

## FEATURES FOR INVERTER DRIVE WINCH SYSTEM

### 1. **ECONOMIZED ENERGY**

Reduction of electric load by high efficiency of Inverter Drive System. It is not necessary to increase capacity of electricity as conventional, because the capacity of electricity is decided by system of over load (150%, 1 minute).

### 2. **LOW NOISE AND FREQUENCY**

It is possible to drive without special noise of gear and frequency when the operation of clutch and drive start, because of controlling smoothly without any steps.

### 3. **FREE MAINTENANCE**

It is not necessary maintenance and service compared with hydraulic system by easy structure and using a strong and reliable squirrel cage type electric motor.

### 4. **NO ENVIRONMENTAL POLLUTION**

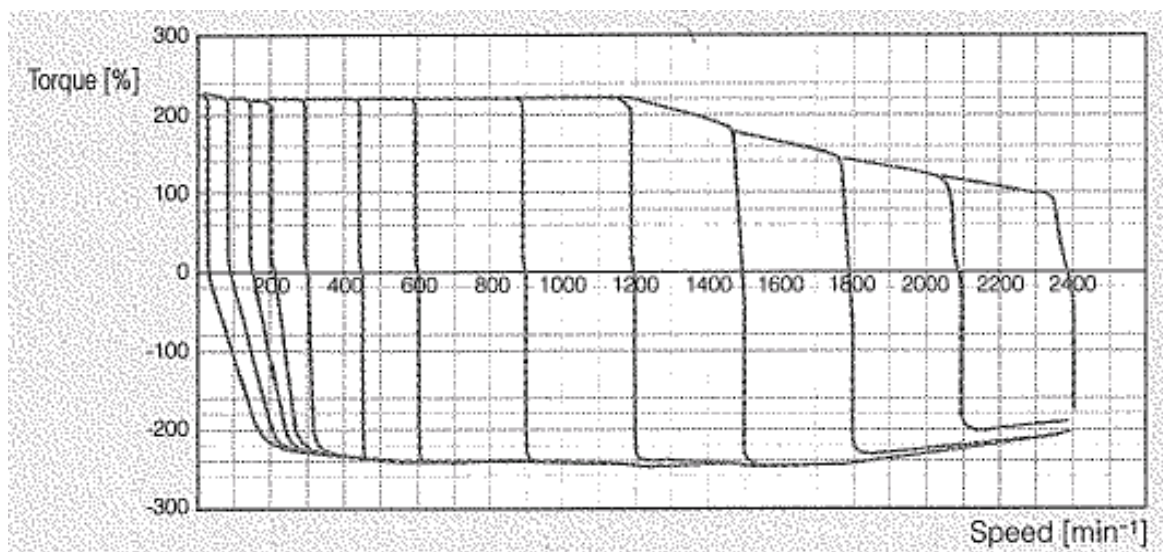
It is not necessary to worry about leaking oil as a hydraulic system, so environmental pollution does not happen.

### 5. **SMOOTH AND WIDE SPEED CONTROL**

It is possible to control from 0.5Hz to maximum.

By vector control with PG sensor, torque from 100% (continuance) to 150% (short time) can show at 0 r/min.

It is possible to wind mooring lines smoothly and work at wharf easily by speed control without any steps.



Example of Torque Characteristics

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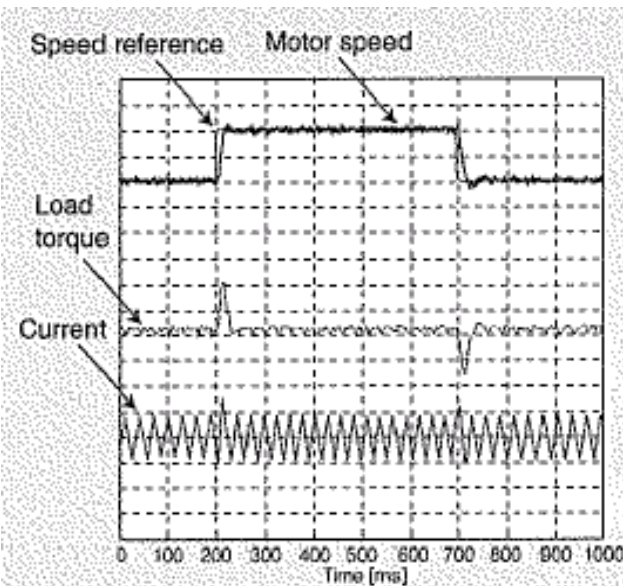
### 6. ADJUSTABLE TORQUE SETTING

Restriction and protection of starting torque acceleration – deceleration torque and over torque.

In stalling situation, it is possible to control the rope tension at zero speed and prevent over load.

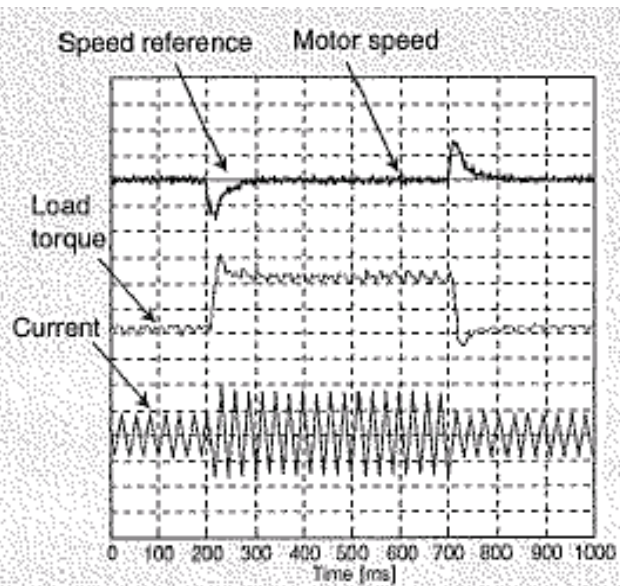
Significantly increases the starting torque of the motor, produce more than 200% torque even at extremely low speeds ( $\leq 0.5$  Hz).

#### Speed Response to Reference Changes



**Fast Response**

#### Speed Recovery Response



**Fast Recovery against Impact Load**

### 7. REDUCTION OF EXPENDITURE ON CABLE WORK

It is possible to change cable size smaller because acceleration electric current that decide the cable size is extreme low compared with other drive system.

### 8. EASY INSTALLATION AND REDUCED START-UP COST

### 9. CENTRALIZED CONTROL OF INVERTER BY PLC AND COMMUNICATION SYSTEM

A number of inverters can be controlled easily by means of a communication system. The means of communication can be selected from among a personal computer, a programmable controller and a higher order network.