32 SERVO TOOL CHANGE FUNCTION

32.1 OUTLINE

32.1.1 Feature of Function

- It is possible to switch more than two servo tools without power off robot controller.
- Switching the air drive tool and the servo tool is also available.

What is a servo tool?

A servo tool is a tool having an axis that is driven by a servo motor controlled by a robot controller.

32.1.2 Basic Specification

The total number of changeable tool	9 for one-axis servo tool change 4 for two-axis servo tool change 3 for three-axis servo tool change Only one tool can be controlled at the same time.
The period of tool detach (standard)	0.4 sec (Battery type) / 0.4 sec(Battery less type) *1)
The period of tool attach (standard)	4 sec(Battery type) / 6 sec(Batteryless type) *1)
Tool axis pulse backup battery	Both battery type and batteryless type can be available.*2)

(*1) The period includes the internal processing period, not include the period of robot motion for changing the tools.

(*2) The batteryless type is not available for multi-axis servo tool change.

32.1.3 Restrictions

Restrictions matters

- Switching is possible only between servo tools that are set within the same motion group.
- Because servo tools that do not have a battery for tool axis pulse value backup require calibration after they are attached, these tools require longer processing time for tool change than battery-equipped tools.
- The motor of the tool change must be controlled by the same amp.
- The tool change instruction can not be used by multi task. (The tool change instruction can not be executed by plural tasks at the same time.)
- Installing both the servo tool change function and servo gun change function cannot be done.
- On a system with the servo tool change function installed, the dynamic brake release function cannot be used for servo guns.
- The motion group that the tool change function is enabled must be used a final group in the system.

Prohibition matters

- Do not force to detach the tool while the controller is off.
- The line tracking can not be used with the tool change function.

Notes on using the batteryless type

- When calibration motion type 1 or 2 is selected, calibration cannot be interrupted by a hold or emergency stop. (Program execution must not be stopped during tool attach processing.)
- When calibration motion type 3 or 4 is selected, the stroke limit must be expanded so that the tool axis touches the open limit.

- When calibration motion type 5 or 6 is selected, a detection switch such as a limit switch or dog switch must be installed in the tool.

For details of the calibration motion types, see Section 32.4, "TOOL CHANGE SETUP".

Notes on using multi-axis servo tool

- The servo tool number must be assigned to successive axes.
- The servo tool must have the pulse backup battery.
- To change two-axis servo tool, the two-axis tool change unit must be used.
- To change three-axis servo tool, the three-axis tool change unit must be used.
- Four (or more)-axis servo tool cannot be changed.

NOTE

When a Pulsecoder αiAR128(A860-2010-T341) shipped until May of 2006 is used, alarm SRVO-068(DTERR) occurs at turning power on and executing TOOL ATTACH instruction. Implement either of following countermeasures.

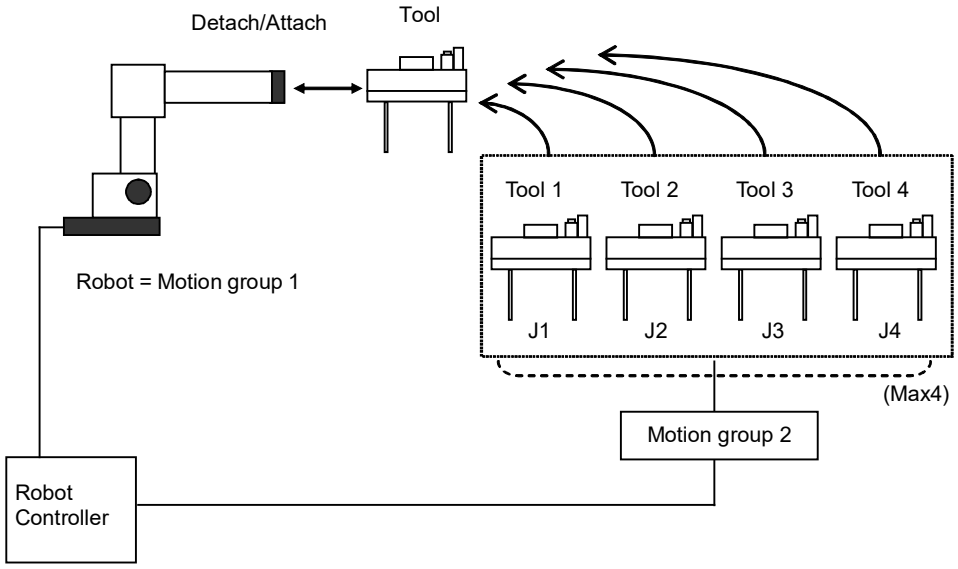
1. Replace Pulsecoder αiAR128 with one shipped after June of 2006.
2. Change system valuables as follows.
   - $SHC_ITF[#].$WAITTM_PCHK = 270
   - $SHC_ITF[#].$WAITTM_PWUP = 550
   - $SHC_ITF[#].$SVON_DELAY = 230
   - $SHC_ITF[#].$WAITTM_STRT = 650

   # is group number of servo tool group using Servo Tool Change Function.

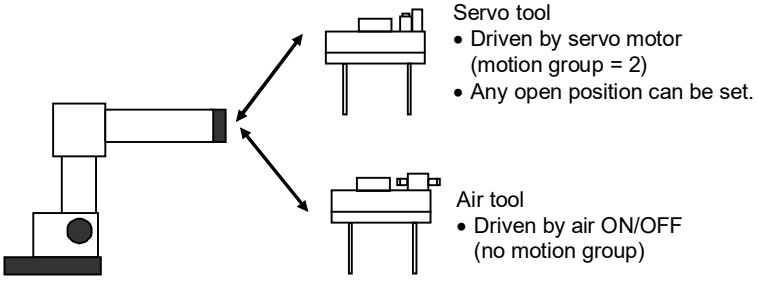
When you implement 2nd countermeasure, tool attach process is extended by about 2 seconds.

32.1.4 System Configuration

One-axis servo tool change system is constructed as follows.



You can replace the servo tool with the air tool by switching on the controller.



32.1.5 Outline of Installation

