ENC Inverter Energy-save Solution for Escalator

Equipments Brief:

Inverter、Motor、Reduction box、Intermediate relays、Photoelectric sensor switch

Application Conditions:

As escalator is widely applied in big mall, city metro and other public place, the application technology develop toward to energy save, more comfort and high performance. In traditional application, escalator always runs at rated speed, no matter how many passengers carried on it. When no passenger on escalator, it causes a lot of energy waste, meanwhile, escalator running at rated speed, can make the components wear easily to increase maintenance cost and shorten the usage lifetime of escalator.

Inverter energy-save application solution for escalator requires inverter smoothly start, good acceleration performance, big start torque and strong carried capacity. EDS1000 series hi-performance speed sensorless inverter can meet all this kinds of requirements. EDS1000 series inverter adopts multi-step control mode, two running frequency corresponding to low speed and high speed. When passengers on escalator, inverter controls the escalator to run at rated speed; when no passenger, it runs at low speed to achieve energy-save effect.

On the top and bottom of the escalator, each there is one infrared sensing switch. When passengers pass escalator and the infrared sensing switch is touched off, inverter will accelerate to rated speed to make escalator run at high speed and the built-in timer starts. When timer counts to the setting time, and there is no passenger to pass, inverter will switch to low speed operation automatically; when passengers pass in setting time, infrared sensing switch will be touched off again, timer reset and start again. Only when escalator is down going, inverter needs to add extra brake resistance so as to consume the balance energy to avoid high busbar voltage of inverter.

Inverter control solution advantages for escalator:

1. EDS1000 inverter is open-loop vector control at low frequency with high start torque, and fast response speed. Output torque can get 150% of rated torque at 0.5HZ.This can meet the need of escalator.
2. Inverter soft-start function can remove the current impact of motor start to lower the start current of escalator greatly.
3. Inverter is capacitive load, it can improve motor power factor to reduce the reactive loss. When there is no passenger carried, escalator run at low speed and it reduce the components wear to make device long lifetime and less maintenance cost.
4. Inverter can make a smooth start, stop and speed switch for the whole system to make passenger a good carried feeling.

Parameter Setup:

F0.00=01（frequency No. providen）
F0.01=15Hz（low speed run frequency）
F0.02=1（terminal control）
F0.08=5（accelerate）
F0.09=5（decelerate，acc/dec time adjust to comfort ）
F2.30=50HZ （ rated speed run corresponding frequency)
F5.00=1（X1 high/low speed switch）
F5.01=36（built-in timer reset terminal X2）
F5.02=37（built-in timer output terminal X3）
F5.27=T （ time)

Wiring Diagram:

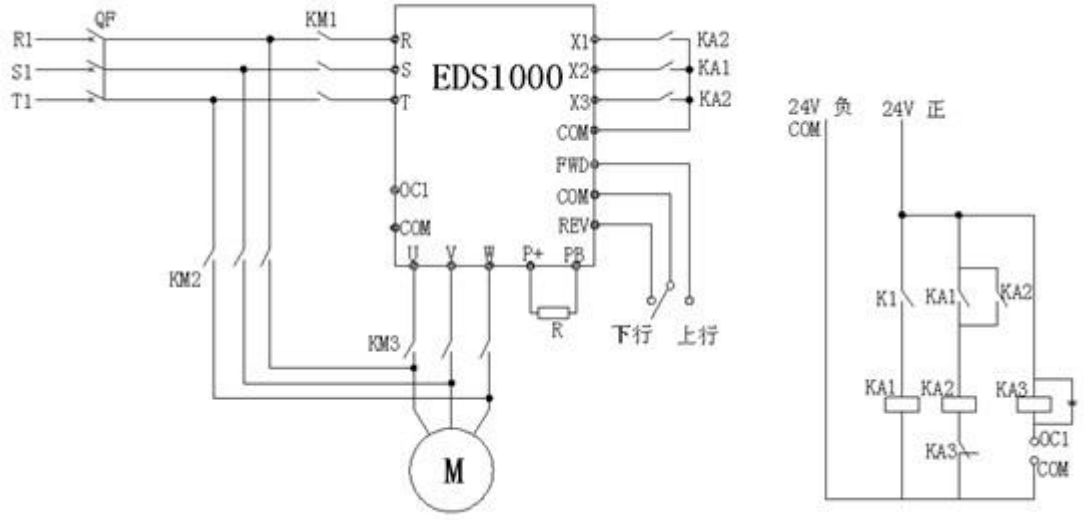

Fig 2. Electric Wiring Diagram

Application Diagram:

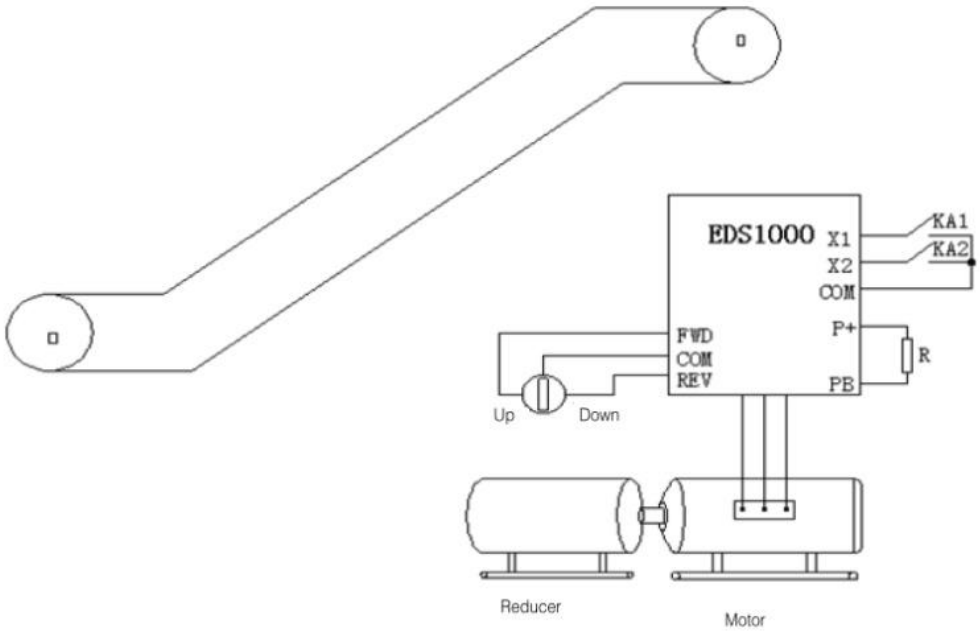

Fig 3. Process Diagram

Fig 4. Photo Show