



FirePoint

5000

Battery Calculation

Information

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1. Control Panel Battery Capacity

By application of the formulae quoted in BS5839-1 : 2002 Annex D, the minimum battery capacity required to support the MK3 Fire Control Panel 5000 series can be calculated.

Part Numbers of control panels included in the calculations are as follows:

Panel Type	Standalone	Network	With Printer
4 Zone	53-5004	53-5904	N/A
12 Zone	53-5012	53-5912	N/A
24 Zone	53-5024	53-5924	/P
96 Zone	53-5096	53-5996	/P as standard
Database Expander	53-5023	53-5923	N/A

Using: $C_{min} = 1.25 (T_1 * I_1 + \frac{D * I_2}{2})$

Where: $T_1 = 24$ hours
 $I_1 = 0.25A$ Standby current
 $I_2 = 1.35A$ Full alarm load current
 $D = 1.16$ De-rating factor at 35°C

The de-rating value is calculated to be 1.16 under the conditions of the fire control panel use and internal temperature environment of 35°C. Therefore the battery capacity required as calculated in accordance with the recommendations in BS5839-1:2002 is 8.479Ah.

The next highest battery capacity available is a 12V 9Ah battery. Panasonic 12V 9Ah, Model No: UPRW1245P1 is recommended.

Two of these batteries are required per control panel.

2. Local Area Network (LAN) Module Battery Capacity

Part Number of LAN Module included in the calculation is 53-5438.

2.1 Battery Backup Capability

$$V_{in} = 12.8V$$

$$I_{in} = 150 \text{ mA}$$

$$\text{Battery Capacity} = 7Ah \text{ (7000mAh)}$$

$$\text{PSU Charging Current} = 350mA$$

Transmissions per hour x transmission duration x current draw on transmission =

$$120 \times 100mS \times 400mA = 4.8As$$

$$\frac{4.8As}{3600s} = 1.33mA \text{ usage in an hour}$$

$$3600s$$

$$I_{in} + 1.33mA = 151.33mA \text{ (Average current usage)}$$

Battery backup period based on 12V 7Ah Yuasa Battery

$$\frac{7000mAh}{151.33mA} = 46.3h$$

$$151.33mA$$

Backup Period 1 day 22 hours

2.2 Battery Charging Capability

$$\frac{7000mAh}{350mA} = 20 \text{ hours}$$

$$350mA$$

Battery charged to 100% capacity in 20 hours

2.3 Conclusion

Battery capacity installed is the 12V 7Ahr YUASA battery.

One battery is required per module.

3. UHF Remote Receiver Battery Capacity

Part Number of UHF Remote Receiver included in the calculation is 53-5428.

3.1 Battery Backup Capability

$$V_{in} = 12.8V$$

$$I_{in} = 154 \text{ mA}$$

$$\text{Battery Capacity} = 7Ah (7000mAh)$$

$$\text{PSU Charging Current} = 350mA$$

$$\frac{7000mAh}{154mA} = 45.45h$$

Battery backup period: - 1 day 21 hours

3.2 Battery Charging Capability

$$\frac{7000mAh}{350mA} = 20 \text{ hours}$$

Battery charged to 100% capacity in 20 hours

3.3 Conclusion

Battery capacity installed is the 12V 7Ahr YUASA battery.
One battery is required per module.

4. VHF Remote Receiver Battery Capacity

Part Number of VHF Remote Receiver included in the calculation is 53-5414.

4.1 Battery Backup Capability

$$V_{in} = 12.8V$$

$$I_{in} = 154 \text{ mA}$$

$$\text{Battery Capacity} = 7Ah (7000mAh)$$

$$\text{PSU Charging Current} = 350mA$$

$$\frac{7000mAh}{154mA} = 45.45h$$

Battery backup period: - 1 day 21 hours

4.2 Battery Charging Capability

$$\frac{7000mAh}{350mA} = 20 \text{ hours}$$

Battery charged to 100% capacity in 20 hours

4.3 Conclusion

Battery capacity installed is the 12V 7Ahr YUASA battery.
One battery is required per module.

5. VHF Transponder Battery Capacity

Part Number of VHF Transponder included in the calculation is 53-5400.

5.1 Battery Backup Capability

$$V_{in} = 12.8V$$

$$I_{in} = 100 \text{ mA}$$

$$\text{Battery Capacity} = 7Ah (7000mAh)$$

$$\text{PSU Charging Current} = 350mA$$

Transmissions per hour x transmission duration x current draw on transmission =

$$250 \times 100mS \times 330mA = 8.25As$$

$$\frac{8.25As}{3600s} = 2.29mA \text{ usage in an hour}$$

$$I_{in} + 2.29mA = 102.29mA \text{ (Average current usage)}$$

Battery backup period based on 12V 7Ah Yuasa Battery

$$\frac{7000mAh}{102.29mA} = 68.4Hrs$$

Backup Period 2 days 20 hours

5.2 Battery Charging Capability

$$\frac{7000mAh}{350mA} = 20 \text{ hours}$$

Battery charged to 100% capacity in 20 hours

5.3 Conclusion

Battery capacity installed is the 12V 7Ahr YUASA battery.

One battery is required per module.

6. VHF/UHF Transceiver Battery Capacity

Part Number of VHF/UHF Transceiver included in the calculation is 53-5415.

6.1 Battery Backup Capability

$$V_{in} = 12.8V$$

$$I_{in} = 160 \text{ mA}$$

$$\text{Battery Capacity} = 7\text{Ahr (7000mAh)}$$

$$\text{PSU Charging Current} = 350\text{mA}$$

$$\frac{7000\text{mAh}}{160\text{mA}} = 43.75\text{Hrs}$$

Backup Period 1 day 23 hours

6.2 Battery Charging Capability

$$\frac{7000\text{mAh}}{350\text{mA}} = 20 \text{ hours}$$

Battery charged to 100% capacity in 20 hours

6.3 Conclusion

Battery capacity installed is the 12V 7Ahr YUASA battery.

One battery is required per module.

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