



# Energy Solutions (Pvt.) Limited



## High Horsepower Solutions For Your Power Needs



**[www.eslpk.com](http://www.eslpk.com)**

The logo for AKSA Power Generation is centered on a yellow background. It consists of a dark blue horizontal bar. Inside this bar, on the left, is a black rectangle containing the letters 'aKsa' in white. To the right of this rectangle, the words 'POWER' and 'GENERATION' are written in white, stacked vertically.

**aKsa**

POWER  
GENERATION





# 2015

## January

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    |    |    | 1  | 2  | 3  |
| 4  | 5  | 6  | 7  | 8  | 9  | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 18 | 19 | 20 | 21 | 22 | 22 | 23 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 |

## February

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  |
| 8  | 9  | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |

## March

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  |
| 8  | 9  | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 | 31 |    |    |    |    |

## April

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    |    |    | 1  | 2  | 3  |
| 4  | 5  | 6  | 7  | 8  | 9  | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 18 | 19 | 20 | 21 | 22 | 22 | 23 |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 |

## May

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    |    |    |    | 1  | 2  |
| 3  | 4  | 5  | 6  | 7  | 8  | 9  |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 |    |    |    |    |    |    |

## June

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    | 1  | 2  | 3  | 4  | 5  | 6  |
| 7  | 8  | 9  | 10 | 11 | 12 | 13 |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 28 | 29 | 30 |    |    |    |    |

## July

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    |    |    | 1  | 2  | 3  |
| 4  | 5  | 6  | 7  | 8  | 9  | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 |

## August

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    |    |    |    |    | 1  |
| 2  | 3  | 4  | 5  | 6  | 7  | 8  |
| 9  | 10 | 11 | 12 | 13 | 14 | 15 |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| 30 | 31 |    |    |    |    |    |

## September

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    |    | 1  | 2  | 3  | 4  |
| 5  | 6  | 7  | 8  | 9  | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 | 29 | 30 |    |    |

## October

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    |    |    | 1  | 2  | 3  |
| 4  | 5  | 6  | 7  | 8  | 9  | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 |

## November

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  |
| 8  | 9  | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 |    |    |    |    |    |

## December

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    |    | 1  | 2  | 3  | 4  |
| 5  | 6  | 7  | 8  | 9  | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 | 29 | 30 | 31 |    |



**Energy Solutions (Pvt.) Limited**

# 2016

## January

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    |    |    |    | 1  | 2  |
| 3  | 4  | 5  | 6  | 7  | 8  | 9  |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 |    |    |    |    |    |    |

## February

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    | 1  | 2  | 3  | 4  | 5  | 6  |
| 7  | 8  | 9  | 10 | 11 | 12 | 13 |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 28 | 29 |    |    |    |    |    |

## March

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    | 1  | 2  | 3  | 4  | 5  |
| 6  | 7  | 8  | 9  | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30 | 31 |    |    |

## April

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    |    |    |    | 1  | 2  |
| 3  | 4  | 5  | 6  | 7  | 8  | 9  |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 |

## May

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  |
| 8  | 9  | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 | 31 |    |    |    |    |

## June

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    |    | 1  | 2  | 3  | 4  |
| 5  | 6  | 7  | 8  | 9  | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 | 29 | 30 |    |    |

## July

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    |    |    |    | 1  | 2  |
| 3  | 4  | 5  | 6  | 7  | 8  | 9  |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 |    |    |    |    |    |    |

## August

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    | 1  | 2  | 3  | 4  | 5  | 6  |
| 7  | 8  | 9  | 10 | 11 | 12 | 13 |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 28 | 29 | 30 | 31 |    |    |    |

## September

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    |    |    | 1  | 2  | 3  |
| 4  | 5  | 6  | 7  | 8  | 9  | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 |    |

## October

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    |    |    |    |    | 1  |
| 2  | 3  | 4  | 5  | 6  | 7  | 8  |
| 9  | 10 | 11 | 12 | 13 | 14 | 15 |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| 30 | 31 |    |    |    |    |    |

## November

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    | 1  | 2  | 3  | 4  | 5  |
| 6  | 7  | 8  | 9  | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30 |    |    |    |

## December

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    |    |    | 1  | 2  | 3  |
| 4  | 5  | 6  | 7  | 8  | 9  | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 |



**Energy Solutions (Pvt.) Limited**



## SELECT YOUR GENERATOR

### POWER CONSUMPTION CHART FOR GENERATOR SIZING

| Item   | Wattage (W)                       |
|--|-----------------------------------|
|  | 4000                              |
| Air Conditioner (1 ton = 12000 BTU) Starting: 3250 W / Running: 2250 W | Running: 2250W / Starting: 3250W  |
| Clothes Dryer (electric)   | 5750                              |
| Coffeemaker  | 1000                              |
| Computer   | 800                               |
| Disc Grinder   | 4000                              |
| Dish Washer  | 500                               |
| Drill  | 1000                              |
| DVD Player   | 100                               |
| Electric Heater, Portable  | 1500                              |
| Energy Saving Light Bulb   | 20                                |
| Fan  | 200                               |
| Fax Machine  | 65                                |
| Freezer  | 400                               |
| Garage Door Opener (1/4 HP)  | 550                               |
| Hair Dryer   | 1200                              |
| Iron   | 1200                              |
| Lift   | 25000                             |
| Oven   | 7000                              |
| Plasma Television  | 500                               |
| Printer  | 700                               |
| Refrigerator   | 500                               |
| Security System  | 1000                              |
| Sound System   | 500                               |
| Standard Light Bulb  | 100                               |
| Television (color) 51 screen   | 300                               |
| Tube Light   | 40                                |
| Vacuum Cleaner   | 1200                              |
| Washing Machine  | 1150                              |
| Water Pump   | 1000                              |
| 3 phase Electric Motor 1 hp  | Running: 1.5kVA / Starting: 13kVA |
| 3 phase Electric Motor 2 hp  | Running: 2.7kVA / Starting: 19kVA |
| 3 phase Electric Motor 3 hp  | Running: 3.7kVA / Starting: 25kVA |
| 3 phase Electric Motor 5 hp  | Running: 6.3kVA / Starting: 35kVA |
| 3 phase Electric Motor 7.5 hp  | Running: 9.3kVA / Starting: 48kVA |

3 phase Electric Motor 10 hp to 200 hp (approximate)

If all the motors need to start at the same time, we need to know the starting kW or kVA for each motor and add them together. If we can start these motors one after the other, take the largest motor first and determine what it takes to start it. Then add the running kVA of the largest motor to the starting kVA of the second motor, and determine what it takes to run the first and start the second. Continue this process until all motors have started. For more details, please visit [www.eslpk.com/customercare.html](http://www.eslpk.com/customercare.html) and read relevant articles on gensizing.

Running: 1.0 to 1.2kVA per hp  
Starting: 5.5 to 6kVA per hp



## kVA/kW Amperage Chart @ 80% Power Factor (Estimates)

| kVA  | kW   | 220V | 240V | 380V | 400V        | 440V | 450V | 480V | 600V | 2400V | 3300V | 11000V |
|------|------|------|------|------|-------------|------|------|------|------|-------|-------|--------|
| 12.5 | 10   | 33   | 30.1 | 19.2 | <b>18.2</b> | 16.6 | 16.2 | 15.1 | 12   |       |       |        |
| 18.7 | 15   | 49.5 | 45   | 28.8 | <b>27.3</b> | 24.9 | 24.4 | 22.5 | 18   |       |       |        |
| 25   | 20   | 66   | 60.2 | 38.4 | <b>36.4</b> | 33.2 | 30.1 | 24   | 6    |       |       |        |
| 31.3 | 25   | 82.5 | 75.5 | 48   | <b>45.5</b> | 41.5 | 40.5 | 37.8 | 30   |       |       |        |
| 37.5 | 30   | 99   | 90.3 | 57.6 | <b>54.6</b> | 49.8 | 48.7 | 45.2 | 36   |       |       |        |
| 50   | 40   | 132  | 120  | 77   | <b>73</b>   | 66.5 | 65   | 60   | 48   |       |       |        |
| 62.5 | 50   | 165  | 152  | 96   | <b>91</b>   | 83   | 81   | 76   | 61   |       |       |        |
| 75   | 60   | 198  | 181  | 115  | <b>109</b>  | 99.6 | 97.5 | 91   | 72   |       |       |        |
| 93.8 | 75   | 247  | 226  | 143  | <b>136</b>  | 123  | 120  | 113  | 90   |       |       |        |
| 100  | 80   | 264  | 240  | 154  | <b>146</b>  | 133  | 130  | 120  | 96   |       |       |        |
| 125  | 100  | 330  | 301  | 192  | <b>182</b>  | 166  | 162  | 150  | 120  |       |       |        |
| 156  | 125  | 413  | 375  | 240  | <b>228</b>  | 208  | 204  | 188  | 150  |       |       |        |
| 187  | 150  | 495  | 450  | 288  | <b>273</b>  | 249  | 244  | 225  | 180  |       |       |        |
| 219  | 175  | 577  | 527  | 335  | <b>318</b>  | 289  | 283  | 264  | 211  |       |       |        |
| 250  | 200  | 660  | 601  | 384  | <b>364</b>  | 332  | 324  | 301  | 241  |       |       |        |
| 312  | 250  | 825  | 751  | 480  | <b>455</b>  | 415  | 405  | 376  | 300  |       |       |        |
| 375  | 300  | 990  | 903  | 576  | <b>546</b>  | 498  | 487  | 451  | 361  |       |       |        |
| 438  | 350  | 1155 | 1053 | 672  | <b>637</b>  | 581  | 568  | 527  | 422  |       |       |        |
| 500  | 400  | 1320 | 1203 | 770  | <b>730</b>  | 665  | 650  | 602  | 481  |       |       |        |
| 625  | 500  | 1650 | 1504 | 960  | <b>910</b>  | 830  | 810  | 752  | 602  |       |       |        |
| 750  | 600  | 1980 | 1803 | 1150 | <b>1090</b> | 996  | 975  | 902  | 721  |       |       |        |
| 875  | 700  | 2310 | 2104 | 1344 | <b>1274</b> | 1162 | 1136 | 1052 | 842  |       |       |        |
| 1000 | 800  | 2640 | 2405 | 1540 | <b>1460</b> | 1330 | 1300 | 1203 | 962  | 241   | 176   | 91     |
| 1125 | 900  | 2970 | 2709 | 1730 | <b>1640</b> | 1495 | 1460 | 1354 | 1082 | 271   | 197   | 102    |
| 1250 | 1000 | 3300 | 3009 | 1920 | <b>1820</b> | 1660 | 1620 | 1504 | 1202 | 301   | 218   | 114    |
| 1563 | 1250 | 4130 | 3765 | 2400 | <b>2280</b> | 2080 | 2040 | 1885 | 1503 | 376   | 273   | 142    |
| 1875 | 1500 | 4950 | 4520 | 2880 | <b>2730</b> | 2490 | 2440 | 2260 | 1805 | 452   | 327   | 170    |
| 2188 | 1750 |      | 5280 | 3350 | <b>3180</b> | 2890 | 2830 | 2640 | 2106 | 528   | 380   | 199    |
| 2500 | 2000 |      | 6020 | 3840 | <b>3640</b> | 3320 | 3240 | 3015 | 2405 | 602   | 436   | 227    |

## Standard Electrical Formulas Used for Power Consumption Calculations

| TO DETERMINE:               | SINGLE-PHASE                                     | THREE-PHASE  | DIRECT CURRENT                         |
|-----------------------------|--|--|--|
| KVA                         | $\frac{I \times E}{1000}$                        | $\frac{I \times E \times 1.73}{1000}$                        | -----                                  |
| Kilowatts                   | $\frac{I \times E \times PF}{1000}$              | $\frac{I \times E \times 1.73 \times PF}{1000}$              | $\frac{I \times E}{1000}$              |
| Horsepower                  | $\frac{I \times E \times \%EFF \times PF}{746}$  | $\frac{I \times E \times 1.732 \times \%EFF \times PF}{746}$ | $\frac{I \times E \times \%EFF}{746}$  |
| Amperes (when HP is known)  | $\frac{HP \times 746}{E \times \%EFF \times PF}$ | $\frac{HP \times 746}{1.73 \times E \times \%EFF \times PF}$ | $\frac{HP \times 746}{E \times \%EFF}$ |
| Amperes (when kW is known)  | $\frac{KW \times 1000}{E \times PF}$             | $\frac{KW \times 1000}{1.73 \times E \times PF}$             | $\frac{KW \times 1000}{E}$             |
| Amperes (when KVA is known) | $\frac{KVA \times 1000}{E}$                      | $\frac{KVA \times 1000}{1.73 \times E}$                      | -----                                  |





**CUMMINS  
POWERED**

**50  
HZ**



| GENSET<br>MODEL | 400/230 V<br>1500 rpm |                | CONTROLLER | ENGINE<br>MODEL | OPEN SET DIMENSIONS |                |
|-----------------|-----------------------|----------------|------------|-----------------|---------------------|----------------|
|                 | Stand by<br>Power     | Prime<br>Power |            |                 | LxWxH(mm)           | Weight<br>(kg) |
|                 | kVA                   | kVA            |            |                 |                     |                |
| AC55            | 55                    | 50             | DSE720     | S3.8G6          | 1780x950x1250       | 870            |
| AC66            | 66                    | 60             | DSE720     | S3.8G7          | 2150x1050x1450      | 950            |
| AC110           | 110                   | 100            | DSE720     | 6BTA 5.9-G5     | 2200x1050x1600      | 1250           |
| AC175           | 175                   | 160            | DSE720     | 6BTAA 5.9-G5    | 2300x1150x1700      | 1470           |
| AC200           | 200                   | 180            | DSE720     | 6CTA 8.3-G2     | 2300x1150x1700      | 1700           |
| AC250           | 250                   | 225            | DSE7320    | 6CTAA 8.3-G2    | 2600x1150x1750      | 1940           |
| AC350           | 350                   | 316            | DSE7320    | NT 855 G6       | 3000x1150x1900      | 2630           |
| AC350           | 350                   | 300            | DSE7320    | QSL9-G5         | 3000x1150x1900      | 2630           |
| AC400           | 400                   | 360            | DSE7320    | NTA 855 G4      | 3250x1150x2000      | 3110           |
| AC500           | 500                   | 455            | DSE7320    | QSX 15 G6       | 3560x1300x1970      | 4150           |
| AC550           | 550                   | 500            | DSE732     | QSK 15 G        | 3560x1300x197       | 4150           |
| AC700           | 700                   | 638            | DSE7320    | VTA 28 G5       | 4000x1350x2180      | 5590           |
| AC825           | 825                   | 750            | DSE7320    | VTA 28 G6       | 4000x1350x2180      | 5610           |
| AC880           | 880                   | 800            | DSE7320    | QSK 23 G3       | 4000x1710x2260      | 6060           |
| AC1100          | 1100                  | 1000           | DSE7320    | QST 30 G4       | 4400x1760x2350      | 7350           |
| AC1410          | 1410                  | 1280           | DSE7320    | KTA 50 G3       | 4950x2100x2500      | 9900           |
| AC1675          | 1625                  | 1500           | DSE7320    | KTA 50 GS8      | 5500x1950x2450      | 10400          |
| AC2250          | 2250                  | 2000           | DSE7320    | QSK 60 G4       | 6000x2500x3220      | 15500          |
| AC2500          | 2500                  | 2000           | DSE7320    | QSK 60 G13      | 6050x2600x3300      | 17200          |

## Standby :

- Continuous running at variable load for duration of an emergency. No overload is permitted on these ratings. In accordance with ISO 3026.

## Prime :

- Continuous running at variable load for unlimited periods with 10% overload available for 1 hour in any 12 hour period. In accordance with ISO 8528, ISO 3046.
- Manufacturer reserves the right to make changes in model, technical specifications, color, equipment and accessories without prior notice.

**PERKINS  
POWERED**

**50  
HZ**



| GENSET<br>MODEL | 400/230 V<br>1500 rpm |                | CONTROLLER | ENGINE<br>MODEL | OPEN SET DIMENSIONS |                |
|-----------------|-----------------------|----------------|------------|-----------------|---------------------|----------------|
|                 | Stand by<br>Power     | Prime<br>Power |            |                 | LxWxH(mm)           | Weight<br>(kg) |
|                 | kVA                   | kVA            |            |                 |                     |                |
| APD10PE         | 10                    | 9              | DSE6020    | 403D.11G        | 1200x760x982        | 307            |
| APD14PE         | 14                    | 12.5           | DSE6020    | 403D.15G        | 1200x760x982        | 317            |
| APD22PE         | 22                    | 20             | DSE6020    | 404D.22G        | 1500x900x1172       | 655            |
| APD33P          | 33                    | 30             | DSE6020    | 1103A.33G       | 1730x900x1185       | 750            |
| APD50P          | 50                    | 45             | DSE6020    | 1103A.33GT1     | 1730x900x1185       | 800            |
| APD66P          | 66                    | 60             | DSE6020    | 1103A.33GT2     | 1730x900x1185       | 830            |
| APD72P          | 72                    | 65             | DSE6020    | 1103A.44GT1     | 1860x900x1285       | 970            |
| APD88P          | 88                    | 80             | DSE6020    | 1103A.33GT2     | 1860x900x1287       | 1042           |
| APD110P         | 110                   | 100            | DSE6020    | 1006TGT2A       | 2150x1000x1519      | 1080           |
| APD110PE        | 110                   | 100            | DSE6020    | 1104C.44TAG2    | 1860x900x1315       | 1050           |
| APD150P         | 150                   | 136            | DSE6020    | 1006TAG         | 2295x1000x1460      | 1420           |
| APD165P         | 165                   | 150            | DSE6020    | 1006TAG2        | 2295x1000x1460      | 1440           |
| APD200PE        | 200                   | 180            | DSE6020    | 1106C.E66TAG4   | 2300x1100x1643      | 1920           |
| APD220PE        | 220                   | 200            | DSE6020    | 1306C.E87TAG3   | 2600x1250x1785      | 1850           |
| APD275PE        | 275                   | 250            | DSE7320    | 1306C.E87TAG6   | 2600x1250x1785      | 1950           |
| APD330PE        | 330                   | 300            | DSE7320    | 2206C-E13TAG2   | 3100x1400x2004      | 3217           |
| APD385PE        | 385                   | 350            | DSE7320    | 2206C-E13TAG2   | 3100x1400x2004      | 3292           |
| APD440PE        | 440                   | 400            | DSE7320    | 2206C-E13TAG3   | 3190x1400x2004      | 3427           |
| APD500PE        | 500                   | 455            | DSE7320    | 2506C-E15TAG1   | 3430x1420x2187      | 3900           |
| APD550PE        | 550                   | 500            | DSE7320    | 2506C-E15TAG2   | 3430x1420x2187      | 3985           |
| APD660P         | 660                   | 600            | DSE7320    | 2806A-E18TAG1A  | 3450x1536x2161      | 4600           |
| APD715P         | 715                   | 650            | DSE7320    | 2806A-E18TAG2   | 3581x1698x2186      | 4750           |
| APD800P         | 800                   | 730            | DSE7320    | 4006-23TAG2A    | 4000x1800x2300      | 5100           |
| APD900P         | 900                   | 810            | DSE7320    | 4006-23TAG3A    | 4000x1800x2300      | 5240           |
| APD1100P        | 1110                  | 1000           | DSE7320    | 4008TAG2A       | 4655x2050x2300      | 7900           |
| APD1400P        | 1400                  | 1250           | DSE7320    | 4012-46TWG2A    | 4752x1868x2344      | N/A            |
| APD1650P        | 1650                  | 1500           | DSE7320    | 4012-46TAG2A    | 5200x2200x2410      | 10000          |
| APD1875P        | 1875                  | 1705           | DSE7320    | 4012-46TAG3A    | 5200x2200x2410      | 11050          |
| APD2250P        | 2250                  | 2000           | DSE7320    | 4016TAG2A       | 5800x2250x2900      | 12000          |
| APD2500P        | 2420                  | 2200           | DSE7320    | 4016-61TRG3A    | 5650x2250x2900      | 12214          |

### Standby :

- Continuous running at variable load for duration of an emergency. No overload is permitted on these ratings. In accordance with ISO 3026.

### Prime :

- Continuous running at variable load for unlimited periods with 10% overload available for 1 hour in any 12 hour period. In accordance with ISO 8528, ISO 3046.
- Manufacturer reserves the right to make changes in model, technical specifications, color, equipment and accessories without prior notice.



**AKSA  
POWERED**

**50  
HZ**



| GENSET<br>MODEL | 400/230 V<br>1500 rpm |                | CONTROLLER | ENGINE<br>MODEL | OPEN SET DIMENSIONS |                |
|-----------------|-----------------------|----------------|------------|-----------------|---------------------|----------------|
|                 | Stand by<br>Power     | Prime<br>Power |            |                 | LxWxH(mm)           | Weight<br>(kg) |
|                 | kVA                   | kVA            |            |                 |                     |                |
| APD12A          | 11.5                  | 10.6           | DSE6020    | A3CRX14         | 1300x796x910        | 400            |
| APD16A          | 15.5                  | 14.5           | DSE6020    | A4CRX18         | 1300x796x910        | 440            |
| APD20A          | 20                    | 18             | DSE6020    | A4CRX22         | 1500x900x1063       | 640            |
| APD25A          | 25                    | 23             | DSE6020    | A4CRX25         | 1500x900x1061       | 665            |
| APD33A          | 33                    | 30             | DSE6020    | A4CRX25T        | 1500x900x1063       | 680            |
| APD40A          | 40                    | 36             | DSE6020    | A3CRX32T        | 1730x900x1138       | 892            |
| APD50A          | 50                    | 45             | DSE6020    | A4CRX47         | 1860x900x1423       | 960            |
| APD70A          | 70                    | 64             | DSE6020    | A4CRX46T        | 1860x900x1281       | 1060           |
| APD90A          | 93                    | 85             | DSE6020    | A4CRX46TI       | 2150x1000x1587      | 1285           |
| APD125A         | 125                   | 115            | DSE6020    | A6CRX65TI       | 2300x1100x1675      | 1510           |
| APD150A         | 150                   | 137.5          | DSE6020    | A6CRX69TI       | 2390x1100x1616      | 1590           |
| APD250A         | 250                   | 230            | DSE6020    | A6CRX98TI       | 2900x1400x2045      | 2645           |

### Standby :

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### Prime :

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- Manufacturer reserves the right to make changes in model, technical specifications, color, equipment and accessories without prior notice.





Energy Solutions (Private) Limited (ESL) is primarily a Sales and Service Company in Power Generation business. It has been created with a ZEAL to help customers select and buy, install and commission, operate and maintain power generation equipment from 1 kVA to 2500 kVA with focus on continuously developing and retaining fleet customers and high horsepower accounts. The Company sincerely strives to "do more than what is said and deliver more than what is promised". ESL understands that this is the only sure course of survival in this age of intense, cut throat competition and very high customers' expectations.

Energy Solutions (Private) Limited (ESL) is a Company run and managed by professionals having a cumulative experience of over a hundred years in power generation. The Company is associated with Aksa Power Generation Turkey as its official distributor. ESL and Aksa have become a force to reckon with in Power Generation market of Pakistan, with an enviable sales tally of over four thousand units. Customers like Banks, Telecommunication Companies, those in Oil and Gas sector, Textile, Food & Beverage Industry, etc., find solace while working with ESL. The value package provided by ESL to its customers includes:

- Turnkey energy solutions with complete range of Aksa diesel gensets up to 2 MW.
- Power generation parts including load demand, load management and bump less transfer panels.
- Paralleling, synchronizing and load sharing solutions between generators of different makes, models, manufacturers, fuel mix and MAINS, etc.
- Portable generators and inverters from Aksa, made to military specifications.
- Operation & Maintenance (O&M) Solutions for Banks, Telecommunication industry, Oil & Gas sector, etc.
- Rebuilding of Cummins high horsepower diesel and gas engines to brand new standards.

ESL customers in Pakistan include companies from virtually all sectors of economy and industry viz Hospitals, Textile, Pharmaceuticals, Automobile Sector, Banks, Leasing Companies, Telecommunication Companies, Airlines, Poultry, Beverage Industry, Port Operations, CNG Stations, etc. Our customers' list reflects the quality of our products and our intense desire (and ability) to provide quality services.

## OUR FOCUS

Create permanent customers by the following:

- Devising customized value packages.
- Delighting customers with a sincere spirit to serve.
- Delivering services in excess of customer's expectations and contract value.
- Developing skills of our people and partners as a vehicle to continuous improvement.
- Depending on people and partners to gel them into a team, which can set high standards of service.



## OUR STRENGTHS

- Spirit to serve
- Value added engineering
- Technical expertise and experienced staff
- Long-term vision
- Teamwork
- Never "give up" attitude
- Putting our feet in the customer's shoes--- Feeling the pain of customer







## ESL MISSION, VISION & BUSINESS POLICY GUIDELINES

- Energy Solutions is our business, our VISION is crystal clear  
Our growth will double our community services every second year.
- High horsepower solutions will be our main sphere  
Our MISSION is to be a leading player.
- Safety first, Quality second to none and Sales efforts sincere  
Project Management (\*) will be the forte of our engineer.
- Our Safety Policy will control risks and reduce fear  
Quality policy will keep raising the performance bar to the next layer.
- The HR Policy will ensure employees' welfare  
Sales Policy will gradually increase the market share.
- No lies, no bribes, nothing unfair  
To the government policies we will fully adhere.
- ESL will perform more than it promises & maximize customer care  
Be it Sales, Service or Spare.

(\*) Project Management = Doing things rightly, timely & cost effectively



## ESL SAFETY POLICY GUIDELINES

- Safety of our people and organization on the whole  
Our top priority and biggest goal.
- Safety is everybody's business  
But leaders have the biggest role.
- Safety will be observed all the time  
At work or at home, with heart and soul.
- Safety meetings will be held on a regular basis  
It will be as important as the monthly pay roll.
- Pause and reflect every now and then, intervene if a danger is seen;  
An ounce of safety prevents tons of disaster control.
- Count your Goal Zero score  
Staying safe for longer number of days is important for every soul.
- Wear helmet, fasten seat belts, no mobile phones  
Drive safe with a journey plan and speed control.
- Poor housekeeping causes most accidents, if not all;  
Remember wet floor can also take its toll.
- Identify hazards, measure risks, exercise control and review often  
This is the recommended safety protocol.
- Hazard elimination, substitution & isolation-our hierarchy for risk control  
Use engineering & administrative measures & PPEs to cover any loophole.
- Recommended safety protocol and hierarchy for risk control  
Follow them whether you rush for work or leisurely stroll.





## ESL QUALITY POLICY GUIDELINES

- Quality is our commitment, not just talking tall  
Do the job right, spare no effort at all.
- We will do what we say and vice versa  
To make sure we neither falter nor fall.
- Quality will be built in our services and at every step  
Be it a big step or very small.
- We will train our people continuously  
To prevent any mishap or a pitfall.
- We will accept our mistakes and learn from them  
Doing so, our progress will never stall.
- Plan-Do-Act and Check  
A quality tool often discussed in our conference hall.
- The rule of Pareto is our guiding principle  
Focus on critical mass first and then what is small.
- We will use Poka Yoke systems  
Our target is no mistakes at all.
- Zero defect is our ultimate goal  
Success will depend on this in the long haul.
- Our product may fail and service fall short  
We will fix it and accept no shortfall.
- Talking to the parts and condition based maintenance  
Our genset service strategy for every Mill or Shopping Mall.
- Parts we sell may cost more  
We'll make sure your plants run and not just crawl.
- Benchmark against best-in-class only  
Learn from best practices of others to grow big like a snowball.
- ESL strives to raise quality and lower life cycle cost  
Be it a power plant or just a major overhaul.
- Any lapse in our quality is not acceptable  
If you see one just give us a call.
- Neglecting quality is dangerous  
It is like playing with a fireball.
- The race to quality has no finish line  
Continuous improvement is the only cure-all.



## ESL HR POLICY GUIDELINES

- Attractive remuneration for every colleague  
Customer satisfaction is the ultimate result we seek.
- Minimum wages always higher than the norm  
Our policy is to take care of the poor and the weak.
- Vacations comprising planned, sick and casual leaves  
Our people must rest properly to raise performance to its peak.
- Overtime for our eligible colleagues  
It is paid before they ask or speak.
- Hospitalization coverage up to 80% fees  
Company may pay 100%, if the case is unique.
- Minimum one bonus on a main festival eve  
If the balance sheet has a good physique.
- Interest free loan for one who is in need  
One year after repayment, he may again proceed.
- Monthly ration for our deserving colleagues  
To help the needy, this is our humble technique.
- Pick up school fees of one in a crisis deep  
Or pay wedding expenses in a manner discreet.
- One who travels and stays night out in other cities  
Daily allowance besides traveling and boarding on actual receipt.
- Gratuity for one who qualifies and for a reason leaves  
He is welcome back if the company again needs.
- A culture of training and continuous improvement  
Our tool to stay in the business, excel and compete.
- Performance appraisal based on attendance, quality and speed  
Attitude is the key which makes even mediocre perform a feat.
- Peace of mind, honor, dignity and prestige  
Join ESL if you want to succeed!







## ESL SALES POLICY GUIDELINES

- Visit five customers a day  
Prosperity will follow your way.
- When the challenge is big and conditions tough  
Increase your customer visits, the sales experts say.
- Identify the critical customers first  
Consider visiting the rest some other day.
- Five customers a day will result in sales and additional perks  
Enough for your own and five supporting employees pay.
- Know your company, product, market, customers, competitors well  
You will succeed even if you are not an MBA.
- Sell yourself first with a smile and sincere efforts  
Otherwise he won't buy from you, come what may.
- Be persistent, show patience till the customers buy or shy away  
Never should you give up nor dismay.
- Identify your customer's needs  
He will turn your fate into gold from clay.
- From the sentry on the gate, to the secretary and the sir  
Greet them with a smile and often present a modest giveaway.
- Cold calling, qualifying, presenting, handling objections, closing and beyond  
Learn your profession well or else you will be in disarray.
- Don't ever trick them, nor lie, nor bribe  
You may succeed for a while but ultimately fall a prey.
- Promise little but perform far more, any time of the day  
Keep him in the business; he will make sure you also stay.
- Your product support should be instant and efficient  
Otherwise, your reputation will be damaged and part its way.
- Never attempt to sell, just assist him to buy  
He will always buy from you even if your hairs turn grey.
- Know the features, advantages and benefits of your products  
He will buy from you instantly or with some delay.
- Never talk low of the competitors nor show contempt  
The customer does not like the guys who bark and bray.
- Honesty is the best policy, a forte even today  
In the long run, honesty alone will pave your way.
- When he buys thank him and look after him well  
If not, be polite and solicit advice if he may.
- Selling on credit is a crime; unless the customer qualifies  
Pillar to post you will often run; he may even betray.
- Think BIG, work hard; pray five times a day  
Your performance will never decline nor decay.

**FOCUS ON...**  
**CRITICAL MASS**  
CRITICAL MASS

## ESL POLICIES

### Safety Policy:



Safety first, even if the business is hurt!

### Business Policy:

Increase community services with profitable growth and fair practices!



### Quality Policy:



Quality second to none with continuous improvement.

### HR Policy:

Employee welfare, with family type care!



### Sales Policy:



Win hearts and minds of customers to increase market share!



## ESL Customer Care

Energy Solutions (Private) Limited – ESL, as a part of its Corporate Social Responsibility (CSR), operates a full- fledged Customer Care Centre. The Customer Care Centre makes available informative articles/literature and handbooks alongside free of cost Training Sessions on operational matters, quality control, continuous improvement and HSSE for its own employees and those of the corporate society, at large. ESL top management stands committed to make these a cornerstone of its business.

The training sessions are conducted at both our own or the Customer's premises as per the customer's requirements.

The information on the website is periodically updated and new articles are uploaded from time to time.

Please reach us at [www.ESLpk.com/CustomerCare.html](http://www.ESLpk.com/CustomerCare.html) and keep watching for what is new.

Please note that the articles/literature listed below are for the purpose of training and awareness. No attempt should be made to use them as a substitute for expert technical help.

For an in-depth discussion(s) and customer specific solution(s), please contact us at:

[customercare@eslpk.com](mailto:customercare@eslpk.com) or [support@eslpk.com](mailto:support@eslpk.com)

Thanks and best regards

ESL Customer Care

Energy Solutions Private Limited (ESL)



## Our Articles include:

- Safety of Our People and Family
- HSSE Training and Awareness
- The Safety Culture We should Adopt
- Why should We Invest in Avoiding an Accident?
- Role of Leader in HSSE
- Safety Considerations while Handling Generators
- Safety Concerns while Handling Diesel
- Five S Approach to Our HSSE Commitment
- Safety of Our Generators and Our Personnel
- Actions which Must Precede Start of Work on Generator
- Check Out Before You Step Out - Talk Not Tick
- Discretion is Better than Valor - Lockout and Tag Out (LOTO)
- Return to Service after Lockout
- Defensive Driving Techniques
- Why Use Diesel Generators
- Power Generation - FAQs (Frequently Asked Questions)
- Know Your Generators
- How an Alternator and a Voltage Regulator Work
- Important Considerations before You Make a Generator Buying Decision
- Cummins High Performance Lean Burn Gas Generators – Technology of Tomorrow Unleashed Today
- Co-Generation – Killing Many Birds with One Stone
- Allow No Interruption in Operations - Use Bumpless Transfer between Utility
- Improving Life and Overhaul Interval of Our Generators to Several Thousand Hours
- Maintenance Considerations for Improving Life and Overhaul Interval of Our Generators to Several Thousand Hours
- Run in Your New or Recently Overhauled Diesel Generator
- Do the Parts Talk?
- Annual Maintenance Contract - Ten Commandments
- Sizing Our Generators
- Steps in Sizing Our Generators
- How Power Factor can Influence the Sizing of Generator Sets for Motor Starting Loads
- How Various Loads Affect the Sizing of Generator Sets
- Gensizing for Motors
- How to Select a Generating Set for My Home?
- How to Select a Generating Set for My Workplace?
- Duty Rating of Our Generators
- Understanding Power Factor of Our Plant
- Improving Fuel Consumption of Our Generators
- Paralleling of Generators - Is the Sum of the Parts Greater than the Whole?
- Paralleling and Synchronizing Aksa Gensets
- Paralleling Generators of Different Makes, Models and Manufacturers
- Measuring, Metering and Monitoring Generators
- Output Derating of Our Generators
- Don't Kill Your Engine by Operating at Light Loads
- Guidelines to Prevent Wet Stacking Caused by Operations at Light Loads
- Understanding the Difference between Three-Phase and Single Phase Generators
- Converting Our Generators from Three-Phase Power to Single Phase
- Converting Our Generators from 60Hz to 50Hz Power
- Dos and Don'ts of Portable Generators
- Rid Yourself from Continuous Load Shedding
- Cummins Installation, Operations & Maintenance Manual
- Diesel Generating Sets Installation-Recommendations Manual
- Glossary of Terms





## AKSA AS A BRAND- FEATURES

|                                |   |
|--------------------------------|---|
| Brand Name                     | <b>Aksa</b> <ul style="list-style-type: none"><li>o Full range of gasoline, diesel and gas generators.</li><li>o Tried, tested and trustworthy – world over.</li></ul>  |
| Brand Origin                   | <b>Turkey</b> <ul style="list-style-type: none"><li>o One of the world's fastest growing economies</li><li>o Approximately 140 billion dollars worth of exports – mainly Europe.</li><li>o Increasing presence in Pakistan and preparing for more</li></ul>   |
| Engines                        | Cummins / Perkins / Mitsubishi / Aksa / Briggs & Stratton / GM / John Deere / Doosan  |
| Alternators                    | Stamford / Meccalte   |
| Distribution and Marketing     | Energy Solutions (Pvt) Limited in conjunction with Shirazi Trading (STC), which is an Atlas Group Company. The two form one of the largest generator marketing and distribution networks in Pakistan.   |
| Aftermarket Support            | Energy Solutions (Pvt) Limited through its countrywide network tailored to meet requirements of Banks (e.g. Allied Bank, etc.) , Telecom (e.g. Mobilink, etc.) and Oil & Gas Companies (e.g. Shell, etc.)   |
| Generator Quality              | <ul style="list-style-type: none"><li>• Conforms to ISO 3046, VDE 0530, BS 4999, BS 5000, IEC 34, etc.</li><li>• Meant for unlimited hours, prime operations at 80% loads.</li><li>• Resilient, robust, rugged, reliable, rental grade product, which means:<ul style="list-style-type: none"><li>o Ease of use</li><li>o Ease of movement</li><li>o Ease of maintenance in terms of parts and skill matrix.</li></ul></li></ul>  |
| Radiator                       | <ul style="list-style-type: none"><li>• Truly 50 degree C meant for harsh, hot and humid conditions.</li><li>• Built in vertically integrated factories in Aksa, Turkey</li></ul>   |
| Controllers                    | <ul style="list-style-type: none"><li>• Deep Sea UK or Woodward Germany (Marine compliant)</li><li>• Choice of leading genset manufacturers, world over.</li><li>• Just 2 cards instead of rigmarole of cards (up to ten) in proprietary controllers.</li><li>• Customer friendly with simple and inexpensive trouble shooting.</li><li>• Per phase monitoring of KVA, KW, KVAR, PF, etc.</li><li>• Remote monitoring &amp; Integration with BMS</li><li>• Digital paralleling signals allow distance of 1200 ft between paralleling generators instead of 120 ft attainable with analogue type.</li><li>• Puts an end to dependence on proprietary controllers, their highly costly cards and single supplier domination with respect to repairs, cost and time.</li><li>• Paralleling version available as standard on most generator models.</li></ul> |
| Governing & Voltage Regulation | <ul style="list-style-type: none"><li>• Cummins standard, low-cost AVR and EFC cards</li></ul>  |



|   |   |
|---|---|
| <b>Skid</b>   | <ul style="list-style-type: none"><li>• Solid, strengthened steel skid to facilitate frequent movement of sets for rental operations.</li><li>• Built-in day fuel tanks made with thick steel sheet.</li></ul>  |
| <b>Canopy / Container</b>   | <ul style="list-style-type: none"><li>• Imported, skid mounted, made to match generator life</li><li>• 2mm thick steel sheet</li><li>• Bolted type construction instead of welded type</li><li>• Electro-statically painted for life with polyester powder paint</li><li>• Thermally insulated silencer instead of asbestos clad</li><li>• Emergency Stop Push Button.</li></ul>  |
| <b>Additional Equipment offered as Standard</b>                               | <ul style="list-style-type: none"><li>• Circuit breakers – as standard and not as an option at additional price.</li><li>• Wide array of protections available through controllers</li><li>• Day fuel tanks, Trickle battery chargers, Jacket water heater, Lube oil filling, drain pumps, etc.</li></ul>   |
| <b>ESL Value Addition (for new as well as existing generators - optional)</b> | <ul style="list-style-type: none"><li>• Generator sizing advice.</li><li>• Installation &amp; Commissioning solutions with customized fuel tanks, lube oil tanks, fuel automation systems, sound proofing, piping, cabling, earthing, transfer switching, etc.</li><li>• Annual Maintenance solutions for a reliable, low total cost of operations (TCO).</li><li>• Genuine aftermarket parts matching and exceeding performance of OE parts at fairly reduced prices.</li><li>• Overhauling solutions to substantially increase engines' life, performance and reliability.</li><li>• Synchronizing, Paralleling and Load Sharing solutions involving sets of any make, model, manufacturer, mix of fuel and Mains.</li><li>• Bumpless transfer solutions with any number of transformers.</li><li>• Load management and demand management solutions to add / shed loads and number of running generators as per requirement.</li><li>• Remote monitoring &amp; integration with BMS</li><li>• Rental solutions with diesel and gas generators up to 1.5 MW.</li></ul> |
| <b>Warranty</b>   | <ul style="list-style-type: none"><li>• 1 year, unlimited hours</li></ul>   |
| <b>Existing Customers in Pakistan</b>   | <ul style="list-style-type: none"><li>• Coca Cola - 30 MW (approximately)</li><li>• Atlas Group - 20 MW (approximately)</li><li>• Mobilink - scores of sets</li><li>• Telenor Pakistan - 1000 sets (approximately)</li><li>• Shaukat Khanum Hospital - 6 MW (approximately)</li><li>• Orix+Saudi Pak+Security Leasing - 60 sets (approximately)</li><li>• Allied Bank - 1000 sets (approximately)</li><li>• Meezan Bank - 200 sets (approximately)</li><li>• Bank Islami - 100 sets (approximately)</li><li>• PICTL - 2.5 MW (approximately)</li><li>• QICTL - 25 sets (approximately)</li><li>• University of Engineering &amp; Technology - 4 MW (approximately)</li><li>• Dow University of Health &amp; Sciences - dozens of sets</li></ul>   |
| <b>Special Offer</b>  | <ul style="list-style-type: none"><li>• Free of cost training whether customer buys or not. Please visit <a href="http://www.esl.pk/customer-care.html">www.esl.pk/customer-care.html</a></li></ul>   |



DATE: \_\_\_\_\_

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**Trusted Source of High Horsepower Generators - Supply, Service and Synchronization Solutions**



DATE: \_\_\_\_\_

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**Trusted Source of High Horsepower Generators - Supply, Service and Synchronization Solutions**

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