

Instruction manual on A10BAT Battery

SAFETY PRECAUTIONS

(Always read before starting use)

Before using this product, please read this manual carefully and pay full attention to safety to handle the product correctly. The instructions given in this manual are concerned with this product. For the safety instructions of the programmable controller system, please read the CPU module user's manual.

In this manual, the safety instructions are ranked as "WARNING" and "CAUTION".



WARNING

Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.



CAUTION

Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight personal injury or physical damage.

Note that the CAUTION level may lead to a serious consequence according to the circumstances. Always follow the instructions of both levels because they are important to personal safety. Please keep this manual in a safe place for future reference and also pass this manual on to the end user.

INSTALLATION PRECAUTIONS

WARNING

- Do not disassemble, modify, heat, place in fire, short circuit, or solder the A10BAT. Mishandling of the A10BAT can cause overheating, cracks, or ignition which could result in injury and fires.

CAUTION

- Use the A10BAT in the environment that meets the general specifications described in the user's manual for the CPU module used.
- Do not drop or give an impact to the A10BAT. Doing so may damage the A10BAT, causing the battery fluid to leak inside the battery.
- Make sure that no foreign substances enter from the openings on top and bottom while using the A10BAT.

CONDITIONS OF USE FOR THE PRODUCT

- Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions:
 - where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
 - where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.
- The PRODUCT has been designed and manufactured for the purpose of being used in general industries.

MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY THE PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR THE PRODUCT.

("Prohibited Application")

Prohibited Applications include, but not limited to, the use of the PRODUCT in:

 - Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
 - Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
 - Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above, restrictions Mitsubishi may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTS are required. For details, please contact the Mitsubishi representative in your region.

1. Overview

This instruction manual explains specifications and handling instructions on the large capacity battery of A10BAT for MELSEC-AnS series CPU modules.

2. Specifications

Item	Specification
Model name	A10BAT
Battery type	Lithium/Thionyl chloride primary battery (assembled battery)
Initial voltage	3.6V DC
Nominal current capacity	13600mAh (1700mAh × 8 pcs)
Storage life	5 years (at normal temperature)
Backup time after power OFF	Refer to section 3.1
Application	For memory backup of IC-RAM and retention of power failure
Dimensions	A10BAT battery 102mm(4.02inch)(H) × 109.5mm(4.31inch)(W) × 35mm(1.38inch)(D)
Accessory	A8BAT connection cable (AC08BAT) × 1

3. Applicable CPU modules

Model name	Target hardware version
A2USHCPU-S1	G or later
A1SHCPU	J or later
A1SJHCPU	S or later
A1SJHCPU-S8	J or later
A2SHCPU	F or later
A2SHCPU-S1	F or later

4. Battery life and procedure for replacement

4.1 A10BAT

Battery life on each CPU depending on the power-on ratio is shown in the following table.

CPU module type	Power-on time ratio*1	Guaranteed value*2 Ambient temperature 75 °C	Actual value (reference value)*3		After SM51, SM52 ON (Backup time after alarm)*4
			Ambient temperature 40 °C	Ambient temperature 25 °C	
			A2USH CPU-S1	0%	
A1SHCPU	30%	32,400hr 3.7 years	43,800hr 5.0 years	43,800hr 5.0 years	360hr 15 days
	50%				
	70%				
	100%				
A1SJH CPU(-S8)	0%	32,400hr 3.7 years	43,800hr 5.0 years	43,800hr 5.0 years	360hr 15 days
	30%				
	50%				
	70%				
A2SHCPU	0%	32,400hr 3.7 years	43,800hr 5.0 years	43,800hr 5.0 years	360hr 15 days
	30%				
	50%				
	70%				
A2SHCPU -S1	0%	18,200hr 2.08 years	43,800hr 5.0 years	43,800hr 5.0 years	198hr 8.2 days
	30%				
	50%				
	70%				
	0%	26,000hr 2.97 years	43,800hr 5.0 years	43,800hr 5.0 years	
	30%				
	50%				
	70%				
	0%	36,400hr 4.16 years	43,800hr 5.0 years	43,800hr 5.0 years	
	30%				
	50%				
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	30%				
	50%				
	70%				

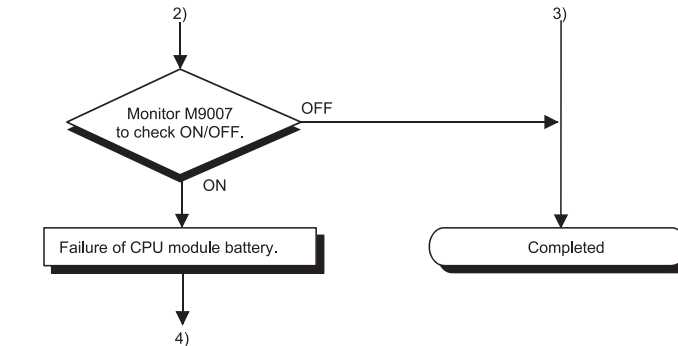
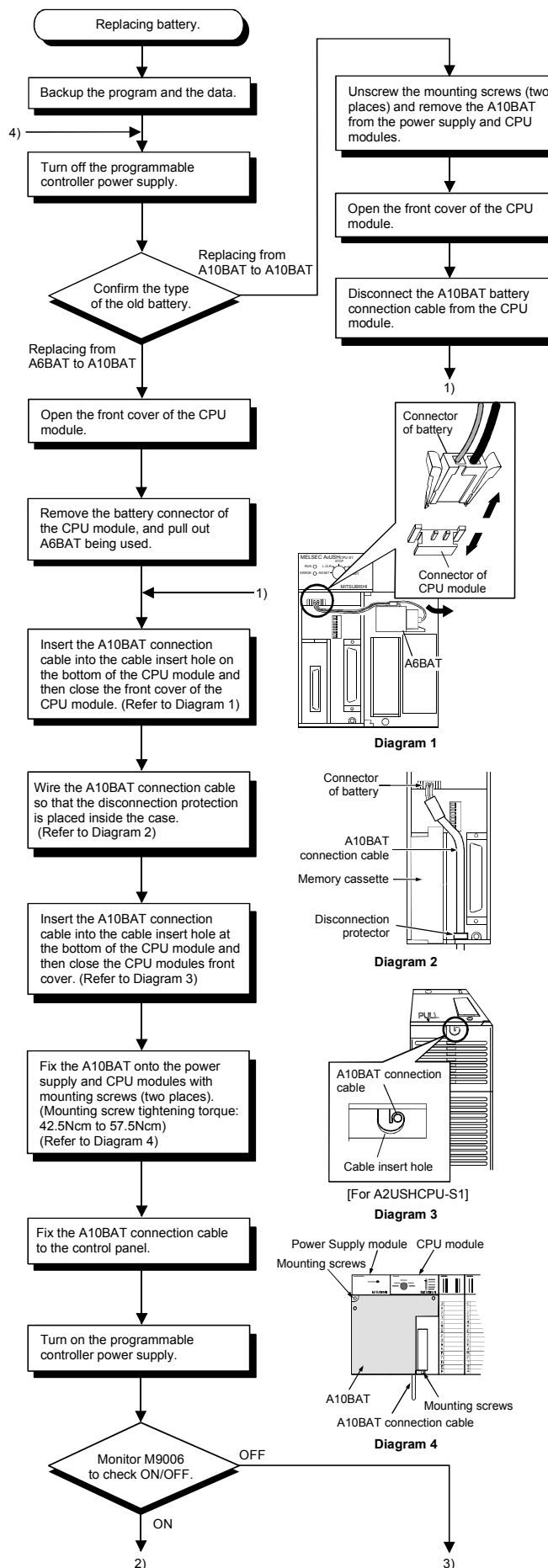
- *1: The power-on time ratio indicates the ratio of programmable controller power-on time to one day (24 hours). (When the total power-on time is 12 hours and the total power-off time is 12 hours, the power-on time ratio is 50%.)
- *2: The guaranteed battery service life; equivalent to the total power failure time that is calculated based on the characteristics value of the memory (SRAM) supplied by the manufacturer and under the storage ambient temperature range of -25 to 75 °C (operating ambient temperature of 0 to 55 °C).
- *3: The actual battery service life; equivalent to the total power failure time that is calculated based on the measured value and under the storage ambient temperature of 40 °C and 25 °C. This value is intended for reference only, as it varies with characteristics of the memory.
- *4: In the following status, the backup time after power OFF is 3 minutes.
- The battery connector is disconnected.
 - The lead wire of the battery is broken.

POINT

- Do not use the battery exceeding its guaranteed life.
- If it is expected that the battery may be used exceeding its guaranteed life, take the following measures: operate the system by ROM so that the program can be protected even if the battery runs out while the programmable controller is powered OFF, or back up programs and data in advance after SM52 turns on (within the backup time after alarm occurrence).
- When the A10BAT is not connected to the CPU module, its service life is five years from the date indicated on the rating plate.
- When the battery-low special relay M9007 turns on. Immediately change the battery. However, if the alarm has not yet occurred, it is recommended to change the battery periodically according to the operating condition.

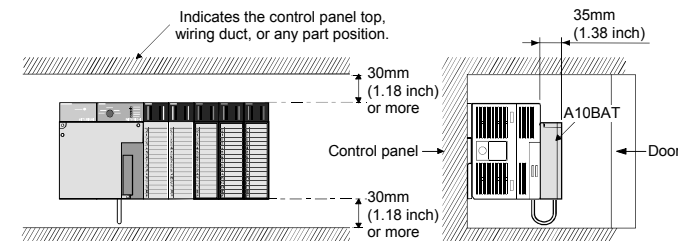
4.2 Connecting procedure of A10BAT

Indication for replacement from A6BAT to A10BAT, and replacement of life-ended A10BAT is as follows. The power for programmable controller needs to be ON for 10 minutes or longer before battery removal. Make sure to complete the battery replacement within 3 minutes. Failure to do so may delete the data in memory, although it includes a condenser to back up the memory for a while without battery. When the MELSEC-AnS series is used as a UL-certified product, the A10BAT replacement must be done by service personnel. The service personnel are defined as experienced technicians who have been sufficiently educated and trained, and are capable of perceiving and avoiding operational hazard.



5. Precautions for connecting A10BAT

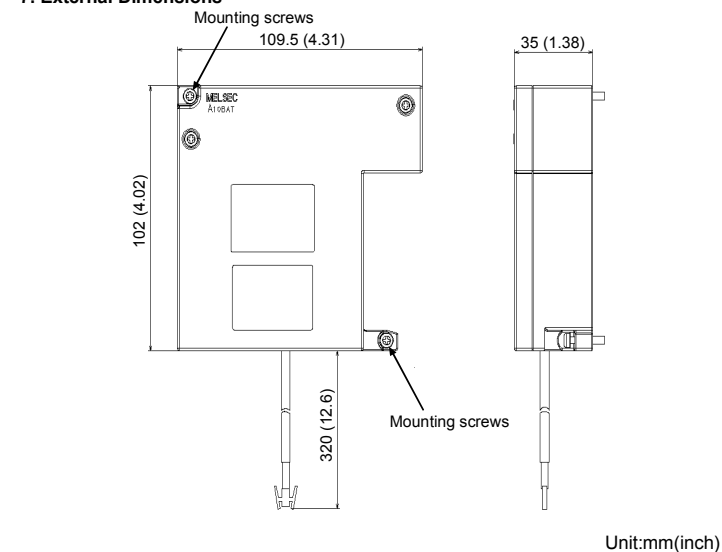
- For the battery connector, carefully pull out the connector so that the A10BAT connection cable will not be damaged.
- When connecting the connection cable, make sure that the connection cable does not interfere with the battery holder or memory cassette. If the cover of the CPU module is closed in the interfering condition, excessive stress is put on the connection cable and can damage the cable. Check that the cover of the CPU module is closed properly without interfering with the connection cable, and then mount the battery unit.
- Fix the A10BAT connection so that the disconnection protector on the cable is placed inside of the case.
- In an environment with constant vibration, make sure to fix the base unit with screws.
- Note that the connector and cable can be damaged from shifting and swaying of cable or carelessly pulling the cable.
- When replacing the battery unit, connect the new battery within three minutes after disconnecting the battery connection cable from the CPU connector.
- When using the A10BAT, add-on connection for peripheral equipment (such as A7PUS) is not available. Use the peripheral equipment with handheld connection.
- When setting the A10BAT, ensure the space as indicated below.



6. Disposal of batteries

When disposing of batteries, separate them from other wastes according to the local regulations. (For details of the battery directive in EU member states, refer to the user's manual for the CPU module used.)

7. External Dimensions



8. Transportation precautions

As they include lithium, the A8BAT must be treated as Class 9 dangerous goods. Prior to shipment, Mitsubishi packs products properly in order to ensure safety. However, when transporting the products, which are unpacked once or repacked after purchase, make sure to observe the dangerous goods regulations of the country as well as IATA Dangerous Goods Regulations and IMDG code. Also, consult and determine the details with the transportation company.