

Energy Saving Products Company - Energy-saving Products



ESE-FP Fan Pump Energy Saving System

About the Product:

ESE-FP Fan Pump Energy Saving System sets the craft object as the control target to meet technique requirements and save energy. Since the fan pump adopts ESE-FP series energy saving system, its power saving efficiency has reached 25%~70% and the workload of the labor force has dramatically reduced. It also can expand the life span of the fan pump as well as other machinery mechanism. It has totally replaced valve mechanism and reduced maintenance.

By adopting closed loop system, the automation of fan pump system has elevated to a new stage, which boasts stable and rapid response and better service.

Energy-saving theory 1 Characteristics of Fluid Load

Wind and water are fluid, they belong to square torque load. In accordance with laws of hydrodynamics, shaft power \ pressure, speed and flow amount have the following relations:

the flow amount is proportional to rotary speed:

the pressure is proportional to quadratic of the rotary speed

the shaft power is proportional to cubic of the rotary speed

It can be expressed with the following equations:

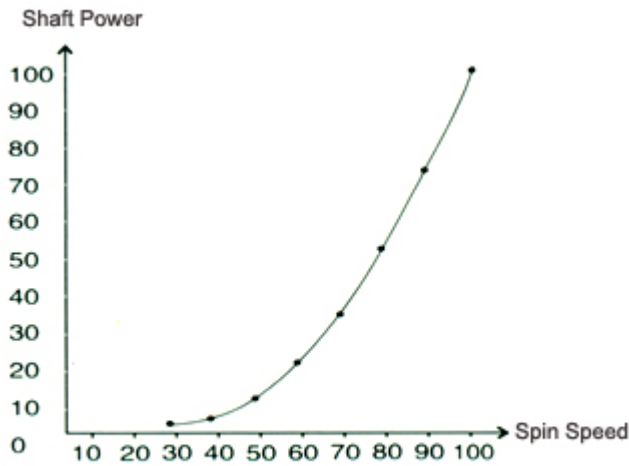
$$Q=K1 \cdot N$$

$$P=K2 \cdot N^2$$

$$PW=K3 \cdot N^3$$

N — ~ rotary speed Q — flow amount P — pump outlet pressure Pw — shaft power K1 , K2 , K3 — constant

Please refer to the chart:



Spin Speed-Shaft Power

As the table below shows, is a group of figures and examples.

Frequency hz	50	45	40	35	30	25	20	15
Spin Speed %	100	90	80	70	60	50	40	30
Pressure %	100	81	64	49	36	25	16	9
Lift Distance %	100	81	64	49	36	25	16	9

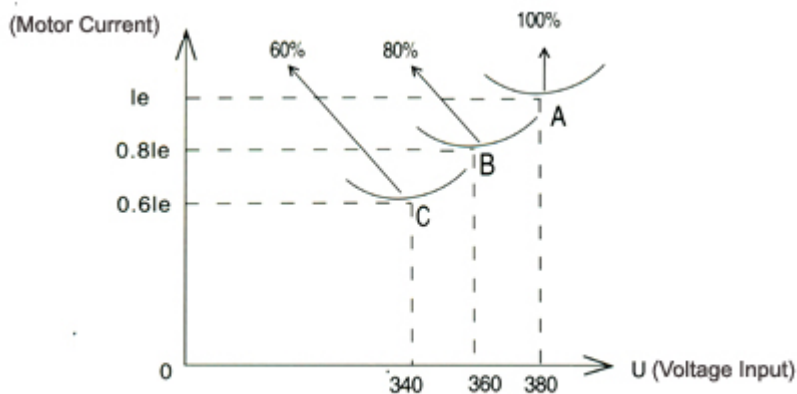
2. ESE-FP Series Energy Saving System Theory

ESE-FP Series Energy Saving System of our company can achieve high energy saving efficiency for the above system. It not only can elevate the stability of the system to a new level, but also can save a large amount of power energy.

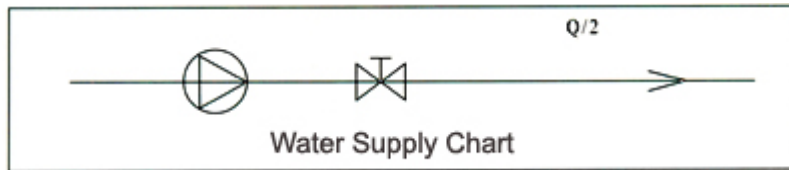
ESE-FP Series Energy Saving System of our company works in the following two aspects:

1) Energy Saving of the best operating voltage

Different points of the three-phase motor load, have the most energy-efficient voltage values. Please refer to the chart



Load Voltage -Current Chart



From the chart we can see that in different point-of-load there is such a turning point (A, B, C), when the voltage is higher than the turning point, the current will fall with the voltage drop; on the contrary, when the voltage is lower than the turning point, the current will rise with the voltage drop. Obviously, A, B, C three points are the most energy-efficient turning points. ES E-FP series of energy-saving system have automatic voltage turning point tracking function so that the voltage can keep at the turning point level to achieve energy-saving.

2) The best energy saving of craft tracking

The widespread application of the frequency control has opened up a revolutionary means for energy-saving pumps, we can illustrate the energy-saving effects brought by referring to the following chart. Assume that there is a water pump, rated power is P_w , rated outlet pressure is P and rated flow broom is Q .

Well, its rated current; I day-inch shaft power is:

$$P_w : K \cdot P \cdot Q$$

K stands for the constant, which after the valve cutting the flow $Q / 2$, the shaft power is:

$$P_{w1} = K \cdot P \cdot Q / 2 = 0.5 P_w$$

After adopting the Frequency Control, the valve opens completely. water pumps outlet pressure is:

$$(1 / 2)^2 P = 0.25P$$

shaft power output is:

$$P_{w2} = K \cdot (1 / 4 P) \cdot Q / 2 = 0.125 P_w$$

Power saving rate is: $(0.5 - 0.125) / 0.5 \times 100\% = 75\%$

Of course, this is on the premise that it can meet the technique requirements of lift distance, which has fallen by 75% at that time.

From the perspective of physics, this is in line with the law of conservation of energy. Regarding certain object that has mass, it has kinetic energy and potential energy. That is: $E = mgh + 1 / 2 mv^2$

From the above equation we can see that the potential is irrevocable, because we have to send it to the required technological height. In fact, we have changed its kinetic energy $1 / 2 mv^2$ by changing the speed of the water pump.

The above theoretical explanation also can be applied to the principle of energy saving fan.

3. Automation System of High Performance

ESE—FP Series Energy Saving System is of system design which includes

PLC throw system, analog signal PID control and configuration application if necessary. Therefore, it can meet such control requirements as: multi-pump operation, failure-off and constant voltage and water level, etc.

Technical parameters

rated voltage output: three-phase 380VAC , 50Hz

allowed voltage working range: 380V±15%

allowed voltage fluctuation: 380V±15% frequency : 50Hz±5%

voltage output: 0~380V

overload capability: 5.5KW~132KW: 120% rated current 1minute

160KW and above: 110% rated current 1 minute

150% rated current 1s

terms of use: Use: Indoor, not exposed to sun light, no corrosive gases, flammable gas, fuel-air, water vapor

altitude: lower than 1000m

environmental temperature: -10 ~+40 (please shorten use frequency at the environmental temperature of 40 -50)

temperature: 20~90%RH (without dew)

Protection rank: IP20~IP44

control: automatic, manual and remote control

cooling: Forced air-cooled, with fan control, using water-cooled for blast occasions System characteristics

High energy-saving rate: Good voltage settings and automated system will comprehensively improve energy-saving effect.

easy to operate: it is designed in accordance with the original operation mode so that users will master it immediately.

Anti-jamming: reasonable layout and scientific anti-interference measures can remove the inter-interference between the equipment and the outside world.

Safe: strictly abide by the electrical design specifications, good protection measures

High reliability: long-term experience and advanced hardware and software measures can ensure high-reliability of the system.

Strong compatibility: It is suitable for the electrical equipments in various occasions and has good convergence with the original system.

High automation: fully consider the technology of the whole system and conduct reasonable design for the failure cutting and running order of the system.

Product Structure

equipment model	configuration motor (KW)	contour dimension (width*depth*height)	net weight (KG)
ESE-FP75	7.5	300*250*580	35
ESE-FP11	11		37

ESE-FP15	15	390*300*780	35
ESE-FP18.5	18.5		35
ESE-FP22	22	560*350*850	35
ESE-FP30	30		35
ESE-FP37	37		35
ESE-FP45	45		35
ESE-FP55	55		35
ESE-FP75	75	600*400*150	35
ESE-FP90	90	800*600*1800	35
ESE-FP110	110		35
ESE-FP160	160	900*600*2000	35
ESE-FP200	200		35
ESE-FP220	220	1200*600*2200	35
ESE-FP260	260		35
ESE-FP280	280		35
ESE-FP315	315	1200*100*2200	35
ESE-FP400	400		35

Note: we won't inform for any change in the dimension, please refer to the equipment.