585 - 2378   | 6 - 9               | 423 - 289   | 129 - 88  | 1¼"            | 32 |
| LSZ-A015-1A-36-1.62k | 1.5        | 1.1  | 1A        | 36             | 1620                           | 1585 - 2378   | 6 - 9               | 495 - 338   | 151 - 103 | 1¼"            | 32 |
| LSZ-A015-1A-42-1.62k | 1.5        | 1.1  | 1A        | 42             | 1620                           | 1585 - 2378   | 6 - 9               | 571 - 390   | 174 - 119 | 1¼"            | 32 |
| LSZ-A020-1A-50-1.8k  | 2          | 1.5  | 1A        | 50             | 1800                           | 1585 - 2378   | 6 - 9               | 679 - 463   | 207 - 141 | 1¼"            | 32 |
| LSZ-A020-1A-57-1.8k  | 2          | 1.5  | 1A        | 57             | 1800                           | 1585 - 2378   | 6 - 9               | 768 - 525   | 234 - 160 | 1¼"            | 32 |
| LSZ-A005-2A-06-0.7k  | 0.5        | 0.37 | 2A        | 06             | 700                            | 2642 - 4491   | 10 - 17             | 105 - 72    | 32 - 22   | 1¼"            | 32 |
| LSZ-A005-2A-09-0.7k  | 0.5        | 0.37 | 2A        | 09             | 700                            | 2642 - 4491   | 10 - 17             | 148 - 98    | 45 - 30   | 1¼"            | 32 |
| LSZ-A007-2A-13-1k    | 0.75       | 0.55 | 2A        | 13             | 1000                           | 2642 - 4491   | 10 - 17             | 213 - 144   | 65 - 44   | 1¼"            | 32 |
| LSZ-A010-2A-18-1.2k  | 1          | 0.75 | 2A        | 18             | 1200                           | 2642 - 4491   | 10 - 17             | 299 - 203   | 91 - 62   | 1¼"            | 32 |
| LSZ-A015-2A-23-1.62k | 1.5        | 1.1  | 2A        | 23             | 1620                           | 2642 - 4491   | 10 - 17             | 387 - 262   | 118 - 80  | 1¼"            | 32 |
| LSZ-A020-2A-28-1.8k  | 2          | 1.5  | 2A        | 28             | 1800                           | 2642 - 4491   | 10 - 17             | 476 - 325   | 145 - 99  | 1¼"            | 32 |
| LSZ-A020-2A-33-1.8k  | 2          | 1.5  | 2A        | 33             | 1800                           | 2642 - 4491   | 10 - 17             | 554 - 377   | 169 - 115 | 1¼"            | 32 |
| LSZ-A030-2A-40-3k    | 3          | 2.2  | 2A        | 40             | 3000                           | 2642 - 4491   | 10 - 17             | 689 - 469   | 210 - 143 | 1¼"            | 32 |
| LSZ-A030-2A-48-3k    | 3          | 2.2  | 2A        | 48             | 3000                           | 2642 - 4491   | 10 - 17             | 820 - 548   | 250 - 167 | 1¼"            | 32 |
| LSZ-A050-2A-75-4.8k  | 5          | 3.7  | 2A        | 75             | 4800                           | 2642 - 4491   | 10 - 17             | 1286 - 869  | 392 - 265 | 1¼"            | 32 |
| LSZ-A050-2A-90-4.8k  | 5          | 3.7  | 2A        | 90             | 4800                           | 2642 - 4491   | 10 - 17             | 1519 - 1010 | 463 - 308 | 1¼"            | 32 |
| LSZ-A005-3A-06-0.7k  | 0.5        | 0.37 | 3A        | 06             | 700                            | 3434 - 6868   | 13 - 26             | 108 - 72    | 33 - 22   | 1¼"            | 32 |
| LSZ-A007-3A-09-1k    | 0.75       | 0.55 | 3A        | 09             | 1000                           | 3434 - 6868   | 13 - 26             | 157 - 108   | 48 - 33   | 1¼"            | 32 |
| LSZ-A010-3A-12-1.2k  | 1          | 0.75 | 3A        | 12             | 1200                           | 3434 - 6868   | 13 - 26             | 217 - 148   | 66 - 45   | 1¼"            | 32 |
| LSZ-A015-3A-15-1.62k | 1.5        | 1.1  | 3A        | 15             | 1620                           | 3434 - 6868   | 13 - 26             | 276 - 187   | 84 - 57   | 1¼"            | 32 |
| LSZ-A015-3A-18-1.62k | 1.5        | 1.1  | 3A        | 18             | 1620                           | 3434 - 6868   | 13 - 26             | 325 - 220   | 99 - 67   | 1¼"            | 32 |
| LSZ-A020-3A-22-1.8k  | 2          | 1.5  | 3A        | 22             | 1800                           | 3434 - 6868   | 13 - 26             | 397 - 272   | 121 - 83  | 1¼"            | 32 |
| LSZ-A020-3A-25-1.8k  | 2          | 1.5  | 3A        | 25             | 1800                           | 3434 - 6868   | 13 - 26             | 446 - 305   | 136 - 93  | 1¼"            | 32 |
| LSZ-A030-3A-29-3k    | 3          | 2.2  | 3A        | 29             | 3000                           | 3434 - 6868   | 13 - 26             | 531 - 361   | 162 - 110 | 1¼"            | 32 |
| LSZ-A030-3A-33-3k    | 3          | 2.2  | 3A        | 33             | 3000                           | 3434 - 6868   | 13 - 26             | 600 - 404   | 183 - 123 | 1¼"            | 32 |
| LSZ-A050-3A-52-4.8k  | 5          | 3.7  | 3A        | 52             | 4800                           | 3434 - 6868   | 13 - 26             | 951 - 686   | 290 - 209 | 1¼"            | 32 |
| LSZ-A050-3A-60-4.8k  | 5          | 3.7  | 3A        | 60             | 4800                           | 3434 - 6868   | 13 - 26             | 1089 - 778  | 332 - 237 | 1¼"            | 32 |
| LSZ-A005-5A-04-0.7k  | 0.5        | 0.37 | 5A        | 04             | 700                            | 6076 - 11095  | 23 - 42             | 72 - 49     | 22 - 15   | 1½"            | 40 |
| LSZ-A007-5A-06-1k    | 0.75       | 0.55 | 5A        | 06             | 1000                           | 6076 - 11095  | 23 - 42             | 102 - 69    | 31 - 21   | 1½"            | 40 |
| LSZ-A010-5A-08-1.2k  | 1          | 0.75 | 5A        | 08             | 1200                           | 6076 - 11095  | 23 - 42             | 138 - 95    | 42 - 29   | 1½"            | 40 |
| LSZ-A015-5A-12-1.62k | 1.5        | 1.1  | 5A        | 12             | 1620                           | 6076 - 11095  | 23 - 42             | 207 - 141   | 63 - 43   | 1½"            | 40 |
| LSZ-A020-5A-17-1.8k  | 2          | 1.5  | 5A        | 17             | 1800                           | 6076 - 11095  | 23 - 42             | 289 - 197   | 88 - 60   | 1½"            | 40 |
| LSZ-A030-5A-21-3k    | 3          | 2.2  | 5A        | 21             | 3000                           | 6076 - 11095  | 23 - 42             | 364 - 249   | 111 - 76  | 1½"            | 40 |
| LSZ-A030-5A-25-3k    | 3          | 2.2  | 5A        | 25             | 3000                           | 6076 - 11095  | 23 - 42             | 430 - 292   | 131 - 89  | 1½"            | 40 |
| LSZ-A050-5A-38-4.8k  | 5          | 3.7  | 5A        | 38             | 4800                           | 6076 - 11095  | 23 - 42             | 673 - 463   | 205 - 141 | 1½"            | 40 |
| LSZ-A050-5A-44-4.8k  | 5          | 3.7  | 5A        | 44             | 4800                           | 6076 - 11095  | 23 - 42             | 751 - 512   | 229 - 156 | 1½"            | 40 |
| LSZ-A075-5A-52-7k    | 7.5        | 5.5  | 5A        | 52             | 7000                           | 6076 - 11095  | 23 - 42             | 899 - 617   | 274 - 188 | 1½"            | 40 |
| LSZ-A075-5A-60-7k    | 7.5        | 5.5  | 5A        | 60             | 7000                           | 6076 - 11095  | 23 - 42             | 1020 - 699  | 311 - 213 | 1½"            | 40 |
| LSZ-A100-5A-75-9k    | 10         | 7.5  | 5A        | 75             | 9000                           | 6076 - 11095  | 23 - 42             | 1283 - 876  | 391 - 267 | 1½"            | 40 |
| LSZ-A100-5A-85-9k    | 10         | 7.5  | 5A        | 85             | 9000                           | 6076 - 11095  | 23 - 42             | 1437 - 971  | 438 - 296 | 1½"            | 40 |
| LSZ-A010-8A-05-1.2k  | 1          | 0.75 | 8A        | 05             | 1200                           | 14001 - 20341 | 53 - 77             | 72 - 49     | 22 - 15   | 2"             | 50 |
| LSZ-A015-8A-07-1.62k | 1.5        | 1.1  | 8A        | 07             | 1620                           | 14001 - 20341 | 53 - 77             | 105 - 72    | 32 - 22   | 2"             | 50 |
| LSZ-A020-8A-10-1.8k  | 2          | 1.5  | 8A        | 10             | 1800                           | 14001 - 20341 | 53 - 77             | 144 - 98    | 44 - 30   | 2"             | 50 |
| LSZ-A030-8A-12-3k    | 3          | 2.2  | 8A        | 12             | 3000                           | 14001 - 20341 | 53 - 77             | 180 - 125   | 55 - 38   | 2"             | 50 |
| LSZ-A030-8A-15-3k    | 3          | 2.2  | 8A        | 15             | 3000                           | 14001 - 20341 | 53 - 77             | 220 - 151   | 67 - 46   | 2"             | 50 |
| LSZ-A050-8A-21-4.8k  | 5          | 3.7  | 8A        | 21             | 4800                           | 14001 - 20341 | 53 - 77             | 312 - 220   | 95 - 67   | 2"             | 50 |
| LSZ-A050-8A-25-4.8k  | 5          | 3.7  | 8A        | 25             | 4800                           | 14001 - 20341 | 53 - 77             | 367 - 259   | 112 - 79  | 2"             | 50 |
| LSZ-A075-8A-30-7k    | 7.5        | 5.5  | 8A        | 30             | 7000                           | 14001 - 20341 | 53 - 77             | 436 - 295   | 133 - 90  | 2"             | 50 |
| LSZ-A075-8A-37-7k    | 7.5        | 5.5  | 8A        | 37             | 7000                           | 14001 - 20341 | 53 - 77             | 531 - 354   | 162 - 108 | 2"             | 50 |
| LSZ-A100-8A-44-9k    | 10         | 7.5  | 8A        | 44             | 9000                           | 14001 - 20341 | 53 - 77             | 633 - 427   | 193 - 130 | 2"             | 50 |
| LSZ-A100-8A-50-9k    | 10         | 7.5  | 8A        | 50             | 9000                           | 14001 - 20341 | 53 - 77             | 709 - 476   | 216 - 145 | 2"             | 50 |
| LSZ-A150-8A-66-13k   | 15         | 11   | 8A        | 66             | 13000                          | 14001 - 20341 | 53 - 77             | 945 - 640   | 288 - 195 | 2"             | 50 |
| LSZ-A150-8A-73-13k   | 15         | 11   | 8A        | 73             | 13000                          | 14001 - 20341 | 53 - 77             | 1033 - 702  | 315 - 214 | 2"             | 50 |
| LSZ-A200-8A-91-17k   | 20         | 15   | 8A        | 91             | 17000                          | 14001 - 20341 | 53 - 77             | 1302 - 886  | 397 - 270 | 2"             | 50 |
| LSZ-A020-14A-05-1.8k | 2          | 1.5  | 14A       | 05             | 1800                           | 19548 - 32229 | 74 - 122            | 92 - 62     | 28 - 19   | 2"             | 50 |
| LSZ-A030-14A-07-3k   | 3          | 2.2  | 14A       | 07             | 3000                           | 19548 - 32229 | 74 - 122            | 135 - 92    | 41 - 28   | 2"             | 50 |
| LSZ-A050-14A-13-4.8k | 5          | 3.7  | 14A       | 13             | 4800                           | 19548 - 32229 | 74 - 122            | 240 - 167   | 73 - 51   | 2"             | 50 |
| LSZ-A075-14A-18-7k   | 7.5        | 5.5  | 14A       | 18             | 7000                           | 19548 - 32229 | 74 - 122            | 338 - 230   | 103 - 70  | 2"             | 50 |
| LSZ-A100-14A-25-9k   | 10         | 7.5  | 14A       | 25             | 9000                           | 19548 - 32229 | 74 - 122            | 463 - 315   | 141 - 96  | 2"             | 50 |

## PERFORMANCE RANGE



### **CURVE CONDITIONS**

- Performance curves are based on solar irradiation of 7 kWh/m<sup>2</sup> per day on a tilted surface.
- Performances may vary based on site condition and irradiation available at site during the year.
- For approximate performance at other than irradiation of 7 kWh/m<sup>2</sup> per day, please multiply the flow with the following factor.

| Irradiation kWh/m <sup>2</sup> per day | Multiplying factor | Irradiation kWh/m <sup>2</sup> per day | Multiplying factor |
|----------------------------------------|--------------------|----------------------------------------|--------------------|
| 6.5                                    | 0.929              | 5.5                                    | 0.786              |
| 6.0                                    | 0.857              | 5.0                                    | 0.714              |



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