8.3 Using absolute encoders

If the servo motor with an absolute encoder is used, an absolute value detection system can be set in the instruction control unit. Thus after power on again, the motor can directly run without zero reset.

Encoder type	Resolution	Data output range	Action when exceed the limit
Absolute encoder with multi-turn memory	17-bit	-32768 ~+32767	• When going beyond the upper limit (+32767) of positive rotation direction, the multi-turn data become -32768. • When going beyond the lower limit (-32768) of reverse rotation direction, the multi-turn data become +32767.

When multi-turn data overflows, E.58 will output. PA007.1 can disable this alarm

Parameter		Meaning
PA007	d.□□0□	Multi-turn data overflows will output E.58 (default).
	d.□□1□	Multi-turn data overflows will not output E.58

8.3.1 Absolute encoder selection

Parameter		Meaning
PA002	d.□0□□	Use absolute encoders as incremental encoders. (default)
	d.□1□□	Use absolute encoders as absolute encoders.

- When use absolute encoders as incremental encoders, no battery is needed.
- After modifying this parameter, restart the servo to take effect.

8.3.2 Using battery for absolute encoder

Even the power is OFF, a battery is needed to back up data, so that the absolute encoder can save the position information.

(1) Battery selection

Please make preparations according to the specification of instruction control unit; the battery shall be the product equivalent to ER3V (3.6V, 1000mA TOSHIBA battery).

(2) Battery installation

The battery shall be mounted inside the battery case of the encoder cable; pay close attention not to reverse the polarities.

8.3.3 Battery replacement

When the battery voltage drops to be below 3.1V, the servo drive will output "17-bit serial encoder battery warning (A.97) ". But this warning only output when the servo drive is ON. If the battery voltage is ultralow when the servo drive is powered on, the servo drive will not give any warning. User can modify warning for ultralow battery voltage.

- **Procedures to replace the battery**

1. Please replace the battery when the control power of servo drive is ON.
2. After replacing the battery, please make the servo drive power OFF, so as to clear "17-bit serial encoder battery warning (A.97) ".
3. Restart the power of servo drive; if there is no abnormal action, the battery is successfully replaced.

Important

When the control power supply of servo drive is OFF and the battery connection has been moved (so has the encoder line), data inside the absolute value encoder will be lost. Therefore, setting of absolute value encoder is necessary. Please refer to Chapter 6.13 Setting up absolute encoders (AF 11).

8.3.4 Setting up absolute encoders (AF 11)

Please refer to Chapter 6.13 Setting up absolute encoders (AF 11).

This function is used under the following conditions:

- Absolute encoder is used for the first time;
- There are alarms related to absolute encoders;
- User intends to set quantity of turns of a multi-turn encoder to 0.

Notes:

- Servo must be OFF;
- A-RST cannot clear alarms related to absolute encoders;
- Power off and power on again after setting;
- This operation will set quantity of turns of a multi-turn encoder to 0 and clear all alarms related to absolute encoders

After AF 11 is done, please restart the servo drive.

8.4 Position control operations

8.4.1 Parameter settings

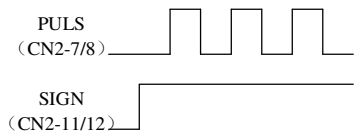
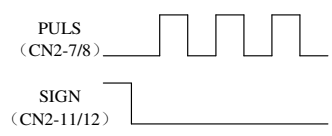
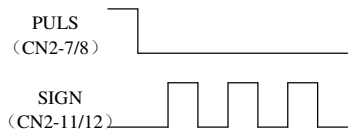
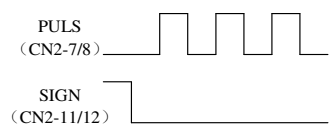
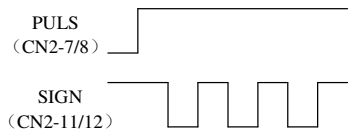
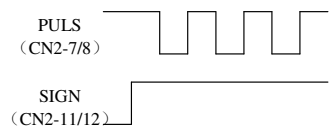
When using pulses for position control, please pay attention to following parameters.

1) Control mode selection

Parameter		Meaning
PA000	h.□□0□	Position control (pulse train)

2) Pulse form selection

Type		Signal	CN2 Pin
Input	Low speed channel (<500 Kbps)	PULS+	43
		PULS-	41
		SIGN+	39
		SIGN-	37
	High speed channel (<4 Mbps)	HPULS+	38
		HPULS-	36
		HSIGN+	42
		HSING-	40

Parameter		Pulse form	Forward rotation	Reverse rotation
PA200	d.□□00	PULS+ SIGN		
	d.□□01	CW+ CCW		
				
	d.□□02	A phase + B phase