

# Instruction manual on A8BAT-SET Battery

This instruction manual explains specifications and handling instructions on the large capacity battery of A8BAT-SET for MELSEC-A/QnA series CPU modules.

## 1. Specifications

Item	Specification
Model name	A8BAT
Battery type	Lithium/Thionyl chloride primary battery (assembled battery)
Initial voltage	3.6V
Nominal current capacity	15300mAh (1700mAh × 9 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	A8BAT battery
	A8BAT connection cable
Accessory	A8BAT connection cable (AC08BAT) × 1

## 2. Applicable CPU modules

Model name	Target hardware version
Q2ASHCPU	H or later
Q2ASHCPU-S1	H or later
Q4ACPU	P or later
Q4ARCPU	L or later
A2USHCPU-S1	G or later
A1SHCPU	J or later
A1SJHCPU	S or later
A1SJHCPU-S8	J or later

## 3. Battery life and procedure for replacement

### 3.1 A8BAT battery life

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

CPU module type	Power-on time ratio	Battery life			
		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	
Q2ASH CPU	0%	8,500hr 1.0 years	27,500hr 3.1 years	32,400hr 3.7 years	90hr 3 days
	30%	12,100hr 1.4 years	39,300hr 4.5 years	43,800hr 5.0 years	90hr 3 days
	50%	17,000hr 1.9 years	43,800hr 5.0 years	43,800hr 5.0 years	90hr 3 days
	70%	28,300hr 3.2 years	43,800hr 5.0 years	43,800hr 5.0 years	90hr 3 days
	100%	43,800hr 5.0 years	43,800hr 5.0 years	43,800hr 5.0 years	90hr 3 days
Q2ASH CPU-S1	0%	6,900hr 0.8 years	27,500hr 3.1 years	32,400hr 3.7 years	70hr 2 days
	30%	9,900hr 1.1 years	39,300hr 4.5 years	43,800hr 5.0 years	70hr 2 days
	50%	13,900hr 1.6 years	43,800hr 5.0 years	43,800hr 5.0 years	70hr 2 days
	70%	23,200hr 2.6 years	43,800hr 5.0 years	43,800hr 5.0 years	70hr 2 days
	100%	43,800hr 5.0 years	43,800hr 5.0 years	43,800hr 5.0 years	70hr 2 days
Q4A CPU	0%	14,100hr 1.6 years	27,300hr 3.1 years	32,400hr 3.7 years	170hr 7 days
	30%	20,200hr 2.3 years	39,100hr 4.5 years	43,800hr 5.0 years	170hr 7 days
	50%	28,300hr 3.2 years	43,800hr 5.0 years	43,800hr 5.0 years	170hr 7 days
	70%	43,800hr 5.0 years	43,800hr 5.0 years	43,800hr 5.0 years	170hr 7 days
	100%	43,800hr 5.0 years	43,800hr 5.0 years	43,800hr 5.0 years	170hr 7 days
Q4AR CPU	0%	10,900hr 1.2 years	27,300hr 3.1 years	32,400hr 3.7 years	130hr 5 days
	30%	15,600hr 1.8 years	39,100hr 4.5 years	43,800hr 5.0 years	130hr 5 days
	50%	21,800hr 2.5 years	43,800hr 5.0 years	43,800hr 5.0 years	130hr 5 days
	70%	36,400hr 4.2 years	43,800hr 5.0 years	43,800hr 5.0 years	130hr 5 days
	100%	43,800hr 5.0 years	43,800hr 5.0 years	43,800hr 5.0 years	130hr 5 days
A2USH CPU-S1	0%	29,100hr 3.3 years	43,800hr 5.0 years	43,800hr 5.0 years	670hr 27 days
	30%	41,600hr 4.7 years	43,800hr 5.0 years	43,800hr 5.0 years	670hr 27 days
	50%	43,800hr 5.0 years	43,800hr 5.0 years	43,800hr 5.0 years	670hr 27 days
	70%	43,800hr 5.0 years	43,800hr 5.0 years	43,800hr 5.0 years	670hr 27 days
	100%	43,800hr 5.0 years	43,800hr 5.0 years	43,800hr 5.0 years	670hr 27 days
A1SHCPU	0%	32,400hr 3.7 years	43,800hr 5.0 years	43,800hr 5.0 years	400hr 16 days
	30%	43,800hr 5.0 years	43,800hr 5.0 years	43,800hr 5.0 years	400hr 16 days
	50%	43,800hr 5.0 years	43,800hr 5.0 years	43,800hr 5.0 years	400hr 16 days
	70%	43,800hr 5.0 years	43,800hr 5.0 years	43,800hr 5.0 years	400hr 16 days
	100%	43,800hr 5.0 years	43,800hr 5.0 years	43,800hr 5.0 years	400hr 16 days

CPU module type	Power-on time ratio	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	
			A1SJH CPU-S8	0%	
A1SJH CPU-S8	30%	43,800hr 5.0 years	43,800hr 5.0 years	43,800hr 5.0 years	400hr 16 days
	50%	43,800hr 5.0 years	43,800hr 5.0 years	43,800hr 5.0 years	400hr 16 days
	70%	43,800hr 5.0 years	43,800hr 5.0 years	43,800hr 5.0 years	400hr 16 days
	100%	43,800hr 5.0 years	43,800hr 5.0 years	43,800hr 5.0 years	400hr 16 days

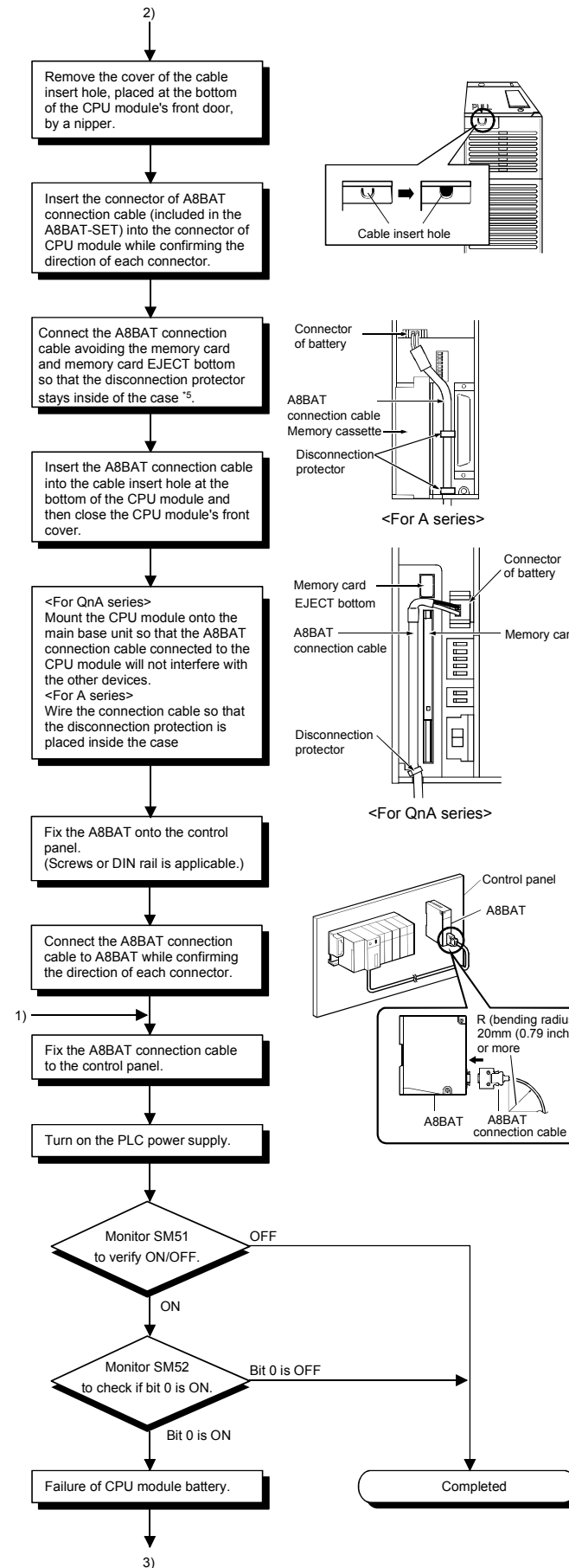
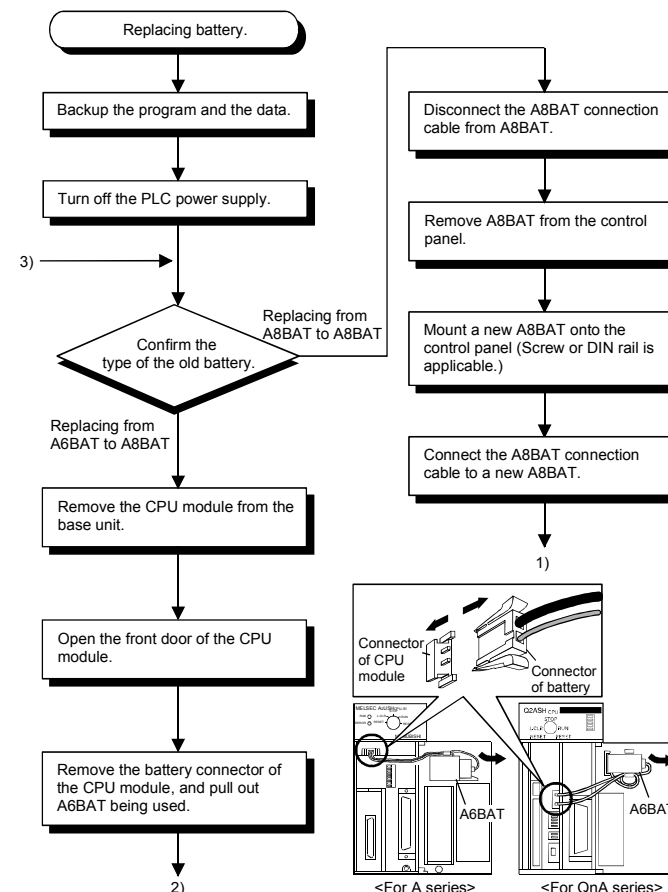
- \*1: The power-on time ratio indicates the ratio of PLC power-on time to one day (24 hours). (When the total power-on time is 12 hours and the total power-off time is 12 hours, the power-on time ratio is 50%.)
- \*2: The guaranteed battery service life; equivalent to the total power failure time that 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 PLC is powered OFF, or back up programs and data in advance after SM52 turns on (within the backup time for after alarm occurrence).
- When the battery (A8BAT) is not connected to the CPU module, its service life is five years.
- When the battery-low special relay SM52 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.

### 3.2 Connecting procedure of A8BAT

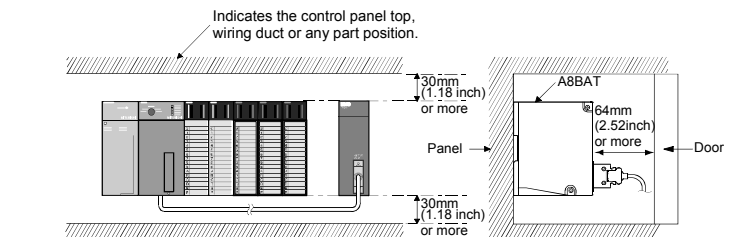
Indication for Replacement from A6BAT to A8BAT and A8BAT battery life ended is as follows. The PLC power needs to be ON for 10 minutes or longer prior to battery removal. Make sure to complete the battery replacement within 3 minutes. Failure to do so may delete the data in memory, although it includes a condenser to back up the memory for a while without battery. When the MELSEC-A/QnA series is used as a UL-certificated product, the A8BAT 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: For A series, this procedure is not necessary as the hole to insert cable is already opened.

## 4. Precautions for connecting A8BAT battery

- While holding the connector, carefully pull out the battery connector so that the A8BAT connection cable will not be broken.
- When removing the cover of the cable insert hole, cut off specified part only by a nipper. Twisting or pulling forcefully may cause damage of the CPU module.
- Fix the A8BAT connection so that the disconnection protector above the cable is placed inside of the case.
- When setting the A8BAT inside the control panel, ensure the above distance, as is the case.
- When mounting the A8BAT directly onto the control panel, make sure to use M4 × 14 screws (user-prepared) and tighten them in the torque range of 0.66 to 0.89N.m.
- In case of using A8BAT in an environment with constant vibration, fix A8BAT directly on to the board.
- Ensure the bending radius of 20mm(0.79 inch) or more for the A8BAT connection cable.
- Fix the A8BAT cable using a clamp. Failure to do so may cause damage of the A8BAT connection cover, connector or cable due to unintentional swinging and shifting or accidental pull of the cable.
- As the case's door of the CPU module is not fixed, do not pull it while connecting the A8BAT connection cable. Doing so may cause damage of the case's door of the CPU module and the connector to connect the battery.

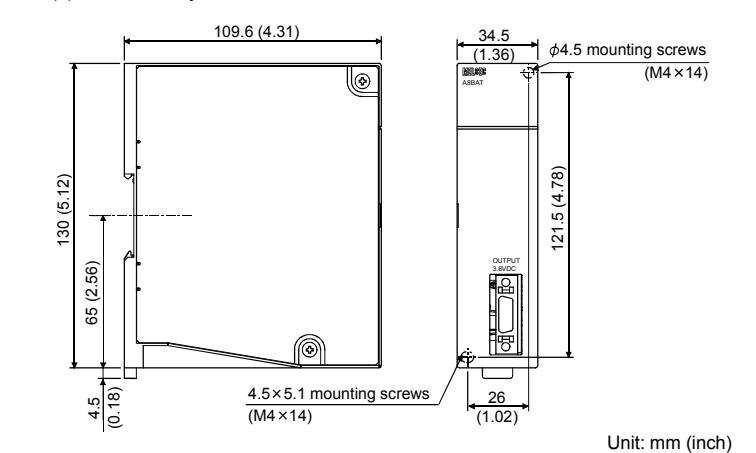


## 5. Disposal of batteries

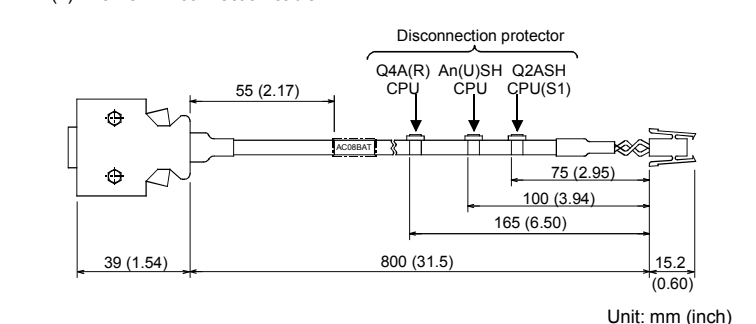
When disposing of batteries, separate them from other wastes according to the local regulations. (For details of the battery directive in EU member states, refer to the user's manual for the CPU module used.)

## 6. External Dimensions

### (1) A8BAT battery



### (2) The A8BAT connection cable



## 7. Transportation precautions

As they include lithium, the A8BAT must be treated as Class 9 dangerous goods during transportation. 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.