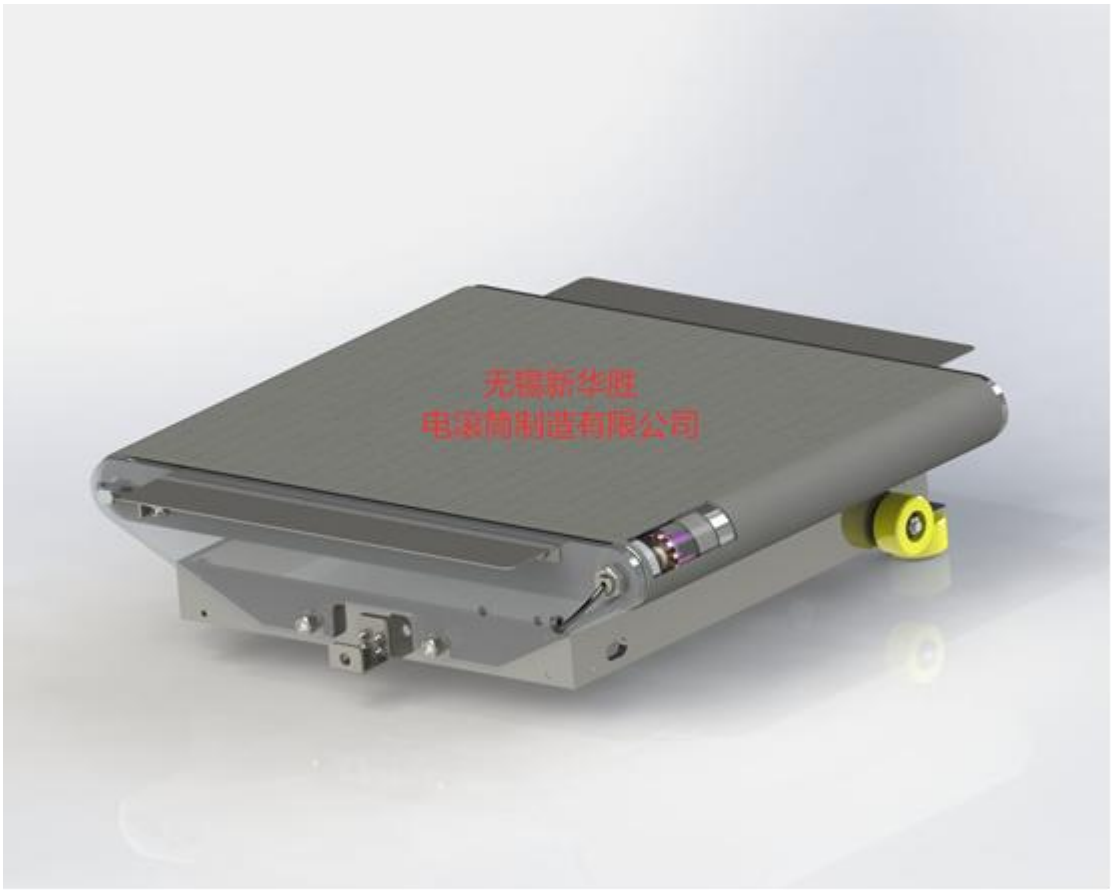
Cross belt sorting unit

HME servo motor controller

Version 1.0



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Change Record

DCR#	Rev.	Date	Remark
1	1.0	29/10/2020	Document set up

1.Main Parameter

Item	Unit	Specification	Remark
motor type		brushless DC hall servo motor	
motor modle		external rotor motor	
voltage	V	DC48+/-10%	
poles number		10	5 pole pairs
rated power range	w	400W	
speed range	r/min	50-1000	
rated torque	N.m	4	
Instantaneous max torque	N.m	18	no more than 4 seconds
working form		interval work 25%	depend on the ambient temperature
controller type		vector variable frequency controller	
rated power	V	DC48	
max power	W	750	interval work 25%
controller size	mm	155*147*39	
communication A		RS485	38400bps,N,8,1
power interface		plug 42000-6P(5557)	nylon(PA66），UL94V-2/0
		terminal 42000-21RT(5556)	phosphor bronzeC5191),wire guage：0.12~0.5mm2,26~20AWG,wire OD：1.1~1.9mm
communication interface		plug 32000-10P(5557)	nylon(PA66），UL94V-2/0
		terminal 32000-01RT(5556)	phosphor bronze(C5191),wire guage：0.032~0.08mm2,32~28AWG,wire OD：0.5~1.0mm
motor interface and encoder interface		specific interface	
temperature	℃	-20~+80	
humidity		below85%	no water,no rain

2.brushless controller

Driver 48V DC input, rated output power 400W, intermittent work 25%;
RS485 communication control running speed, running pulse number, and direction, response controller current state;
Through the terminal auxiliary control motor start stop and rotation direction.

2.1.Control dimensions and interface definition

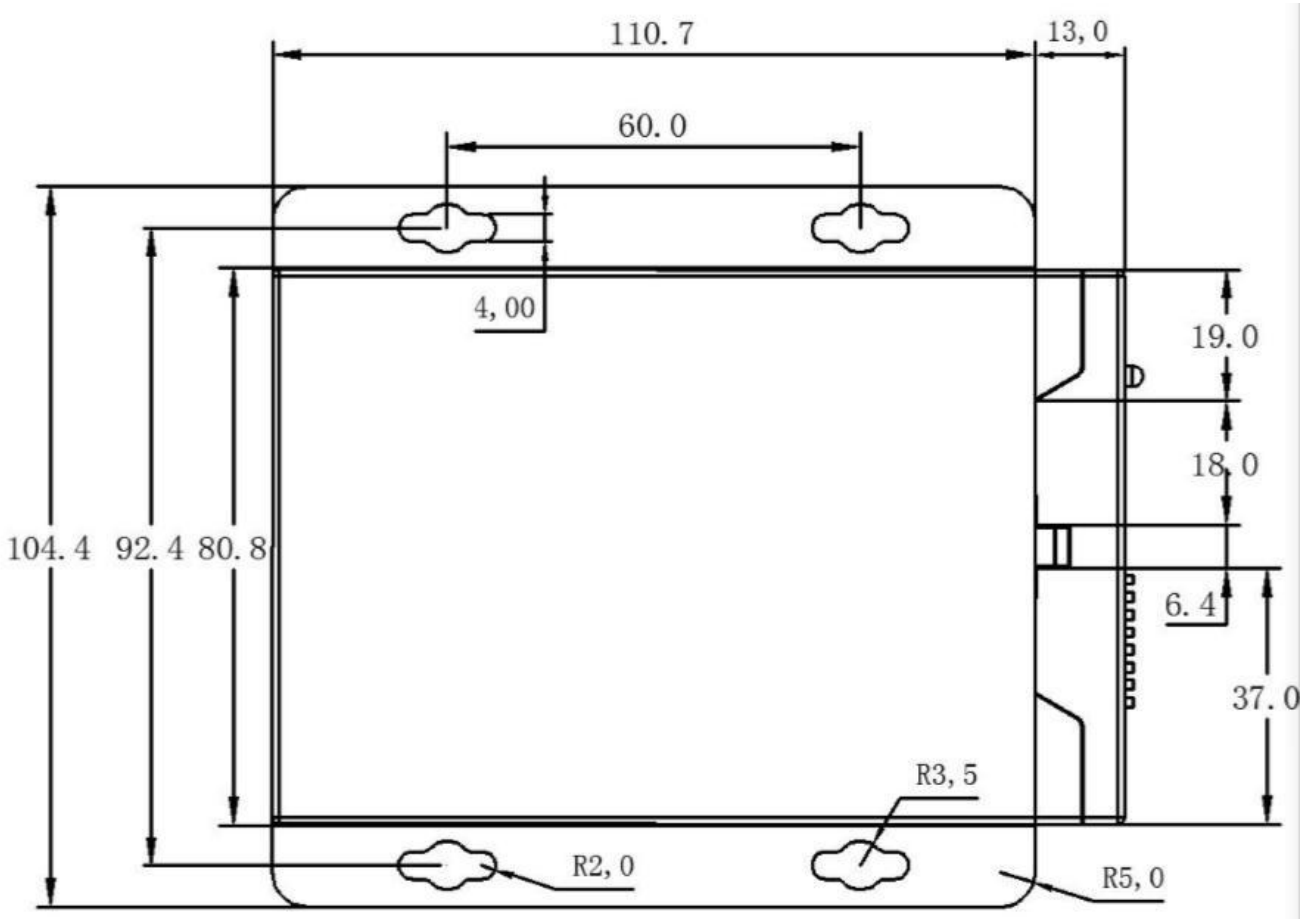

图 2-1 structure size 1

Table 1-1input side interface definition

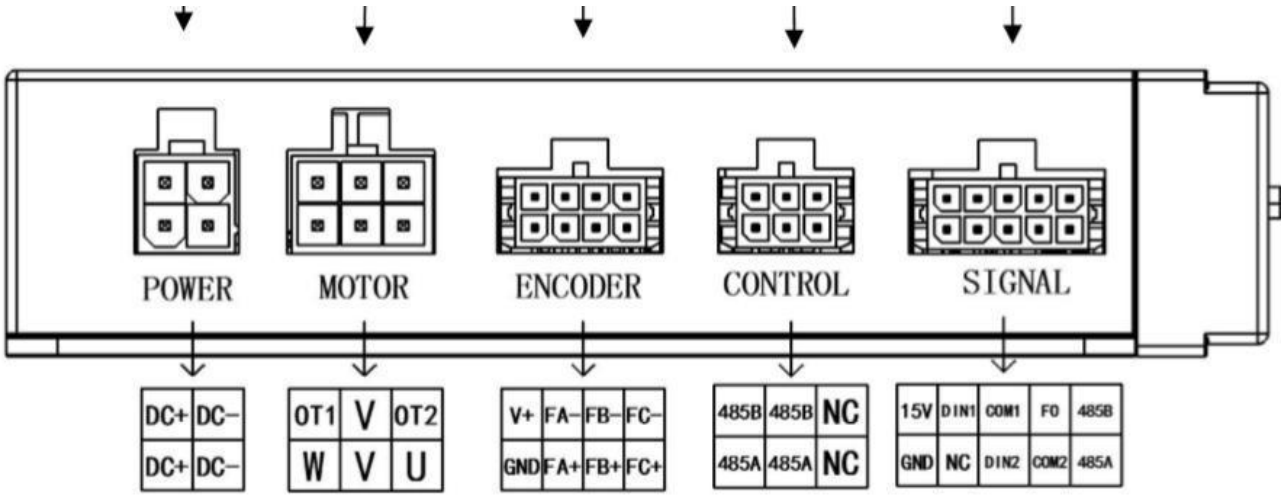

图 2-3 controller interface 1

Interface specification

Motor interface	42000-6P	U	motor phase line
		V	motor phase line
		W	motor phase line
		OUT1	temperature control switch interface
		OUT2	temperature control switch interface
DC power interface	42000-4P	DC+	48V+
		DC-	48V-
Sensor interface	HX30002-8P	V+	anode
		GND	cathode
		FA\FB\FC	Position sensing signal
Control port	HX30002-10P	15V	
		GND	
		RUN	running signal
		F/R	reverse enable signal
		COM1	signal common port
		FO	signal output port
		COM2	
		485A	485 signal
		485B	485 signal
		NC	

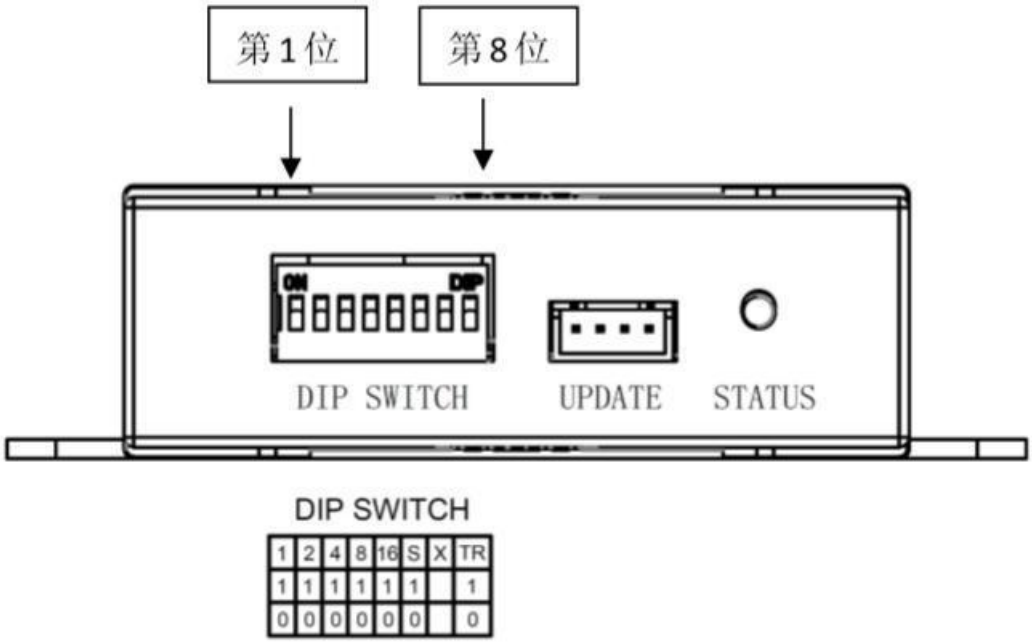

图 2-4 controller interface 2

interface	model	pin	pin definition	remark
upgrade interface	2.5_4P（HX）			software upgrade port
status light				refer“ 2.2.indicator status definition”
DIPswitch		1	1	ADD=X1*1+X2*2+X3*4+X4*8+X5*16 ON=1,OFF=0; ADD setting range：1~31
		2	2	
		3	4	
		4	8	
		5	16	
		6	32	high speed gear
		7	64	reserved
		8	128	485terminal resistance

2.2.**Indicator status definition**

1.**The red LED indicator is the controller status indicator, which is described as follows:**

No	indicator light flickers	information description	handling method
1	Lighting always	Controller standby	
2	Periodic flicker	Frequency varies with velocity	
3	flicker 1 time per cycle	sensor fault	check sensor
4	flicker 2 times per cycle	Overtemperature fault	excess temperature
5	flicker 3 times per cycle	Overcurrent fault	
6	flicker 4 times per cycle	locked-rotor fault	locked-rotor or overload
7	flicker 5 times per cycle	reserve	
8	flicker 6 times per cycle	Low voltage fault	voltage under 25V
9	flicker 7 times per cycle	high voltage fault	voltage over 60V
10	flicker 8 times per cycle	reserve	

2.3.RS485 **Communication and protocol definition**

Table1-5 communication parameter

No	item	parameter	remarks
1	Max number of sites	31	The address is set using the DIP switch
2	Communication format	format A :38400，N,8，1 format B :115200，N,8，1	The default is format A
3	Verification mode	Frame check	
4	terminal resistance	120Ω	decide to use a terminal resistor or not through the terminal resistor DIP switch

Table 1-6 Run parameter setting frame

No	item	parameter	remarks
1	Initial symbol of Parameter setting	85H(or 95H)	*No run parameter reply frame is returned when the start byte is 95H
2	Direction, car number	B7=0，B6=direction，B5-B0=car number is six digits lower	Number=byte6.B4~B3,B5-B0 The address is set using the DIP switch
3	Operation speed	B7=0，B6-B0=0~127	Default gear：speed=(B6-B0)*6RPM （ 100 RPM ~762 RPM） High speed gear：speed=(B6-B0)*8RPM（ 100 RPM ~1016RPM）
4	Delay run time is 7 bits lower	B7=0，B6-B0=0~127	Time=(byte6.B0,B6-B0)*0.01S
5	Operation time/steps	B7=0，B6-B0=0~127	time=(byte6.B1,B6-B0)*0.01S steps=(byte6.B1,B6-B0)*1 step Note: The number of running steps according to the 10-pole (5-pole) motor as an example, the number of steps in a motor cycle =5*6=30
6	Complex data 1	B7=0，B6,B5,B4,B3combine into PI adjustment items，B2=control mode，B1=Run time 8 bit，B0=delay time 8 bit	B6~B3,PI adjustment reserve B2=0 for time control mode；B2=1 for pocition control mode
7	Complex data 2	B7=0，	Acceleration and deceleration adjustment
8	Check character	Byte2-7XOR	

*Remark:*The starting byte of the parameter is unique, and the same character will not appear in subsequent characters. B7=1 for the starting byte, and B7=0 for subsequent characters.

Table 1-7 **Operation parameter response frame**

No	item	parameter	remark
1	Car response start symbol	99H	
2	Answered car number	B7=0，B6=0，B5-B0=car number	
3	Reply content	B7-B6=0 B5=Motor operation failure B4=No action command before parameter B3=There are no parameters before the action command B2=Sensor fault B1=Overcurrent fault B0=Overtemperature fault	Error or protection set to 1, no error or protection set to 0.
4	Check character	Byte2-3XOR	Check character

Note: The starting byte of the parameter is unique, and the same character will not appear in subsequent characters. The starting byte has B7=1, and subsequent characters have B7=0.

Table 1-8,Operation command frame (broadcast, no response frame required)

No	item	parameter	remark
1	Start symbol for car response	8AH	
2	Register group 1	B7=0，B6-B0=car7-1	
3	Register group 2	B7=0，B6-B0=car15-9	
4	Register group 3	B7=0，B6-B0=car23-17	
5	Register group 4	B7=0，B6-B0=car31-25	
6	Register group 5	B7=0，B6-B0=car32,24,16,8	
7	Change indication (serial number)	B7=0，B6-B0=Incremental	Only indicate serial number
8	Check character	Byte2-7XOR	

Note: The starting byte of the parameter is unique, and the same character will not appear in subsequent characters. The starting byte has B7=1, and subsequent characters have B7=0.

RS485 Frame transmission timing:

After the control center sends the running parameter frame, the driver returns the response frame, and then the control center sends the running command frame. There must be a parameter frame before each command frame, otherwise the driver will not act.

2.4 RS485 Debugging and Testing Software Description

2.4.1Open debugging and testing software as an administrator
2.4.2Select the appropriate device port
2.4.3 Set the operating parameters of the motor by pulling the slider and selection box;
2.4.4Press the "Settings" button to set motor parameters
2.4.5Check the corresponding car number for 'Run Command (Broadcast)' and send the broadcast data with the 'Send' button

4.Quality monitoring and inspection

All motors leaving the factory have a tracking inspection table that can trace the size of each component; Motor insulation performance testing includes voltage resistance and inter turn testing, with 100% testing before leaving the factory; The motor performance testing adopts the back electromotive force method, which 100% checks the back electromotive force of all motors.

5. Warranty period

The warranty period of the entire machine is one year, and any abnormal use or damage will result in a maintenance service fee.