VEICHI










# CH310
## Crane
## AC Drive

# About us




VEICHI Electric (stock code: 688698) has always been dedicated to the field of electrical drive and industrial control since its establishment, and now it is a high-tech enterprise engaged in R&D, production, and sales of industrial automation products in one. With R&D and production bases in Suzhou, Shenzhen and Xi'an, and a wholly-owned subsidiary in India, VEICHI now is capable of conducting its business to many countries and regions with competitive, safe and reliable products and services to customers all over the world.

Plentiful products cover AC drives, servo systems and control systems, which are widely used in heavy industry, light industry, high-end equipment and more to facilitate the intellectualized transformation of the manufacturing industry with solutions customized to different scenarios. In the meanwhile, along the development trend of the times, VEICHI is extending its place to the emerging fields such as robotics, new energy, and medical care, and has developed products such as coreless motors, frameless motors, photovoltaic AC drives, and surgical power systems, which have deeply empowered the impressively promising industries.

On long-term and persistent independent R&D and innovation, VEICHI has successfully cultivated a series of patented technologies with independent intellectual property rights, and has mastered the core technologies of motor control such as vector control of PMSM, high-frequency pulse injection control, field-weakening control for higher speed, scalar V/F control and vector control etc., and of silicon carbide application, motor parameter tuning and identification, motor control and protection, and motor speed tracking and start-up control. As of June 30, 2023, a total of 163 patents have been granted, including 43 patents for inventions.

VEICHI has been developing step by step over the past 18 years with abundant honorary awards and certificates from the state and competent authorities, including "the Third Batch of Special and Sophisticated 'Small Giant' Enterprises That Produce Novel and Unique Products" "High-tech Enterprises", "Jiangsu Provincial Engineering Technology Research Center", "Jiangsu Provincial Enterprise Technology Center", "Jiangsu Provincial Industrial Internet Development Demonstration Enterprise (Benchmarking Factory Category)" and others.

In the future, VEICHI Electric will continue to uphold the business philosophy of " guided by market demand and driven by technological innovation", strengthen the key core technology research and product iteration, and constantly expand its high-performance, high-quality, high-reliability applications, contributing to the development of electrical drive and industrial control with might and main.

## 2005

- Beginning of entrepreneurship in Shenzhen
- First-generation of AC drive successfully launched

## 2013

- Suzhou VEICHI Electric Co., Ltd established
- First generation of servo system successfully developed

## 2014

- First stage of Suzhou VEICHI project groundbreaking and put into construction

## 2016

- First stage of Suzhou VEICHI project put into operation
- First generation of motion control system launched

## 2019

- Indian subsidiary established
- Restructure to a company limited by shares

## 2020

- A-share of science and technology innovation board landing
- Awarded as provincial Specialized and Sophisticated "Small Giant" Firms That Produce New and Unique Products

## 2021

- A VEICHI controlled subsidiary established
- Awarded as the third patch of Specialized and Sophisticated "Small Giant" Firms That Produce New and Unique Products

## 2022

- Xi'an R&D Center established
- VEICHI Digital Energy subsidiary established

## 2023

- Suzhou VEICHI Phase II project put into operation
- Suzhou VEICHI Phase III Project put into construction
- VEICHI Medical Equipment subsidiary established

# CH310 Crane AC Drive

Drawing from extensive industry expertise, the CH310 series stands out for its exceptional torque management, braking control timing, and speed/torque monitoring.

It also excels in power optimization, positional processing, and intelligent deceleration mechanisms.

These advanced features are meticulously designed to guarantee the utmost safety, reliability, and efficiency of cranes of harbors, ships, marine engineering projects, and mining.




## Power range

**220V/380V/660V: 0.75kW-1120kW**

## Basic features

- High performance and quality on rigid requirements high power density for better user experience
- Low voltage protection for quick stop to avoid hook slippage
- Software with built-in functions for cart rectification, sync hoisting, precise positioning, grab adjustment, anti-swing, and tower control.
- Precise positioning for optimal efficiency in the designated position without creeping

## Application

Rubber tyre gantry cranes, rail-mounted cranes, gantry cranes, general cranes, tower cranes etc.

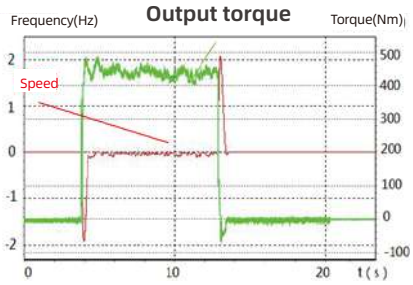


# Reliability

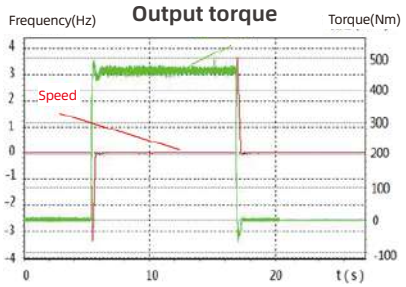
## Low frequency and large torque

It can realize 200% of the rated torque output at 0.0Hz, and stable operation with load at the ultra-low speed under 0.01Hz. High torque output for starting ensures smooth ascending/descending process without sliding.

Stable torque output in torque control mode with linearity tolerance within 3% or lower.




200% of rated torque (230Nm) at 0rpm in open loop

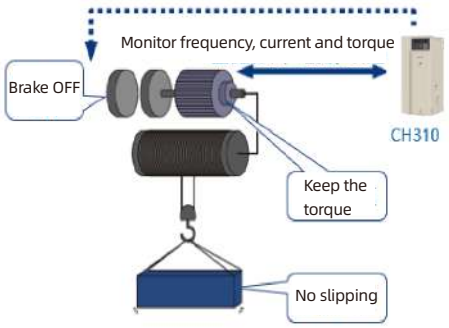



200% of rated torque (230Nm) at 0rpm in closed loop

(A 45kW drive for a 37kW motor with a rated torque of 230NM)

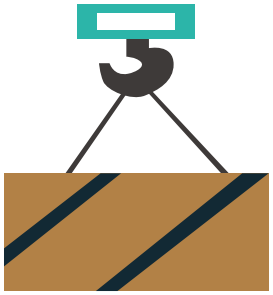
## Brake release/apply logic control

The brake will act only when the two conditions of release/apply frequency and release/apply torque are satisfied at the same time to ensure smooth lifting and stopping without slipping.



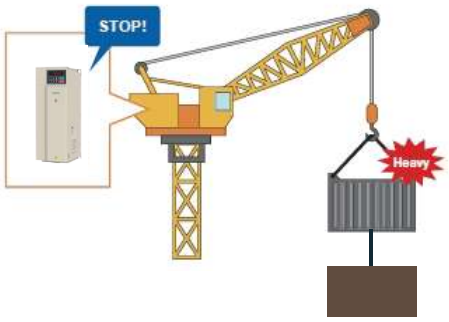

## Steel wire rope protection

Speed is automatically lowered to tighten the wire rope slowly when goods are raised at high speed and the rope is slack, so as to prevent overstretching of the wire rope and to prolong its service life.



## Anti Snag

When a sudden increase in load torque is detected during the hoisting process (hanging by a foreign object or being held by an obstacle), an alarm is issued and operation is stopped.



## Sync control

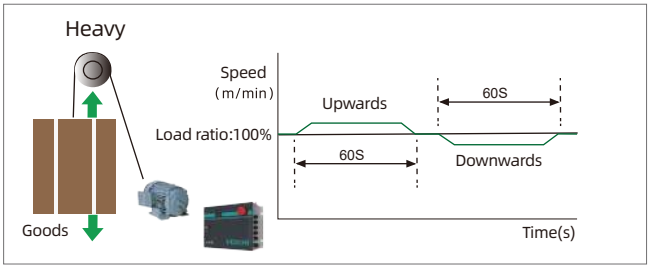
Master-slave sync control function: when the dual hoisting mechanism lifts one object at the same time, this function can ensure that it is lifted synchronously to ensure safety.

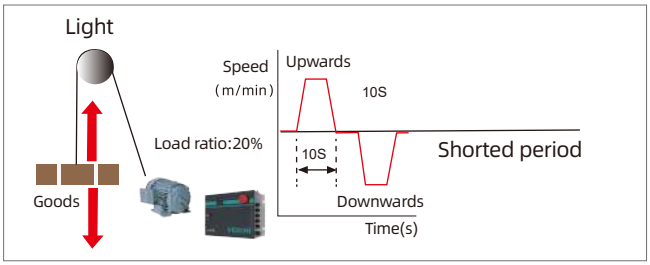


# Efficiency

## Fast under light duty and slow under heavy duty

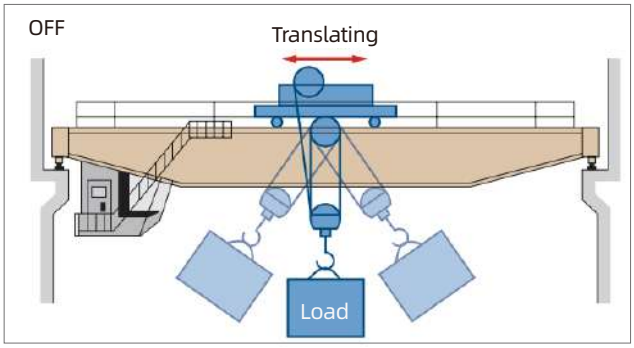
Built-in constant power control algorithm (speed change with load ) automatically matches the best running speed according to the current lifting weight, 1-2 times up of the working efficiency.

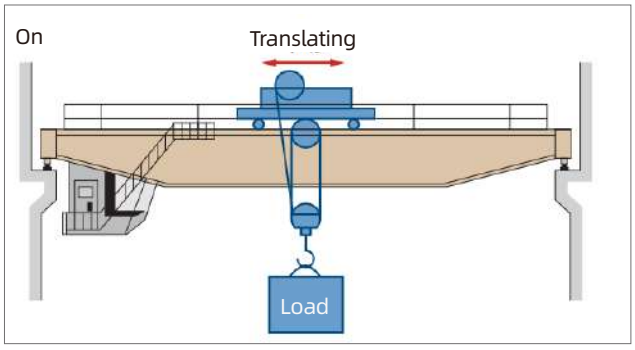



## Anti Swing

Open/closed loop anti-swing control algorithm with simple debugging and good adaptability reduces hook swaying caused by inertial shock from the cart and trolley and goods swing during translation.



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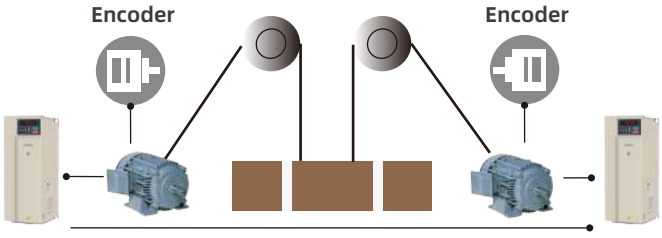
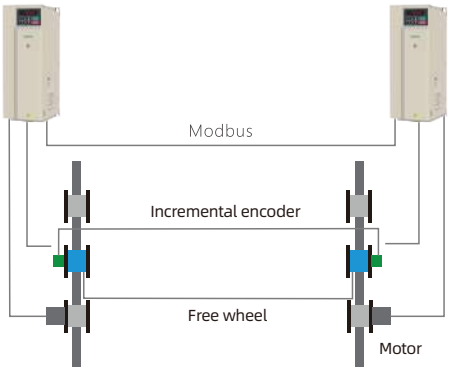



## Real-time correction

Real-time position correction is adopted for master and slave for traveling mechanisms with large spans to realize synchronization control.




## Anti Swing (Slewing)

Low-speed slewing is smooth without "stuttering" for quick positioning.

### Quick stop with reverse gear (Slewing)

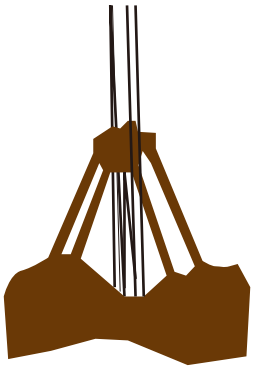
Quick stop can be realized by the reverse gear during slewing without boom shake and rebounce.(for slewing mechanism of tower cranes).



## Grab sync control

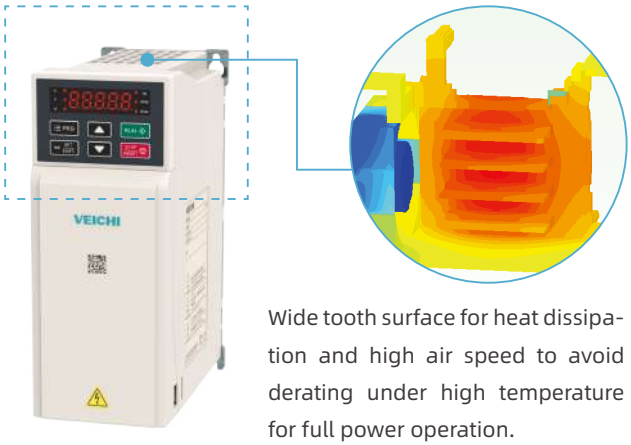
CH310 AC drives automatically control the grab with a single closing command, the system will close the grab automatically, then adjust tension of the supporting rope and the clamping rope until they are balanced.

Similarly, the clamping of the grab only needs a command, and the system automatically completes it. Its status is determined by the absolute rope difference between the clamping and the supporting ropes, and the deceleration zone is automatically set up to prevent the sudden impact.



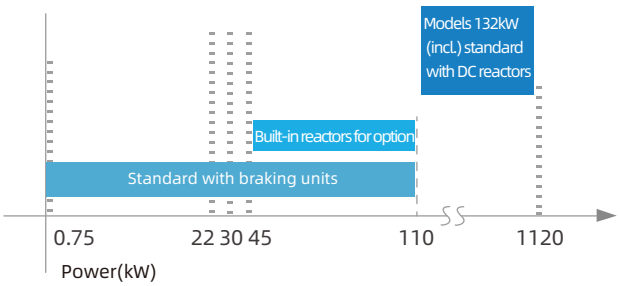
# Adaptability

## New structure




Wide tooth surface for heat dissipation and high air speed to avoid derating under high temperature for full power operation.

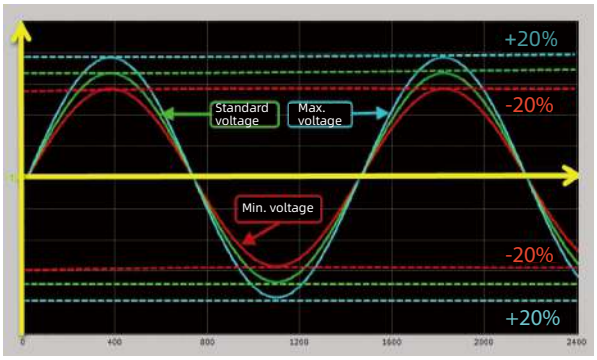
## Braking unit and reactor




- 0.75kW~110kW standard with braking units
- 45kW~110kW optional for built-in reactors
- 132kW (incl.) standard with DC reactors

## Wide voltage

The allowable fluctuation range of input voltage is ±20% of the standard rated voltage to avoid its influence effectively and at the same time, the output is still qualified under harsh grids.




## Protection

It realizes all-round protection for the drives and peripheral devices including short-circuit protection to ground, internal buffer relay protection, fan protection, external 24V DC short-circuit protection, motor overload protection and more.

| | | | | |
|---|---|---|---|---|
| System error | Input phase loss | Stall | Overcurrent during acceleration | Output phase loss |
| Load protection 1 | Overvoltage during acceleration | **Fault Type** | Overheat | PID feedback fault |
| Undervoltage during operation | Current detection fault | Excessive speed deviation | Motor overload | Motor detection fault |

## Superior overload capacity

150% of the rated current for 1 minute, 180% for 10 seconds, and 200% for 3s.

## Multiple PG boards

CH310 series supports several encoder interfaces of collector signal, differential signal, and resolver signal for closed-loop vector control.

## Speed change with voltage

The drive reduces the operating frequency when the supply voltage decreases to keep working.

# Expansion

## Various expansions

A variety of expansion interfaces are available for customization.
CH310 control board retains two SPI high-speed channels for the external expansions, and its type and parameters are automatically recognized.

## Function expansions

| Type | Requirement |
|---|---|
| IO | Optional for high-speed pulse and relay |
| Speed tracking | Optional(software tracking by default) |
| PG | Optional for different encoders |
| Simple logic board | Optional |
| RT Resolver | Optional |
| GPRS | Optional |

### IO expansion

| Type | Terminal | Description |
|---|---|---|
| IO | X6/X7/X8/X10 | PLC/COM |
| High-speed pulse input | X10 | 0-100kHz |
| DO | Expansion port Y2 | DC24V/50mA |
| RO | Expansion relay TA2/TB2/TC2 | 3A/240VAC |
| Temp. detection | PK+/PK- | PT100/PT1000/KTY84, motor temp. detection |
| Public | COM/PLC2 | Public port for external appliances |
| Change-over switch | S7 | Polarity of input terminals |

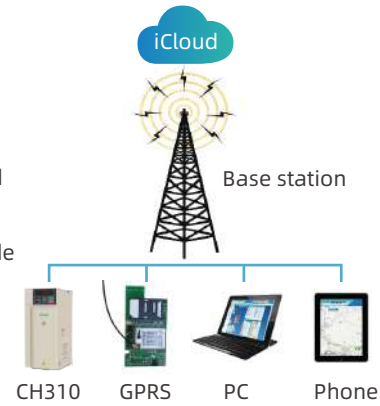
### Logic board expansion

Drive can perform simple logic instead of PLC with the widely used MELSEC programmable controller program development environment integrated with general and comprehensive function blocks.



### VEICHI IoT

Intelligent terminations feature high positioning accuracy, small size and easy installation.
GPRS and GSM dual-mode communications ensures stable operation and reliable performance.
And online monitoring, and remote fault diagnosis are realized through the remote monitoring module, offering customers with a wider range of value-added services.




## Communication expansion

| Type | |
|---|---|
| Modbus-RTU | Modbus |
| PROFIBUS-DP | PROFIBUS |
| CANopen | CANopen |
| PROFINET | PROFINET |

## Naming Rules

**CH310 - T 3 - 011 B**

**Series Name**
CH310

**Voltage Type**

T: Three phase

S: Single phase

**Voltage Level**

2: 220V 3: 380V

6: 660V 11: 1140V

**Accessory Type**

B: Brake

L: DC reactor

D: Cabinet product

**Motor power(kW)**

7R5: 7.5

011: 11

132: 132

### Drive Output Current

| Voltage | 220V | 380V | 660V |
|---|---|---|---|
| Power(kW) | Rated Output Current (A) | | |
| 0.75 | 4 | 3 | - |
| 1.5 | 7 | 4 | - |
| 2.2 | 10 | 6 | - |
| 4 | 16 | 10 | - |
| 5.5 | 20 | 13 | - |
| 7.5 | 30 | 17 | - |
| 11 | 42 | 25 | - |
| 15 | 55 | 32 | - |
| 18.5 | 70 | 38 | - |
| 22 | 80 | 45 | 28 |
| 30 | 110 | 60 | 35 |
| 37 | 130 | 75 | 45 |
| 45 | 160 | 90 | 52 |
| 55 | 200 | 110 | 63 |
| 75 | 260 | 150 | 86 |
| 90 | 320 | 180 | 98 |
| 110 | 380 | 210 | 121 |
| 132 | 420 | 250 | 150 |

| Voltage | 220V | 380V | 660V |
|---|---|---|---|
| Power(kW) | Rated Output Current (A) | | |
| 160 | 550 | 310 | 175 |
| 185 | 600 | 340 | 198 |
| 200 | 660 | 380 | 218 |
| 220 | 720 | 415 | 235 |
| 250 | - | 470 | 270 |
| 280 | - | 510 | 330 |
| 315 | - | 600 | 345 |
| 355 | - | 670 | 380 |
| 400 | - | 750 | 430 |
| 450 | - | 810 | 466 |
| 500 | - | 860 | 540 |
| 560 | - | 990 | 600 |
| 630 | - | 1200 | 690 |
| 710 | - | 1340 | 760 |
| 800 | - | 1500 | 860 |
| 900 | - | 1620 | 932 |
| 1000 | - | 1720 | 1080 |
| 1120 | - | 1980 | 1200 |

# VEICHI

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