胜牌股份
WINROLLER

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使 用 说 明 书

INSTRUCTION MANUAL

VECTOR-S100

矢量变频电动滚筒控制器

Vector variable frequency motor controller

请仔细阅读此说明书并妥善保管
以便日后维修保养

Please carefully read this manual and preserve it for the future need of maintenance and repairing.

胜牌智能装备股份有限公司

更新记录
Update Record

序号 DCR#	版本 Rev.	日期 Date	备注 Remark
1	1.0	2022.06.18	create document
2	2.0	2022.07.10	renew the details
3	3.0	2022.08.09	1. Added the description of the driver card status indicator 2. Add a description of the mailing address

目录

Catalogue

02 Noun Explanation

02 symbol definition

03 Drive Card Layout

03 Drive card external interface

04 Run A 和 Run B

06 Power supply requirement

05 Motor port

06 Drive card DIP function description

07 brake mode selection

08 Speed setting

09 Drive card wiring diagram

10 Drive card indicator status definition

11 Drive card communication address

11 Drive card communication protocol

12 Drive card size

13 appendix

名词解析
Noun explanation

DC brushless motor

Permanent magnet rotor
Composed of a stator wound with coils, this motor has the advantages of simple structure, high reliability, good stability, high efficiency, and strong adaptability, so it has been widely used.

Hall sensor

Due to brushless motor cancels the carbon brushes, the motor cannot function by itself and needs to rely on external drive. Hall sensor is installed inside the motor for giving feedback of the position signal to the drive.

LED

Light-emitting diodes, used to indicate the status of the drive system.

PNP/NPN

Logic level of effective control signal: NPN means low level is active, that is, connected to DC- Effective; PNP means high level is effective, that is, it is effective when connected to DC+.

PLC

Industrial Programmable Logic Controller

Speed open loop / closed loop

Speed open loop / closed loop

ECO and BOOST

The C type controller supports the ECO and BOOST Mode when running the drum motor.

Vector frequency conversion

Field oriented control is currently the best choice for efficiently control of DC brushless motor.

符号定义
symbol definition

This symbol indicates that special care should be taken to ensure correct operation, avoid injury to personnel or products, and ensure the correct use of the product, otherwise it may lead to some unexpected results.

This symbol indicates the correct usage method, prompts, or other useful information.

驱动卡布局
Driver card layout

1. Signal terminal
2. Firmware upgrade port
3. Power terminal
4. DC+
5. DC-
6. Drum motor socket
7. SPEED
8. DIP dialing
9. LED
10. ACC/DEC

Power terminal	DC power input
Signal terminal	Control signal input and error signal output, some functions are used in conjunction with DIP dialing
DIP dialing	Function dialing
LED	Power and status indicators
Drum motor socket	Special drum motor 9-core square socket
Firmware upgrade port	Firware upgrade jack
SPEED	Speed select
ACC/DEC	ACC/DEC time setting

驱动卡外部接口
External ports of the driver card

Pluggable I/O connector

the use of a small terminal unlocking buckle

Press down

0~10V Analog speed regulation	**External 0-10V analog voltage input speed adjustment**
SPEED	**Speed pulse feedback; PNP and NPN optional (controller internal jumper)**
ERROR	**Error signal output; PNP and NPN optional (controller internal jumper)**
REVERSE	**The drum motor runs in the opposite direction of the default direction.**
RUN A/B	**Effective level based on COM port status/specific function**
COM	**It can be connected to the common end of the optocoupler through a jumper internally, and the port controls the fixed position NPN when suspended; Please connect 0V when inputting and outputting PNP signals; Please connect 24V when NPN signal input and output;** **Note: Ensure that the jumper has been set with the corresponding signal input and output mode**
485A/B	**485 communication interface**

Run A & Run B

Run A	Run B	Description
ON	OFF	The drum motor operates at a fixed set speed of 100%
ON	ON	The drum motor operates at a fixed set speed of 75%
OFF	ON	The drum motor operates at a fixed set speed of 50%
OFF	OFF	Drum motor stops running

Type	VECTOR-T100
Rated power input	24V/48V
Allowable voltage range	20~28/40~60V
Allow voltage fluctuations	±15%
Driver peak input current	5A

Note:

1. The motor receives a control signal and the green light comes on;
2. The peak current in the above table is the DC bus current limit value of the controller, After reaching the limit current, it will continue to output at the limit current.

电机端口

Motor port

Pin No.	Name	Remark
1	hall sensor GND	GND
2	hall sensor positive pole	hall sensor positive pole
3	Coil U	Coil U
4	Coil V	Coil V
5	Coil W	Coil W
6	hall sensor U	hall sensor U
7	hall sensor V	hall sensor V
8	hall sensor W	hall sensor W
9	temperature sensing line	/

Note: When connecting the lead wire of the drum motor to the controller end or extension line end, the connector needs to be tightly inserted so that the white positioning line on the male end is completely covered by the female end (the female end does not expose white lines), and it is judged that the connector is tightly inserted in place

供电要求
power supply requirement

Selection requirements for switching power supply:

电动滚筒功率	开关电源功率
40w	60W~80W
80w	120W~160W
100w	150W~200W

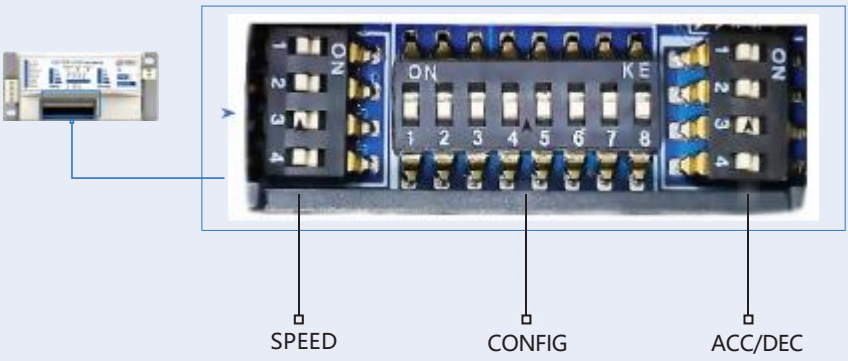
The power supply of the controller needs to meet the following requirements:

- 24V/48V The output current of the power supply needs to meet the requirement that each drive card can have a 5A current supply.
- NEC Class II certified
- The power output has appropriate short-circuit and overload protection

Do not allow any liquid to penetrate the interior of the controller, otherwise it may cause damage to the controller.

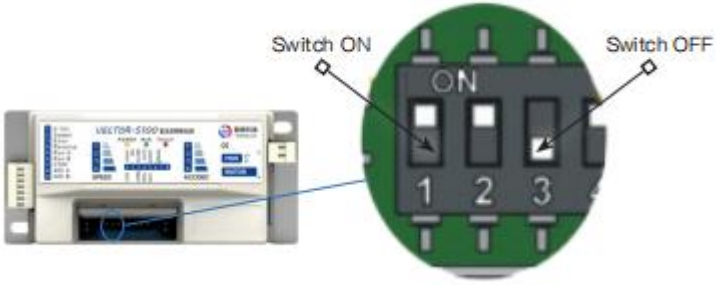
驱动卡 DIP 拨码功能说明
DIP dialing function

VECTOR-100 has three rows of toggle switches, SPEED，CONFIG 和 ACC/DEC



SPEED	FUNCTION	OFF	ON
1	Speed selection	The 4-digit dial code constitutes a 2-digit dial code, with a total of 16 gears for speed regulation. Please refer to P8 for specific speeds	
2			
3			
4			
ACC/DEC	Speed selection function	OFF	ON
1	ACC/DEC time setting	The 4-digit dial code constitutes a 2-digit dial code, with a total of 16 gears for speed regulation. Please refer to P9 for specific speeds.	
2			
3			
4			
CONFIG	Function	OFF	ON
1	High and low speed switching	Low speed	High speed
2	Forward and reverse settings	CCW	CW
3	Open loop and closed loop settings	Open loop	Closed loop
4	Automatic/manual error recovery	Manual	Automatic (Adjustable after 5 restarts)
5	Current limit selection	Large	Small
6		Refer to the brake mode selection table	
7			
8	analog input	switch	

The toggle switch is protected by a transparent plastic shell, which can be opened through the lower end of the protective shell and relevant settings can be made.



刹车模式选择
Brake mode selection

Brake mode	SW6	SW7
Electronic Brake	OFF	OFF
Free braking	ON	OFF
Servo brake	OFF	ON

Note:

These settings are for electronic brakes with electric rollers. If it is an electric roller with a built-in mechanical brake, it will use its internal mechanical device to maintain the locked position. Mechanical brakes have automatic fault prevention devices and require additional excitation signals to control them.

The following table explains the basic principles of braking mode:

Electronic Brake

When starting the brake, direct current is applied to the stator coil, which generates a magnetic field. If there is motion between the rotor and stator, it is equivalent to a conductor cutting the magnetic induction line, which is different from the existing magnetic field.
The magnetic field will have a reaction force.

Free braking

The power supply circuit of the electric roller inside the drive card is disconnected, becoming an open circuit, Make the rotor continue to rotate until the mechanical load is negative
Let it stop automatically.

Servo brake

When the running signal disappears, the drive card utilizes the Hall effect sensor of the drum motor to confirm the position of the stator and rotor, while input the current
to the motor coil to maintain the rotor position.

速度设置
Speed setting

The following table shows the motor speed corresponding to each gear of the internal knob speed regulation in the closed-loop state:

No (low speed)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Speed switch 1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
Speed switch 2	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
Speed switch 3	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
Speed switch 4	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
Rotary speed (rpm)	500	719	902	1102	1410	1500	1705	1902	2086	2290	2487	2691	2889	3093	3297	3485

No (high speed)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Speed switch 1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
Speed switch 2	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
Speed switch 3	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
Speed switch 4	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
Rotary speed (rpm)	3678	3878	4086	4303	4474	4671	4871	5066	5270	5460	5665	5869	6066	6257	6440	6600

Dialing explanation: ON—1
OFF—0

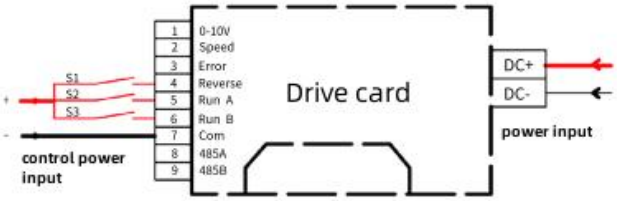
Remark : high speed =low speed *

DIP switch acceleration/deceleration setting table

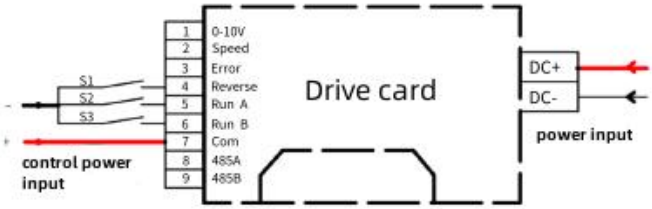
No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ACC/DEC speed switch 1	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON
ACC/DEC speed switch 2	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON
ACC/DEC speed switch 3	OFF	OFF	OFF	OFF	ON	ON	ON	ON	OFF	OFF	OFF	OFF	ON	ON	ON	ON
ACC/DEC speed switch 4	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON	ON	ON
ACC/DEC time (second)	3.90	2.44	1.77	1.39	1.15	0.98	0.85	0.75	0.67	0.61	0.56	0.51	0.48	0.44	0.41	0.39

驱动卡接线示意图

Driver card wiring diagram



PNP IO Control Wiring Principle



NPN IO Control Wiring Principle

驱动卡指示灯状态定义

Indicator status definition

The yellow LED light is the power indicator light;
The green LED light is the running indicator light, which follows the speed change of the motor during operation;
The red LED light is the fault

No	light flashing	info description	Solution
1	OFF	Drive card standby or normal operation	
2	One flash per cycle	Sensor fault	Check the sensor
3	Two flashes per cycle	Overheat protect	(75° start, 100° overheat protection)
4	Three flashes per cycle	Over current protect	Remove load or blockage
5	Four flashes per cycle	Rotation-Clogging protect	Check if the motor is stuck
6	Five flashes per cycle	keep	
7	Six flashes per cycle	Low voltage fault	Check if the voltage is too low
8	Seven flashes per cycle	High voltage fault	Check if the voltage is too high
9	Eight flashes per cycle	keep	

驱动卡通讯地址

Address of drive card

Communication address setting switch

No	Position	DIP dialing	Address parameters	Remark
1	left	1	1	Address =X1*1+X2*2+X3*4 +X4*8+X5*16+X6*32+ X7*64+X8*128 X1~8: ON=1,OFF=0; Address setting range: 1~255
2	left	2	2	
3	left	3	4	
4	left	4	8	
5	right	5 (1)	16	
6	right	6 (2)	32	
7	right	7 (3)	64	
8	right	8 (4)	128	

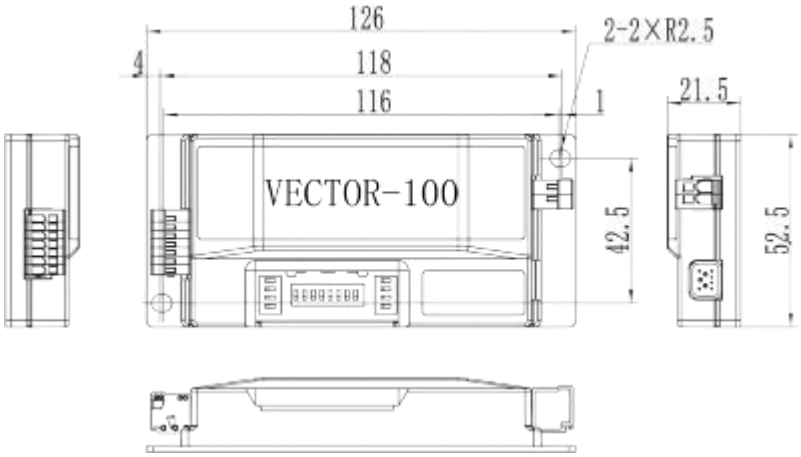
驱动卡通讯协议

ModBus-RTU

Format: Baud rate 38400, 8-bit data, no checksum, 1-bit stop bit			
Coil bit variables are readable and writable			
Bit data	Bit name	Parameter	Description
1	BDAT0.0	Run order	0: stop; 1 run
2	BDAT0.1	forward、reverse rotating	0: forward rotating; 1 reverse rotating
3	BDAT0.2	Open and closed loop selection	0: closed loop; 1 open loop
4	BDAT0.3	Running mode	0: 485 mode; 1: I/O mode (default I/O)
5	BDAT0.4	Restart mode	0: manual restart ; automatic restart
6	BDAT0.5	Brake mode	00: Electronic Brake; 01 Servo brake; 10/11: 7 free braking
7	BDAT0.6		
8	BDAT0.7	Over current state	0: no over current; 1: over current protection
9	BDAT1.0	Rotation-Clogging protect	0: no clog; 1: Rotation-Clogging protect
10	BDAT1.1	Motor hall fault	0: no fault; 1: hall fault
11	BDAT1.2	Motor fault	0: no fault; 1: motor fault
12	BDAT1.3	Power low voltage	0: normal; 1: low voltage
13	BDAT1.4	Power over voltage	0: normal; 1: over voltage
14	BDAT1.5	Motor overheat protection	0: normal; 1: motor overheat
15	BDAT1.6	Controller overheat protection	0: normal; 1: controller overheat
16	BDAT1.7	Controller fault	0: normal; 1: controller fault
Read-only memory word			
Address	Bit name	Parameter	Description
30001	RDAT0	Current speed value	Unit RPM
30002	RDAT1	Current bus line current	Unit 0.1A
30003	RDAT2		
30004	RDAT3		
30005	RDAT4		
Read and write register			
Address	Bit name	Parameter	Description
40001	WDAT0	Speed value (RPM)	Setting value 100~1000
40002	WDAT1	Acceleration value	Setting value 5~50
40003	WDAT2	Deceleration value	Setting value 5~50
40004	WDAT3	Bus current value setting	
40005	WDAT4	Phase current value setting	

驱动卡尺寸
Driver card size

The unit of all the dimensions is mm.



附录
appendix

The position of the jumper cap is shown in the following figure::

From top to bottom on the left:

1. Speed feedback PNP/NPN selection as shown in the left short-circuit NPN diagram
2. Fault feedback PNP/NPN selection as shown in the left short-circuit NPN diagram
3. Select left short circuit for COM end and PNP/NPN for external selection; Right short-circuit fixed NPN

To set the jumper, the outer shell of the drive card needs to be opened. Personnel conducting relevant operations must be familiar with the performance of the drive card or have received relevant training. Electrostatic discharge during operation before appropriate check may cause damage to the drive card.