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SVD2300-RS

High Voltage Servo Drive

User's Manual

Table of Contents

I. Product Introduction

1. Overview

SVD2300-RS has three working modes: position, speed and torque. It can set internal parameters and start/stop control in three working modes through ModBUS-RTU communication.

2. Technical features

- Adopting advanced servo control technology;
- Adopting a highly integrated solution to achieve a smaller size;
- With Regenerative resistor and integrated dynamic braking function, applicable to more industries;
- With software filtering and hardware filtering, anti-high-frequency interference capability is greatly enhanced;
- Support single-phase or three-phase 220V AC input, greatly reducing wiring requirements;
- With digital screen, the drive parameters can be modified offline without connecting to PC;
- Support ModBus communication protocol, speed control mode and torque control mode.

3. Application Fields

Widely used in small and medium-sized automation equipment and instruments, such as: screw rod, synchronous belt, reducer, rack and pinion, etc., but also accept customer-specific function customization, Truly achieving industry customization.

II.Electrical, mechanical and environmental indicators

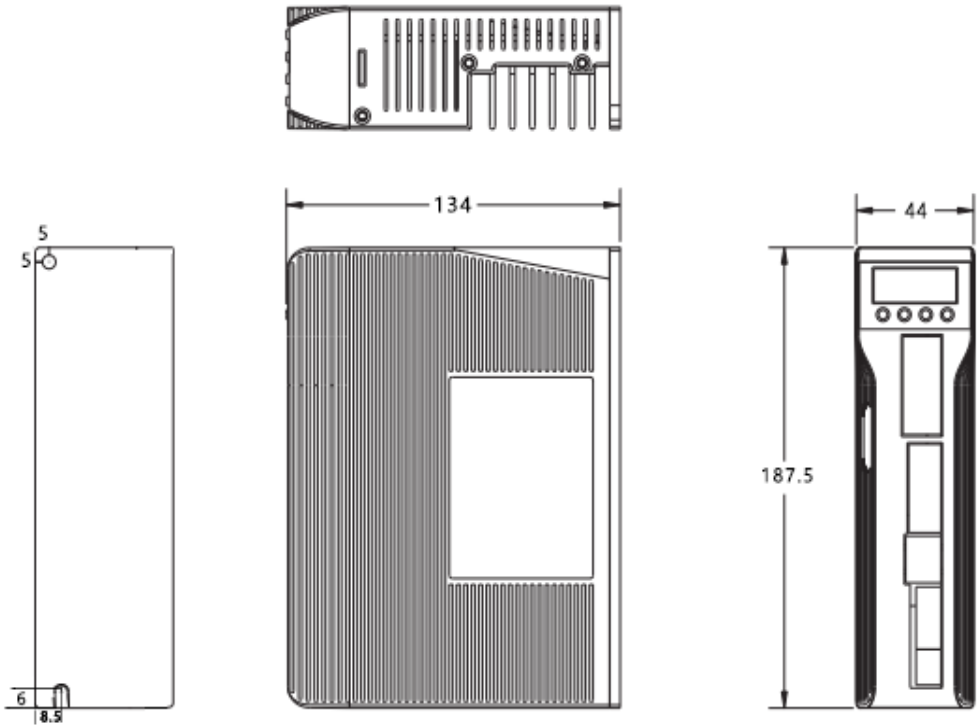
1. Electrical indicators

Parameter	SVD2300-RS		
	Minimum value	Maximum value	Unit
Continuous output current		60	A
AC single-phase and three-phase supply voltage	180	230	V_{AC}
Pulse frequency	0	150K	Hz
Insulation resistance	100	/	MΩ
Alarm output logic current	7	16	mA
Alarm output port voltage		0/24	V

2. Use of the environment and parameters

Cooling method	Natural cooling or external heat sink	
Operating environment	Use Environment	Avoid oil mist, dust
	Temperature.	-20°C to 70°C
	Humidity	40-90%RH
	Vibration	10~55Hz/0.15mm
Storage Temperature	-20°C-65°C	
Weight	Approx. 1500g	

3. Mechanical Installation Dimension Drawing



(1) The driver's reliable operating temperature is normally within 60°C, and 80°C for the motor;
(2) Mount the driver with upright side mounting. If necessary, install a fan close to the drive to force heat dissipation and ensure that the drive works within the reliable operating temperature range.

III. Drive interface and wiring introduction

1. Interface definition

(1) Power input port

Pin number	Symbol	Name	Description
1	P+	Brake resistor common terminal	DC bus voltage
2	D		Shorted to P+, internal resistor braking
3	C	External Regenerative resistor	
4	T	T-phase 220V	Connect to three-phase transformer output T-phase
5	S	S-phase 220V	Connect to three-phase transformer output S-phase
6	R	R-phase 220V	Connect to three-phase transformer output R phase

2) Motor Wiring Ports

Pin number	Symbol	Name	Description
1	U	Motor U phase	External motor U-phase winding
2	V	Motor V phase	External motor V-phase winding
3	W	Motor phase W	External motor phase W winding
4	PE	To earth	Connect to motor housing

3) Encoder signal input port

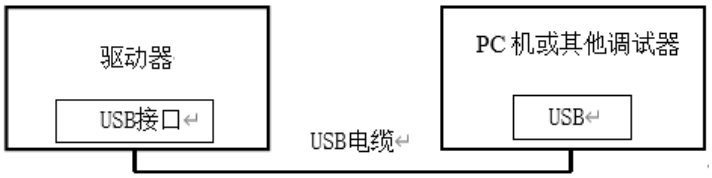
Pin number	Symbol	Name	Description
1			
2			
3	5V	Encoder power supply positive	+5V
4	GND	Encoder power negative	0V
5	A	Absolute 485 communication phase A	
6	B	Absolute 485 communication phase B	

4) Control signal port

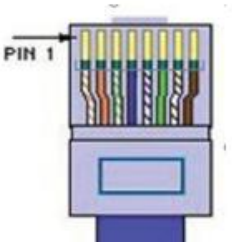
Pin number	Symbol	Name	Description
1	PUL+24	Pulse positive input	Pulse input 24V+
2	PUL+5	Pulse positive input	Pulse input 5V+
3	PUL -	Pulse negative input	Pulse input -
4	DIR+24	Direction positive input	Direction input 24V+
5	DIR +5	Direction positive input	Direction input 5V+
6	DIR-	Input 6	Direction input-
7	ALM+	Alarm positive	Internal triode 0C gate
8	ALM-	Alarm Negative	
9	EN+	Enable Positive	Supports 5-24V input
10	EN-	Enable negative	
11	VR+	Potentiometer positive	External 4.7K adjustable resistor
12	VR+	Potentiometer Negative	
13	O+	Output positive	Output function definable
14	B-	Brake negative	Brake negative
15	B+/24+	External 24V positive	External 24V supply positive, holding brake positive
16	O-/24-	External 24V power supply negative	External 24V power supply negative, output model negative

5）USB input port

The interface adopts the standard TypeC, which can be connected to our specialized software for parameter debugging.



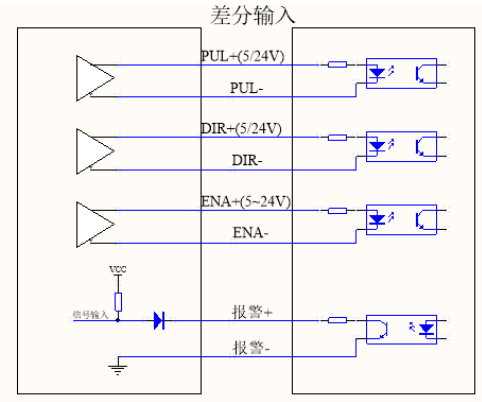
6）Communication network port



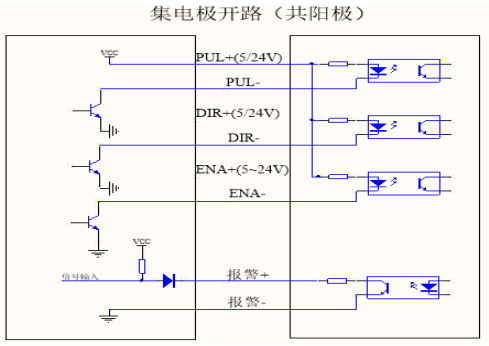
Communication interface	485A	485B	Isolated GND
RJ45 network port	1	2	5
It is recommended to use twisted shielded wire to ensure the quality of communication.			

2. Control signal interface circuit diagram

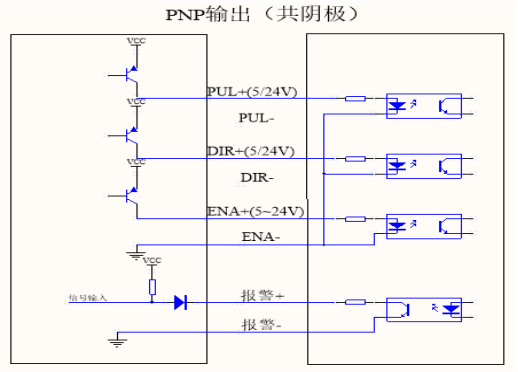
The control signal and input/output interface circuit diagrams are as follows



Differential



Common



Common
Cathode

3. Control signal timing diagram

In order to avoid some malfunctions and deviations, PUL, DIR and ENA should meet certain requirements, as follows
shown in Figure 4:

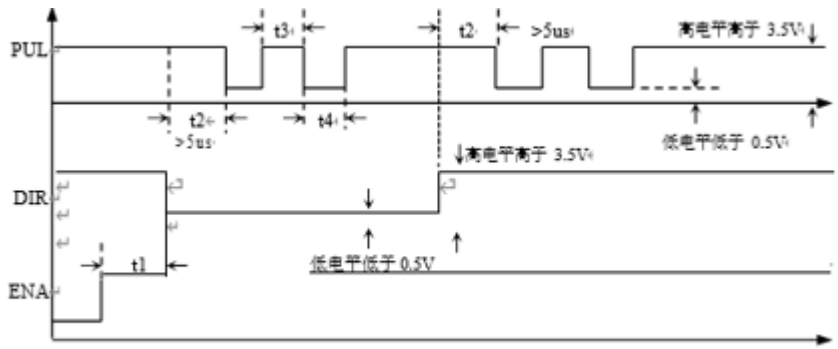


图 4 控制信号时序图

Notes:

(1) t1:ENA enable signal is at least 5us ahead of DIR, and it is generally recommended to suspend.

(2) t2:DIR determines its state high or low at least 5us in advance of the falling edge of PUL.

(3) t3:Pulse width greater than 2.5us.

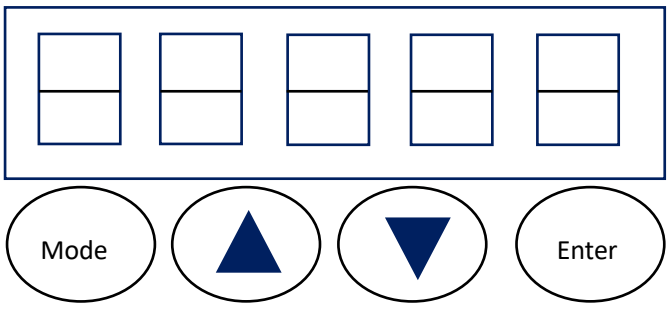
(4) t4:The width of low level is greater than 2.5us.

4. Control signal mode setting

Pulse trigger edge and single-double pulse selection: through the driver parameter (Pn) mode or PC software to set the pulse rising edge or falling edge trigger is valid; you can also set a single pulse or double pulse.

IV. Operating Panel

The keys below the digital tube screen from left to right are Mode, Up, Down and Enter.



The functions of the keys on the display board are shown in the table below:

Compared with the same type of drives on the market, SVD2300-RS has a more friendly HMI design, the drive will be automatically stored after setting the parameters, and when adjusting larger data (e.g., from 0 to 10,000), you can use the toggle key to switch the number to the 10,000 digit directly and set it to 1 through the up key, instead of having to keep pressing the up key, which greatly optimizes the process of parameter setting.

Key Name	Symbol	Function Introduction
Toggle	Mode	For mode switching and parameter digit switching
Up key	▲	For submenu switching and digit increase
Down key	▼	For submenu switching and digit decrease
OK key	Enter	For sub-menu switching and number confirmation

1. Mode Introduction

The complete parameters of each mode are shown in the table below. The drive has three functions:
Fn000 belongs to the historical alarm code view, after pressing the confirmation key to enter, you can use the up key to view the previous alarm code record of the drive;
Fn001 belongs to the restoration of factory settings, press the confirmation key to go in and then long press the confirmation key, if the screen displays donE after the need to re-power up, then the drive successful initialization;
Fn002 belongs to the trial run, after pressing the confirmation key to enter, you can make the motor rotate by long pressing the up key and down key.

Mode Name	Symbol	Function Introduction
Monitor Mode	RUN	Used for monitoring the status of various data (e.g., speed) of the motor and driver.
Parameter mode	Pn	Setting of the drive's internal parameters, excluding EtherCAT-related parameters.
Function mode	Fn	The drive has the functions of trial operation, restoration of factory settings and alarm code view.

2. Monitoring parameters

Monitoring parameter	Symbol	Function
Speed	SPEEd	For monitoring the motor speed in r/min
Encoder low	Enc_L	For monitoring the motor encoder position, this bit is low
Encoder high bit	Enc_H	Enc_H for monitoring the motor encoder position, this bit

		is high.
Input pulse low bit	Pul_L	For monitoring the number of pulses input to the driver, this bit is low
Input pulse high	Pul_H	High bit for monitoring the number of pulses to the input driver.
Position deviation low bit	PErr_L	For monitoring the position deviation of the motor, this bit is the low bit
Position deviation high bit	PErr_H	Position deviation of the motor, this bit is high.
IO status	Io_Io	Used to monitor the status of the drive IOs
Bus voltage	V_buS	Used to monitor the bus voltage of the motor in V
Current electrical angle	AngLE	For monitoring the current electrical angle
Torque monitoring	Trq-	for monitoring the torque
Drain time	P-duty	Used to display the Regenerative resistor working time

3. Drive internal parameters

Parameter number	Parameter name	Parameter value	Parameter range	Explanation
Pn000	Motor model	14615	5415A 8315A 11515 14615	5415A. 850W servo motor 8315A 1300W servo motor 11515 1800W servo motor 14615. 2300W servo motor
Pn001	Pulses per revolution	1000	200-65535	Number of pulses per revolution of the motor
Pn002	Default motor steering	0	0~1	0: Forward rotation 1: Reverse rotation
Pn003	Motor Rigidity	5	1~10	For setting motor rigidity
Pn004	Inertia Ratio	5	1~30	For setting the load motor inertia ratio
Pn005	Position loop Kp	7	1~100	For position PID setting
Pn006	Position feed forward	0	0~500	For position PID setting
Pn007	Current filter	20	0~65535	For current filtering
Pn008	Speed Filter	100	0~65535	For speed filtering
Pn009	Filter Smoothing Time	0	0~65535	Unit: us Command in place time, after setting, note that there may be

				a slight delay in place.
Pn010	Enable control signal polarity selection	1	0~1	0: high level 1: low level
Pn011	Fault output polarity selection	1	0~1	0: low level 1: high level
Pn012	Pulse input mode	0	0~1	0: pulse + direction 1: double pulse
Pn013	Pulse input edge selection	0	0~1	0: Rising edge, 1: Falling edge active
Pn014	Overload alarm detection time	10	0~65535	Overload alarm delay setting
Pn015	Number of position overrun turns	5	0~65535	Used to adjust the sensitivity of overload alarm, the alarm will be activated when the real-time deviation exceeds the set value
Pn016	Number of encoder lines for positioning completion	20	0~2500	In place accuracy
Pn017	Maximum speed limit	2000	200~3000	Maximum speed
Pn018	Positive torque limit	200	0~250	For forward torque limit
Pn019	Reverse torque limit	200	0~250	For reverse torque limit
Pn020	Acceleration time constant	0	0~65535	For internal control
Pn021	Deceleration time constant	0	0~65535	For internal control
Pn022	Manual speed	200	1~3500	For trial run
Pn023	Control mode	0	0~5	0: P-PUL External pulse mode 1: S -Io speed mode 2: S- Vr Potentiometer speed mode 3: P-485 RS485 position mode 4: S-485 RS485 speed mode 5: t-485 RS485 torque mode

Pn024	Monitor display adjustment	0	0~11	Power-on default display. 0: Main interface. 1: Rotation speed. 2, 3: Encoder low, high bit. 4, 5: Pulse low, high bit . 6, 7: Deviation pulse low, high. 8: Input and output Output I/O status. 9: Bus voltage. 10: Current electrical angle. 11: Current motor torque. 12: Regenerative resistor work duty cycle
Pn025	485 communication baud rate	3	1~6	1：4800 2：9600 3：19200 4：38400 5：57600 6：115200
Pn026	485 communication address	1	1~255	For communication address setting
Pn027	Encoder battery alarm	1	0~1	0: enable 1: disable
Pn028	Overheat alarm threshold setting	95	0~150	For Overheat alarm threshold setting
Pn029	OUT1 output function	0	0~1	0: In place 1: Z signal

The internal parameters of the drive can be set offline through the drive parameter (Pn) mode, and can also be set online by connecting the Nachuan servo drive software on the PC through the USB cable.

4. Fault alarm and treatment

Phenomenon	Problems	Solutions
Err_gL	Overcurrent	Disconnect the motor winding wire from the drive, restart the drive, if there is no alarm, please check the motor and motor power line for any abnormality; if the alarm is still there, the drive is damaged.
Err_CC	Exceeds the Position deviation	Check whether the motor power line wire sequence and encoder line are abnormal. Or whether the load is overloaded.
Err_gy	Overvoltage	Restart the drive, if the alarm still exists, check if the power supply voltage is too high.
Err_dy	Low	Restart the drive and if the alarm persists,

	voltage	check if the supply voltage is too low.
Err_SJ	Data error	Enter Fn001 interface after power on, long press enter key, power on again when 'done' appears
Err_En	Encoder alarm	Check whether the encoder wiring is abnormal.
Err_CS	Overspeed	Power off and restart, reduce speed
Err_g2	Overload	Check if the load is overloaded, then power off and restart
Err_gr	Overheat	Regenerative resistor is overheated, adjust the acceleration and deceleration.
Note: After solving the alarm or eliminating the causes of the alarm, the drive needs to be power on again to resume normal operation.		

V. Control mode and communication protocol

1. Conventional position control mode (Pn023 = P-PUL)

In conventional mode, the drive only receives external signals (pulse, direction, enable) to control the motor operation, and internal operation parameters can be read through the 485 bus.

Position mode setting: set Pn023 to P-PUL (factory default 0, position mode)
Connect the pulse input port: PUL+24/+5 connects to the positive pole of the pulse input port, PUL- connects to the negative pole of the pulse input port.
Connecting direction input: DIR+24/+5 to connect pulse input positive, DIR- to connect direction input negative
Setting driver enable: ENA+/- are connected to the controller enable port, factory default enable is on, you can not connect the control line.
Set the pulse number per revolution Pn001 parameter
Set the default direction Pn002
Adjust and set Pn003, Pn004, Pn0xx and other performance parameters.

2. External IO speed and torque control mode (Pn023 = S-IO)

2.1) External IO speed mode.

Adopting internal self-generated pulse, only need to access the corresponding high level in PUL port (PUL+24,PUL+5 corresponds to 24V and 5V) to run. The speed is controlled by the Pn022 parameter, and the default is 200 revolutions per minute. The running direction is controlled by DIR direction port just like pulse mode.

Speed mode setting: set Pn023 to S-IO.

Set the value of rotation speed: Pn022 (unit: rpm)

Connecting start/stop control signal: PUL+24/+5 connects to the positive terminal of pulse input port and PUL- connects to the negative terminal of pulse input port for start/stop control.

Connecting direction input: DIR+24/+5 connects to pulse input positive, DIR- connects to direction input negative, used for steering control.

Setting acceleration, deceleration and other related performance parameters Pn020, Pn021

2.2) Simple fixed torque mode

The motor takes Pn18 and Pn19 as the maximum torque, and moves according to the set speed of Pn22 before reaching the maximum torque; if the external torque reaches the set value, the motor will stop or be pushed back by the load.

Torque mode setting: Set Pn023 to S-IO.

Setting the value of rotation speed: Pn022 (unit: rpm)

Setting fixed forward/reverse torque, forward Pn018, reverse Pn019, unit is the percentage of motor rated torque

Connect start/stop control signal: PUL+24/+5 connects to the positive pole of pulse input port, PUL- connects to the negative pole of pulse input port for start/stop control.

Connecting direction input: DIR+24/+5 connects to pulse input positive, DIR- connects to direction input negative, used for steering control.

3. External potentiometer speed control mode (Pn023 = S-vr)

Using an external 4.7KΩ potentiometer, connect it to the driver between VR+ and VR- to adjust the speed between 0 and the manual setting speed.

Set rotational speed value: Pn022 (unit: rpm)

4. Modbus position, speed, torque and other control modes

Adopt Modbus protocol RTU mode.
Default communication parameters: baud rate 19200; check bits: odd parity (none), data bit 8, stop bit 1.

To modify the 485 communication baud rate and address you can adjust the following parameters:

Register	Register Content Definition	Default Value	Parameter Optional	Parameter Definition
Pn025	485 communication baud rate	3	1-6	1: 4800 2：9600 3：19200 4: 38400 5: 57600 6：115200
Pn026	485 communication address	1	1-255	For communication address setting

For 485 communication, parameter area, monitoring area, reserved area, and control area are set inside the driver, and the corresponding object dictionaries are as follows:

Area	Register address (Hexadecimal)	Data type/length	Data type/length
Parameter area	0x0000-0x0063	Parameter area	uint16
Monitor area (read-only, not modifiable)	0x0064	Alarm Code	uint16
	0x0065	Rotation speed	int16
	0x0066 (low 16 bits) 0x0067 (high 16 bits)	Current singleturn encoder reading information	int32
	0x0068 (low 16 bits) 0x0069 (high 16 bits)	Current lap encoder readout information	int32
Monitor Area (read-only, not modifiable)	0x006A (low 16 bits) 0x006B (high 16 bits)	Number of pulses	int32
	0x006C (low 16 bits)	Position error	int32

	0x006D (high 16 bits)		
	0x006E (low 16 bits) 0x006F (high 16 bits)	Test	int32
	0x0070	Voltage	uint16
	0x0071	Torque Percentage	int16
	0x0072 (low 16 bits) 0x0073 (high 16 bits)	Encoder angle	int32
	0x0074-0x00C7	Remaining address	uint16
Reserved area	0x00C8-0x0383	Reserved area	uint16
Control area	0x0384	Start-stop control	uint16
	0x0385	Position mode speed	uint16
	0x0386 (lower 16 bits) 0x0387 (high 16 bits)	Number of pulses to run	int32
	0x0388	Speed mode speed	int16
	0x0389	Torque mode torque	int16
	0x038A	Torque Arrival	uint16
	0x038B	Position Arrival	uint16
	0x038C (low 16 bits) 0x038D (high 16 bits)	Position Mode Speed	int32
	0x0390	EEPROM storage	uint16
	0x0392 (low 16 bits) 0x0393 (high 16 bits)	Position Mode Acceleration	int32
	0x0394 (low 16-bit) 0x0395 (high 16-bit)	Position mode deceleration	int32

4.1) ModBUS position control mode setting (Pn23 = P-485)

4.1.1) The user can control the servo to run at the set position via Modbus_RTU protocol 485 half-duplex communication.

Execute relative position movement, i.e., the actual motor position at the time the position

instruction trigger takes effect plus the position data in the position register as the next target position.

Register Address	Name of register	Parameter Range	Unit	Effective mode
0x0385	Position validation trigger	0,1		0 to 1 rising edge
0x0386 (low 16 bits) 0x0387 (high 16 bits)	Position	0x80000000- 0x7FFFFFFF	Number of pulses	
0x038B	Position Arrival	0: not in place. 1: in place		
0x038C (low 16 bits) 0x038D (high 16 bits)	Speed	0x80000000- 0x7FFFFFFF	Pulses per second	
0x0392 (low 16 bits) 0x0393 (high 16 bits)	Acceleration	0x80000000- 0x7FFFFFFF	Pulses/sec^2	
0x0394 (low 16 bits) 0x0395 (high 16 bits)	Deceleration	0x80000000- 0x7FFFFFFF	Pulse/sec^2	

4.1.2) Example

Pulses per revolution: 10 000 (Pn001=10 000)
Rotation speed: 20 rpm, i.e., 200 000 pulses/second
Acceleration: 500 000 pulses/sec^2
Acceleration: 500 000 pulses/sec^2
Bit shift: 100 revolutions positive. (If address 0x038C is positive, it is forward rotation; if negative, it is reverse rotation).
Slave number: 1

Modbus command control is shown in the table below:
Step 1: Panel set Pn023=4 (communication position mode), panel set station number to 1 (Pn026=1), power off and restart
Step 2: Set running speed 200 000 pulses/sec, (200 000=0x30D40).
Communication address 0x038C write 0x0D40.
Host sends data to servo 01 06 03 8C 0D 40 4D 05
Communication address 0x038D writes 0X0003.
Host sends data to servo 01 06 03 8D 00 03 59 A4

Step 3: Set the running acceleration 500 000 pulses/sec^2, (500 000=0x7A120).
Communication address 0x0392 writes 0xA120.
Host sends data to servo 01 06 03 92 A1 20 50 2B
Communication address 0x0393 writes 0x0007.

Host sends data to servo 01 06 03 93 00 07 38 61

Step 4: Set the running deceleration 500 000 pulses/sec^2, (500 000=0x7A120).

Communication address 0x0394 writes 0xA120.

Host sends data to servo 01 06 03 94 A1 20 B0 2A

Communication address 0x0395 writes 0x0007.

Host sends data to servo 01 06 03 95 00 07 D8 60

Step 5: Set the running position to 100 revolutions. (100*10 000 pulses/revolution = 1 000 000 = 0x000F 4240).

Communication address 0x0386 writes 0x4240.

Host sends data to servo 01 06 03 86 42 40 59 37

Communication address 0x0387 writes 0x000F.

Host sends data to servo 01 06 03 87 00 0F 79 A3

Step 6: Position register effective departure start stop. Write 0 to communication address 0x0385 followed by 1 to start.

Host sends data to servo 01 06 03 85 00 00 98 67

Host sends data to servo 01 06 03 85 00 01 59 A7

4.1.3) To stop the motor by braking during operation, the motor can be stopped by writing 0 to the position register. This is done by writing 0 to the 0x0386 and 0x0387 address registers, and then writing 0 to 0x0385 followed by 1.

Step 1: Set the running position 0.

Communication address 0x0386 write 0x0000.

Host sends data to servo 01 06 03 86 00 00 68 67

Communication address 0x0387 writes 0x0000.

Host sends data to servo 01 06 03 87 00 00 39 A7

Step 2: Position register takes effect to trigger start-stop. Write 0 to communication address 0x0385 followed by 1 to start.

Host sends data to servo 01 06 03 85 00 00 98 67

Host sends data to servo 01 06 03 85 00 01 59 A7

4.2) ModBUS speed control mode (Pn23 = S-485)

4.2.1) The user can control the servo to run at the set speed via Modbus_RTU protocol 485 half-duplex communication.

Object dictionary:

Register Address	Name	Parameter Range	Unit	Effective mode
0x0014	Acceleration time constant	0x0000~0xFFFF		
0x0015	Deceleration time	0x0000~0xFFFF		

	constant			
0x0017	Control mode	0x0000~0x0004		Power failure effective
0x0384	Start Stop	0x0000~0x0001		
0x0388	Speed	0xF448~0x0BB8	r/min	
0x0390	EEPROM memory	0x0000~0x0001		

4.2.2)Example:

The motor is running positively at 100r/min. (Positive rotation if the 904 running speed is positive, and reverse rotation if the target speed is negative.) Assuming that the slave station number is 1, the Modbus command control is shown in the table below:

Rotation speed: 100r/min Positive operation

Slave station number: 1

Modbus command control is shown in the table below:

Step 1: Panel set Pn023=4 (communication position mode), panel set station number to 1 (Pn026=1), power off and restart

Step 2: Set running speed 100r/min, (100=0x0064).

Communication address 0x0388 write 0x0064.

Host sends data to servo 01 06 03 88 00 64 08 4F

Step 3: Start operation.

Communication address 0x0384 write 1 to start.

Host sends data to servo 01 06 03 84 00 01 08 67

Step 4: Stop operation.

Communication address 0x0384 write 0 to stop.

Host sends data to servo 01 06 03 84 00 00 C9 A7

4.3) ModBUS torque control mode (Pn23 = t-485)

4.3.1) The user can control the servo to run according to the set torque via Modbus_RTU protocol 485 half-duplex communication.

Object dictionary:

Register Address	Name	Parameter range	Unit	Effective mode
0x0014	Acceleration time constant	0x0000~0xFFFF		
0x0015	Deceleration time constant	0x0000~0xFFFF		
0x0017	Control mode	0x0000~0x0004		Power failure effective

0x0384	Start Stop	0x0000~0x0001		
0x0388	Speed	0xF448~0x0BB8	r/min	
0x0389	Torque Percentage	0x0000~0x0064	%	
0x038A	Torque Arrival	0x0000~0x0001		
0x0390	EEPROM storage	0x0000~0x0001		

4.3.2)Example:

The motor is running at 100r/min positive. (Positive rotation if the 904 running speed is positive, and reverse rotation if the target speed is negative.) Assuming the slave station number is 1, the Modbus command control is shown in the table below:

Rotation speed: 100r/min Positive operation

Slave number: 1

Modbus command control is shown in the table below:

Step 1: Panel set Pn023=4 (communication position mode), panel set station number to 1 (Pn026=1), power off and restart

Step 2: Set running speed 100r/min, (100=0x0064).

Communication address 0x0388 write 0x0064.

Host sends data to servo 01 06 03 88 00 64 08 4F

Step 3: Set torque percentage 50%, (50=0x0032).

Communication address 0x0389 writes 0x0032.

Host sends data to servo 01 06 03 89 00 32 D9 B1

Step 4: Start operation.

Communication address 0x0384 write 1 to start.

Host sends data to servo 01 06 03 84 00 01 08 67

Step 5: Stop operation.

Communication address 0x0384 writes 0 to stop.

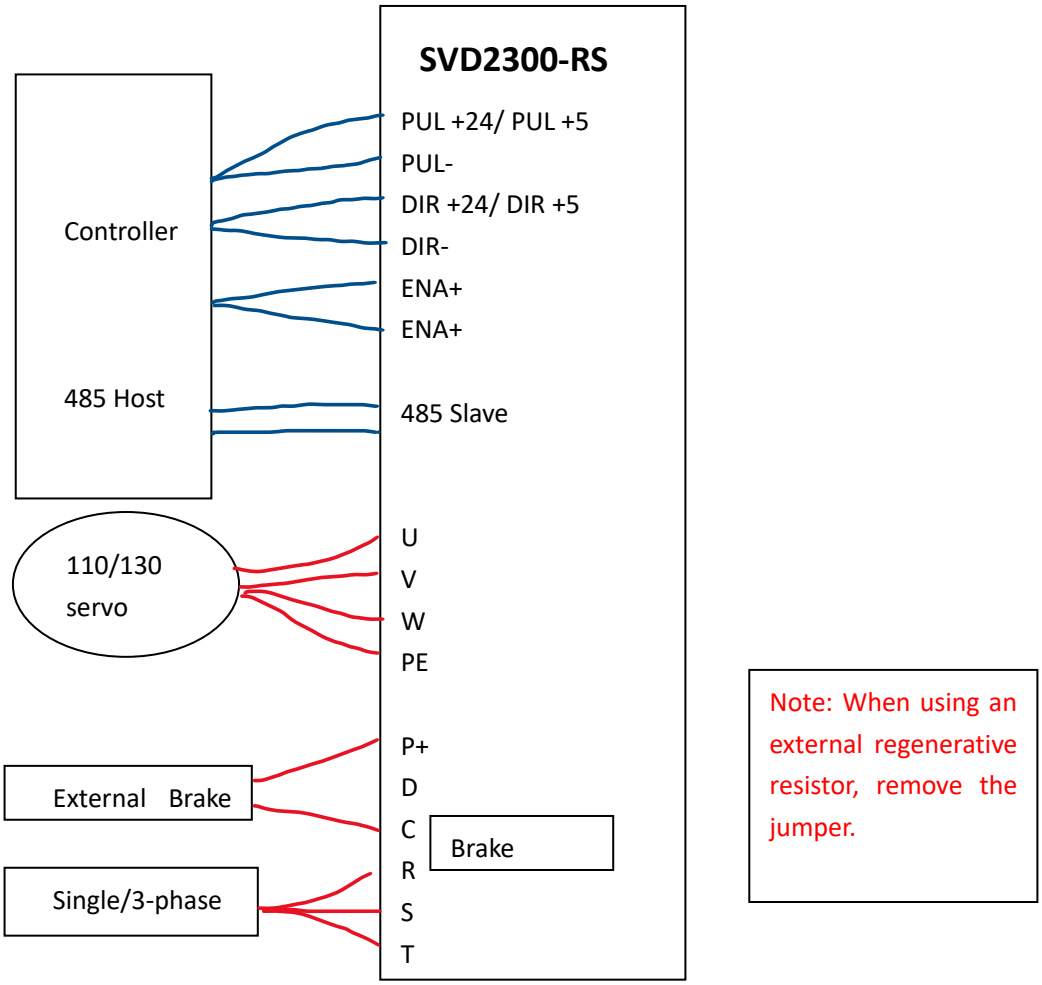
Host sends data to servo 01 06 03 84 00 00 C9 A7

When the driver detects that the torque has reached the set value, the servo will send a 1 to

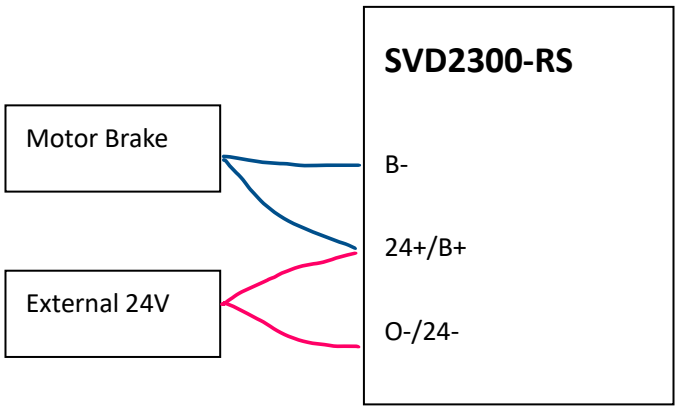
the host 0x038A address as well as a 1 output from the driver's O1 port to indicate that the torque has reached.

VI. Typical application wiring diagram

the SVD2300-RS drive and other components of the AC servo system's typical wiring diagram shown in Figure.



Typical Wiring Diagram for Brake Motor



Note:The motor holding brake must be controlled by the driver, otherwise an unexpected situation such as a flying motor may occur.

Warranty of Nachuan products

Ningbo Nachuan Automation Technology Co., Ltd. warrants its products against defects in raw materials and workmanship for a period of one year from the date of shipment. During the warranty period, Nachuan will provide free repair service for defective products.

Not included in the warranty:"
Improper wiring, such as mixing power and motor wires, and unplugging with electricity
Unauthorized alteration of internal components
Use beyond electrical and environmental requirements

Maintenance process:
Call Nachuan customer service for return authorization prior to shipment;
Send a written description with the shipment, describing the fault phenomenon of the returned drive, the voltage, current and the use of the environment at the time of the fault, the name of the contact person, telephone number and mailing address and other information.
Send the prepaid postage to 3/F, Building 3, Intelligent Equipment R&D Park, No.36 Moganshan Road, Beilun District, Ningbo, China Nachuan Automation Technology.

Warranty Limitations:
Warranty coverage of Nachuan products is limited to the product's devices and workmanship (i.e., consistency), improper use of the damage caused by the warranty is not included!
Nachuan company does not guarantee that its products can be suitable for the customer's specific purpose, because whether it is also suitable for the use of technical specifications and requirements and conditions of use and the environment, due to improper selection by the customer caused by the inapplicability of the problem, does not belong to the warranty.
The Company does not recommend the use of this product for clinical medical purposes.

Release Note

Version	Date	Changes
V1.0	2023.12.07	Initial version