

RT-SAM-2X

Modular servo valve amplifier without
electrical position feedback, single electromagnet
Design number: 2X series
Power supply range: 19~35VDC
Command types: $\pm 10V$, 4~20mA
(confirmed before leaving the factory)
Maximum output current: 0~1A
(confirmed before leaving the factory))



SAM

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Features

- The maximum current is adjustable from $\pm 10mA$ to $\pm 1000mA$.
- There are four - level current gears to choose from: $\pm 30mA$, $\pm 100mA$, $\pm 300mA$, $\pm 1000mA$.
- The front panel potentiometer or the host computer can be used for fine adjustment of the zero position and gain.
- The chatter frequency and chatter amplitude can be adjusted independently (on the host computer.).
- Fast - current drive mode ensures the dynamic characteristics of servo valves.
- The $\pm 10V$ reference voltage facilitates users to connect an external potentiometer.
- DIN 35mm rail installation

Ordering Model

RT-SAM	-	2X	-	A1	-	W5	-	F250
01		02		03		04		05

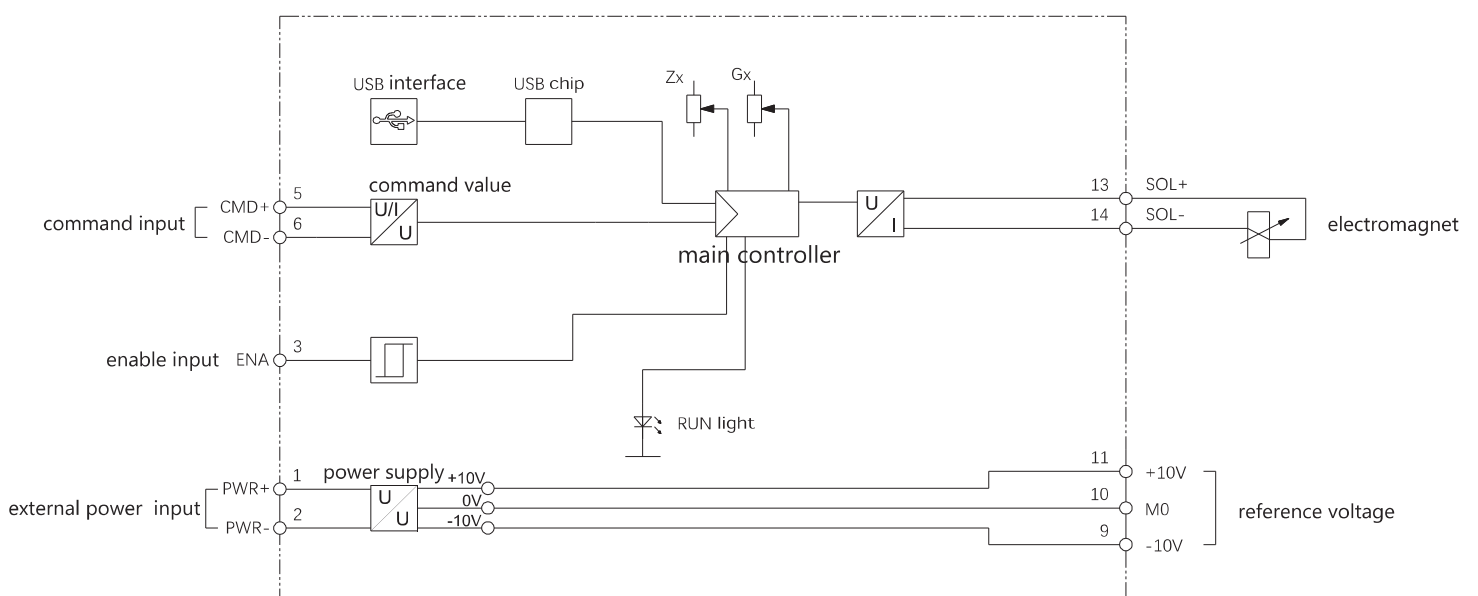
01	RT-SAM	Modular servo valve amplifier (positive and negative current output)
02	2X	The design number is of 2X series .
03	A1	The command input of $\pm 10V$
	F1	The command input of 4~20mA
04	W5	chatter amplitude is set to 5% by default at the factory.
	Wxx	Customers can customize the chatter amplitude value, and the selectable range of the amplitude is from 0 to 20%.
05	F250	The chatter frequency is set to 250 Hz by default at the factory.
	Fxx	Customers can customize the chatter frequency, and the selectable frequency range is from 50Hz to 500Hz.

Technical Data

SAM

Working Voltage	19~35 VDC (commonly 24VDC)
Maximum Power Consumption	< 25VA
No-load Current	≤100mA (24V)
Differential Signal Input	0~10 V, input impedance ≥100KΩ 4~20 mA, input impedance =100Ω (Specify before delivery, not switchable on site)
Resolution	≤1 ‰
Nonlinearity	≤1 ‰
Output of Actual Position Value	Four selectable ranges 10~30mA adjustable 30~100mA adjustable 100~300mA adjustable 300~1000mA adjustable
Chatter Frequency Chatter Amplitude	50~500Hz (settable) 0~20% (settable)
Enable Input	0<U<1.5V: when the amplifier is operating, the green light is always on. 2.5V<U<UB: when the amplifier is not working, the green light flashes.
Operating Temperature Storage Temperature Operating and Storage Humidity	-20~70℃ -25~85℃ 0%~90%
Connection Types	Plug-in threaded fastening terminals

Principle Block Diagram



Terminal Definition

Terminals		Function Descriptions
1	PWR+	External power input, 24VDC
2	PWR-	
3	ENA	Low - level enable $0 < U < 1.5V$, the amplifier is operating and the green light is always on. $2.5V < U < U_B$, the amplifier is not operating and the red light is always on.
4	N.C.	Not connected
5	CMD+	Analog command input Type A1: 0~10 V, input impedance $\geq 100 \text{ K}\Omega$. Type F1: 4 - 20 mA, input impedance = 100 Ω .
6	CMD-	
7	N.C.	Not connected
8	N.C.	
9	-10V	Reference voltage, which is used to connect an external potentiometer for control.
10	M0	
11	+10V	
12	N.C.	Not connected
13	SOL+	Electromagnet
14	SOL-	
15	N.C.	Not connected
16	N.C.	

① A positive given input value (0 to +10V or 12 to 20mA) applied to pins 5 and 6 will cause a positive current to be generated at pins 13 and 14. A negative given input value (0 to -10V or 12 to 4mA) applied to pins 5 and 6 will cause a negative current to be generated at pins 13 and 14.

Display and Adjustment

Indicator light display

Status of the RUN indicator light	Descriptions
Green light always on	Normal
Green light flashing	Disabled

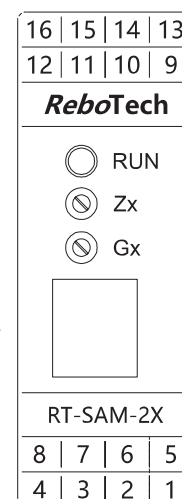
Potentiometer adjustment

Potentiometer name	Descriptions
Zx	Current zero - position adjustment. Adjust when the output current is asymmetrical.
Gx	Current gain adjustment. Adjust when the maximum current doesn't meet the actual requirements.

Attention: The DIP switch J6 - 2 must be set to the OFF state (the default setting at the factory is OFF) before the potentiometer can be used to adjust the zero - position and gain. If adjustment via the host computer is required, please contact rboTech Company.

Communication interface function

Communication interface types	Descriptions
USB2.0-B(square port)	Connect the computer and the amplifier via a USB data cable, and you can perform a wide range of parameter settings. For details, please see the user manual of the host computer software.



Note: Please use data cables from legitimate manufacturers for connection. Otherwise, it may lead to failed connection with the host computer!

Parameter Table

Serial Number	Item	Factory-set Value	Value Range	Unit	Descriptions
1	Chatter Amplitude ①	5	0~20	%	recommended to keep the factory - set values
2	Chatter Frequency ①	250	50~500	Hz	recommended to keep the factory - set values
5	Command Gain ②	1	0.001~10		
6	Command Zero ③	0	±100	%	

① It is recommended to keep the factory - set values for both "chatter amplitude value" and "chatter frequency". If the valve experiences jitter orh as a large hysteresis loop, adjusting these two parameters may lead to improvement.

② The "command gain" is used to adjust the maximum output current. In scenarios where highly precise current control is required, it is advisable to connect a DC ammeter in series at the electromagnet end for calibration. (Specifically, set the given command to 100%, and then adjust the " command gain" by observing the actual value on the ammeter until the actual value reaches the desired level.)

③ It is recommended to maintain the factory - set value for "command zero". Compensation should be carried out when there is an offset in the zero - position of the output current. It is advisable to connect an ammeter in series for observation and adjustment.

Warning: If you need to measure the actual driving current using an instrument, you must connect the ammeter in series in the servo valve coil circuit for measurement. It is strictly prohibited to directly short - circuit terminals 13 and 14 with the ammeter for measurement. Otherwise, there is a risk of burning out the internal circuits of the amplifier!

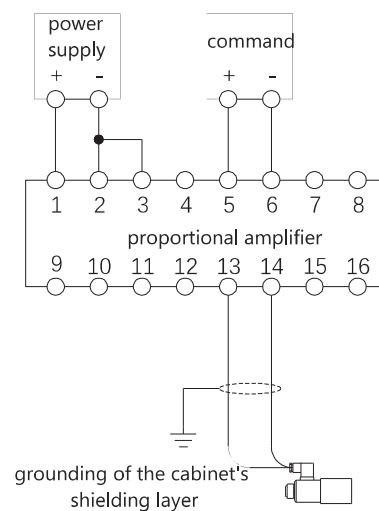
Wiring Examples

Example 1

Give an analog commands through PLC, CNC, acquisition card, etc.

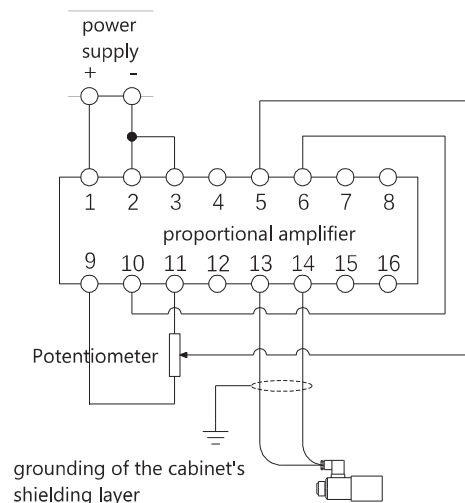
The analog commands can be any signal of ±10V, 4~20mA

Note: The command type has been determined at the factory and cannot be changed on site.

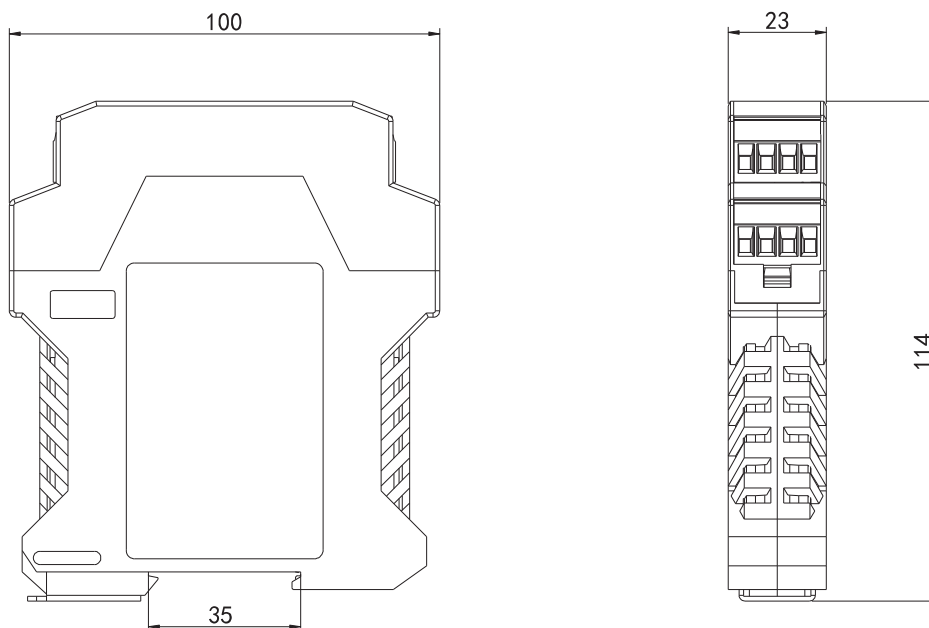


Example 2:

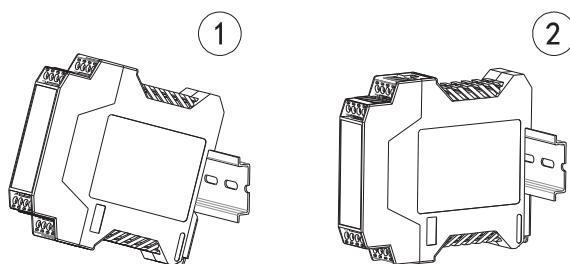
Give an analog command through a potentiometer. Connect the potentiometer to the reference voltage of the amplifier. Note: It is recommended to use a potentiometer with a resistance value of 5KΩ or 10KΩ.



Overall Dimensions (Unit: mm)

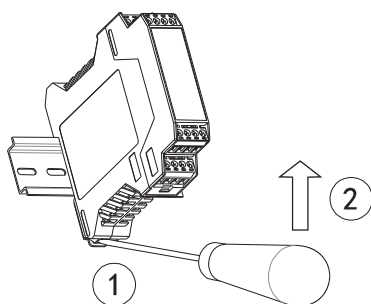


Installation Guidance



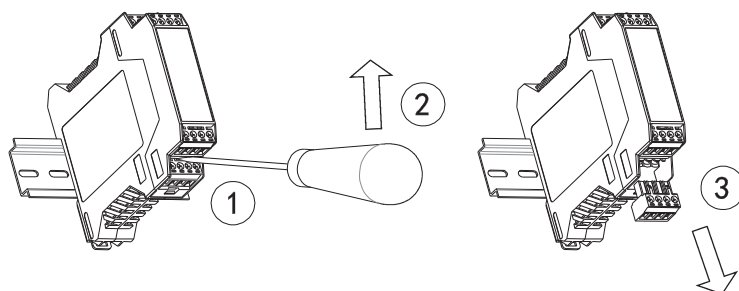
Amplifier Installation:

1. Clip the upper end of the back bayonet of the amplifier onto the guide rail
2. Press the lower front of the amplifier by hand until you hear a "click", meaning it's installed properly.



Amplifier Removal:

1. Insert a flathead screwdriver into the bottom latch.
2. Push the handle of the screwdriver in the direction shown in the illustration to remove the amplifier from the guide rail.



Terminal Disassembly:

1. Insert a flathead screwdriver into the gap between the terminal and the housing.
2. Push the handle of the screwdriver in the direction shown in the illustration to separate the terminal from the socket.
3. Pull out the terminal in the direction shown in the illustration.

Instruction: If it is necessary to replace the amplifier on site, the terminals can be directly disassembled and then a new amplifier can be inserted. There is no need to repeatedly disassemble and assemble the wires. This effectively avoids amplifier failures caused by incorrect wiring.

- The amplifier can only be plugged in or unplugged when the power is off!
- When connecting to the electromagnet, do not use plugs with freewheeling diodes or LED displays!
- When measuring the amplifier, instruments with $R_i > 100k\Omega$ must be used!
- Use relays with gold contacts to switch the command values (low voltage, low current)!
- When using external control, the maximum fluctuation of the control voltage should not exceed 10%!
- The distance from antennas, wireless power sources and radar equipment must be greater than 1m!
- Don't lay the electromagnet and the command value cables near the power cables!
- For coil cables with a length within 50 m, wires with a wire diameter of 1.5mm^2 are applicable. If longer cables are needed, please contact us!
- Suggestion: The connections of the electromagnet should also be shielded!
- The electrical signals generated by the amplifier (such as the reference voltage +10V) are not allowed to be used as functional signals related to equipment safety! Please refer to the European standard "EN 982:1996 Safety of machinery - safety requirements for fluid power systems and their components - Hydraulic power transmission devices"!