

HONEYWELL

Variable Frequency Drive

Honeywell VFD (AC Drive)

HAC10 and HAC310

March 2023, V00

Introduction

This document provides technical information for the Honeywell Honeywell VFD (AC Drive). Further product descriptions can be found in the Product Information Note. Detailed planning, installation and configuration information is available in the product user guides.

Honeywell VFD Overview

'Honeywell VFD' is a general-purpose Drive solution and meet automation requirements in process and general application, where is needed to control motors (inductive, single phase and three phase), and to bring the better performance and effectively management the whole system. Also, it delivers users to take benefits, which are Simplicity-Precision, Flexibility-Standardization, Easy to use-Diversity. The Honeywell VFD provides effective integration with Experion® and reduces configuration efforts by utilizing a tool for parameter setting, as well as remote configuration.

Document Scope

This document provides specifications for the following components:

<ul style="list-style-type: none">• Honeywell VFD-HAC10	<ul style="list-style-type: none">• Honeywell VFD-HAC310
<ul style="list-style-type: none">• Communication modules	<ul style="list-style-type: none">•
<ul style="list-style-type: none">• Option modules-IO points	<ul style="list-style-type: none">• Accessory module-Interface

User-friendly functions deliver added value thru a Config tool. Refer manuals for each series.



Key options

Enclosure

All Honeywell VFD units are supplied with enclosure as standard. Please note IP level for each item. This enclosure level is ideal for panel mounting in areas where a high degree of protection is required. Please check Model Selection Guide for Honeywell VFD.

Harmonic filter

The harmonic currents do not affect power consumption directly, but they increase the heat losses in the installation (transformer, cables).

That is why, in a system with a relatively high percentage of rectifier load, it is important to keep the harmonic currents at a low level so as to avoid a transformer overload and high cable temperature. For the purpose of ensuring low harmonic currents, Honeywell VFD HAC10/HAC310 are fitted with coils in their intermediate circuit as standard. This reduces the input current IRMS by typically 40 %.

Please note that 1 x 220-240 V units up to 1.5 kW are not supplied with coils in their intermediate circuit.

Brake

Honeywell VFD is available with or without an integral brake module. See also the section entitled Brake resistors for selecting a Brake resistor.

Built-in EMC filter

Honeywell VFD is available with a built-in EMC filter, and which meets the electrical noise reduction regulation.

Related standards: In Conformity with EN61800-3

Control unit

The Honeywell VFD is always supplied with an integral control unit.

All displays are in the form of Keyboard capable of showing one item of operating data continuously during normal operation. As a supplement to the display, there are some indicator lamps for status of operation. Most of the Drive's parameter Setups can be changed immediately via the integral control panel. A Keyboard to be connected via a plug to the front of the Honeywell VFD is available as a module basically or optionally.

The Keyboard can be installed up to 3 meters away from the Drive, e.g., on a front panel, by means of the accompanying flange kit for mounting. During programming, all the information required for quick, efficient parameter Setup of the Honeywell VFD is displayed.

The parameter Setups on Honeywell VFD can be changed immediately via the Keyboard.

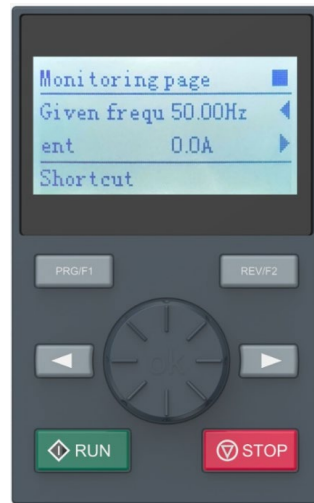
(1) Keyboard with 7-Segment LED (less than 37kW)



(2) Detachable Keyboard, with LED display and LCD display



(a) LED Key pad (37kW or more)



(b) LCD keypad (Optional)

Fieldbus option

The increasing information requirements in industry make it necessary to collect or visualize many different process data. Important process data help the system technician with the daily monitoring of the system. The large amounts of data involved in major systems make a higher transmission speed.

Parameter Config and Copier-HAC

It's a tool for configuring/monitoring the parameters remotely, without any Keyboard.

All series of Honeywell VFD has one or two comm port to interface with other external device, which are serial port and Ethernet port (installed optionally).

This tool supports,

(1) Serial communication: Modbus rtu (or dedicated protocol)

(2) Ethernet communication: Modbus TCP

Most Ethernet option cards can support Modbus TCP, and available for configuring seamlessly.

Specifications

Honeywell VFD HAC10

The HAC10 is based on the market oriented for miniaturization, high reliability and cost-competitive with performance.

Stable Vector control

Starting torque of 150%/0.5Hz is produced and provides robust power in the low-speed region.

The motor auto-tuning function is optimized to maximize motor performance.

Ease-of-use

Convenient installation, small compact size, suppressed temperature increasing, high protection.

Space efficient design and user benefits

Drive is installed Side-by-side on the panel, Various field networks, built-in EMC filter, Extension IO option, replacements.



Hardware Specifications and Features

Items		Specification
Input	Voltage, Frequency	Single-phase 220V 50/60Hz Three-phase 220V 50/60Hz Three-phase 380V 50/60Hz
	Allow fluctuations	Voltage imbalance rate: <3%; Frequency: ±5% The distortion rate meets the requirements of IEC61800-2
	Impact current when power on	Less than rated current
	Power factor	≥0.94 (with DC reactor)
	Inverter efficiency	≥96%
Output	Output voltage	Output under rated conditions: 3 phases, 0 to input voltage, error less than 5%
	Output frequency range	0-600.00Hz
	Output frequency accuracy	±0.5% of the maximum frequency value
	Overload capability	T3 model: 150% rated current for 89 seconds, 180% rated current for 10 seconds, 200% rated current for 3 second S2 model: 150% rated current 24 seconds, 180% rated current 3.4 seconds
Main control performance	Motor type	PMSM, AM
	Motor control mode	No PG V/F control, no PG vector control
	Modulation	Optimized space vector PWM modulation
	Carrier frequency	1.0 ~ 16.0kHz
	Speed control range	No PG vector control, rated load 1:100
	Steady state speed accuracy	No PG vector control: ≤ 2% rated synchronous speed
	Starting torque	No PG vector control: 150% rated torque at 0.5Hz
	Torque response	No PG vector control: <20ms
	Frequency accuracy	Digital setting: maximum frequency × ± 0.01%; analog setting: maximum frequency × ± 0.2%
Frequency resolution	Digital setting: 0.01Hz; Analog setting: Maximum frequency × 0.05%	
Basic product function	DC braking capability	Starting frequency: 0.00~50.00Hz Braking time: 0.0~60.0s Braking current: 0.0~150.0% rated current
	Torque boost	Automatic torque increases 0.0%~100.0% Manual torque increases 0.0% ~ 30.0%

	V/F curve	Four modes: linear torque characteristic curve, self-set V/F curve, torque reduction characteristic curve (1.1 to 2.0 power), square V/F curve	
	Acce. / Dece. curve	Two ways: linear acceleration and deceleration, S curve acceleration and deceleration Four sets of acceleration and deceleration time, the time unit is 0.01s, the longest is 650.00s	
	Rated output voltage	Using the power supply voltage compensation function, the rated voltage of the motor is 100%, which can be set within the range of 50 to 100% (the output cannot exceed the input voltage)	
	Automatic voltage adjustment	Automatically keeps the output voltage constant when the grid voltage fluctuates	
	Automatic energy saving operation	Automatically optimize output voltage according to load under V/F control mode to achieve energy-saving operation	
	Automatic current limiting	Automatically limit current during operation to prevent frequent overcurrent fault trips	
	Instant power down handling	Uninterrupted operation through bus voltage control during instantaneous power loss	
	Standard function	PID control, speed tracking and power-down restart, skip frequency, frequency upper and lower limit control, program operation, multi-step speed, RS485, analog output, frequency pulse output	
	Frequency setting channel	Keyboard digital setting, keyboard potentiometer, analog voltage/current terminal AI, communication setting and multi-channel terminal selection, main and auxiliary channel combination, can be switched in various ways	
	Feedback input channel	Keyboard potentiometer, voltage/current terminal AI, communication reference, pulse input X4/PUL	
	Run command channel	Operation panel reference, external terminal reference, communication reference	
	Input command signal	Start, stop, forward and reverse, jog, multi-speed, free stop, reset, acceleration/deceleration time selection, frequency setting channel selection, external fault alarm	
	External output signal	1 relay output, 1 collector output, 1 AO output can be selected as 0~10V or 4~20mA or 4~20mA output	
Protective function		Overvoltage, undervoltage, current limiting, overcurrent, overload, electronic thermal relay, overheating, overvoltage stall, data protection, fast protection, input and output phase loss protection	
Keyboard display	LED display	Single line 5-digit display	1 inverter status quantity display
		Double line 5-digit digital tube display	2 inverter status quantity display
	Parameter copy	Upload and download function code information of the inverter for fast parameter copying	
	Status monitoring	All parameters of the monitoring parameter group such as output frequency, given frequency, output current, input voltage, output voltage, motor speed, PID feedback amount, PID given amount, module temperature, etc.	
Error alarm	Overvoltage, undervoltage, overcurrent, short circuit, phase loss, overload, overheat, overvoltage stall, current limit, data protection damage, current fault operation, historical fault		
Environment	Installation place	The altitude is less than 1000 meters, and the derating is more than 1000 meters. The derating is 1% for every 100 meters. No condensation, icing, rain, snow, sputum, etc., solar radiation is less than 700W/m ² , air pressure 70~106kPa	
	temperature humidity	-10 ~ +50°C, derating can be used above 40 °C, the maximum temperature is 60 °C (no-load operation) 5% to 95% RH (no condensation)	
	Vibration	At 9 to 200 Hz, 5.9 m/s ² (0.6 g)	
	Storage temperature	-30 ~ +60°C	
	Installation method	Wall-mounted, closet	
	Protection level	IP20	
cooling method	Forced air cooling		

Note: The three-phase 220V 50/60Hz power input mode is specially described:
The HAC10T2 series VFD is designed for single-phase 220V AC voltage input; it is compatible with three-phase 220V AC input, which will cause the three-phase current imbalance of the grid R, S, T.

Model Selection Guide

HAC	10	T2	011	G	E	X	B	X	S	E	0
Key number			Table I		Table II				Table III		
HAC: Honeywell Drive			Motor Rating(kW)		Keypad				E: Manual (English)		
10 : Product name			7R5 7.5		E 7-seg LED keypad				C: Manual (Chinese)		
Input Rating			022 22		C LCD keypad				0: Future option		
T2	1-/3-phase 200-240V		Load		EMC Filter				Future Option		
T3	3-phase 380-480V		G	Heavy Load	N Non-EMC				0 Non		
			P	Light Load	X Built-in, C3						
					Brake Unit				Brake Unit		
					N None				N None		
					B Brake unit				B Brake unit		
					Reactor						
					N Non-Reactor						
					X DCL(Built-in Reactor)						
					I/O						
					S Standard(pitch=5mm)						

Refer to 7.

Performance and Capability

Voltage	220V	380V	Acceleration and deceleration
Power (KW)	Rated output current (A)		time default value (s)
0.4	2.5	---	6.00
0.75	4	3	6.00
1.5	7	4	6.00
2.2	10	5	6.00
4	---	9.5	6.00
5.5	---	13	6.00
7.5	---	17	6.00
11.0	---	25	6.00
15.0	---	32	6.00
18.5	---	38	6.00
22.0	---	45	12.00

Default Voltage Protection Point

The default voltage value of the VFD includes rated voltage, overvoltage suppression point, overvoltage point, undervoltage suppression point, undervoltage point and energy consumption braking point, etc., as shown in the following table.

Note: The values in the table are in volts (V)

Voltage level (VAC)	Rated voltage (VDC)	Undervoltage suppression point (VDC)	Undervoltage point (VDC)	Overvoltage suppression point (VDC)	Overvoltage point (VDC)	Energy consumption braking point (VDC)
220	311.1	240	190	365	400	350
380	537.4	430	320	750	820	740

Types and Characteristics of Control Modes

The VFD can select AM-V/F control (initial setting) and AM-open loop vector control.

Asynchronous motor V/F control

- It means that when the frequency (F) is variable, the ratio of the control frequency to the voltage (V) remains constant.
- This control mode is used for all variable speed control that does not require fast response and precise speed control, as well as the use of multiple VFDs with one frequency VFD. This method is also used when the motor parameters are not clear or cannot be self-tuned.

Asynchronous motor open loop vector control

- The vector can be divided into the excitation current and the torque current by performing vector calculation on the output current of the VFD, and the frequency and voltage are compensated to flow the motor current matched with the load torque to improve the low-speed torque. At the same time, the output frequency compensation (slip compensation) is implemented to make the actual rotation speed of the motor closer to the speed command value.
- This control mode is used for applications requiring high speed control accuracy. High speed response and torque responsiveness, high torque output at low speeds. Suitable for general high-performance control applications, one VFD can only drive one motor.

Note:

- For best control, enter the motor parameters correctly and perform motor self-tuning. The F02.0x group is the basic parameter group of the motor.
- In the open loop control, the VFD can only drive one motor; and the VFD capacity and motor capacity can not be too different, the VFD can be two or smaller than the motor's power level, otherwise the control performance may be degraded., or the drive system is not working properly

Communication Capabilities

(1) Serial communication (RS-485)

The RS-485 communication standards support the Multi-drop Link System and offer an interface that is strongly resistant to noise

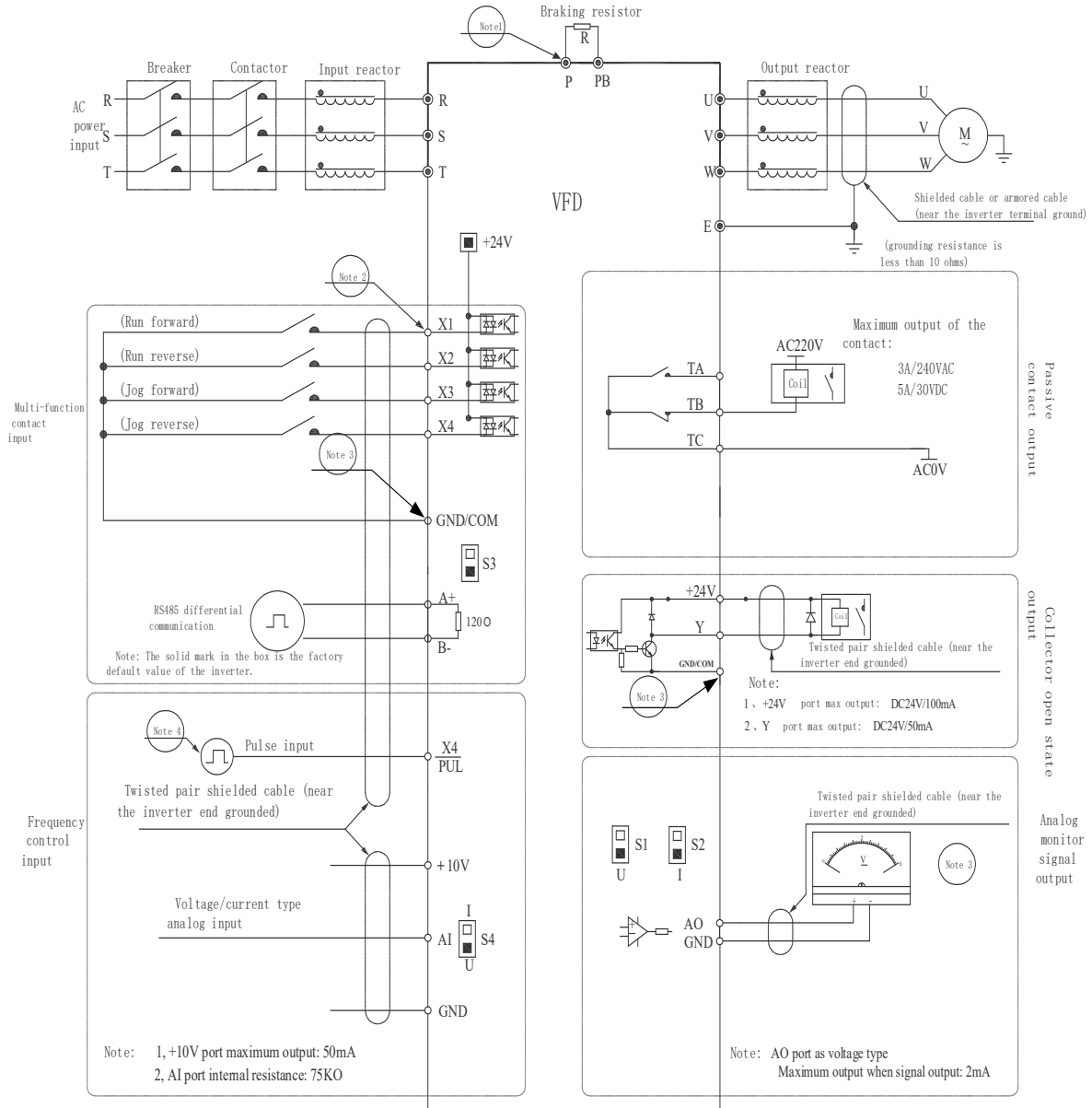
Item	Specification
Communication method/ Transmission type	RS-485/Bus type, Multi-drop Link System
Transmission distance	Maximum1,200m (recommended distance: within 700m)
Recommended cable size	0.75mm ² , (18AWG), Shielded Type Twisted-Pair (STP) Wire
Installation type	Dedicated terminals (S+/S-/SG) on the control terminal block
Power supply	Supplied by the VFD - insulated power source from the VFD's internal circuit
Communication speed	1,200 / 2,400 / 9,600 / 19,200 / 38,400 / 57,600 / 115,200 bps
Control procedure	Asynchronous communications system
Communication system	Half duplex system
Protocols	Various Interface modules
Stop bit length	1-bit/2-bit
Frame error check	2 bytes
Parity check	None/Even/Odd

Wirings

- Electronic thermal motor protection against overload.
- The frequency converter is protected against short-circuits on motor terminals U, V, W.
- Monitoring of the intermediate circuit voltage ensures that the frequency converter cuts out if the intermediate circuit voltage is too low or too high.
- The frequency converter is protected against earth fault on motor terminals U, V, W.

(1) Standard NPN Connection Diagram

Motor Ratings: 7.5kw~22kw

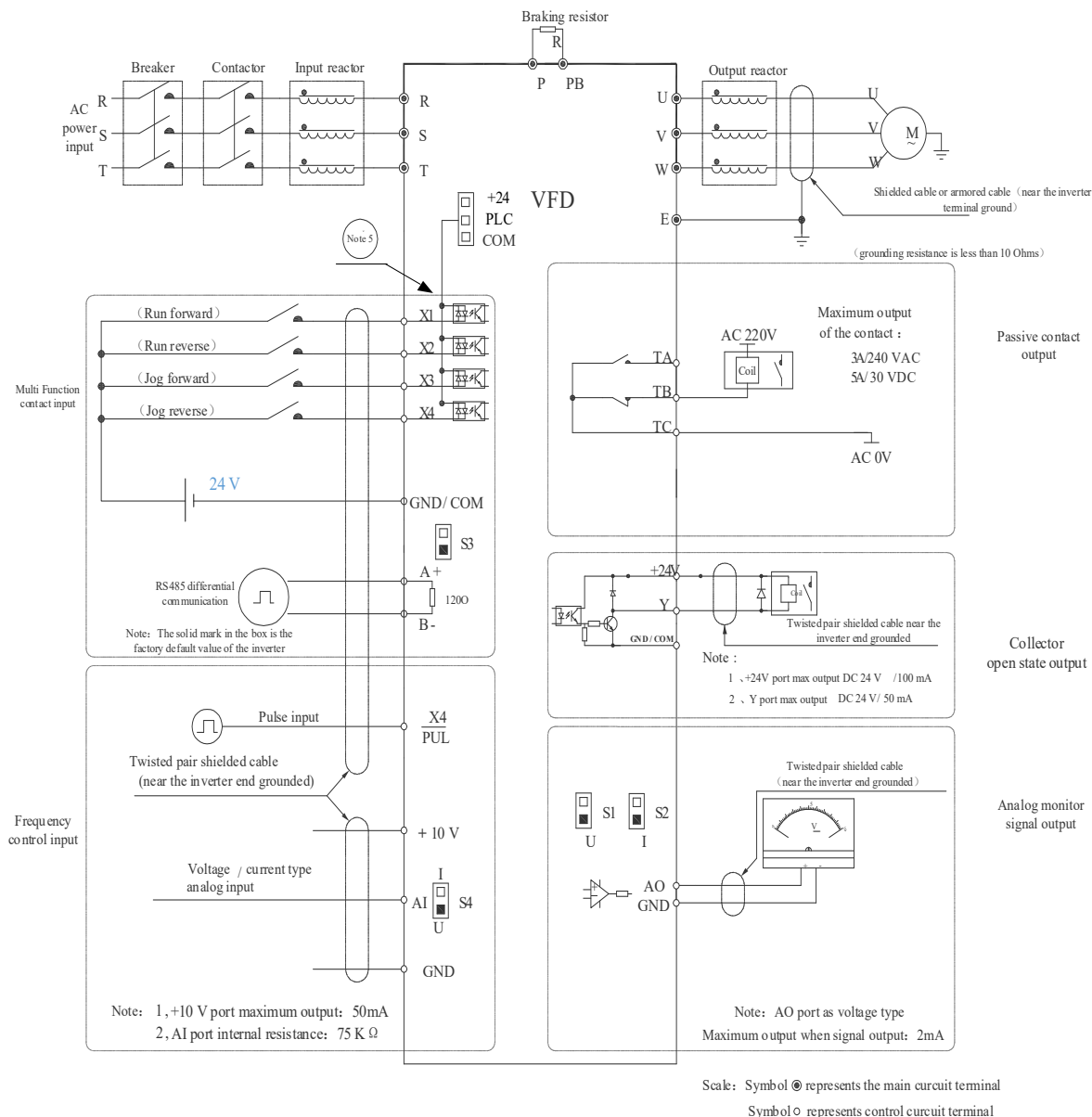


Note3: 0.4kW-5.5kW corresponds to access to GND,
5.5kW-22kW corresponds to access to COM.

Scale: Symbol ● represents the main circuit terminal
Symbol ○ represents control circuit terminal

HAC10—7.5KW ~ 22KW Standard wiring diagram for power products

(2) Standard PNP Connection Diagram



HAC10—7.5KW ~ 22KW Standard wiring diagram for power products

Note:

1. Please select the appropriate braking resistor according to the site working conditions and the 《Braking Resistor Specification Parameters》.
2. The multi-function input terminals (X1 to X4/PUL) can support NPN transistor signals as inputs.
3. The analogue monitoring output is a dedicated output for indicator meters such as ammeters and voltmeters and should not be used for control operations such as feedback control.
4. As there are several pulse types in practice, please see the detailed description for the specific wiring.
5. For 0.4kW to 5.5kW Honeywell VFDs, the COM and GND terminals are two-in-one function terminals and are combined externally as GND terminals; for 7.5kW to 22kW Honeywell VFDs, both COM and GND terminals are available.

(3) Auxiliary Terminal Output Capability

Terminal	Function definition	Max output
+10V	10V auxiliary power supply output, constitutes loop with GND.	50mA
AO	Analog monitor output, constitutes loop with GND.	As frequency, voltage signal, max output 2mA
+24V	24V auxiliary power supply output, constitutes loop with COM.	100mA
Y	Collector open circuit output, can set the action-object by program.	DC24V/50mA
TA/TB/TC	Passive connector output can set the action-object by program.	3A/240VAC

(4) Function Specification of Switch Terminals

0.4kW-5.5Kw Description of dip switch

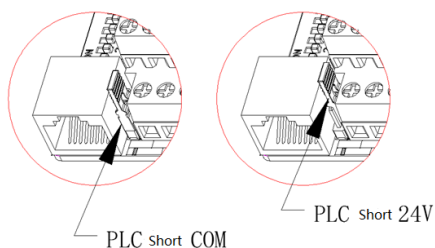
Encode switch	S(number)	Position	Function description
	S1	ON	Enable AO output 0~10V
		OFF	Disabling AO voltage output
	S2	ON	Enable AO output 0~20mA or 4~20mA
		OFF	Disabling AO current output
	S3	ON	RS485 communication access 120Ω termination
		OFF	RS485 communication disconnects 120Ω
	S4	I	AI input 0~20mA or 4~20mA
		U	AI input 0~10V

7.5kW-22kW dipswitch description

	S(number)	Position	Function description
	S1	ON	AI input 0mA to 20mA
		OFF	AI input 0V to 10V
	S2	ON	Enable AO 0kHz to 100kHz frequency output
		OFF	Turn off AO frequency output
	S3	ON	Enable AO output 0V~10V
		OFF	Turn off AO voltage output
	S4	ON	Enables AO output 0mA to 20mA or 4mA to 20mA
		OFF	Turn off AO current output
	S5	ON	RS485 communication access 120Ω termination resistor
		OFF	RS485 communication disconnect 120Ω
	S6	ON	Control board grounding
		OFF	Control board not grounded

More details:

Connection diagram of jumper caps "+24V", "PLC", "COM"



(5) Main Circuit Wiring

Main circuit terminal arrangement and definition

Main Circuit Terminal Arrangement and Definition of HAC10 Series Honeywell VFDs

Terminal	Terminal name	Terminal function definition
(+)	DC power terminal	DC power output, (-) for DC bus negative, (+) for DC bus positive, terminal block for 7.5kW-22kW models.
(-)		
(+)	Brake resistor terminal	For external braking resistors for fast shutdown.
PB		
R	Honeywell VFD input terminal	Used to connect three-phase AC power.
S		
T		
U	Honeywell VFD output terminal	Used to connect the motor.
V		
W		
⊕	Ground	Ground terminal, grounding resistance <10 ohms.
E		

(6) Wiring of the main circuit of a three-phase 380V class machine

Recommended main circuit diameter and fixed torque of three-phase 380V class machine

Model	Main circuit terminal screw specifications (mm)	Recommended fixed torque (N·m)	Recommended copper core cable size mm ² (AWG)
HAC10T3-R75G-B	M4	1.2 ~ 1.5	1.5mm ² (14)
HAC10T3-1R5G-B	M4	1.2 ~ 1.5	2.5mm ² (12)
HAC10T3-2R2G-B	M4	1.2 ~ 1.5	2.5mm ² (12)
HAC10T3-004G-B	M4	1.2 ~ 1.5	4mm ² (10)
HAC10T3-5R5G-B	M4	1.2 ~ 1.5	6mm ² (9)
HAC10T3-7R5G-B	M4	1.2 ~ 1.5	6mm ² (9)
HAC10T3-011G-B	M4	1.2 ~ 1.5	10mm ² (7)
HAC10T3-015G-B	M5	2 ~ 3	10mm ² (7)
HAC10T3-018G-B	M5	2 ~ 3	16mm ² (5)
HAC10T3-022G-B	M5	2 ~ 3	16mm ² (5)

(7) Wiring of the main circuit of single-phase 220V class machine

Table 3-5: Recommended single-phase 220V class machine main circuit wire diameter and fixed torque

Model	Main circuit terminal screw specifications (mm)	Recommended fixed torque (N·m)	Recommended copper core cable specifications mm ² (AWG)
HAC10T2-R40G-B	M4	1.2 ~ 1.5	1.5mm ² (14)
HAC10T2-R75G-B	M4	1.2 ~ 1.5	2.5mm ² (12)
HAC10T2-1R5G-B	M4	1.2 ~ 1.5	2.5mm ² (12)
HAC10T2-2R2G-B	M4	1.2 ~ 1.5	4mm ² (10)

(8) Recommended main circuit device specifications

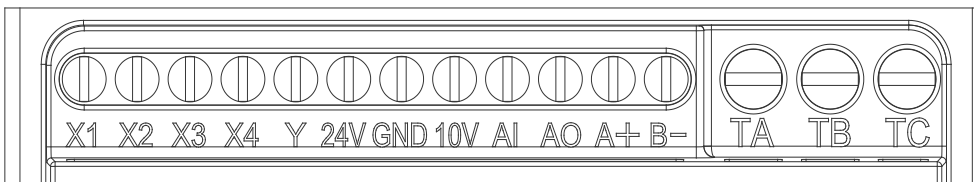
Recommended three-phase 380V class machine main circuit other accessories specifications

Model	Contactors specifications	Circuit breaker specifications	DC reactor	Input filter	Output filter
HAC10T3-R75G-B	10A	10A	-----	NFI-005	NFO-010
HAC10T3-1R5G-B	10A	10A	-----	NFI-005	NFO-010
HAC10T3-2R2G-B	16A	20A	-----	NFI-010	NFO-010
HAC10T3-004G-B	16A	20A	-----	NFI-010	NFO-010
HAC10T3-5R5G-B	25A	20A	-----	NFI-020	NFO-020
HAC10T3-7R5G-B	25A	30A	-----	NFI-020	NFO-020
HAC10T3-011G-B	32A	40A	-----	NFI-036	NFO-036
HAC10T3-015G-B	40A	50A	-----	NFI-036	NFO-036
HAC10T3-018G-B	50A	60A	-----	NFI-050	NFO-050
HAC10T3-022G-B	50A	75A	-----	NFI-050	NFO-050

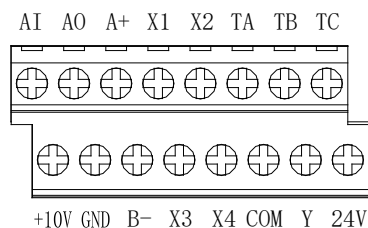
Model	Contactors specifications	Circuit breaker specifications
HAC10T2-R40G-B	10A	10A
HAC10T2-R75G-B	10A	10A
HAC10T2-1R5G-B	16A	20A
HAC10T2-2R2G-B	16A	20A

(9) Control Circuit Wiring

0.4kW-5.5kW Control circuit terminal arrangement



7.5kW-22kW Control circuit terminal arrangement



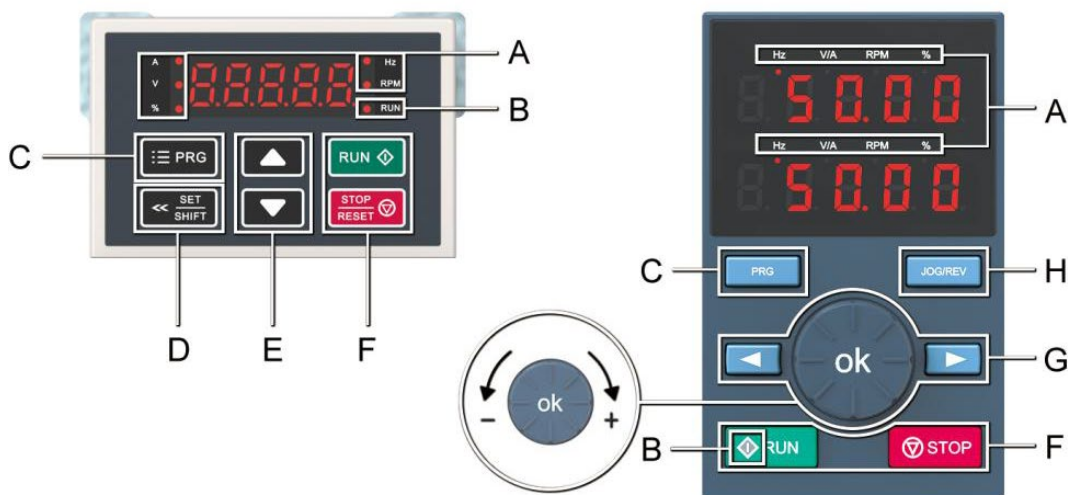
HAC10 series Honeywell VFD control circuit terminal arrangement and definition










Items	Terminal symbol	Terminal name	Terminal function definition
Power	+10V-GND	External +10V power supply	Provide +10V power supply to the outside, the maximum output current: 50 mA is generally used as external potentiometer working power supply, potentiometer resistance range: 1K Ω ~ 5K Ω
	+24V- GND	External +24V power supply	Provides +24V power supply to the outside, generally used as digital input and output terminal working power supply and external sensor power supply Maximum output current: 100 mA
Analog input	AI-GND	Voltage or current type analog input	1. Input current range: DC 0V ~ 10V / 0mA ~ 20mA 2. Voltage type input impedance: 100K Ω 3. Current input impedance: 500 Ω
Digital input	X1-GND/com	Multi-function contact input 1	Only unipolar polarity inputs are supported, active low. 1. Input impedance: 6.3 K Ω 2. High-level input voltage range: 10 ~ 30V 3. Low-level input voltage range: 0 ~ 5V Note: 0.4kW-5.5kW corresponds to access to GND, 5.5kW-22kW corresponds to access to COM.
	X2-GND/com	Multi-function contact input 2	
	X3-GND/com	Multi-function contact input 3	
	X4-GND/com	Multi-function contact input 4	
	X4/PUL-GND	Multi-function contact input 4 / high speed pulse input	In addition to the features of X1 to X3, X4 can be used as a high-speed pulse input channel. 1. Maximum input frequency: 100kHz 2. Input impedance: 0.4kW-5.5kW power 6.3k Ω ; 7.5kW-22k Power 1.5k Ω 3. Pulse input signal level range. High level: 10V~30V; Low level: 0V~5V Note: 0.4kW-5.5kW corresponds to access to GND, 5.5kW-22kW corresponds to access to COM.
Digital output	Y-GND/com	Digital output	Open collector output 1. Output voltage range: DC 0V ~ 30V 2. Output current range: DC 0mA ~ 50mA Note: 0.4kW-5.5kW corresponds to access to GND, 5.5kW-22kW corresponds to access to COM.
Analog output	AO-GND	Analog output	1. Output voltage range: DC 0V ~ 10V 2. Output current range: DC 0mA ~ 20mA
Relay output	TA-TC	Normally open terminal	Contact drive capability: 240VAC, 3A 30VDC, 5A
	TB-TC	Normally closed terminal	
Communication terminal	A+	Communication terminal A+	RS485 communication interface. Selection by dipswitch determines whether RS485 communication is connected to 120 Ω termination resistor
	B-	Communication terminal B-	

(10) Control Circuit Terminal Wiring Specifications

Terminal name	Screw specification (mm)	Fixed torque (N·m)	Cable specification (mm ²)	Cable type
A+ B-	M2.5	0.4 ~ 0.6	0.75	Twisted pair shielded cable
+10V GND AO AI	M2.5	0.4 ~ 0.6	0.75	Twisted pair shielded cable
+24V GND Y TA TB TC X1 X2 X3 X4	M2.5	0.4 ~ 0.6	0.75	Shielded cable

(11) Keypad function












Symbol	Built-in single-line keypad	Built-in dual-line keypad	Function
A	Unit indicator		Hz: Frequency A: Current V: Voltage A/V: Current or Voltage RPM: Revolutions Per Minute %: Percentage
B	Status indicator		On: Forward running status Blinking: Reverse running status Off: Stop status
C	Menu button 	Menu button 	Press to enter the function menu interface in standby or running status; press this button to exit the modification in parameter modification state; press and hold (for 1 second) this button to directly enter the status interface in standby or running status.
D	Set/Shift button 		Set function: After changing the value, press this button to confirm the change. Shift function: Press and hold (for 1 second) this button to move the operating position; press and hold to perform cyclic shift.
E	Up and down buttons 		Press Up button to increase the operation value, and the Down button to decrease the operation value.
F	Run button 	Run button 	When the run/stop function is controlled by the keypad, press this button and the VFD will run forward. The status indicator is always on for forward running, and blinking for reverse running.
	Stop/Reset button 	Stop/Reset button 	When the given command channel is controlled by keypad, press this button to stop the VFD; you can define whether other command channels are valid through the parameter [F11.03] ; press this button in the fault state to reset the VFD.
G			Digital potentiometer: Turn clockwise to increase the operating value; turn counterclockwise to decrease the operating value.
			OK button: Press this button after modifying the value to confirm the modification.
	Left shift and right shift buttons 		Move the operating position leftward and rightward.

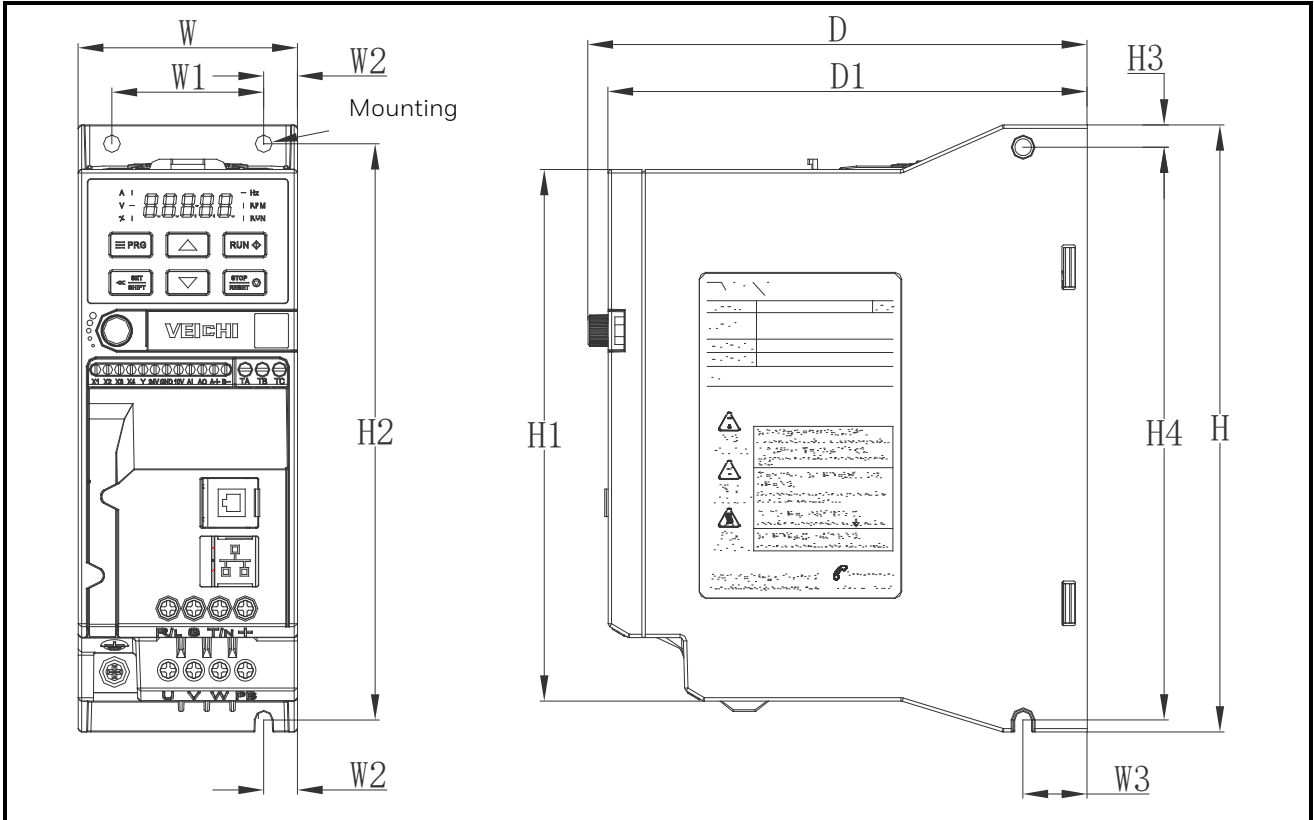
H		Jog/Reverse 	Select the function of this button by parameter [F11.02].
---	--	--	---

LED Status Indicator

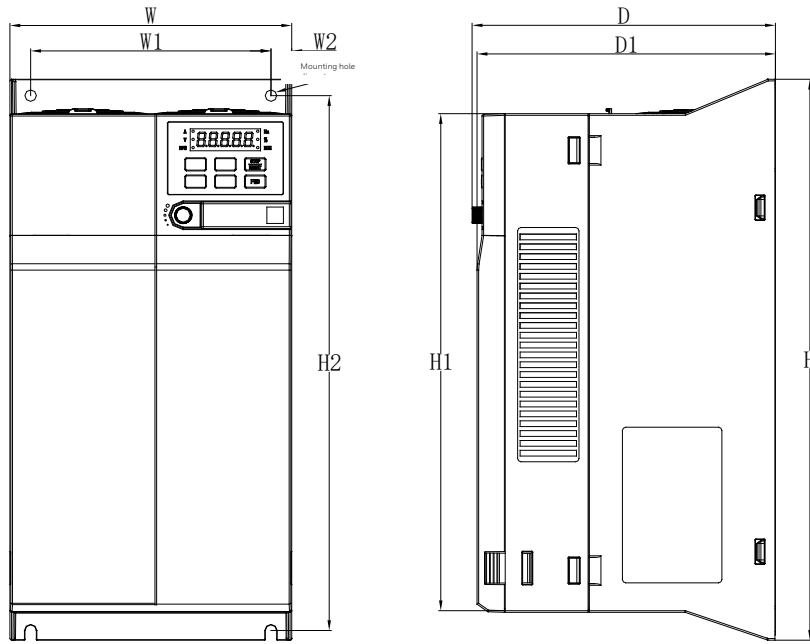
In the following chart:  represents light on,  represents light off,  represents flashing.

RUN Running lights	RUN 	Light off: stop status
	RUN 	Lights on: running forward
	RUN 	Blinking: Reverse running
Run  Button	RUN 	Light off: stop state
	RUN 	Lights on: running forward
	RUN 	Blinking: Reverse running
Unit indicator Hz, A, V, RPM, %		Light on: Monitor this value
		Light off: no value is monitored
Hz: frequency A: current V: voltage RPM: speed %: percentage		

Dimensions



Honeywell VFD Model	Dimensions(mm)					Forward mounting size (mm)			Side mounting size (mm)			Mounting aperture
	W	H	H1	D	D1	W1	W2	H2	W3	H3	H4	
HAC10T2-R04G-B	65	177	155	148	142	45	10	168	19	6.5	167	3-M4
HAC10T2-R75G-B												
HAC10T2-1R5G-B	75	202	180	163	157	55	10	193	19	6.5	192	3-M4
HAC10T2-2R2G-B												
HAC10T3-R75G-B	65	177	155	148	142	45	10	168	19	6.5	167	3-M4
HAC10T3-1R5G-B												
HAC10T3-2R2G-B												
HAC10T3-004G-B	75	202	180	163	157	55	10	193	19	6.5	192	3-M4
HAC10T3-5R5G-B												



7.5kW-22kW Installation Dimension Drawing

Honeywell VFD Model	Dimensions(mm)					Forward mounting size (mm)			Side mounting size (mm)			Mounting aperture
	W	H	H1	D	D1	W1	W2	H2	W3	H3	H4	
HAC10T3-7R5G-B	130	320	286	161	158	105	12.5	302	—	—	—	M5
HAC10T3-011G-B												
HAC10T3-015G-B	170	342.5	303.5	183	180	145	12.5	326.5	—	—	—	M6
HAC10T3-018G-B												
HAC10T3-022G-B												

Honeywell VFD HAC310 ac300-t3-2r2g left HW.png

HAC310 generates a more powerful performance through its superior V/F control, V/F PG, slip compensation, and sensor less vector control.

The HAC310 focuses on a user-friendly interface and environment-friendly features including a 7-Seg LED keyboard and optionally graphic LCD Keyboard, electro-thermal functions for motor protection, and protection for input/output phase loss.



Hardware specification and Features

Item		Specification
Power input	Voltage and frequency	T2: Single/Three-phase 200 V-240 V 50/60 Hz. T3: Three-phase 380 V-480 V 50/60 Hz. T6: Three-phase 660 V-690 V 50/60 Hz.
	Allowable fluctuation	T/S2: -10%~10%; T3: -15%~10%; T6: -10%~10% Voltage imbalance rate: < 3%; Frequency: ±5%. Distortion rate meets IEC61800-2.
	Switching inrush current	Less than rated current
	Power factor	Power factor ≥0.94 (with DC reactor)
	VFD efficiency	≥96%
Output	Output voltage	Output under rated conditions: Three-phase, 0 V to input voltage, inaccuracy less than 5%.
	Output frequency range	G/P model: 0.00 Hz - 600.00 Hz.
	Output frequency accuracy	±0.5% of Max Freq.
	Overloading capability	G model: 150% rated current for 89 s, 180% rated current for 10 s, and 200% rated current for 3 s. P model: 120% rated current for 35 s, 140% rated current for 7 s, and 150% rated current for 3 s.
Main control performance	Motor type	Asynchronous motor, synchronous motor, and synchronous reluctance motor
	Motor control mode	V/F control, open-loop vector control, closed-loop vector control, and VF separation control.
	Modulation mode	Optimized space vector PWM modulation.
	Carrier frequency	1.0kHz~16.0kHz
	Speed control range	Vector control without PG, rated load: 1:200. Vector control with PG, rated load: 1:1000.
	Steady-state speed accuracy	Vector control without PG: ≤ 0.5% of rated synchronous speed (asynchronous), ≤ 0.1% of rated synchronous speed (synchronous). Vector control with PG: ≤ 0.02% of rated synchronous speed.
	Starting torque	Vector control without PG: 150% rated torque at 0.25 Hz. Vector control with PG: 200% rated torque at 0 Hz.
	Torque response	Vector control without PG: < 10 ms, vector control with PG: < 5 ms.
	Torque accuracy	Vector control without PG: ±5%, vector control with PG: ±2.5%.
	Frequency accuracy	Digital setting: Maximum frequency × ±0.01%; Analog setting: Maximum frequency × ±0.2%.

	Frequency resolution	Digital setting: 0.01 Hz; Analog setting: maximum frequency × ±0.05%.	
	Torque compensation	Automatic torque compensation: 0.0% to 100.0%. Manual torque compensation: 0.0% to 30.0%.	
	V/F curve	Four modes: linear torque characteristic curve, self-setting V/F curve, reduced torque characteristic curve (to the power of 1.1 to 2.0), and square V/F curve.	
	Acceleration and deceleration curve	Two modes: linear acceleration and deceleration, S-Curve acceleration and deceleration. Four sets of acceleration and deceleration time; the time unit is 0.01 s, the longest is 650.00 s.	
	Rated output voltage	With power supply voltage compensation, the motor rated voltage reaches 100%, which can be set in the range of 50% to 100% (the output cannot exceed the input voltage).	
	Automatic voltage regulation	When the power grid voltage fluctuates, it can automatically keep the output voltage constant.	
	Automatic energy-saving operation	Under V/F control mode, the output voltage is automatically optimized according to the load to realize energy-saving operation.	
	Automatic current limiting	The current is automatically limited during operation to prevent trips caused by frequent over-current faults.	
	Instantaneous power failure processing	In case of instantaneous power failure, uninterrupted operation can be realized through bus voltage control.	
	Standard features	PID control, speed tracking and restart after power failure, hopping frequency, upper and lower frequency limit control, program operation, multi-speed, RS485 communication, analog output, and frequency pulse output.	
	Frequency setting channel	Keypad digital setting, analog voltage/current terminal AI1, analog voltage/current terminal AI2, pulse input PUL, communication setting and multi-channel terminal selection, main/auxiliary channel combination, and extension card can be switched in various ways.	
	Feedback input channel	Analog voltage/current terminal AI1, analog voltage/current terminal AI2, communication setting, and pulse input PUL.	
	Run command channel	Operation panel setting, external terminal setting, communication setting, and extension card setting.	
	Input order signal	Start, stop, forward and reverse, jogging, multi-speed, free stop, reset, acceleration and deceleration time selection, frequency setting channel selection, and external fault alarm.	
External output signal	1 relay output, 1 collector output, 1 AO output (can be selected as 0 V - 10 V or 0 mA - 20 mA or 4 mA - 20 mA output, or frequency pulse output).		
Protection function		Overvoltage, undervoltage, current limit, overcurrent, overload, electronic thermal relay, overheating, overvoltage stall, data protection, fast protection, input and output phase loss protection.	
Keypad display	LED display	Single-line 5-digit digital tube display	1 VFD status display
		Dual-line 5-digit digital tube display	2 VFD status displays
	Parameter copy	The function code information of the VFD can be uploaded and downloaded to realize fast parameter copying.	
	Status monitoring	All parameters of the monitoring parameter group such as output frequency, given frequency, output current, input voltage, output voltage, motor speed, PID feedback, PID given, module temperature, etc.	
	Failure alarm	Overvoltage, undervoltage, overcurrent, short circuit, phase loss, overload, overheating, fast speed, damaged data protection, current fault status, and fault history.	

Environment	Installation site	Altitude shall be lower than 1,000 m. If the altitude exceeds 1,000 m, it shall be derated by 1% for every 100 m increase. Be free of condensation, icing, rain, snow, hail, etc., with solar radiation less than 700 W/m ² and air pressure between 70 kPa - 106 kPa.
	Temperature and humidity	-10°C - +50°C. It can be derated above 40°C, and the maximum temperature is 60°C (No-load operation). 5% RH - 95% RH (no condensation).
	Vibration	5.9 m/s ² (0.6 G) at 9 Hz - 200 Hz.
	Storage temperature	-30°C - +60°C.
	Installation method	Wall-mounted or vertical cabinet type.
	Protection level	IP20.
	Pollution degree	II
	Cooling method	Forced air cooling.

Model Selection Guide

HAC

310

T2

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011

G

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E

X

B

X

S

-

E

0

Key number	
HAC:	Honeywell AC-Drive
310:	Product name
Input Rating (Voltage)	
T2	1/3-phase 200-240V
T3	3-phase 380-480V

Table I	
Motor Rating(kW)	
7R5	7.5
022	
22	
Load	
G	Heavy Load
P	Light Load

Table II	
Keypad	
E	7-seg LED keypad
C	LCD keypad
EMC Filter	
N	Non-EMC
X	Built-in, C3
Brake Unit	
N	None
B	Brake unit
Reactor	
X	Non-Reactor
D	DCL(Built-in Reactor)
I/O	
S	Standard(pitch=5mm)

Table III	
E: Manual (English)	
C: Manual (Chinese)	
0: Future option	
Future Option	
0	Non
Brake Unit	
N	None
B	Brake unit

For more details, please refer to [‘7. Model Selection Guide’](#)

Communication Capabilities

(1) Serial Communication

The Serial communication supports the Multi-drop Link System and offer an interface via wide protocols.

Item	Specification
Communication method/ Transmission type	Serial, RS485 Electrically, see specifications for each module
VFD type name	HAC310
Number of connected VFDs/ Transmission distance	Depends on protocol
Recommended cable size	0.75mm ² , (18AWG), Shielded Type Twisted-Pair (STP) Wire
Installation type	Dedicated terminals (S+/S-/SG) on the control terminal block

Item	Specification
Power supply	Supplied by the VFD - insulated power source from the VFD's internal circuit
Communication speed	1,200/2,400/9,600/19,200/38,400/57,600/115,200 bps
Control procedure	Asynchronous communications system
Character system	Modbus-RTU, Profibus-DP, CAN open
Parity check	None/Even/Odd

(2) Ethernet

Optionally, Ethernet communication is used for interface with clients.

Item	Specification
Transmission Speed	10Mbps, 100Mbps
Transmission Method	Baseband
Max. Extensible Distance between Nodes	100m (Node-Hub)
Max. Node Number	Switch (Hub) connection
Auto-Negotiation	Supported
Max. Frame Size	1,500 bytes
Communication Zone Access Method	CSMA/CD
Frame Error Checking Method	CRC32
Recommended TCP Socket	2 Sockets
Protocol	Modbus TCP, Ether CAT, Profinet., *Ethernet/IP Topology: LINE(STAR), RING (depends on protocol)

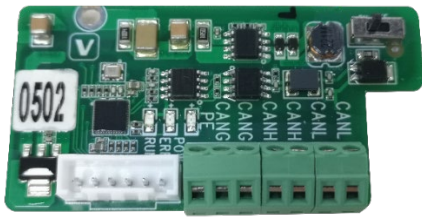
(3) Specification of Detailed communication

(3-1) Profibus-DP



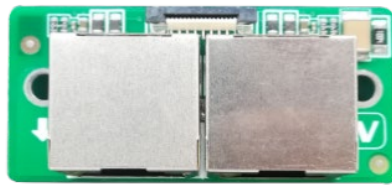
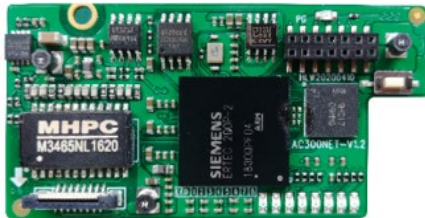
Item	Specification					
Standard	EN50170 / DIN 19245					
Interface	RS-485(Electric)					
Media access	Polling					
Topology	Bus					
Modulation	NRZ					
Network Interface	Auto baud rate					
Master / Slave	Slave					
Max. number of slave per network	99					
Max. number of slave per segment	32					
Cable	Shield twisted pair cable					
Max. I/O data	244 bytes					
Configuration tool	Master View					
Transmission distance and speed	Trans. speed(kbps)	9.6	19.2	93.75	187.5	500
	Max. network length(m)	1200	1200	1200	1000	400
	Trans. speed(kbps)	1500	3000	6000	12000	-
	Max. network length(m)	200	100	100	100	-
Max num. of node	99(0~98)					
Max num. of transmission block	24					
Current consumption (mA)	410					
Weight (g)	103					

(3-2) CANopen



Items	Description
Network Topology	Bus Topology
Communication Baud Rate	20kbps, 50kbps, 125kbps, 250kbps, 500kbps, 1Mkbps
Max. number of Node	64 nodes (Including Master) With 1 Master connected to network, the maximum number of VFD nodes is 63 (64-1).
Device Type	AC Drive
Supported Communication Type	PDO, SDO, Sync, NMT
Terminal Resistance	120 ohm 1/2W Lead Type
Available PDO	PDO1 (CiA 402 Drive and Motion Control device profile) PDO3 (LS Profile)
Vendor name	0x7D
PDO Mapping	N/A
Group Messaging	N/A
LSS Supported	N/A

(3-3) Profinet




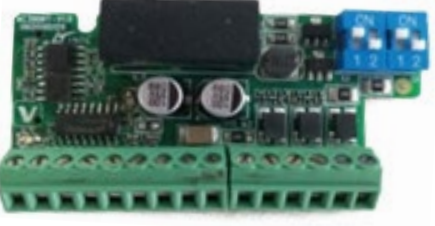
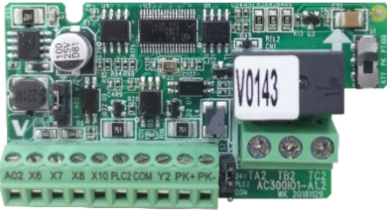


Items	Description
Communication protocol	PROFINET IO CC-A
Communication speed	100 Mbps
Communication type	Full Duplex
Max. number of nodes	64
Distance	100m (Twisted Pair)
Service	PROFIdrive Class 1
Topology	RING, Line, Tree, Star topology


(3-5) IoT Gateway



Items	Description
Communication protocol	PROFINet IO CC-A
Communication speed	100 Mbps

(3-6) Option IO modules

Image	Items	Description
	HAC300-PG01 (5V) Differential PG card	5 V differential signal input, support maximum frequency 500 kHz, with input signal disconnection detection function.
	HAC300-PG01 (12V) Differential PG card	12 V differential or OC signal input, support a maximum frequency of 500 kHz, with input signal disconnection detection function.
	HAC300RT1 Resolver card	Supports resolvers with four different ratios of 0.219, 0.286, 0.5, 0.58, and the Default ratio is 0.5.
	HAC300IO1 Terminal extension card	Four digital inputs (X10 supports 50K pulse input), one digital output, one analog output, and one relay output. Support temperature detection (PT100, PT1000 and KTY84).
	KBD10-15 Single-line digital tube keypad	External LED five-digit display and operation Keypad, support potentiometer speed control.
	KBD300-25 Dual-line digital tube keypad	Dual-line external five-digit display Keypad, Silicone keypad, and digital potentiometers.
	KBD300-L1 LCD keypad	User-friendly human-machine interface.

	<p>HAC300-SL-A1.1 Flash card</p>	<p>For HAC310, parts of the general VFD burn-in program can be opened to the core agents (authorized by the regional director.)</p>
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(3-7) Dual Ethernet

Items		Description
Transmission Specifications		
Protocols	Profibnet, ModbusTCP	
Transmission speed (Mbps)	10/100/1000	
Transmission method	Baseband	
Maximum distance between nodes	100m (Node-Switch) / 328 fts	
Send media	Electric: Category 5E or higher STP (Shielded Twisted pair) cable	
Maximum protocol size	1,500 Byte	
Communication network access method	CSMA/CD	
Frame error check method	CRC32	
Max. load	Ethernet: 10,000pps, RAPIEnet: 40,000pps	
Topology	Line, Tree, Star, Ring (Ethernet/IP)	
Diagnosis function	Station number / IP collision detection function, Diagnosis using MasterView	
Station number / IP setting method	Rotary switch, MasterView, BOOTP/DHCP	
Station number / IP setting range	Station number setting value set by the tool (MasterView) (0 to 220)	
External connecting terminal	- IP: 192.168.1.xx(xx:100 + rotary switch 1~99)	
External connecting terminal	RJ45, SFP: PADT connection, data communication	
Basic Specific		
Current consumption (mA)	100Mbps	560
	1Gbps	900
Weight(g)	146	

Performance and Capability

(1) Correlation: Rated Voltage Output Current vs Voltage Level and Power

Input Voltage (V) Output Current (A) Power (kW)	220	380	660	1140
	0.75	4	3	---
1.5	7	4	---	---
2.2	10	6	---	---
4	16	10	---	---
5.5	20	13	---	---
7.5	30	17	10	---
11	42	25	15	---
15	55	32	18	---

18.5	70	38	22	--
22	80	45	28	--
30	110	60	35	--
37	130	75	45	25
45	160	90	52	31
55	200	110	63	38
75	260	150	86	52
90	320	180	98	58
110	380	210	121	75
132	420	250	150	86
160	550	310	175	105
185	600	340	198	115
200	660	380	218	132
220	720	415	235	144
250	--	470	270	162
280	--	510	330	175
315	--	600	345	208
355	--	670	380	220
400	--	750	430	260
450	--	810	466	270
500	--	860	540	325
560	--	990	600	365
630	--	1200	690	400
710	--	1340	760	480
800	--	1500	860	
900	--	1620	932	
1000	--	1980	1080	

(2) Default time data of Acceleration and Deceleration

The default acceleration and deceleration of the VFD vary with the power level. See the table below for details.

VFD power rating (kW)	Default of acceleration and deceleration time (s)
0.4	6.00
0.75	6.00
1.5	6.00
2.2	6.00
3.0	6.00
4.0	6.00
5.5	6.00
7.5	6.00
11.0	6.00
15.0	6.00
18.5	6.00
22.0	12.00
30.0	12.00
37.0	12.00
45.0	18.00
55.0	18.00

75.0	24.00
90.0	30.00
110.0	36.00
160.0	48.00
185.0	54.00
200.0	60.00
220.0 and above	60.00

(3) Default Voltage Protection Point

The default voltage value of the VFD includes voltage level, rated voltage, undervoltage suppression point, undervoltage point, overvoltage suppression point, overvoltage point and dynamic braking point, etc. See the table below for details.

Note: The units for the values in the table are all volts (V).

Voltage Grade	Rated Voltage	Undervoltage Suppression Point	Undervoltage Point	Overvoltage Suppression Point	Overvoltage Point	Dynamic Braking Point
220	311.1	240	190	370	400	360
380	537.4	430	320	750	820	740
660	933.2	700	560	1100	1180	1080
1140	1612	1200	1000	1900	2100	1870

(4) Carrier Frequency

Voltage Grade (V)	Default Carrier (kHz)	
220	Less than 11 kW	4.0
	11 kW - 45 kW	3.0
	Above 45 kW	2.0
380	Less than 11 kW	4.0
	11 kW - 45 kW	3.0
	Above 45 kW	2.0
660	2.0	
1140	2.0	

Note: The VFD shall be derated under high carrier frequency conditions; the higher the carrier, the greater the derating.

Control Modes-Types and Features

The VFD can choose AM-V/F control (initial setting), AM - open-loop vector control, AM - closed-loop vector control, PM-V/F control, PM - open-loop vector control, PM - closed-loop vector control, and VF separation control.

Asynchronous motor V/F control

- When the frequency (F) is variable, the ratio of the control frequency to the voltage (V) remains constant.
- This control mode is used for all variable speed controls that do not require fast response and precise speed control, as well as one VFD for multiple motors. This mode is also used when the motor parameters are not clear, or Auto-tuning cannot be performed.

Asynchronous motor open-loop vector control

- The output current of the VFD can be calculated through vector calculation, and divided into excitation current and torque current, to carry out frequency and voltage compensation, so that the motor current matching the load torque can flow to improve the low-speed torque. At the same time, the output frequency compensation (slip compensation) is implemented to make the actual rotation speed of the motor closer to the speed instruction value.
- This control mode is used for applications requiring high speed control accuracy. With high-speed response and torque response, high torque can be output even under low-speed running. It is suitable for general high-performance control occasions, and one VFD can only drive one motor.

Asynchronous motor closed-loop vector control

- This control mode is used where high-precision speed control or torque control is required, and high-precision speed control is required even at zero speed.
- An encoder must be installed at the motor end, and the VFD must be equipped with a PG card of the same type as the encoder. One VFD can only drive one motor.

Synchronous motor V/F control (PMV/F)

- When the frequency (F) is variable, the ratio of the control frequency to the voltage (V) remains constant.
- This control mode is used for all variable speed controls that do not require fast response and precise speed control. This mode is also used when the motor parameters are not clear, or Auto-tuning cannot be performed.

Synchronous motor open-loop vector control (PMSVC)

- By combining with a PM (permanent magnet) motor that is more efficient than an induction motor, it is possible to achieve motor control with high-speed control accuracy more efficiently. With no need for a speed detector such as PG, the rotation speed of the motor is estimated through the output voltage and output current of the VFD. In addition, in order to maximize the efficiency of the motor and control the PM motor, the current is minimized when the load is applied.
- This control mode is used for applications that require precise speed control and torque limit functions.

Synchronous motor closed-loop vector control (PMFVC)

- This control mode is used where high-precision speed control or torque control is required, and high-precision speed control is required even at zero speed.
- An encoder must be installed at the motor end, and the VFD must be equipped with a PG card of the same type as the encoder. One VFD can only drive one motor.

Voltage frequency separation control (VF_separation)

- This control mode is used to control the output voltage and frequency separately.
- This function is valid only for T3 models with 7.5 kW and above, and T/S2 models with 5.5 kW and above.

Note:

In order to obtain the best control effect, please input the correct motor parameters and perform motor auto-tuning. Group F02.0x is the basic parameter group of the motor.

In open-loop and closed-loop vector control, the VFD can only drive one motor; and there shall not be too large between the level of VFD capacity and that of motor capacity. The power of VFD can be two levels higher or one level lower than that of the motor, otherwise it may cause degraded control performance or failure of drive system.

PID function

PID control is one of the most common auto-control methods. It uses a combination of proportional, integral, and differential (PID) controls that provide more effective control for automated systems. The functions of PID control that can be applied to the inverter operation are as follows:

Purpose	Function
Speed Control	Controls the speed by monitoring the current speed levels of the equipment or machinery being controlled. This control maintains a consistent speed or operates at the target speed.
Pressure Control	Controls the pressure by monitoring the current pressure levels of the equipment or machinery being controlled. This control maintains a consistent pressure or operates at the target pressure.
Flow Control	Controls the flow by monitoring the current amount of flow in the equipment or machinery being controlled. This control maintains a consistent flow or operates at a target flow.
Temperature Control	Controls the temperature by monitoring the current temperature levels of the equipment or machinery being controlled. This control maintains a consistent temperature or operates at the target temperature.

PID Basic Operation: PID operates by controlling the output frequency of the inverter, through automated system process control to maintain the speed, pressure, flow, temperature, or tension

Installations

(1) Installation Environment

The installation environment is very important to give full play to the performance of this product and maintain its function for a long time. Please install this product in an environment that meets the requirements shown in the table below.

Table 3-1: Environmental conditions required for reliable operation of HAC310 series VFDs

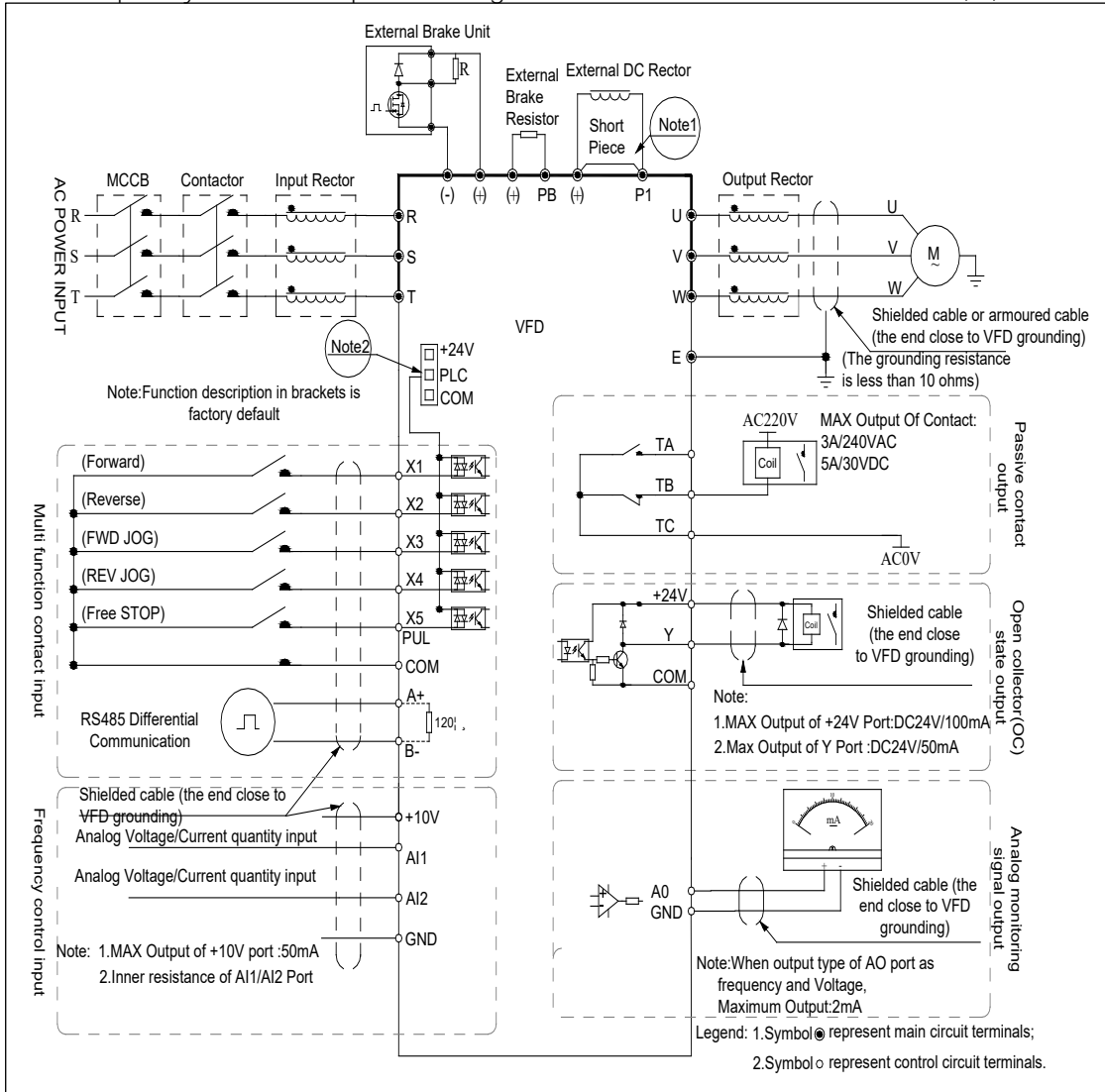
Environment	Requirements
Installation site	Indoor installation, free of direct sunlight.
Use temperature	-10°C~+50°C
Storage temperature	-30°C~+60°C
Ambient humidity	No condensation below 95% RH.
Surroundings	<p>Please install the VFD in the following places:</p> <ul style="list-style-type: none"> • Places free of oil mist, corrosive gas, flammable gas, and dust. • Places where metal powder, oil, water and other foreign objects will not enter into the VFD (do not install the VFD on flammable materials such as wood). • Places free of radioactive materials and flammable materials. • Places free of harmful gases and liquids. • Places with less salt erosion. • Places without direct sunlight;
Altitude	Below 1,000 m; it shall be derated for use above 1,000 m.
Vibration	5.9 m/s ² (0.6 G) at 9 Hz - 200 Hz.
Installation and cooling	<ul style="list-style-type: none"> • The VFD must not be installed horizontally, but vertically. • Please install braking resistors and other high-heating devices independently, rather than installing them in the same cabinet as the VFD. It is strictly forbidden to install high-heating devices such as braking resistors at the air inlet of the VFD.

Wirings

(1) Wirings

Electronic thermal motor protection against overload.

- The frequency converter is protected against short-circuits on motor terminals U, V, W.
- Monitoring of the intermediate circuit voltage ensures that the frequency converter cuts out if the intermediate circuit voltage is too low or too high.
- The frequency converter is protected against earth fault on motor terminals U, V, W.



Note :
 1. +10V Maximum output: 50mA
 2. AI1/AI2 internal resistance: 100kΩ

Note:

1. For T3 models with power of 22 kW and below, and models with built-in braking unit, braking resistors can be connected as required; for models without built-in braking unit, external braking units can be installed as needed.
2. The terminals (X1 - X5/PUL) can support NPN or PNP transistor input signals, and the voltage supply can be selected from the VFD's internal power supply (+24 V terminal) or external power supply (PLC terminal).

Auxiliary terminal output capacity

Terminal	Definition of Function	Maximum Output
+10V	10 V auxiliary power output, forming a loop with GND.	50mA
A0	Analog output, forming a loop with GND.	The maximum output is 2 mA for the signal of frequency

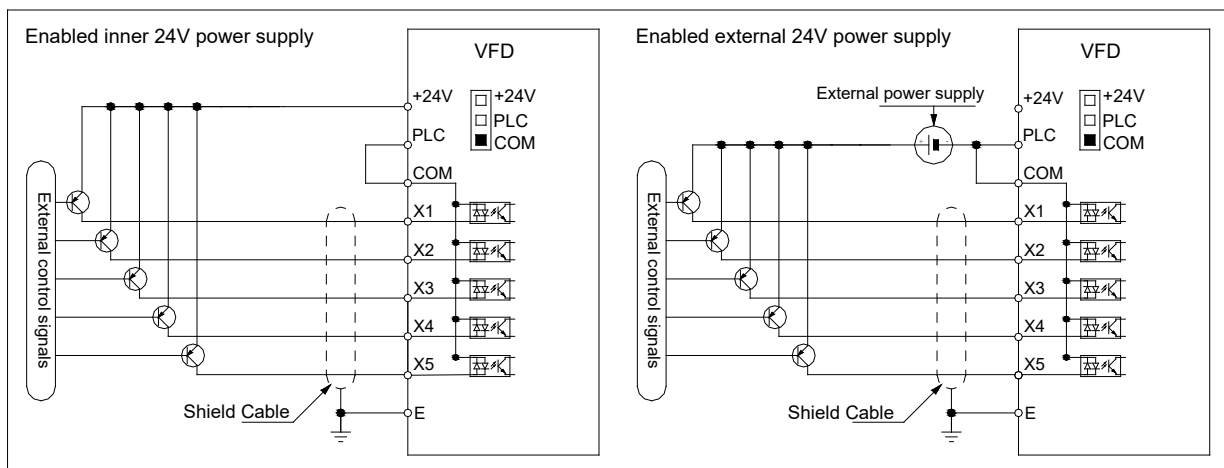
Terminal	Definition of Function	Maximum Output
		and voltage type.
+24V	24 V auxiliary power output, forming a loop with COM.	100mA
Y	Open collector output: the action object can be set by program.	DC24V/50mA

Illustration and description of PID switch function

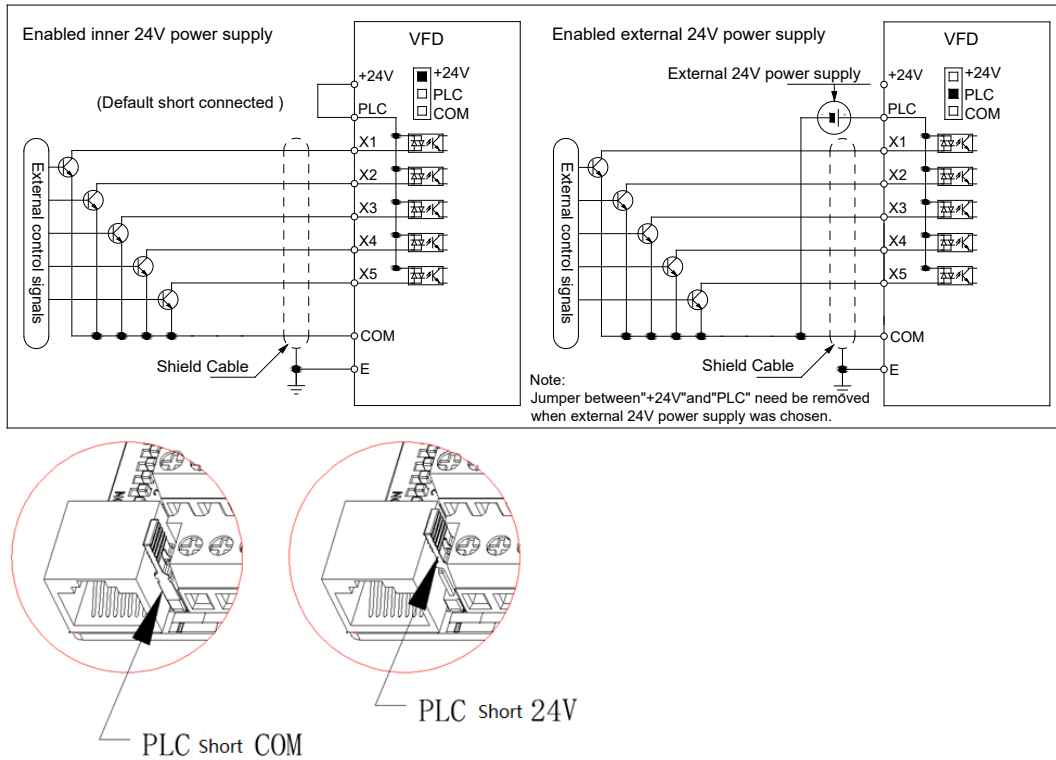
Position Number	Position	Function Description
	RS485 terminal resistance	RS485 communication connected to 120 Ω terminal resistance.
	AO output-frequency	AO output; output of 0.0 kHz - 100 kHz frequency. Switch to ON of AO-F; external pull-up is required (Generally pull up to 10 V when connecting to 5.1 kΩ).
RS485 OFF AO-F OFF AO-I OFF AO-U OFF AI1 U AI2 U	AO output-current	AO output; current output of 0 mA - 20 mA or 4 mA - 20 mA.
	AO output-voltage	Output of 0 V - 10 V voltage
	AI1 input-current/voltage	AI1 input of 0 mA - 20 mA or AI1 input of 0 V - 10 V.
	AI2 input-current/voltage	AI2 input of 0 mA - 20 mA or AI2 input of 0 V - 10 V.

Multi-function input point connection

(a)Wiring method of PNP characteristic transistor:



(b)Wiring method of NPN characteristic transistor:



Wirings for Main Circuit

(1) Terminal Arrangements

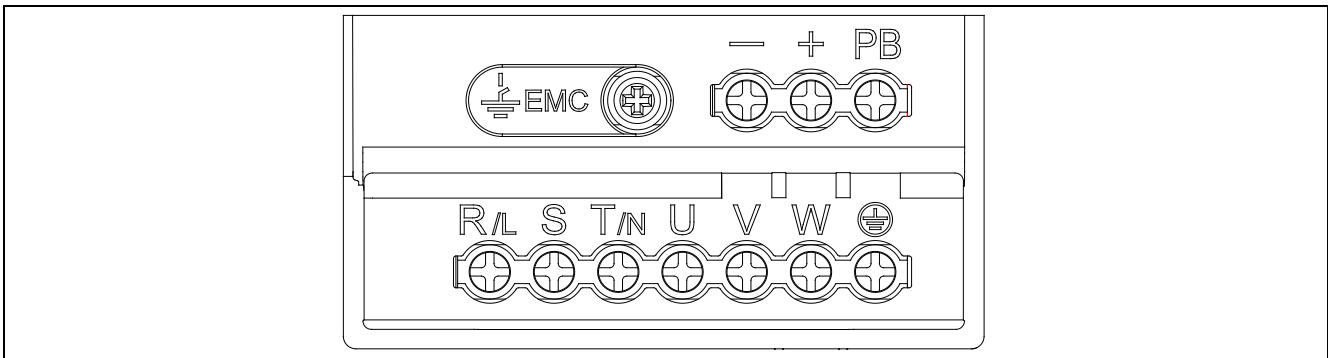


Table 3-2: Arrangement and Definition of Terminals of HAC310 Series VFD Main Circuit

Terminal	Terminal Name	Functional Definition
(+)	DC power terminal	Output DC power: (-) is the cathode of the DC bus, and (+) is the anode of the DC bus; for connecting an external braking unit.
(-)		
(+)	Brake resistor terminal	For connecting external braking resistor to realize quick stop.
PB		
R	VFD input terminal	For connecting three-phase AC supply.
S		
T		
U	VFD output terminal	For connecting motor.
V		
W		

⏚	Grounding	Grounding terminal, with the grounding resistance < 10 Ω.
E		

(2) Cable Recommendations for Single/Three-phase 220Vac

Model	Specifications of Screws for Main Circuit Terminal (mm)	Recommended Fixed Torque (N·m)	Specifications of Recommended Copper Core Cable (mm ²) (AWG)
HAC310T/S2-R40G	M3	0.8~1.0	1.5mm ² (14)
HAC310T/S2-R75G	M3	0.8~1.0	2.5mm ² (12)
HAC310T/S2-1R5G	M3	0.8~1.0	2.5mm ² (12)
HAC310T/S2-2R2G	M3.5	1.2~1.5	4mm ² (10)
HAC310T/S2-004G	M3.5	1.2~1.5	4mm ² (10)
HAC310T/S2-5R5G	M4	1.2~1.5	10mm ² (7)
HAC310T/S2-7R5G	M6	4~6	16mm ² (5)
HAC310T/S2-011G	M6	4~6	16mm ² (5)
HAC310T/S2-015G	M6	4~6	25mm ² (3)
HAC310T2-018G	M6	4~6	25mm ² (3)
HAC310T2-022G	M6	4~6	25mm ² (3)
HAC310T2-030G	M8	8~10	35mm ² (2)
HAC310T2-037G	M8	8~10	50mm ² (1)
HAC310T2-045G	M8	8~10	50mm ² (1)
HAC310T2-055G	M8	8~10	70mm ² (2/0)

(3) Recommendations Accessories for Three-phase 380Vac

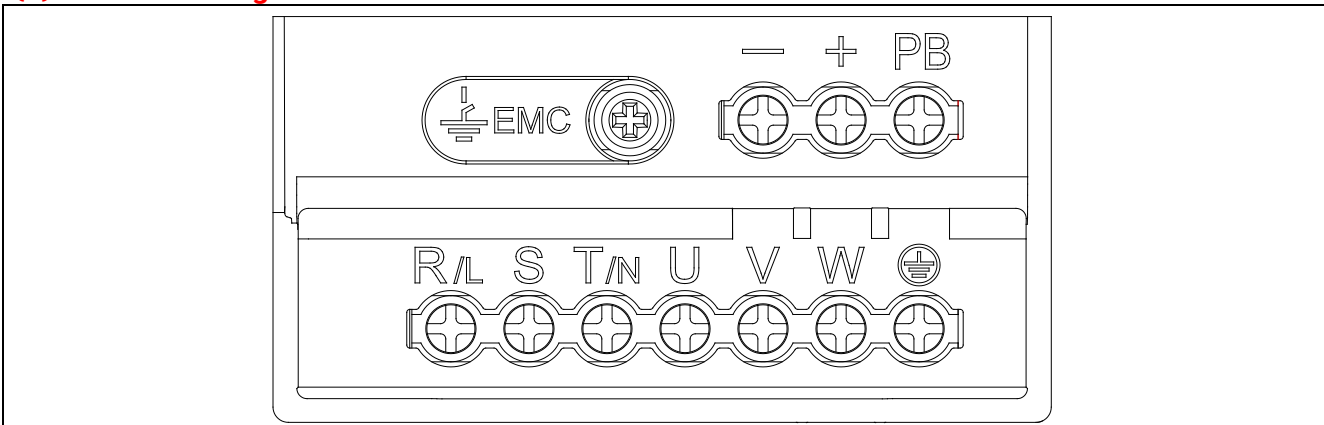
Model	Contactor Specificatio	Circuit Breaker	DC Reactor	Input Filter	Output Filter
HAC310T3-R75G	10A	10A	-----	NFI-005	NFO-010
HAC310T3-1R5G	10A	10A	-----	NFI-005	NFO-010
HAC310T3-2R2G	16A	15A	-----	NFI-010	NFO-010
HAC310T3-004G	16A	20A	-----	NFI-010	NFO-010
HAC310T3-5R5G	25A	20A	-----	NFI-020	NFO-020
HAC310T3-7R5G	25A	30A	-----	NFI-020	NFO-020
HAC310T3-011G	32A	40A	-----	NFI-036	NFO-036
HAC310T3-015G	40A	50A	-----	NFI-036	NFO-036
HAC310T3-018G	50A	60A	-----	NFI-050	NFO-050
HAC310T3-022G	50A	75A	-----	NFI-050	NFO-050
HAC310T3-030G	63A	100A	DCL-80	NFI-080	NFO-080
HAC310T3-037G	80A	125A	DCL-100	NFI-100	NFO-100
HAC310T3-045G	100A	150A	DCL-110	NFI-100	NFO-100
HAC310T3-055G	125A	175A	DCL-125	NFI-150	NFO-150
HAC310T3-075G	160A	200A	DCL-150	NFI-150	NFO-150
HAC310T3-090G	220A	250A	DCL-200	NFI-200	NFO-300
HAC310T3-110G	220A	300A	DCL-200	NFI-200	NFO-300
HAC310T3-132G	250A	400A	DCL-300	NFI-300	NFO-300
HAC310T3-160G	300A	500A	DCL-300	NFI-300	NFO-300
HAC310T3-185G	400A	600A	DCL-400	NFI-400	NFO-400

HAC310T3-200G	400A	700A	DCL-400	NFI-400	NFO-400
HAC310T3-220G	630A	800A	DCL-500	NFI-600	NFO-600
HAC310T3-250G	630A	1000A	DCL-600	NFI-600	NFO-600
HAC310T3-280G	630A	1200A	DCL-600	NFI-600	NFO-600
HAC310T3-315G	630A	1200A	DCL-800	-----	-----
HAC310T3-355G	800A	1400A	DCL-800	-----	-----
HAC310T3-400G	1000A	1600A	DCL-1000	-----	-----
HAC310T3-450G	1000A	2000A	DCL-1000	-----	-----
HAC310T3-500G	1000A	2000A	DCL-1200	-----	-----
HAC310T3-560G	1200A	2000A	DCL-1200	-----	-----
HAC310T3-630G	1200A	2000A	DCL-1200	-----	-----
HAC310T3-710G	1400A	2000A	DCL-1200	-----	-----

Note: For detailed specifications and circuit connection forms of DC reactors, input filters, output filters, etc., please refer to the "External Units and Optional Parts" section.

Wirings for Control Circuit

(1) Terminal Arrangements



Types	Terminal Symbol	Terminal Name	Functional Definition
Power supply	+10V-GND	External +10 V power supply	Provide +10 V power supply, with maximum output current of 50 mA; generally used as the power supply for external potentiometer with the resistance range of 1 k Ω - 5 k Ω .
	+24V-COM	External +24 V power supply	Provide +24 V power supply, generally used as the power supply for digital input and output terminals and for external sensors. Maximum output current: 100 mA
	PLC	External common terminal	Connected to +24 V by default When X1-X5/PUL is driven with external signals, PLC needs to be connected to external power supply and disconnected from the +24 V power supply (see "+24V", "PLC", "COM" connection diagram for details).
Analog Input	AI1-GND	Voltage or Current Analog Input	1. Input current range: DC 0 V - 10 V/0 mA - 20 mA. 2. Voltage model input impedance: 100 k Ω . 3. Current input impedance: 500 Ω .
	AI2-GND	Voltage or Current Analog Input	1. Input range: DC 0 V - 10 V/0 mA - 20 mA. 2. Voltage input impedance: 100 k Ω . 3. Current input impedance: 500 Ω .
	X1-PLC	Multi-function contact input 1	Opto-coupler isolation, compatible with bipolar input.

Digital Input	X2-PLC	Multi-function contact input 2	1. Input impedance: 4.4 k Ω . 2. High-level input voltage range: 10 V - 30 V. 3. Low-level input voltage range: 0 V - 5 V.
	X3-PLC	Multi-function contact input 3	
	X4-PLC	Multi-function contact input 4	
	X5-PLC	Multi-function contact input 5	
	X5/PUL-PLC	Multi-function contact input 5/high-speed pulse input	In addition to the characteristics of X1 - X4, X5 can also be used as a high-speed pulse input channel (single model). 1. Opto-coupler isolation, compatible with bipolar input, with the maximum input frequency of 100 kHz. 2. Input impedance: 1.5 k Ω . 3. Pulse input level range: 10 V - 30 V.
Analog Output	AO-GND	Analog output	1. Output voltage range: DC 0 V - 10 V. 2. Output current range: DC 0 mA - 20 mA. 3. Pulse output range: 0 kHz - 50 kHz.
Digital Output	Y-COM	Digital output 1	Optocoupler isolation, open collector output 1. Output voltage range: DC 0 V - 30 V. 2. Output current range: DC 0 mA - 50 mA.
Relay output	TA-TC	Normally open terminal	Contactor drive capability: 240 VAC, 3 A. 30 VDC, 5 A.
	TB-TC	Normally closed terminal	
Communication terminal	A+	Communication terminal A+	RS485 communication interface. According to the illustration and description of DIP switch function, the position of the RS485 DIP switch determines whether the RS485 communication is connected to 120 Ω terminal resistor.

(2) Spec Terminal and cables

Terminal Name	Screw Model (mm)	Fixed Torque (N·m)	Cable Model (mm ²)	Cable Type
A+ B-	M2.5	0.4~0.6	0.75	Shielded twisted pair cable
+10V GND AO AI1 AI2	M2.5	0.4~0.6	0.75	Shielded twisted pair cable
+24V COM Y TA TB TC PLC X1 X2 X3 X4 X5/PUL	M2.5	0.4~0.6	0.75	Shielded cable

- Recommended specifications of brake resistor

The resistance value and power of the braking resistor described in the following table are determined for the normal inertia load and the intermittent braking mode. If it needs to be used in the applications with large inertia load and long-time frequent braking, please adjust the resistance value and power of the brake resistor appropriately according to the specifications of VFD and the rated parameters of braking unit. If you have any questions, please consult the customer service department of Suzhou VEICHI Electric Co., Ltd.

Three-Phase 380 V			
Motor Power (kW)	Resistance Value	Resistance Power (W or kW)	Braking Torque (%)
0.75 kW	750 Ω	150W	100%
1.5 kW	400 Ω	300W	100%

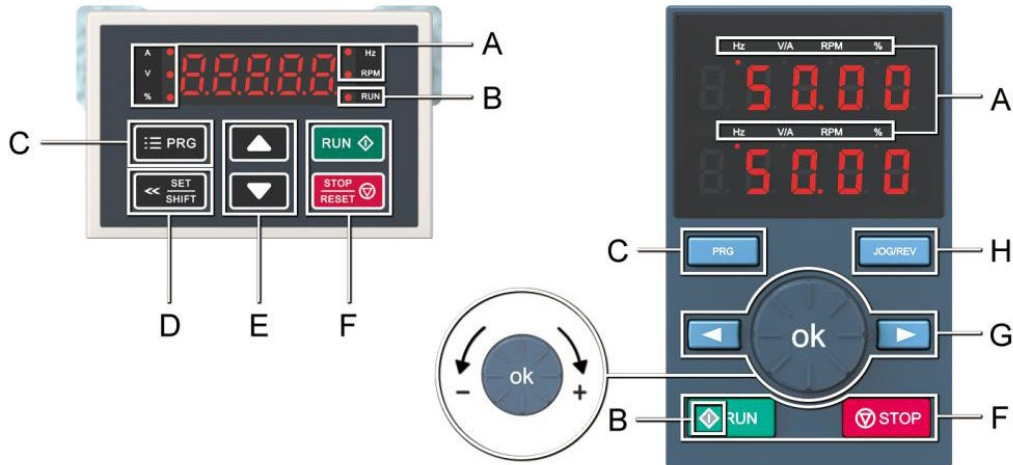
2.2 kW	250Ω	400W	100%
4.0 kW	150Ω	500W	100%
5.5 kW	100Ω	600W	100%
7.5 kW	75Ω	780W	100%
11 kW	50Ω	1.2kW	100%
15 kW	40Ω	1.5kW	100%
18.5 kW	35Ω	2.0kW	100%
22 kW	32Ω	2.5kW	100%
30 kW	24Ω	3.0kW	100%
37 kW	20Ω	3.7kW	100%
45 kW	16Ω	4.5kW	100%
55 kW	13Ω	5.5kW	100%
75 kW	9.0Ω	7.5kW	100%
90 kW	6.8Ω	9.3kW	100%
110 kW	6.2Ω	11.0kW	100%
132 kW	4.7Ω	13.0kW	100%
160 kW	3.9Ω	15.0kW	100%
185 kW	3.3Ω	17.0kW	100%
200 kW	3.0Ω	18.5kW	100%
220 kW	2.7Ω	20.0kW	100%
250 kW	2.4Ω	22.5kW	100%
280 kW	2.0Ω	25.5kW	100%
315 kW	1.8Ω	30.0kW	100%
355 kW	1.5Ω	33.0kW	100%
400 kW	1.2Ω	42.0kW	100%
450 kW	1.2Ω	42.0kW	100%
500 kW	1.0Ω	42.0kW	100%
560 kW	1.0Ω	50.0kW	100%
630 kW	0.8Ω	60.0kW	100%

710 kW	0.8Ω	70.0kW	100%
--------	------	--------	------

Table 3-8: Recommended specifications of brake resistors for HAC310 series VFDs


Single/Three-Phase 220 V			
Motor Power (kW)	Resistance Value	Resistance Power (W or kW)	Braking Torque (%)
0.4 kW	400Ω	100W	100%
0.75 kW	200Ω	120W	100%
1.5 kW	100Ω	300W	100%
2.2 kW	75.0Ω	300W	100%
4.0 kW	50.0Ω	500W	100%
5.5kW	32.0Ω	600W	100%
7.5kW	25.0Ω	780W	100%
11kW	16.0Ω	1.2kW	100%
15kW	13Ω	1.5kW	100%
18.5kW	8.2Ω	2.0kW	100%
22kW	7.5Ω	2.5kW	100%
30kW	6.2Ω	3.0kW	100%
37kW	4.7Ω	3.7kW	100%
45kW	3.9Ω	4.5kW	100%
55kW	3.0Ω	5.5kW	100%

Keypad function

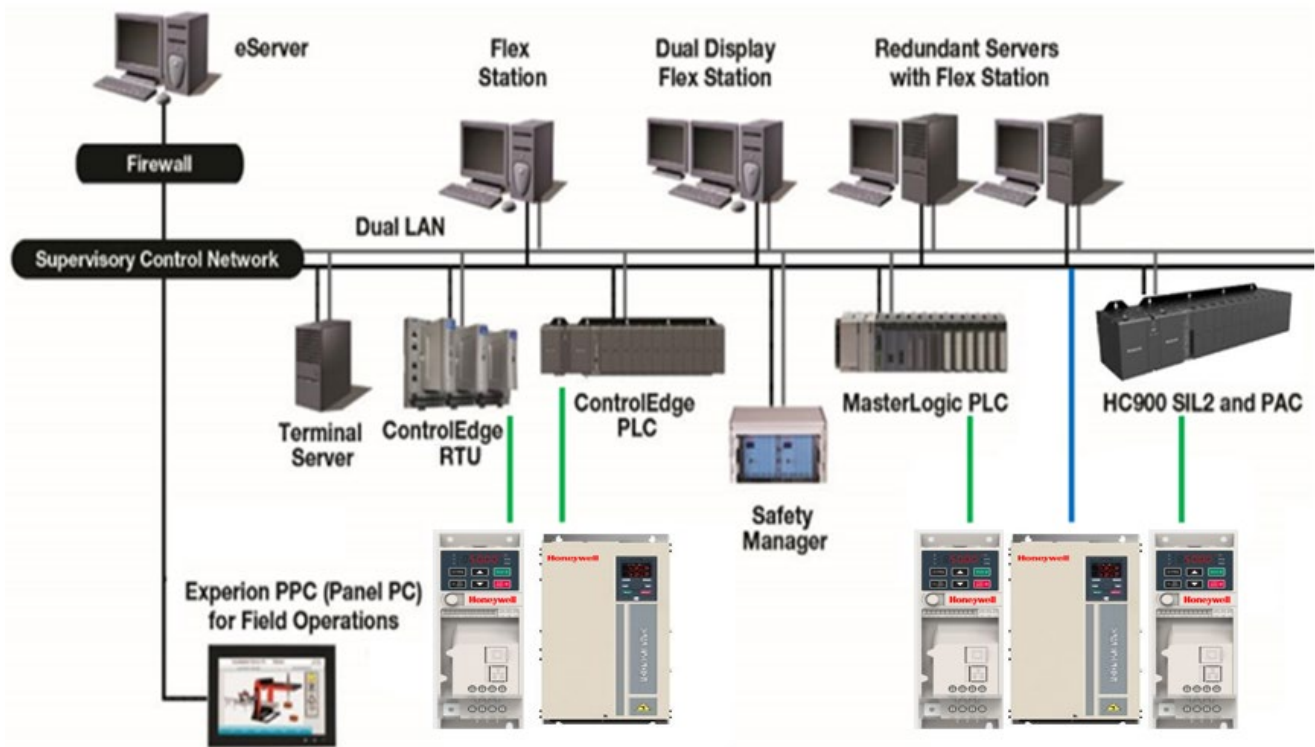


Symbol	Built-in single-line keypad	Built-in dual-line keypad	Function
A	Unit indicator		Hz: Frequency A: Current V: Voltage A/V: Current or Voltage RPM: Revolutions Per Minute %: Percentage
B	Status indicator		On: Forward running status Blinking: Reverse running status Off: Stop status
C	Menu button 	Menu button 	Press to enter the function menu interface in standby or running status; press this button to exit the modification in parameter modification state; press and hold (for 1 second) this button to directly enter the status interface in standby or running status.
D	Set/Shift button 		Set function: After changing the value, press this button to confirm the change. Shift function: Press and hold (for 1 second) this button to move the operating position; press and hold to perform cyclic
E	Up and down buttons 		Press Up button to increase the operation value, and the Down button to decrease the operation value.
F	Run button 	Run button 	When the run/stop function is controlled by the keypad, press this button and the VFD will run forward. The status indicator is always on for forward running, and blinking for reverse running.
	Stop/Reset 	Stop/Reset 	When the given command channel is controlled by keypad, press this button to stop the VFD; you can define whether other command channels are valid through the parameter [F11.03] ;
G			Digital potentiometer: Turn clockwise to increase the operating value; turn counterclockwise to decrease the operating value. OK button: Press this button after modifying the value to confirm the modification.
		Left shift and right shift buttons 	Move the operating position leftward and rightward.
H		Jog/Reverse 	Select the function of this button by parameter [F11.02].

LED Status Indicator

In the following chart: ● represents light on, ○ represents light off, ●○ represents flashing.		
RUN Running lights	RUN ●	Light off: stop status
	RUN ○	Lights on: running forward
	RUN ●○	Blinking: Reverse running
Run  Button	RUN ●	Light off: stop state
	RUN ○	Lights on: running forward
	RUN ●○	Blinking: Reverse running
Unit indicator Hz, A, V, RPM, %	○	Light on: Monitor this value
	●	Light off: no value is monitored
Hz: frequency A: current V: voltage RPM: speed %: percentage		

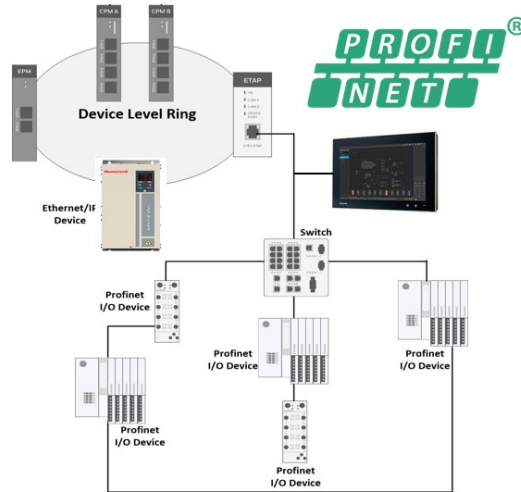
Modbus rtu and Mosbus TCP



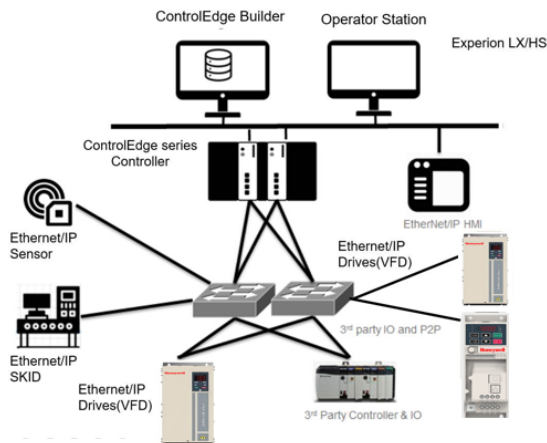
PROFINET and Ethernet /IP

EtherNet/IP™ is a best-in-class Ethernet communication network that provides users with the tools to deploy standard Ethernet technology (IEEE 802.3 combined with the TCP/IP Suite) in industrial automation applications while enabling Internet and enterprise connectivity.

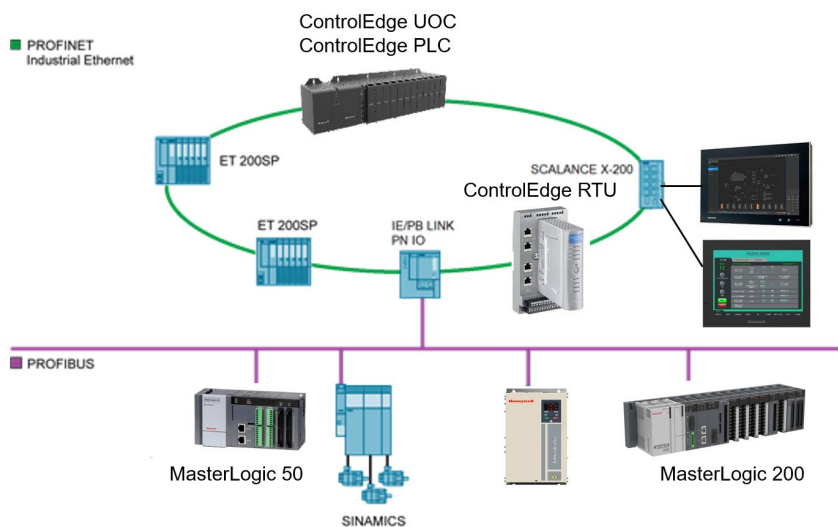
(1) RING topology with DLR



(2) STAR Topology



(3) Profibus-DP (with PROFINET)



HAC Builder

System Requirement

Category	Requirement
Windows	Windows 7/8/10
Processor	1 GHz or higher
RAM	1 GB (32-bit) or 2 GB (64-bit)
HDD	16 GB (32-bit) or 20 GB (64-bit)
Interface	CANopen, RS485, Baud rate=1200 to 57600bps
Others	.NET3.5 framework

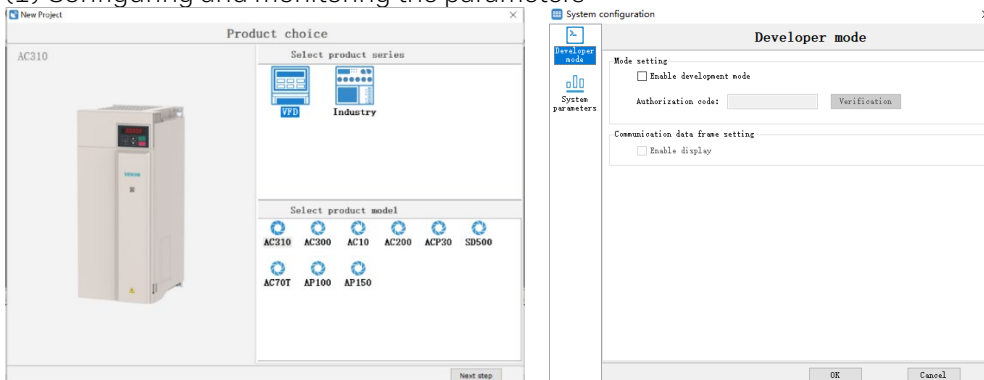
HAC Builder is a configuration tool to configure parameters and monitoring the operating conditions on-real time, uploading the parameters from drives.

Specification

Items	Descriptions	
Configured items	HAC10, HAC310, etc	
Communication	RS485	Ethernet TCP/IP
Protocol	Modbus rtu	CANopen
Connections	Local connection = 1	
Functions	(1) Parameters modifications Configuring, Monitoring, Trend (History) on-real time Uploading/Downloading parameter (2) Event logging (3) EEPROM Save (4) Drive operation: Forward, Reverse (5) Compare parameter (6) Report (7) Data export: *.csv	
Time event scheduling	to start the desired operation at the specified time by using an RTC (Real Time Clock)	
Operation mode	●	
Aux Settings	●	
User interface	User sequence, Configurable Drives, upto 18 Convert parameters	
Displaying language	English, Korea	
Displaying mode	Hz or RPM	

Configurations

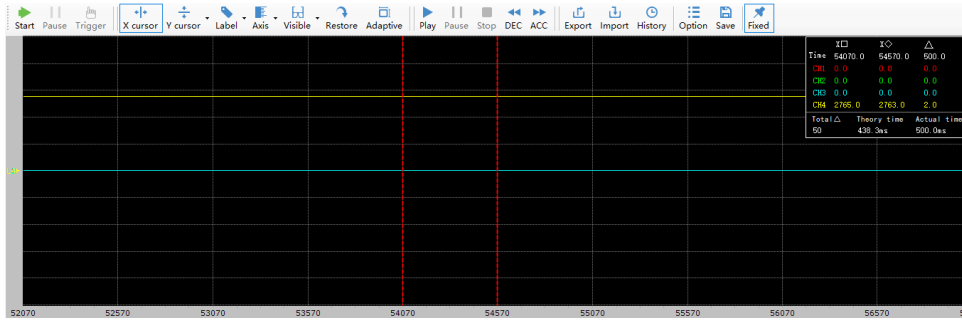
(1) Configuring and monitoring the parameters



(2) Parameter Reading and Writing

Function code name	current value	unit	default value	min value	max value
C00.00 Given frequency	50.00	Hz	-	-	-
C00.01 Output frequency	0.00	Hz	-	-	-
C00.02 Output current	0.0	A	-	-	-
C00.03 Input voltage	441.7	V	-	-	-
C00.04 Output voltage	0.0	V	-	-	-
C00.05 Machine speed	0	rpm	-	-	-
C00.06 Given torque	0.0	%	-	-	-
C00.07 Output torque	0.0	%	-	-	-
C00.08 PID given value	0.0	%	-	-	-
C00.09 PID feedback value	0.0	%	-	-	-
C00.10 Output power	0.0	%/kW	-	-	-
C00.11 DC bus voltage	624.8	V	-	-	-

(3) Trend



(3) Real Time Monitoring

Function name	Value	Unit	Function name	Value	Unit
C00 Monitoring parameters(10)					
C00.00 Given frequency	---	Hz	C00.01 Output frequency	---	Hz
C00.02 Output current	---	A	C00.04 Output voltage	---	V
C00.05 Machine speed	---	rpm	C00.06 Given torque	---	%
C00.07 Output torque	---	%	C00.11 DC bus voltage	---	V
C00.12 Module temperature 1	---	°C	C00.30 Fault pre alarm code	---	-

(3) Function Code Comparison

Function name	Value (source)	Value (Target)	Unit	Range

Function Code: Total(0)-Difference(0)

EtherNet/IP™

CIP and Ethernet/IP™

The **C**ommon **I**ndustrial **P**rotocol (**CIP™**) is a fully networked solution that encompasses a comprehensive suite of messages and services to fully support a broad spectrum of process needs and applications on one protocol. CIP is a peer-to-peer object-oriented protocol that provides connections between industrial devices (sensors, actuators, drives, motors, I/O, etc.) and higher-level devices (controllers). CIP is applicable to factory and process automation control, safety, synchronization, motion, and the configuration and management of intelligent field devices.

CIP is the protocol language used to enable communication between all nodes on the network. It is physical media and data link layer independent. This media independence provides the ability to choose the CIP Network best suited for your application.

CIP is implemented on various networks as follows...

- CompoNet™ CIP on TDMA technology
- DeviceNet™ CIP on CAN technology
- ControlNet™ CIP on CTDMA technology
- **EtherNet/IP™** CIP on **ETHERNET** technology

EtherNet/IP™ is the name given to the Common Industrial Protocol (CIP™), as implemented over standard Ethernet (IEEE 802.3 and the TCP/IP UDP protocol suite). Ethernet/IP is a high-level industrial application layer protocol for industrial automation applications that uses the tools and technologies of traditional Ethernet. Ethernet/IP uses all the transport and control protocols used in traditional Ethernet including the Transport Control Protocol (TCP), the Internet Protocol (IP) and the media access and signaling technologies found in off-the-shelf Ethernet interfaces and devices.

EtherNet/IP was introduced in 2001 and today is one of the most developed, proven, and complete industrial Ethernet network solutions available for industrial control and automation solutions. It enables real-time control and data acquisition for discrete applications, continuous process, safety, drive, motion, and applications requiring high availability. Ethernet/IP is applicable to factory automation, process automation, and is well suited for both batch and continuous operations.

ODVA

Founded in 1995, ODVA is a global association whose members comprise the world's leading automation companies. ODVA's mission is to advance open, interoperable information and communication technologies in industrial automation.

EtherNet/IP™ and CIP™ are managed by ODVA. ODVA publishes *The EtherNet/IP Specification* and helps ensure compliance through conformance testing.

More information is available at the ODVA website, WWW.ODVA.org

PROFINET and PROFIBUS-DP

A Siemens Scalance switch coupled with a Rockwell ETAP allow the Honeywell VFD to connect to a PROFINET MRP network.

Standards and Approvals

Item	Specification
CE Conformity	This product is in conformity with the protection requirements of the following European Council Directives: 2014/35/EU, the Low Voltage Directive, and 2014/30/EU, the EMC Directive. Conformity of this product with any other "CE Mark" Directive(s) shall not be assumed.
	LVD Directive:

Item	Specification		
	Title	Number	Issue date
	Safety requirements for electrical equipment for measurement, control, and laboratory use –Part 1: General requirements	EN 61010-1	2010
	EMC directive:		
	Title	Number	Issue date
	Programmable controllers- Part 2: Equipment requirements and Tests	IEC 61131-2	2007
	Electrical equipment for measurement, control, and laboratory use – EMC requirements – Part 1: General requirements	EN 61326-1	2013
	Industrial, scientific, and medical (ISM) radio-frequency equipment – Electromagnetic disturbance characteristics – Limits and methods of measurement	CISPR 11	2015
	Electromagnetic compatibility (EMC) – Part 3-2: Limits –Limits for harmonic current emissions (equipment input current $\leq 16A$ per phase)	IEC 61000-3-2	2014
	Electromagnetic compatibility (EMC) – Part 3-3: Limits –Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current $\leq 16 A$ per phase and not subject to conditional connection	IEC 61000-3-3	2013
	Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test	IEC 61000-4-2	2008
	Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radiofrequency, electromagnetic field immunity test	IEC 61000-4-3	2006+A1:2007+A2;2010
	Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test	IEC 61000-4-4:2012	2012
	Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test	IEC 61000-4-5	2014
	Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields	IEC61000-4-6	2013
	Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test	IEC61000-4-8	2009
	Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions, and voltage variations immunity tests	IEC61000-4-11	2004
c UL us (General purpose safety)	Compliant with EN61010-1, ANSI/UL 61010-1 and CAN/CSA-C22.2 No. 61010-1-12		

Model Selection Guide and Accessories

HAC10

Key numbers		Description		Selection	Availability		
VFD and Voltage Type		Honeywell VFD HAC10, 3-phase 200 ~ 240VAC (Note 1)		HAC10T2-	↓	↓	
		Honeywell VFD HAC10, 3-phase 380 ~ 480VAC (Note 1)		HAC10T3-			

TABLE I

Motor Rating	0.75kW (1HP)	R75 _	•	•	
	1.5kW (2HP)	1R5 _	•	•	
	2.2kW (3HP)	2R2 _	•	•	
	4kW (5.4HP)	004 _	•	•	
	5.5kW (7.5HP)	5R5 _	•	•	
	7.5kW (10HP)	7R5 _	•	•	
	11kW (15HP)	011 _	•	•	
	15kW (20HP)	015 _	•	•	
	18kW (24HP)	018 _	•	•	
	22kW (30HP)	022 _	•	•	
Load Type	Heavy Duty Type	_ G	•	•	

TABLE II

a. Keypad	LED Keypad (Note 2)	E _ _ _ _	•	•	
	LCD Keypad (Note 3)	C _ _ _ _			
b. Enclosure	IP20(UL Open)	_ M _ _ _	•	•	
	IP66(UL Open)	_ X _ _ _			
c. EMC Filter	Non-EMC	_ _ N _ _	•	•	
	C2, Built-in EMC	_ _ B _ _			
	C3, Built-in EMC	_ _ G _ _			
d. Reactor	None(Non-Reactor)	_ _ _ N _	•	•	
	DCL(Built-in Reactor, DC Line Filter)	_ _ _ X _			
e. I/O	Standard IO (pitch=5mm) (Note 4)	_ _ _ _ S	•	•	

Note 4 Standard IO, 5xDigital Input, 1xRelay 1xTransistor out output, 2xAanalog input, 1xAnalog output

Table III

f. Manual	English	E _	•	•	
	Chinese	C _			
g. Future Option	None	_ 0	•	•	

Note 1 Range of rated power: -15%~+10%

Note 2 LED Keypad (Built-in Configurator) with wire 10 centi-mtrs or less

Note 3 LCD Keypad (Built-in Configurator) with wire 10 centi-mtrs or less

Note 4 Standard IO, 5xDigital Input, 1xRelay out, 1xTransistor out, 2xAanalog input, 1xAnalog output

Input Rating 1-phase 200~240V (-15%~+10%), IP20, C2 EMC Filter, No-Reactor

Model Key number	Pricing Table 1												LP(USD)	
	Table I				Table II									
Input Rating	Motor Rating			a. Keypad		b. Enclosure		c. EMC Filter		d. Reactor		e. I/O		
HAC10T2-R75	R75	0.75kW	1HP	E	LED Keypad	X	IP66	B	C2	X	None	S	Standard IO	0
HAC10T2-1R5	1R5	1.5kW	2HP	E	LED Keypad	X	IP66	B	C2	X	None	S	Standard IO	43
HAC10T2-2R2	2R2	2.2kW	3HP	E	LED Keypad	X	IP66	B	C2	X	None	S	Standard IO	78
HAC10T3-R75	R75	0.75kW	1HP	E	LED Keypad	X	IP66	B	C2	X	None	S	Standard IO	0
HAC10T3-1R5	1R5	1.5kW	2HP	E	LED Keypad	X	IP66	B	C2	X	None	S	Standard IO	3
HAC10T3-2R2	2R2	2.2kW	3HP	E	LED Keypad	X	IP66	B	C2	X	None	S	Standard IO	19
HAC10T3-004	004	4kW	5.4HP	E	LED Keypad	X	IP66	B	C2	X	None	S	Standard IO	77
HAC10T3-5R5	5R5	5.5kW	7.5HP	E	LED Keypad	X	IP66	B	C2	X	None	S	Standard IO	143
HAC10T3-7R5	7R5	7.5kW	10HP	E	LED Keypad	X	IP66	B	C2	X	None	S	Standard IO	256
HAC10T3-011	011	11kW	15HP	E	LED Keypad	X	IP66	B	C2	X	None	S	Standard IO	372
HAC10T3-015	015	15kW	20HP	E	LED Keypad	X	IP66	B	C2	X	None	S	Standard IO	589
HAC10T3-018	018	18kW	24HP	E	LED Keypad	X	IP66	B	C2	X	None	S	Standard IO	640
HAC10T3-022	022	22kW	30HP	E	LED Keypad	X	IP66	B	C2	X	None	S	Standard IO	791

HAC10 Accessories and Spare parts

Category	Description	Part Number
Keypad	Single line LED keypad	50188977-001
	AC10 VFD buckle	50188977-002
	Dual line LED keypad	50188977-003
	LCD keypad	50188977-004
PG card	Differential PG card	50188977-005
	Resolver PG card	50188977-006
Interface Options	CANopen Communication card	50188977-007
	Profibus Communication card	50188977-008
	Terminal expansion card	50188977-009
	Profinet card	50188977-010
IoT Options	4G IOT Module	50188977-011
	4G IOT card	50188977-012
	4G IOT card	50188977-013
	2G IOT card	50188977-014

HAC310- ac300-t3-2r2g left HW.png



Instructions

Select the desired Key Number. The arrow to the right marks the selections available.
 Make one selection each from Tables I through III using the column below the proper arrow.
 A dot (•) denotes unrestricted availability. A letter denotes restricted availability.

Key Numbers I II III

HAC310 - _ _ _ _ _

REV4

Key numbers

Description		Selection	Availability		
VFD and Voltage Type	Honeywell VFD HAC10, 3-phase 220VAC (Note 1)	HAC3102-	↓		
	Honeywell VFD HAC10, 3-phase 400VAC (Note 1)	HAC3103-		↓	
	Honeywell VFD HAC10, 3-phase 690VAC (Note 1)	HAC3106-			↓

		HAC310	02	03	06			
TABLE I			↓	↓	↓			
Motor Rating	0.75kW (1HP)	Output current, A =	4	3		R75 _	•	•
	1.5kW (2HP)		7	4		1R5 _	•	•
	2.2kW (3HP)		10	6		2R2 _	•	•
	4kW (5.4HP)		16	10		004 _	•	•
	5.5kW (7.5HP)		20	13		5R5 _	•	•
	7.5kW (10HP)		30	17		7R5 _	•	•
	11kW (15HP)		42	25		011 _	•	•
	15kW (20HP)		55	32		015 _	•	•
	18kW (24HP)		70	38		018 _	•	•
	22kW (30HP)		80	45	28	022 _	•	•
	30.0kW (40HP)		110	60	35	030 _	•	•
	37.0kW (50HP)		130	75	45	037 _	•	•
	45.0kW (60HP)		160	90	52	045 _	•	•
	55.0kW (75HP)		200	110	63	055 _	•	•
	75.0kW (100HP)		260	150	86	075 _	•	•
	90.0kW (125HP)		320	180	98	090 _	•	•
	110kW (150HP)		380	210	121	110 _	•	•
	132kW (175HP)		420	250	150	132 _	•	•
	160kW (215HP)		550	310	175	160 _	•	•
	185kW (250HP)		600	340	198	185 _	•	•
	200kW (270HP)		660	380	218	200 _	•	•
	220kW (300HP)		720	415	235	220 _	•	•
	250kW (335HP)			470	270	250 _	•	•
	280kW (373HP)			510	330	280 _	•	•
	315kW (420HP)			600	345	315 _	•	•
	355kW (476HP)			670	380	355 _	•	•
	400kW (536HP)			750	430	400 _	•	•
	450kW (603HP)			810	466	450 _	•	•
	500kW (670HP)			860	540	500 _	•	•
	560kW (750HP)			990	600	560 _	•	•
	630kW (845HP)			1200	690	630 _	•	•
	710kW (952HP)			1340	760	710 _	•	•
	800kW (1073HP)			1500	860	800 _	•	•
	900kW (1207HP)			1620	932	900 _	•	•
	1000kW (1341HP)			1980	1080	1000 _	•	•
	1120kW (1502HP)					1120 _	•	•
Load Type	Heavy Duty Type					G	•	•

TABLE II			
a. Keypad	LED Keypad (Note 2)	E _ _ _ _	• • •
	LCD Keypad (Note 3)	C _ _ _ _	
b. EMC Filter	Non-EMC	_ N _ _ _	
	C2, Built-in EMC	_ X _ _ _	• • •
c. BRAKE Unit	Non-Brake	_ _ X _ _	a c,e •
	BRAKE unit	_ _ B _ _	b d

Table II(Cont'd)

d. Reactor	None(Non-Reactor)	_ _ X _	• • •
	DCL(Built-in Reactor, DC Line Filter)	_ _ _ D _	• c •
e. I/O	Standard IO (pitch=5mm) (Note 4)	_ _ _ _ S	• • •

Note 4 Standard IO, 5xDigital Input, 1xRelay out 1xTransistor Out, 2xAanalog input, 1xAnalog output

Table III

f. Manual	English	E _	- - -
	Chinese	C _	- - -
	French	F _	
	Korean	K _	
g. Future Option	None	_ 0	- - -

MODEL RESTRICTIONS

Restriction	Available Only With		Not Available With	
	Letter	Table	Table	Selection(s)
a	I	018G, 022G, 030G, 037G, 045G, 055G		
b	I	R75G, 1R5G, 2R2G, 004G, 5R5G, 7R5G, 011G, 015G		
c	I	055G, 075G, 090G, 110G, 132G, 160G, 185G, 200G, 220G, 250G, 280G, 315G, 355G, 400G, 450G, 500G, 560G, 630G, 710G		
d	I	R75G, 1R5G, 2R2G, 004G, 5R5G, 7R5G, 011G, 015G, 018G, 022G		
e	I	030G, 037G, 045G, 055G, 075G, 090G, 110G		

Input Rating 1-phase /3-phase 200~240V (-15%~+10%) , with Brake, No DC Reactor

Pricing Table 1

Model Key number	Table I			Table II									
	Input Rating	Motor Rating		a. Keypad	b. EMC Filter	c. Brake opt.	d. Reactor	e. I/O					
HAC3102-	R75G	1HP	0.75kW	E	LED Keypad	X	C2	B	Brake	X	None	S	Standard IO
HAC3102-	1R5G	2HP	1.5kW	E	LED Keypad	X	C2	B	Brake	X	None	S	Standard IO
HAC3102-	2R2G	3HP	2.2kW	E	LED Keypad	X	C2	B	Brake	X	None	S	Standard IO
HAC3102-	004G	5.4HP	4kW	E	LED Keypad	X	C2	B	Brake	X	None	S	Standard IO
HAC3102-	5R5G	7.5HP	5.5kW	E	LED Keypad	X	C2	B	Brake	X	None	S	Standard IO
HAC3102-	7R5G	10HP	7.5kW	E	LED Keypad	X	C2	B	Brake	X	None	S	Standard IO
HAC3102-	011G	15HP	11kW	E	LED Keypad	X	C2	B	Brake	X	None	S	Standard IO
HAC3102-	015G	20HP	15kW	E	LED Keypad	X	C2	B	Brake	X	None	S	Standard IO

Input Rating 1-phase /3-phase 200~240V (-15%~+10%) & None of Brake, DC Reactor

HAC3102-	018G	24HP	18kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO
HAC3102-	022G	30HP	22kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO
HAC3102-	030G	40HP	30.0kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO
HAC3102-	037G	50HP	37.0kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO
HAC3102-	045G	60HP	45.0kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO
HAC3102-	055G	75HP	55.0kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO

Input Rating 3-phase 380~440V (-15%~+10%) , with Brake, no DC Reactor

HAC3103-	R75G	1HP	0.75kW	E	LED Keypad	X	C2	B	Brake	X	None	S	Standard IO
HAC3103-	1R5G	2HP	1.5kW	E	LED Keypad	X	C2	B	Brake	X	None	S	Standard IO
HAC3103-	2R2G	3HP	2.2kW	E	LED Keypad	X	C2	B	Brake	X	None	S	Standard IO
HAC3103-	004G	5.4HP	4kW	E	LED Keypad	X	C2	B	Brake	X	None	S	Standard IO
HAC3103-	5R5G	7.5HP	5.5kW	E	LED Keypad	X	C2	B	Brake	X	None	S	Standard IO
HAC3103-	7R5G	10HP	7.5kW	E	LED Keypad	X	C2	B	Brake	X	None	S	Standard IO
HAC3103-	011G	15HP	11kW	E	LED Keypad	X	C2	B	Brake	X	None	S	Standard IO
HAC3103-	015G	20HP	15kW	E	LED Keypad	X	C2	B	Brake	X	None	S	Standard IO
HAC3103-	018G	24HP	18kW	E	LED Keypad	X	C2	B	Brake	X	None	S	Standard IO
HAC3103-	022G	30HP	22kW	E	LED Keypad	X	C2	B	Brake	X	None	S	Standard IO

Input Rating 3-phase 380~440V (-15%~+10%) , None of Brake, with Reactor													
HAC3103-055G	75HP	55.0kW	E	LED Keypad	X	C2	X	None	D	DC Reactor	S	Standard IO	
HAC3103-075G	100HP	75.0kW	E	LED Keypad	X	C2	X	None	D	DC Reactor	S	Standard IO	
HAC3103-090G	125HP	90.0kW	E	LED Keypad	X	C2	X	None	D	DC Reactor	S	Standard IO	
HAC3103-110G	150HP	110kW	E	LED Keypad	X	C2	X	None	D	DC Reactor	S	Standard IO	
HAC3103-132G	175HP	132kW	E	LED Keypad	X	C2	X	None	D	DC Reactor	S	Standard IO	
HAC3103-160G	215HP	160kW	E	LED Keypad	X	C2	X	None	D	DC Reactor	S	Standard IO	
HAC3103-185G	250HP	185kW	E	LED Keypad	X	C2	X	None	D	DC Reactor	S	Standard IO	
HAC3103-200G	270HP	200kW	E	LED Keypad	X	C2	X	None	D	DC Reactor	S	Standard IO	
HAC3103-220G	300HP	220kW	E	LED Keypad	X	C2	X	None	D	DC Reactor	S	Standard IO	
HAC3103-250G	335HP	250kW	E	LED Keypad	X	C2	X	None	D	DC Reactor	S	Standard IO	
HAC3103-280G	373HP	280kW	E	LED Keypad	X	C2	X	None	D	DC Reactor	S	Standard IO	
HAC3103-315G	420HP	315kW	E	LED Keypad	X	C2	X	None	D	DC Reactor	S	Standard IO	
HAC3103-355G	476HP	355kW	E	LED Keypad	X	C2	X	None	D	DC Reactor	S	Standard IO	
HAC3103-400G	536HP	400kW	E	LED Keypad	X	C2	X	None	D	DC Reactor	S	Standard IO	
HAC3103-450G	603HP	450kW	E	LED Keypad	X	C2	X	None	D	DC Reactor	S	Standard IO	
HAC3103-500G	670HP	500kW	E	LED Keypad	X	C2	X	None	D	DC Reactor	S	Standard IO	
HAC3103-560G	750HP	560kW	E	LED Keypad	X	C2	X	None	D	DC Reactor	S	Standard IO	
HAC3103-630G	845HP	630kW	E	LED Keypad	X	C2	X	None	D	DC Reactor	S	Standard IO	
HAC3103-710G	952HP	710kW	E	LED Keypad	X	C2	X	None	D	DC Reactor	S	Standard IO	
Input Rating 3-phase 380~440V (-15%~+10%) , none of Brake & DC Reactor													
HAC3103-030G	40HP	30.0kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3103-037G	50HP	37.0kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3103-045G	60HP	45.0kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3103-055G	75HP	55.0kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3103-075G	100HP	75.0kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3103-090G	125HP	90.0kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3103-110G	150HP	110kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
Input Rating 3-phase 690~770V (-15%~+10%) , non of Brake & DC Reactor													
HAC3106-022G	30HP	22kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3106-030G	40HP	30.0kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3106-037G	50HP	37.0kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3106-045G	60HP	45.0kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3106-055G	75HP	55.0kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3106-075G	100HP	75.0kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3106-090G	125HP	90.0kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3106-110G	150HP	110kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3106-132G	175HP	132kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3106-160G	215HP	160kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3106-185G	250HP	185kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3106-200G	270HP	200kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3106-220G	300HP	220kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3106-250G	335HP	250kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3106-280G	373HP	280kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3106-315G	420HP	315kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3106-355G	476HP	355kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3106-400G	536HP	400kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3106-450G	603HP	450kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3106-500G	670HP	500kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3106-560G	750HP	560kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3106-630G	845HP	630kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3106-710G	952HP	710kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3106-800G	1073HP	800kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3106-900G	1207HP	900kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3106-1000G	1341HP	1000kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	
HAC3106-1120G	1502HP	1120kW	E	LED Keypad	X	C2	X	None	X	None	S	Standard IO	

HAC310 Accessories and Spare parts

Category	Description	Part Number
Keypad	Single line LED keypad	50188977-001
	AC10 VFD buckle	50188977-002
	Dual line LED keypad	50188977-003
	LCD keypad	50188977-004
PG card	Differential PG card	50188977-005
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Interface Options	CANopen Communication card	50188977-007
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IoT Options	4G IOT Module	50188977-011
	4G IOT card	50188977-012
	4G IOT card	50188977-013
	2G IOT card	50188977-014

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