Séminaire de formation des techniciens des hôpitaux sur l'entretien des systèmes d'alimentation électrique d'urgence

organisé dans le cadre du Projet d'Amélioration des Infrastructures de Santé en Haïti (IHFI) financé par l'USAID et mis en œuvre par Tétra Tech

Inverter Batterie/ Génératrice cahier d'enregistrement des données.

Nom de l'hôpital : _____

06 – 10 mai 2013
Centre de formation UGP, Port-au-Prince, Haïti

Ce séminaire a été rendu possible grâce au patronage de l'Unité de Gestion de Projets (UGP) du Ministère de la Santé Publique et de la Population (MSPP).

Prensip fondamantal batri ak sekirite

INTERNAL– NOT FOR DISTRIBUTION

Objektif

- **Definisyon batri ak konpozan ki fèl yo , Nivo dechaj (DOD), eta de chaj (SOC), otonomi, 3-etap chajman yon batri, e egalizasyon.**
- **Bay avantaj e dezavantaj ki gen nan batri ak elektwolit yo e batri ki ak gel yo.**
- **Bay mezi sekirite ou dwe pran lè wap travay nan batri.**

INTERNAL– NOT FOR DISTRIBUTION

Batri ak plon

Batri a dechaj pwofon = yo kapab itilize 80% kapasite yo.

Efisyan batri yo = 80 – 85%

Elektwolit:
Acid silfirik
SG ~ 1.265

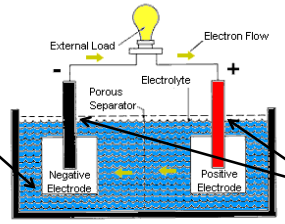


Figure 1 - Components of a Battery Cell (Discharge Circuit)

Plak en plon

Yon selil batri = 2 V

INTERNAL– NOT FOR DISTRIBUTION

tèminoloji

Jou san chaje = kantite jou batri yo fè ap travay san pran chaj.

Sik = Chaje epi dechaje

SOC	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
DoD	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%

SOC (Eta chaj lan) = kantite chaj en % ki dispinib nan batri yo.

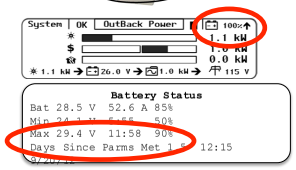
DOD (Nivo dechaj) = kantite chaj en % ou retire nan kapasite total batri yo.

INTERNAL– NOT FOR DISTRIBUTION

kijan pou nou detemine SOC

1. **Mezire vòltaj nan batri yo?**
   (pandan ke yo pap chaje).

2. **Kontwol Batri yo (FNDC)** –
   utilize shunt pou kontrole anpè-è kap entre e soti nan batri yo pou ka li SOC a.



3. **idromèt**
   Pou mezire spesifik gravite elektwolit lan (battri ak elektwolit)

1.265 →

100% SOC Voltaj
Batri ak elektwolit yo = 12.6 to 12.7 V
Outback RE Batri = 12.8 V

INTERNAL– NOT FOR DISTRIBUTION

Premye fwa batri yo ap komanse chaje

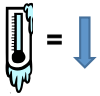
1. **Mezire e enregistre vale chak selil pandan ke batri yo pap chaje.**
2. **Chaje batri yo a absorb voltaj pandan 24 è.**
3. **Chaje batri yo a float voltaj pou 3 a 7 jou.**
4. **Mezire e enregistre vale chak selil pandan ke batri yo pap chaje.**

Nòt: batri bezwen byen konecte aavn yo komanse pran npremye chaj yo.

INTERNAL– NOT FOR DISTRIBUTION

Ki efè kapasite batri yo?

- **Tanperati anbyen**
  Ban batri yo



= ↓ Kapasite batri yo

= ↓ Dire vi batri yo

- **DOD vs. Sik**

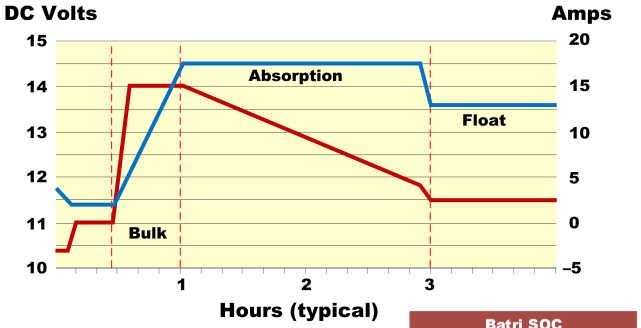
Ezanp
Pa jou 20% DOD, 3300 Sik.
Pa jou 80% DOD, 675 Sik.

- **Nivo dechaj**

Nivo a monte ↑ Kapasite a desann ↓

INTERNAL– NOT FOR DISTRIBUTION

3-etap leu batri yo ap chaje



Batri SOC
- 70% to 90% aprè Bulk staj
- 100%+ aprè absorption

Sistem Outback lan tou genyen andan l aparey ki pou mezire tanperatin (lè RTS instale deja).

INTERNAL– NOT FOR DISTRIBUTION

Prensip fondamantal batri ak sekirite

Sekirite

Elèktrolitik – (Batri ak acid)

- Kab boule ge, po, rad.

Danje–

Gwo kout-sikwi

Pa janm kole pozitif ak negatif a ansanm

Gaz idrogen ki nan batri a

Ka pwodwi explizif

Batri yo ekstrèman lou

Sekirite pou pran kont batri yo

Photo used with permission from
Safety Systems and Signs in Hawaii.

Entretyen batri yo epi swen

- **Chaje batri a 100% SOC pou pi piti you fwa pa semèn.**
- **TCheke sistèm mezi pou asire tout bagay ap mache byen.**
- **Netwaye vè de gri nan teminal yo.**
- **Sere koneksyon ki lach yo.**
- **Egalize si sa nesesè(pa pou batri gel yo)**
- **Gade nivo dlo a (batri ak elektwolit), ajoute dlo distile , netwaye tet batri yo.**
- **Separe batri pou pi piti ½" youn ak lot.**
- **Verifie si yo gonfle oswa anfle, fant, fwit.**

Pa janm chaje batri ki pa pa bon!

- **Sèvi ak ekipman pwoteksyon pèsonèl ak zouti ki izole.**

Egalizasyon batri ki gen acid yo

Kisa egalizasyon ye?

- Sichaje batri ki gen elektwolit yo
- You voltaj tre wo pandan tan egalizasyon
- Konpare voltaj egalizasyon ak voltaj nòmal

Poukisa egalizasyon?

- Ogmante kapasite epi ak la vi batri yo
  - Melanje elektwolit lan
  - Retire silfatasyon
  - Balanse spesifik gravite na selil yo

Kiteu pou nou fe egalizasyon?

- Espesifikasyon fabrikan an, diferans SG ki genyen nan selil yo.
- **Koman fè egalizasyon?**
- Rekòmandasyon an nan liv MATE3 a.

Swiv rekòmandasyon fabrikan an.
Asire bon vantilasyon e nivo elektwolit yo.

Prensip fondamantal batri ak sekirite

Not pou pran chak jou

POU RANPLI 2 FWA PA JOU: PREMYE FWA ANVAN YO DEMARE DELKO A

DEZYEM FWA: Avan labrim di swa

OU DWE RANPLI L SI OU TANDE KLAKSON NAN

Non Sant Sante a:

Non Teknisyen an:

Haiti Energy Team

DAT J/M/A	Lè	Inisyal	Voltaj Batri yo (MATE)	Eske Batri yo chaje (MATE)	Di si ou we 100% nan Mate lan ap limen, etann	Este ou tande Klakson nan?	Kisa ou fè			Gen limyè erè ki paret? Wi/No	Si Se Wi ki Erè?	Remak
							Pase Delko Wi ou No	Delko Lè li derape	Delko Lè li kampe			
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Not pou pran chak jou

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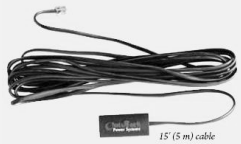
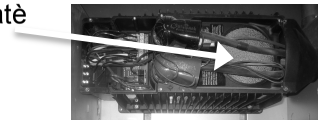
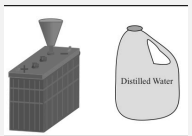
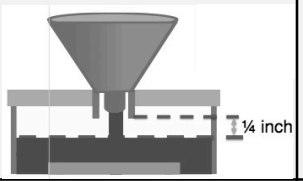
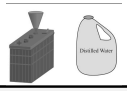
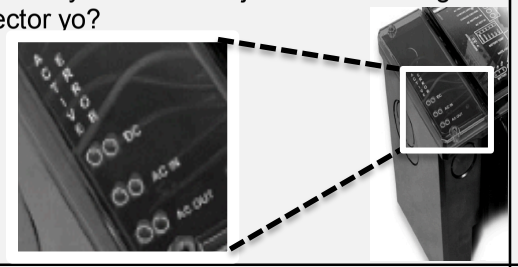
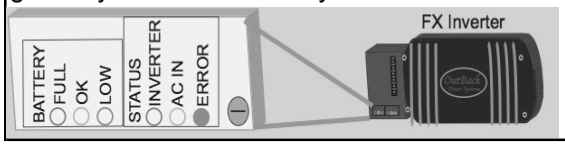
List kontwol Chak mwa- Creole

	Janvye	Fevriye	Mas	Avwil	Me	Jen	Jiyè	Out	Septanb	Oktòb	Novanm	Desanm
Netwaye vè de gri nan bon batri yo												
Netwaye tèt batri yo												
Verifye ke tanperati sensor byen kole sou batri yo												
Verifye ke kab tanperati sensor a pa koche ki kase 												
Netwaye filtè vantilatè invètè yo 												
Mete dlo nan batri yo  												
Ki kantite dlo ou ajoute mwa ki sot pase a? 												
pa gen limyè ki limen rouj ki limen nanserge protector yo? 												
gen limye erè nan invètè yo? 												

List kontwol Chak mwa- Creole

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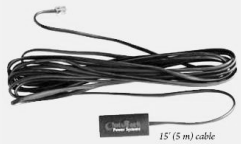
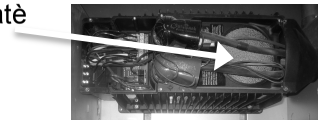
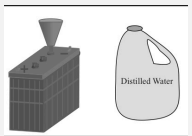
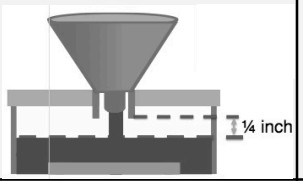
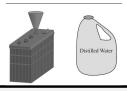
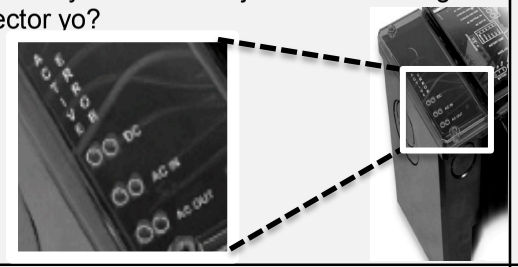
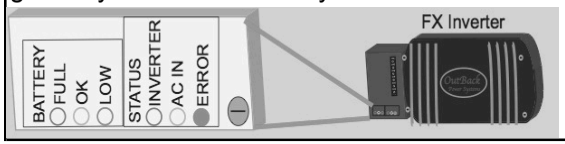
Verifye ke kab tanperati sensor a pa koche ki kase 												
Netwaye filtè vantilatè invètè yo 												
Mete dlo nan batri yo  												
Ki kantite dlo ou ajoute mwa ki sot pase a? 												
pa gen limyè ki limen rouj ki limen nanserge protector yo? 												
gen limye erè nan invètè yo? 												

Lis pou Tcheke pou egalizasyon an

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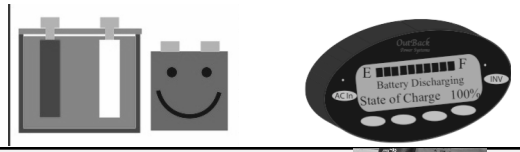
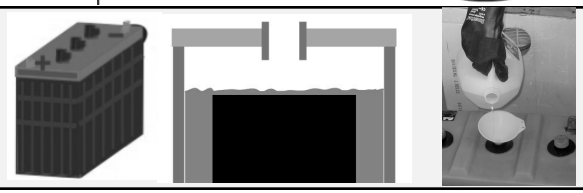
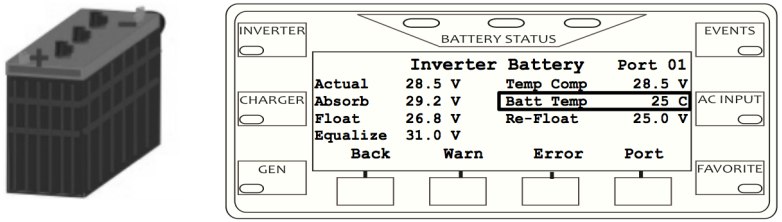
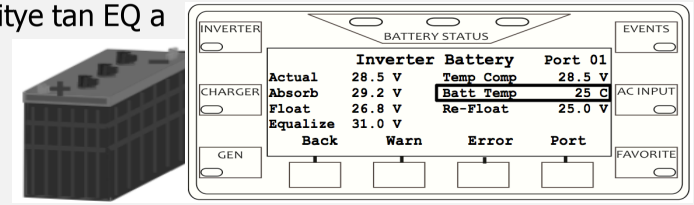
Chaje batri yo a 100% 		
cheki nivo dlo an e asire nou plak yo pa paret, men ke batri a pa two plin. 		
Cheke tamperati batri a 		
Komanse EQ (nan Mate lan) swiv instriksyon ki nan paj lan		
Tan kantite tan EQ an		
Re cheke tanperati e niveau dlo anan moitye tan EQ a 		
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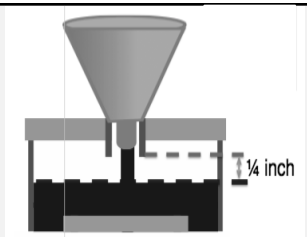
Mete dlo nan batri yo 		
Ki kantite dlo ou te ajoute nan mwa ki sot pase a?		
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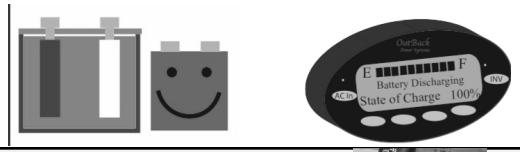
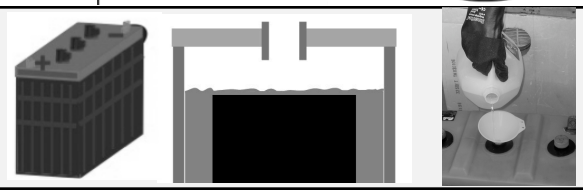
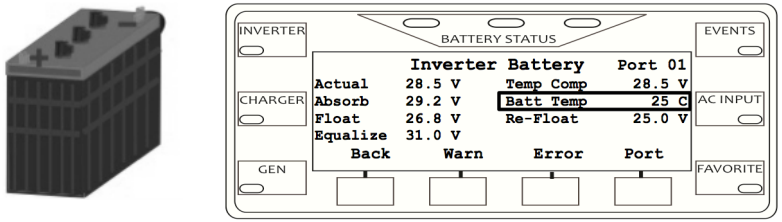
Siyati		

Lis pou Tcheke pou egalizasyon an

Objektif Travay la	Fin konplete?	Dat
Chaje batri yo a 100% 		
cheki nivo dlo an e asire nou plak yo pa paret, men ke batri a pa two plin. 		
Cheke tamperati batri a 		
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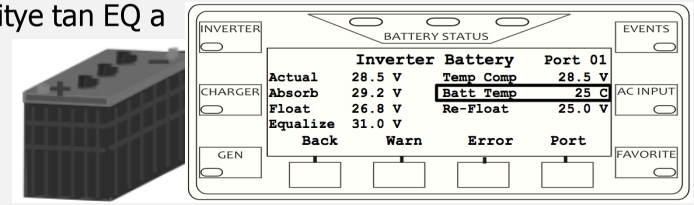
Re cheke tanperati e niveau dlo anan moitye tan EQ a 		
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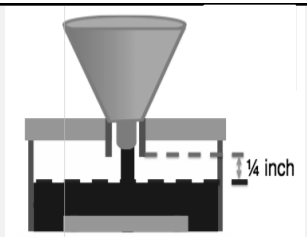
Mete dlo nan batri yo 		
Ki kantite dlo ou te ajoute nan mwa ki sot pase a?		
Dat		
Siyati		

OutBack
Power Systems

MATE Summary Screens

AC In

INV

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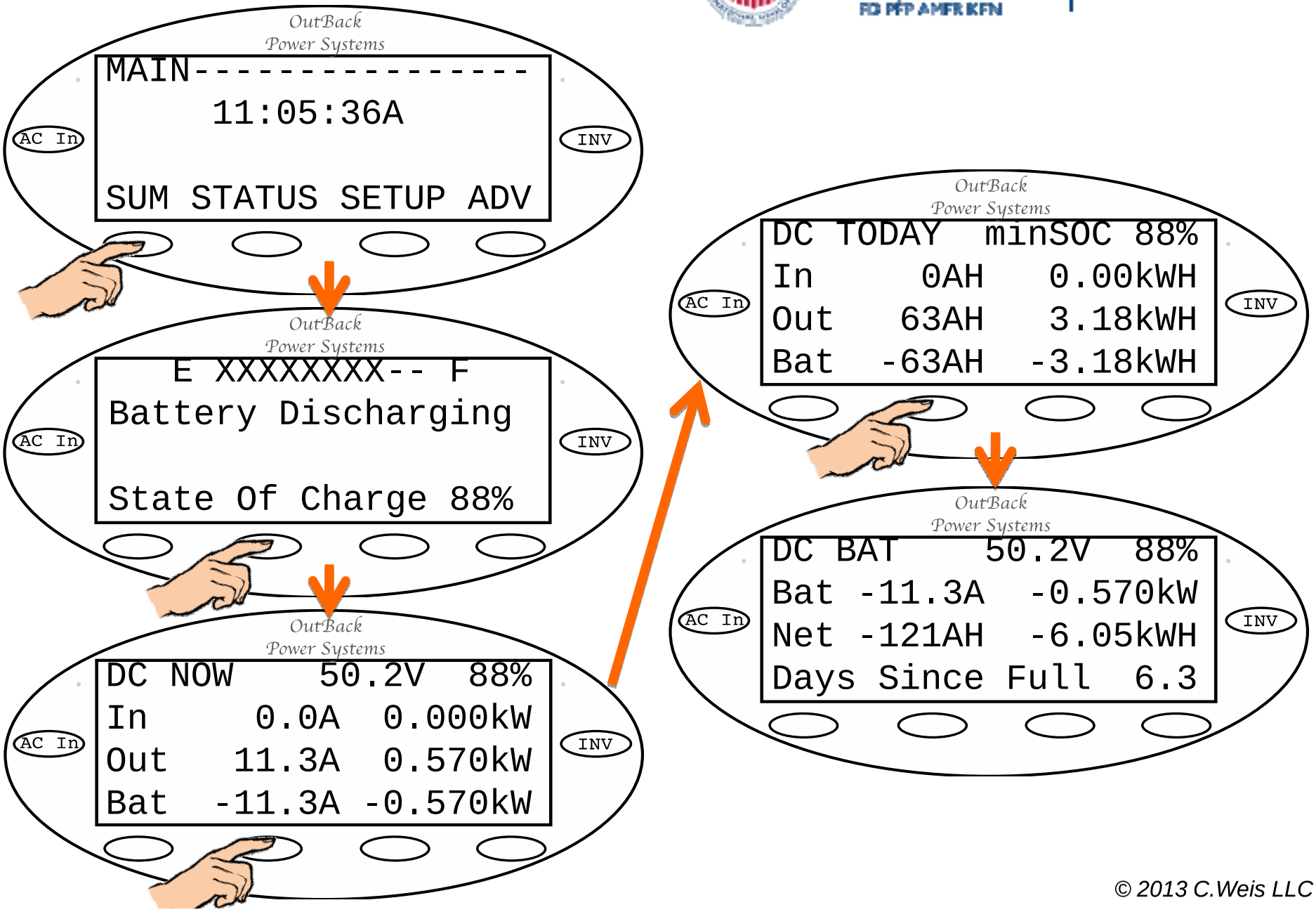
#1



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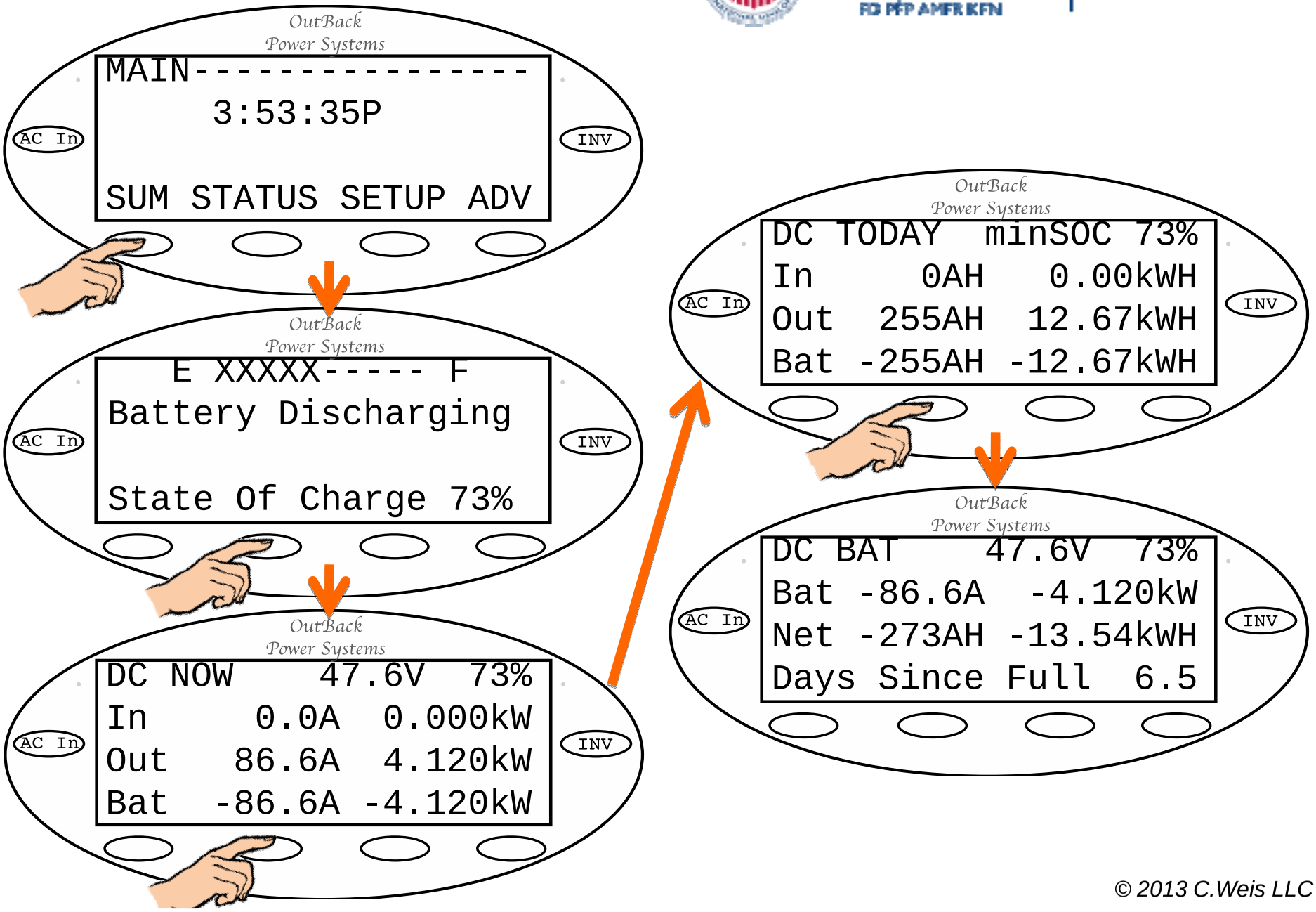
#2



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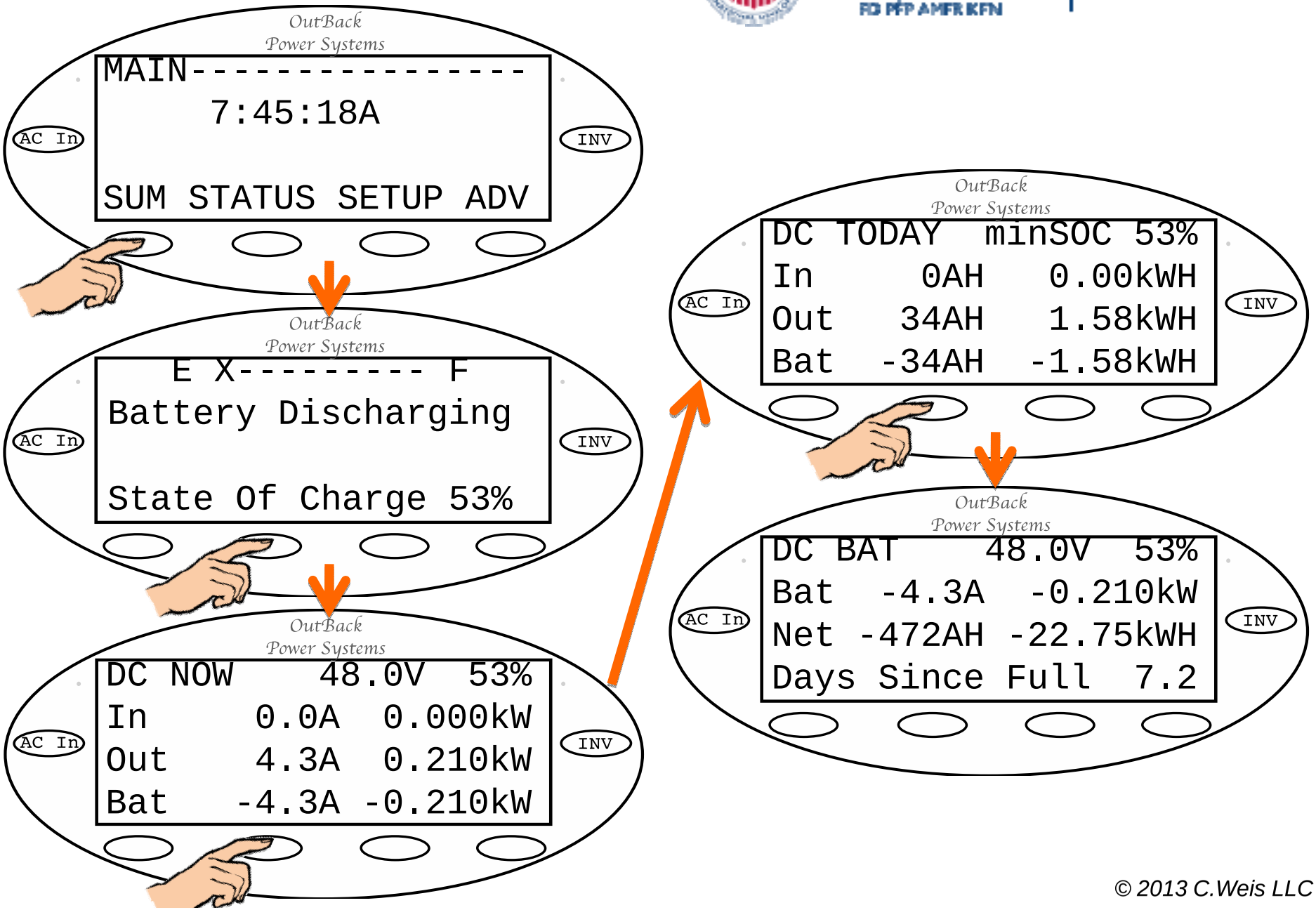
#3



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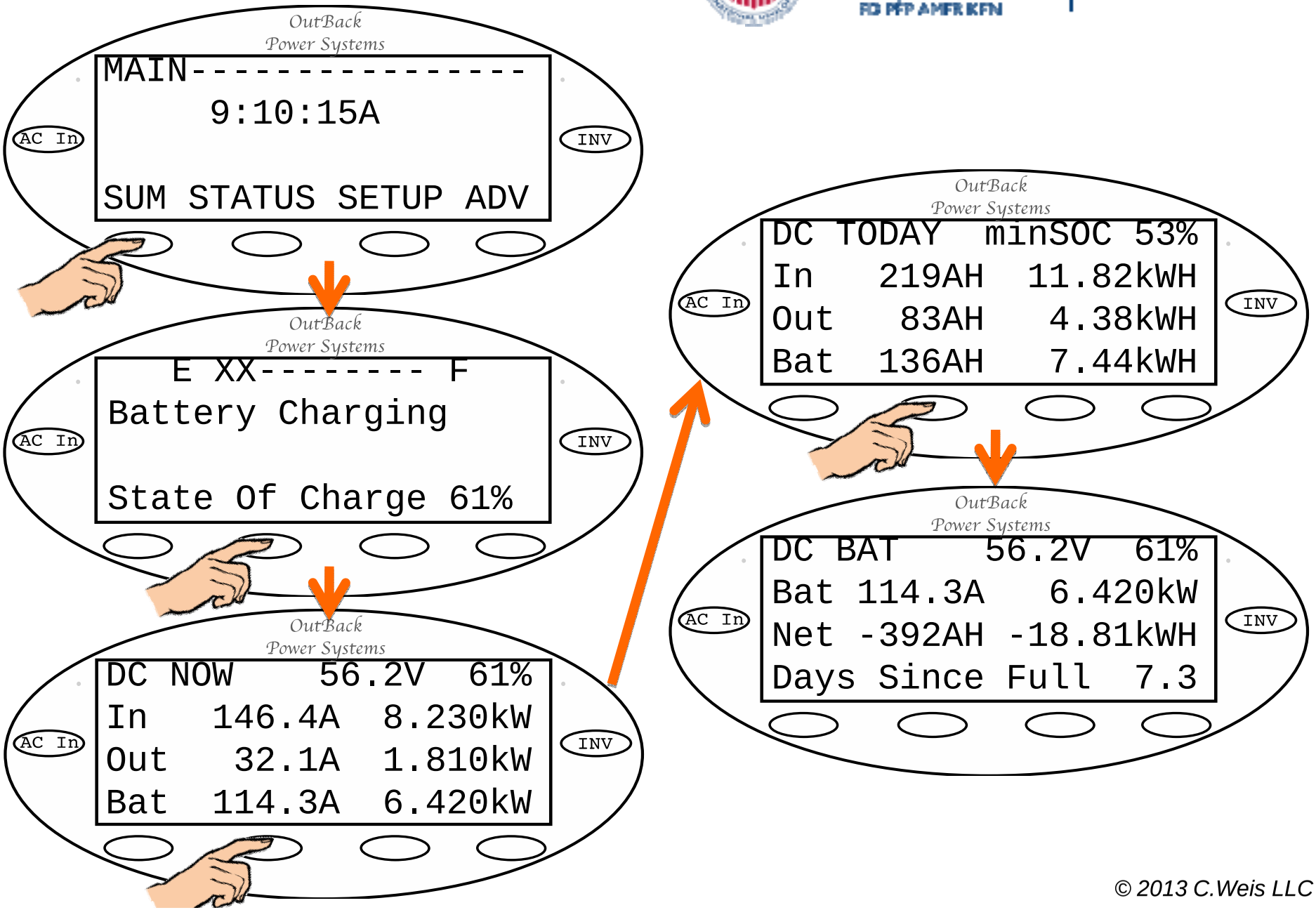
#4



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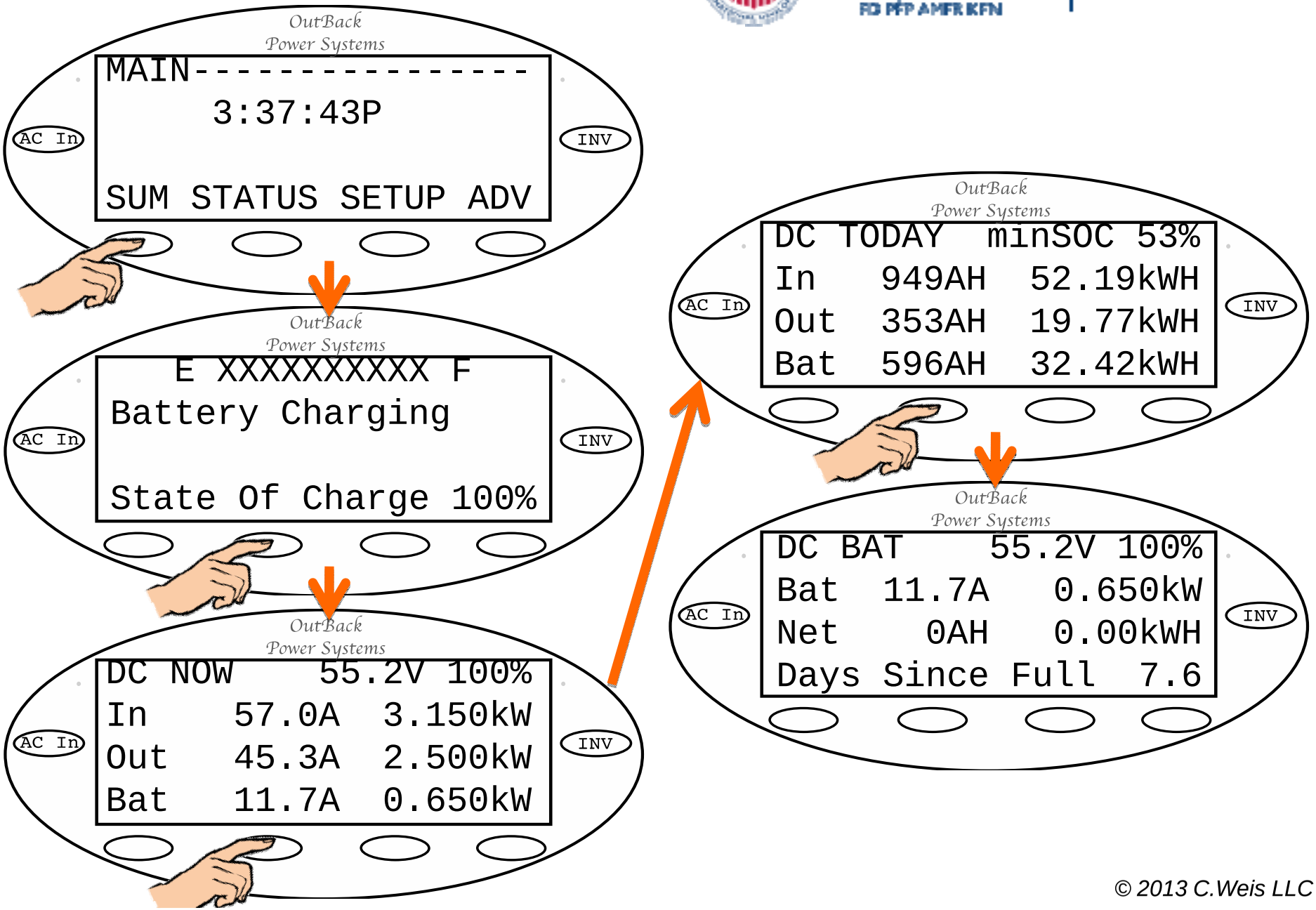

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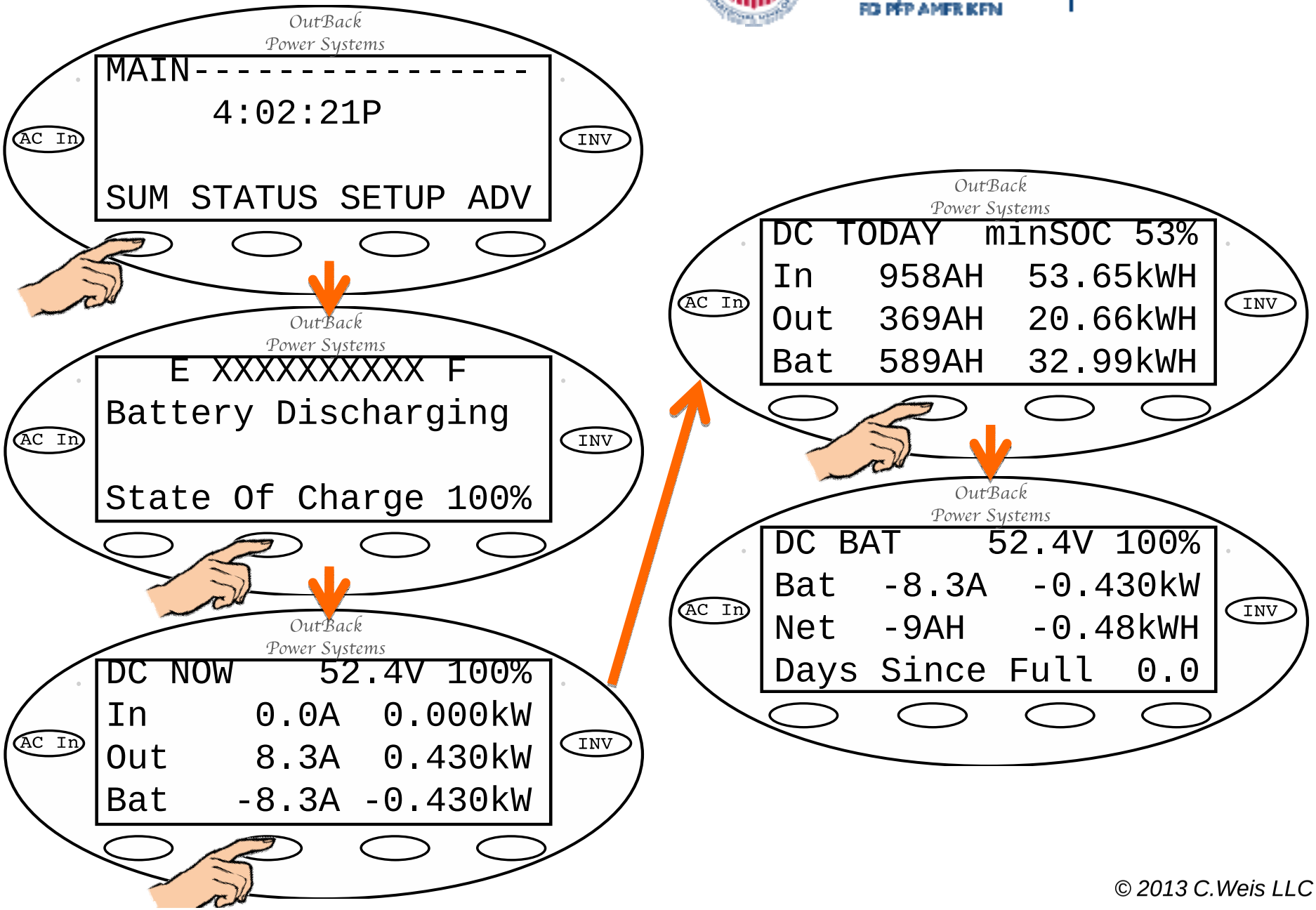

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MATE Summary Screens

#1

1. Ki lè ki make nan mate la? (What time does the MATE screen say?)

2. Ki voltaj batri yo ye koulye la? (What is the battery voltage right now?)

3. Ki vale SOC batri yo ye? (What is the battery SOC right now?)

4. Eske batri yo chaje ou byen yo dechaje? (Is the battery charging or discharging now?)

5. Ki kantite anpè ki antrè nan batri yo? (How many amps are charging into the battery?)

6. Ki kantite anpè kap soti nan batri yo? (How many amps are discharging out of the battery?)

7. Eske batri yo recevwa plis chaj key o bay? (Are the batteries receiving more charge than discharge right now?)

8. Eske batri yo recevwa plis chaj key o bay pandan jounen an? (Have the batteries received more charge than discharge over the course of the day?)

9. Ki vale minSOC ye Jodi a? (What is the minimum SOC today?)

10. Konbye jou ki pase depi ke batri yo te chaje? (How many days has it been since the batteries were full?)

#2

11. Ki lè ki make nan mate la? (What time does the MATE screen say?)

12. Ki voltaj batri yo ye koulye la? (What is the battery voltage right now?)

13. Ki vale SOC batri yo ye? (What is the battery SOC right now?)

14. Eske batri yo chaje ou byen yo dechaje? (Is the battery charging or discharging now?)

15. Ki kantite anpè ki antrè nan batri yo? (How many amps are charging into the battery?)

16. Ki kantite anpè kap soti nan batri yo? (How many amps are discharging out of the battery?)

17. Eske batri yo recevwa plis chaj key o bay? (Are the batteries receiving more charge than discharge right now?)

18. Eske batri yo recevwa plis chaj key o bay pandan jounen an? (Have the batteries received more charge than discharge over the course of the day?)

19. Ki vale minSOC ye Jodi a? (What is the minimum SOC today?)

20. Konbye jou ki pase depi ke batri yo te chaje? (How many days has it been since the batteries were full?)

#3

21. Ki lè ki make nan mate la? (What time does the MATE screen say?)

22. Ki voltaj batri yo ye koulye la? (What is the battery voltage right now?)

23. Ki vale SOC batri yo ye? (What is the battery SOC right now?)

24. Eske batri yo chaje ou byen yo dechaje? (Is the battery charging or discharging now?)

25. Ki kantite anpè ki antrè nan batri yo? (How many amps are charging into the battery?)

26. Ki kantite anpè kap soti nan batri yo? (How many amps are discharging out of the battery?)

27. Eske batri yo recevwa plis chaj key o bay? (Are the batteries receiving more charge than discharge right now?)

28. Eske batri yo recevwa plis chaj key o bay pandan jounen an? (Have the batteries received more charge than discharge over the course of the day?)

29. Ki vale minSOC ye Jodi a? (What is the minimum SOC today?)

30. Konbye jou ki pase depi ke batri yo te chaje? (How many days has it been since the batteries were full?)

#4

31. Ki lè ki make nan mate la? (What time does the MATE screen say?)

32. Ki voltaj batri yo ye koulye la? (What is the battery voltage right now?)

33. Ki vale SOC batri yo ye? (What is the battery SOC right now?)

34. Eske batri yo chaje ou byen yo dechaje? (Is the battery charging or discharging now?)

35. Ki kantite anpè ki antrè nan batri yo? (How many amps are charging into the battery?)

36. Ki kantite anpè kap soti nan batri yo? (How many amps are discharging out of the battery?)

37. Eske batri yo recevwa plis chaj key o bay? (Are the batteries receiving more charge than discharge right now?)

38. Eske batri yo recevwa plis chaj key o bay pandan jounen an? (Have the batteries received more charge than discharge over the course of the day?)

39. Ki vale minSOC ye Jodi a? (What is the minimum SOC today?)

40. Konbye jou ki pase depi ke batri yo te chaje? (How many days has it been since the batteries were full?)

#5

41. Ki lè ki make nan mate la? (What time does the MATE screen say?)

42. Ki voltaj batri yo ye koulye la? (What is the battery voltage right now?)

43. Ki vale SOC batri yo ye? (What is the battery SOC right now?)

44. Eske batri yo chaje ou byen yo dechaje? (Is the battery charging or discharging now?)

45. Ki kantite anpè ki antrè nan batri yo? (How many amps are charging into the battery?)

46. Ki kantite anpè kap soti nan batri yo? (How many amps are discharging out of the battery?)

47. Eske batri yo recevwa plis chaj key o bay? (Are the batteries receiving more charge than discharge right now?)

48. Eske batri yo recevwa plis chaj key o bay pandan jounen an? (Have the batteries received more charge than discharge over the course of the day?)

49. Ki vale minSOC ye Jodi a? (What is the minimum SOC today?)

50. Konbye jou ki pase depi ke batri yo te chaje? (How many days has it been since the batteries were full?)

#6

51. Ki lè ki make nan mate la? (What time does the MATE screen say?)

52. Ki voltaj batri yo ye koulye la? (What is the battery voltage right now?)

53. Ki vale SOC batri yo ye? (What is the battery SOC right now?)

54. Eske batri yo chaje ou byen yo dechaje? (Is the battery charging or discharging now?)

55. Ki kantite anpè ki antrè nan batri yo? (How many amps are charging into the battery?)

56. Ki kantite anpè kap soti nan batri yo? (How many amps are discharging out of the battery?)

57. Eske batri yo recevwa plis chaj key o bay? (Are the batteries receiving more charge than discharge right now?)

58. Eske batri yo recevwa plis chaj key o bay pandan jounen an? (Have the batteries received more charge than discharge over the course of the day?)

59. Ki vale minSOC ye Jodi a? (What is the minimum SOC today?)

60. Konbye jou ki pase depi ke batri yo te chaje? (How many days has it been since the batteries were full?)

MATE3 Scenarios

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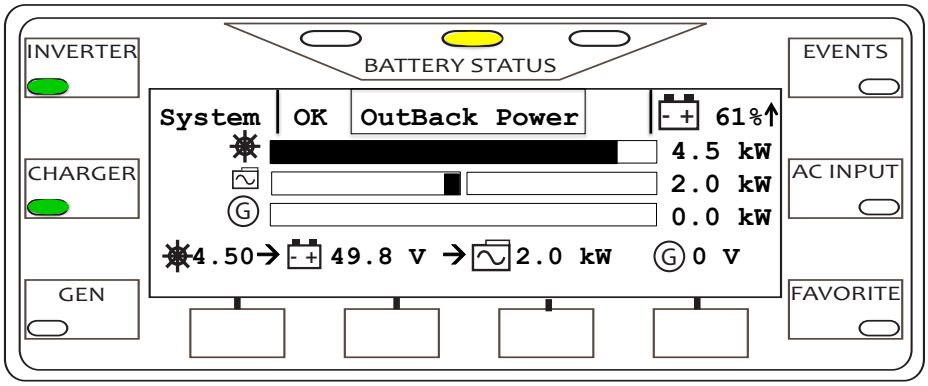
1



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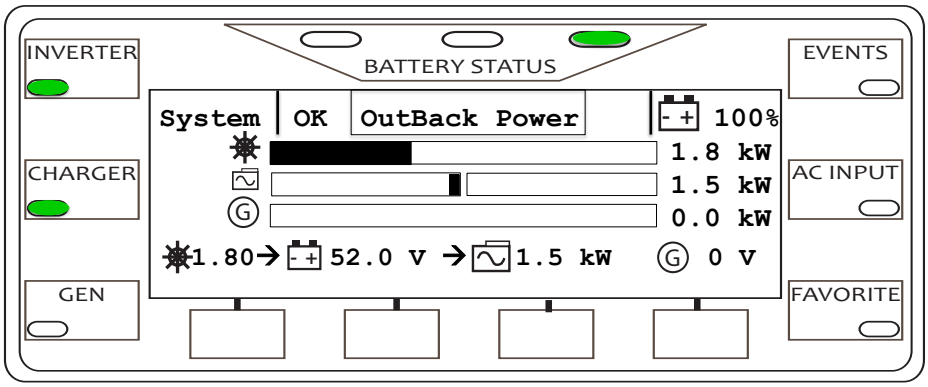

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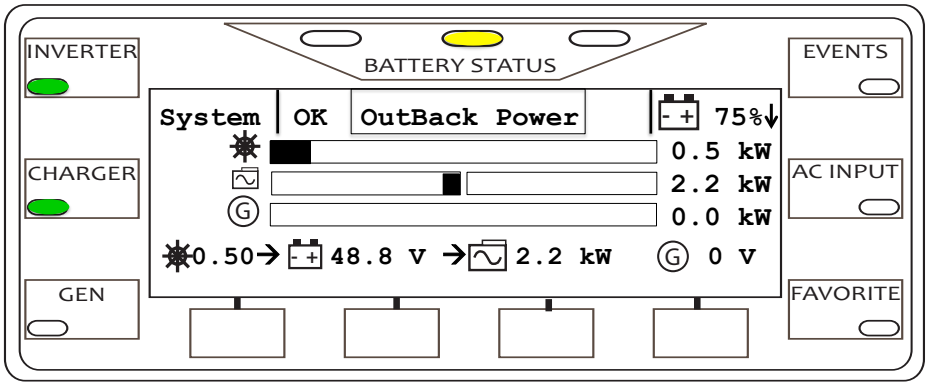

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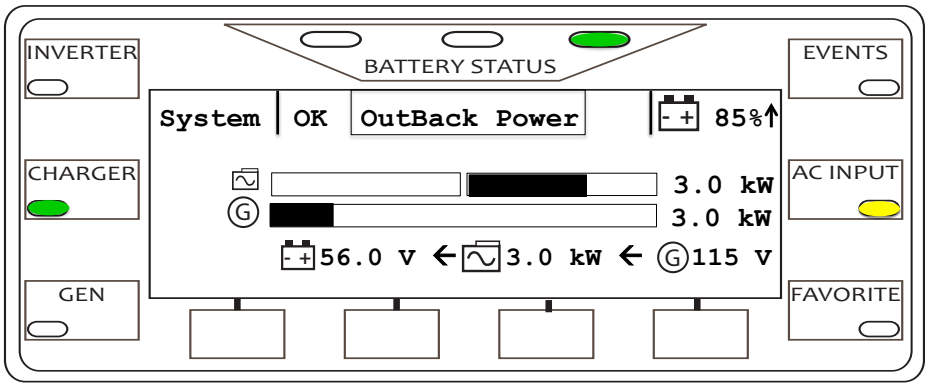

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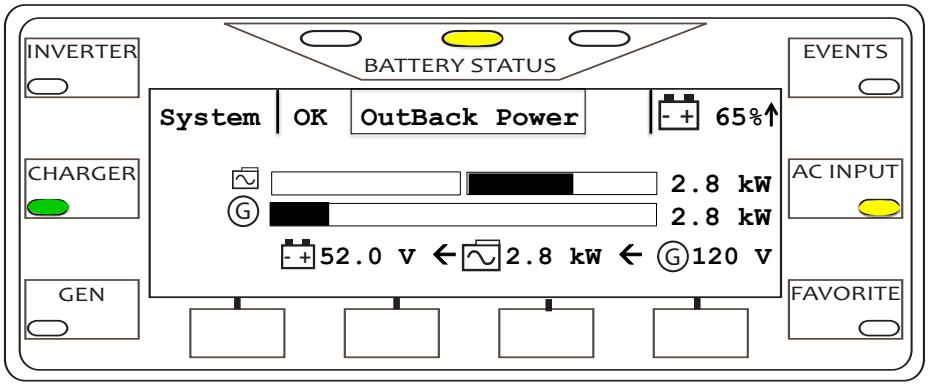

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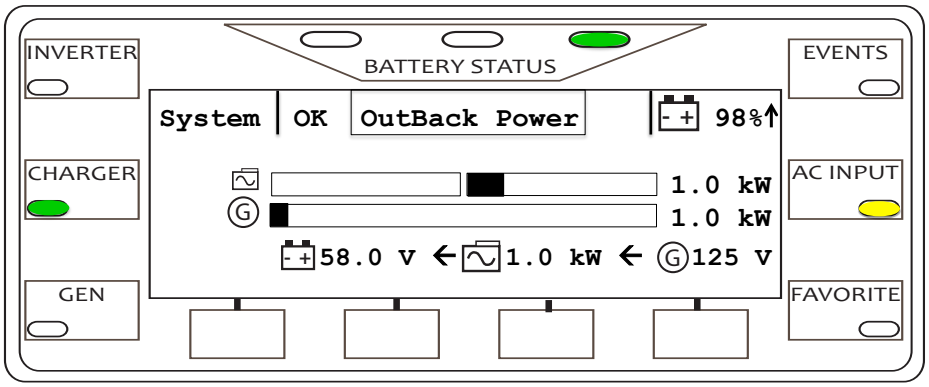

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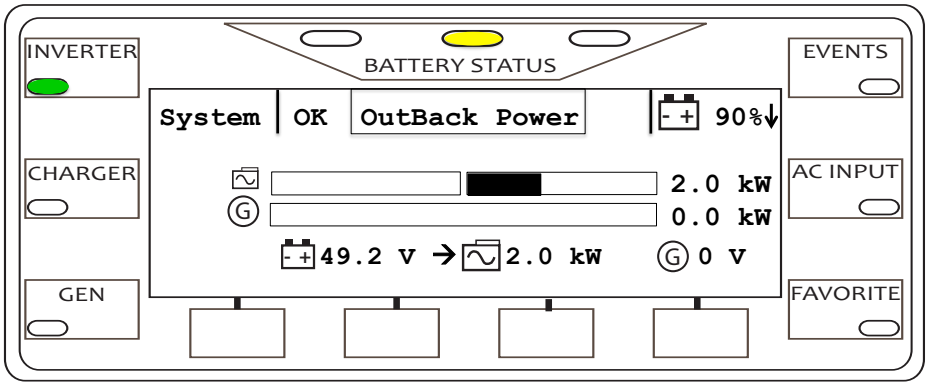

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MATE3 home-screen questions

#1

1. Kisa SOC batri a ye? (What is the battery SOC?)

2. Kisa vòltaj batri a ye? (What is the battery voltage?)

3. Eske batri a ap chaje ou byen lap dechaje? (Is the battery being charged or discharged?)

4. Ki kantite enègi system PV a ap pwodwi? (How much energy is the PV system producing?)

5. Ki vòltaj delco a? (What is the generator voltage?)

6. Ki kantite enègi delco a ap pwodwi? (How much energy is the generator producing?)

#2

7. Kisa SOC batri a ye? (What is the battery SOC?)

8. Kisa vòltaj batri a ye? (What is the battery voltage?)

9. Eske batri a ap chaje ou byen lap dechaje? (Is the battery being charged or discharged?)

10. Ki kantite enègi system PV a ap pwodwi? (How much energy is the PV system producing?)

11. Ki vòltaj delco a? (What is the generator voltage?)

12. Ki kantite enègi delco a ap pwodwi? (How much energy is the generator producing?)

#3

13. Kisa SOC batri a ye? (What is the battery SOC?)

14. Kisa vòltaj batri a ye? (What is the battery voltage?)

15. Eske batri a ap chaje ou byen lap dechaje? (Is the battery being charged or discharged?)

16. Ki kantite enègi system PV a ap pwodwi? (How much energy is the PV system producing?)

17. Ki vòltaj delco a? (What is the generator voltage?)

18. Ki kantite enègi delco a ap pwodwi? (How much energy is the generator producing?)

#4

19. Kisa SOC batri a ye? (What is the battery SOC?)

20. Kisa vòltaj batri a ye? (What is the battery voltage?)

21. Eske batri a ap chaje ou byen lap dechaje? (Is the battery being charged or discharged?)

22. Ki kantite enègi system PV a ap pwodwi? (How much energy is the PV system producing?)

23. Ki vòltaj delco a? (What is the generator voltage?)

24. Ki kantite enègi delco a ap pwodwi? (How much energy is the generator producing?)

#5

25. Kisa SOC batri a ye? (What is the battery SOC?)

26. Kisa vòltaj batri a ye? (What is the battery voltage?)

27. Eske batri a ap chaje ou byen lap dechaje? (Is the battery being charged or discharged?)

28. Ki kantite enègi system PV a ap pwodwi? (How much energy is the PV system producing?)

29. Ki vòltaj delco a? (What is the generator voltage?)

30. Ki kantite enègi delco a ap pwodwi? (How much energy is the generator producing?)

#6

31. Kisa SOC batri a ye? (What is the battery SOC?)

32. Kisa vòltaj batri a ye? (What is the battery voltage?)

33. Eske batri a ap chaje ou byen lap dechaje? (Is the battery being charged or discharged?)

34. Ki kantite enègi system PV a ap pwodwi? (How much energy is the PV system producing?)

35. Ki vòltaj delco a? (What is the generator voltage?)

36. Ki kantite enègi delco a ap pwodwi? (How much energy is the generator producing?)

#7

37. Kisa SOC batri a ye? (What is the battery SOC?)

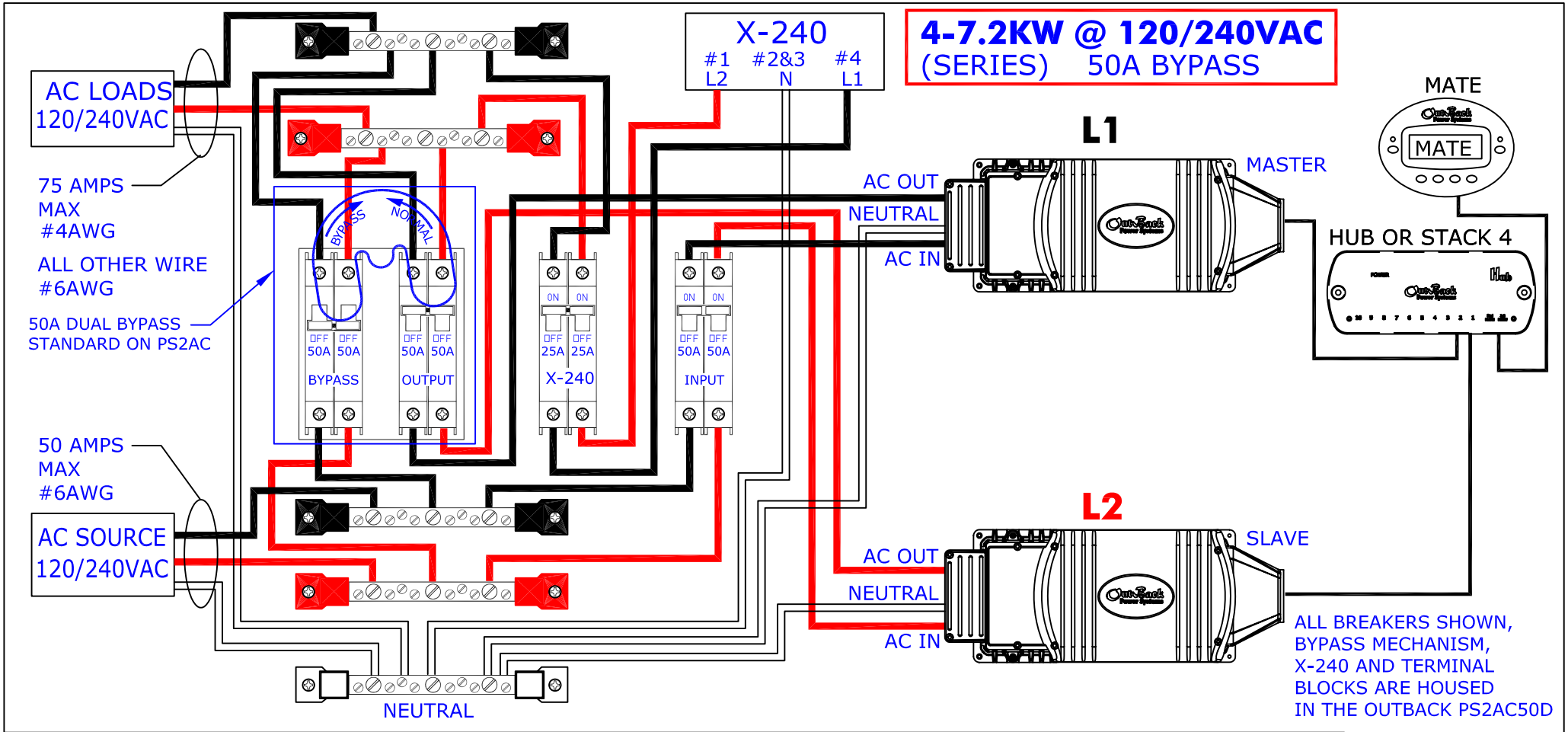
38. Kisa vòltaj batri a ye? (What is the battery voltage?)

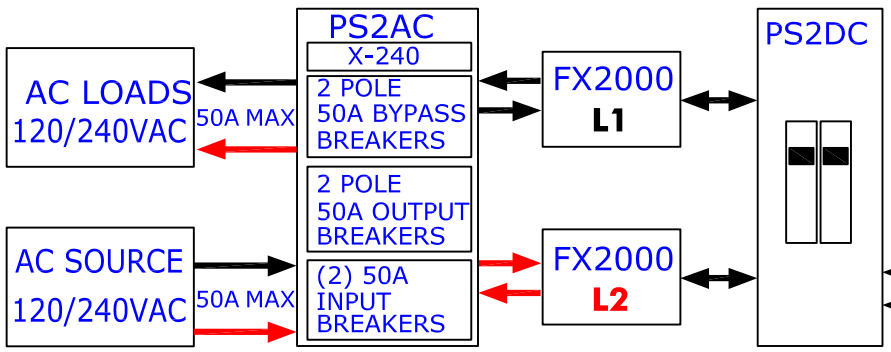
39. Eske batri a ap chaje ou byen lap dechaje? (Is the battery being charged or discharged?)

40. Ki kantite enègi system PV a ap pwodwi? (How much energy is the PV system producing?)

41. Ki vòltaj delco a? (What is the generator voltage?)

42. Ki kantite enègi delco a ap pwodwi? (How much energy is the generator producing?)





4-5KW @ 120/240VAC
(SERIES) 50A BYPASS

24V: TWO 175A BRKRS
TWO PAIR 2/0 CABLES
48V: TWO 100A BRKRS
TWO PAIR 2/0 CABLES

7-7.2KW @ 120/240VAC
(SERIES) 50A BYPASS

24V: TWO 250A BRKRS
TWO PAIR 4/0 CABLES
48V: TWO 175A BRKRS
TWO PAIR 2/0 CABLES

BATTERY

4KW = 2 FX2024
5KW = 2 FX2548
14KW = 4 VFX3524
14.4KW= 4 VFX3648

OutBack Power Systems
19009 62nd AVE NE
ARLINGTON, WA. 98223
360-435-6030
4-7.2KW-50A-BYPASS-SER