

Title: Why do Yaskawa MP Controllers and ServoPacks use multiple batteries?

Product(s): MP2000 series, MP3000 series, ServoPacks

Doc. No. CNT-SRV-05588T

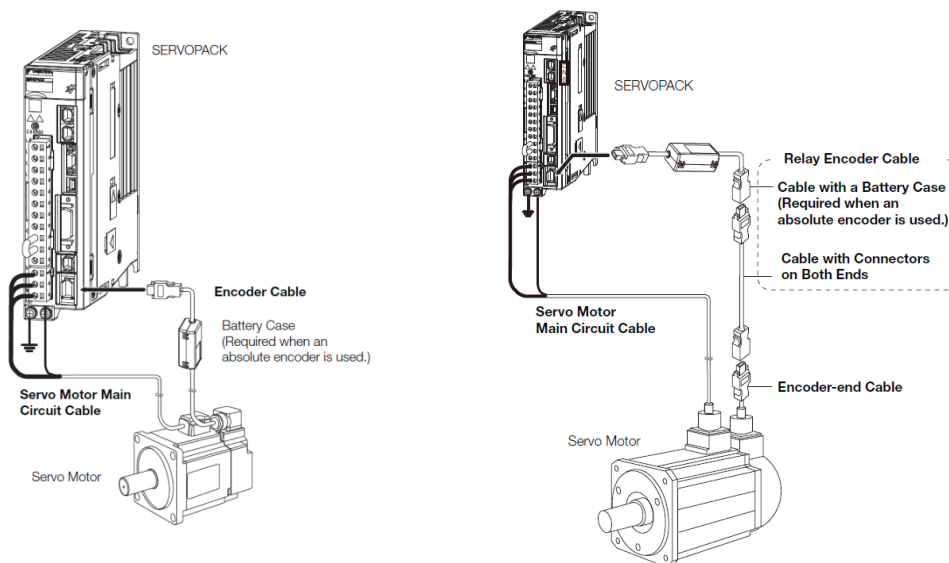
Question:

Why do Yaskawa MP Controllers and ServoPacks use multiple batteries?

Answer:

Yaskawa motion systems use lithium batteries for mainly two different functions: maintaining Absolute encoder data and preserving CPU non-volatile memory.

The encoder battery used with the ServoPacks (JZSP-BA01) is required if a multi-turn absolute encoder is needed because it holds the multi-turn encoder data when the drive power is down. Therefore, when setting the drive to use the absolute encoder as an incremental encoder or a single-turn absolute encoder, the encoder battery is not needed. The encoder battery power can be applied via the battery case on the ABS encoder cable (CN2), or through the I/O connector (CN1, for example Sigma7 ML-III ServoPack, pins 14[+] & 15[-]).

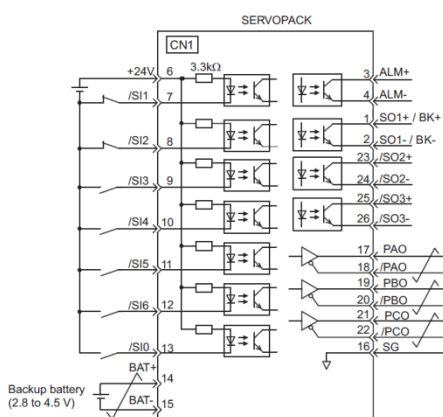


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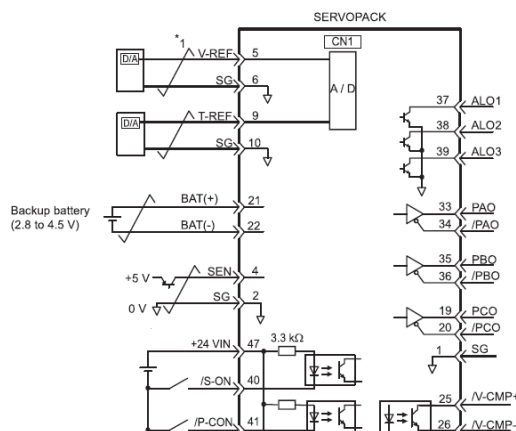
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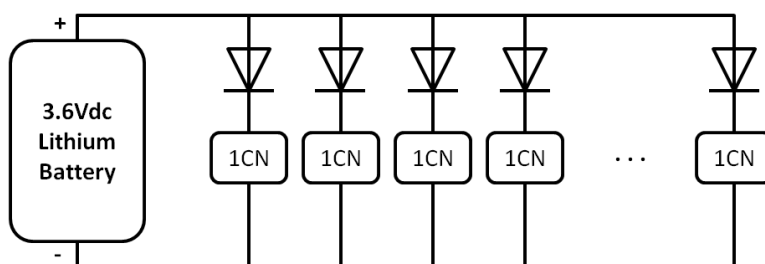
When using an absolute encoder without the encoder battery case, the battery can be connected to through CN1 connector on the ServoPack:



CN1 pins 14&15 for M-link / Option Card ServoPacks



CN1 pins 21&22 for Analog ServoPacks



For multiple ServoPacks

The Absolute Encoder Current Draw specification is:

- 20 μ A when ServoPack is powered off
- 3 μ A when ServoPack is powered on (w/o diode in place)

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To determine the worst case battery life, divide the A-hour rating of the battery by the Sum of the current of all encoders when powered off.

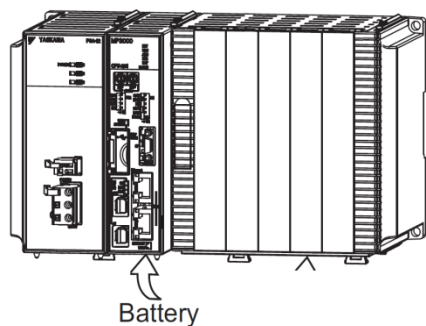
For example, assume 16.5 A-hr battery and 16 Encoders are connected: $16.5 \text{ A-hr} / (.000020 \text{ A} * 16)$
= 51500 hours or 5.8 years

For installing and replacing the battery in the ServoPack, refer to:

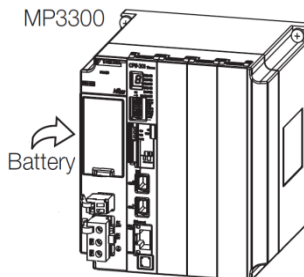
- YASKAWA SIGMA-7 AC Servo Drives and Motors Technical Supplement (YAI-KAEPS80000123F)
- YASKAWA AC Servo Drives Sigma-V Series Product Catalog (YEA-KAEPS80000042)

The other type of batteries is used for the MP controllers. These batteries (JZSP-BA01) provide a backup power for the CPU non-volatile memory, preserving the SRAM data when CPU power is down. This data includes the retained variables, the alarm history, the absolute encoder offset and the real-time clock data. The SRAM can last for one hour without the battery connected. This battery must be replaced while power is supplied, within 2 weeks of when the BAT indicator first lights. For the MP2600, the SRAM battery power can be applied through the battery connector (CN14), or through the I/O connector (CN13 pins 7[+] & 32[-]).

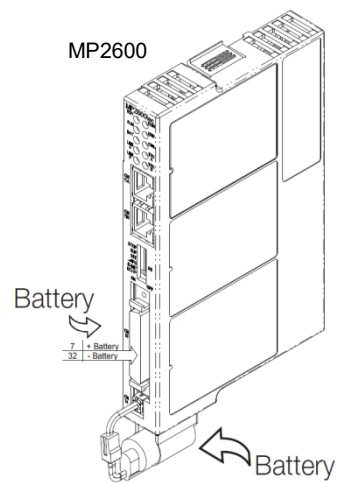
MP3200iec



MP3300



MP2600



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For installing and replacing the battery in the CPU, refer to:

- YASKAWA MP3200iec Machine Controller Hardware Manual (YAI-SIA-IEC-5)
- YASKAWA MP2600iec Hardware Manual (YEA-SIA-IEC-6)

More references on the encoder usage in Yaskawa motion systems:

- [The absolute encoder battery back-up techniques:](#)
- [Material Safety Data Sheet \(MSDS\) for Toshiba ER3V and ER6V batteries:](#)
- [A.810 Absolute Encoder Battery Life and Replacement:](#)
- [MP940 Dip switch settings, battery and PC cable:](#)