



Supplement for use with Lithium-Ion
house battery installations.
KBI Form # 131525



KBi KSM Kompact™
KAPower Starting Module

Installation-Operation Manual

Existing Manual



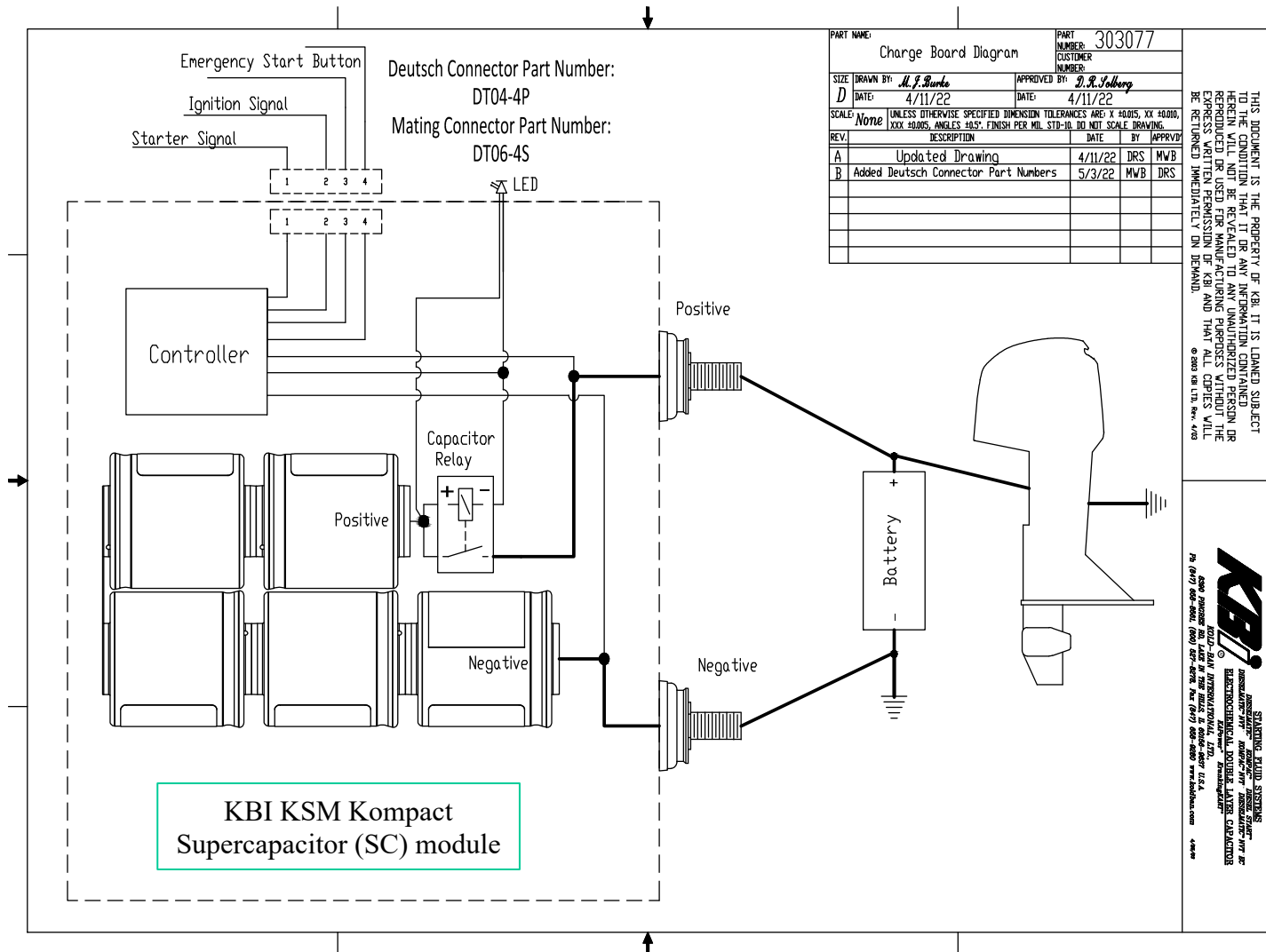
Rev. A

November 2023
Rev B

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Original concept



- 1) **The Capacitor module:** is an array of 5- 1200F Cells in series.
- 2) **Charger / Control Module:** Consists of the Charge controller / Timer, Buck Boost Charger, Input interface and Capacitor cell balancing.
- 3) **Charge timer:** The charge controller has an integrated timer circuit that will activate when either the battery switch is turned “on” / batteries connected and / or the Ignition Signal Input is turned “on”. The purpose of the Ignition Signal Input is to ensure that the cap is fully charged by enabling the buck boost charger to fully charge the cap.
- 4) **The input interface consists of the following:** Starter Signal input (**starter motor “S” terminal circuit input**), Ignition signal input (**input that the boat or vehicle is in service, turned on**), and Emergency Start Button input.
- 5) **Starter Input:** The starter input ties into the starter signal from the engine’s cranking motor starter circuit. It only needs about 5-6 volts from the start circuit to activate the capacitor contactor. The capacitor contactor is always powered by the fully charged capacitor module, not relying on battery voltage. This is a nice feature in low battery conditions! (**Closes the contactor in the KBI Kompact and powers up the vessel’s / vehicle’s system, starter motor regardless of battery SOC**)
- 6) **Ignition Signal Input:** When an Ignition signal is received this simply activates the charge controller timer. Again, to make sure the cap is fully charged. (**Wakes up the Kompact’s buck-booster and gets the cap fully charged**) There may be other creative uses for this input.
- 7) **Emergency Start Button:** If for some reason, the batteries are too deeply discharged to activate the capacitor module through the starter input, the **ESB** (Emergency Start Button) can be used to bring the capacitor system online. (**Manually closes the contactor in the Kompact and powers up the vessel’s / vehicle’s electrical system**)
Note: this is a momentary type of switch. Engine start attempt must be made while the switch is closed ASAP.
- 8) **Cell Balancing:** Cell balancing is required to keep the cells at an optimum state of charge.
- 9) **Lithium-Ion battery enhancement; Auxiliary output used for auxiliary contactor:** This accessory contactor may be required in some lithium-ion battery applications. The contactor is a normally closed (NC) type and paralleled with the Kompact capacitor relay contactor when connected to the KBI KSM Kompact module wire-harness pin 5 orange (+) and pin 6 black (-) wires. The purpose of the auxiliary contactor is to bypass the power from a lithium battery through a power resistor (**or PWM PCB device**) to limit the lithium battery output current in the engine starting circuit. Contact KBI for additional information.



Example of existing key-switch.

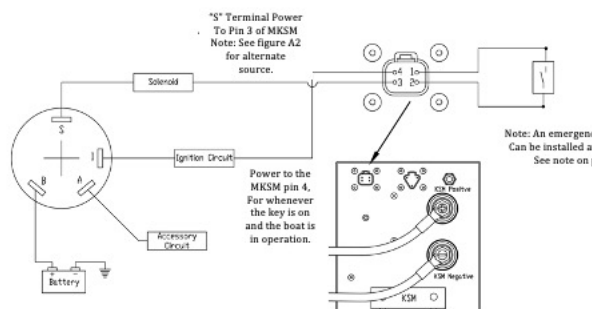
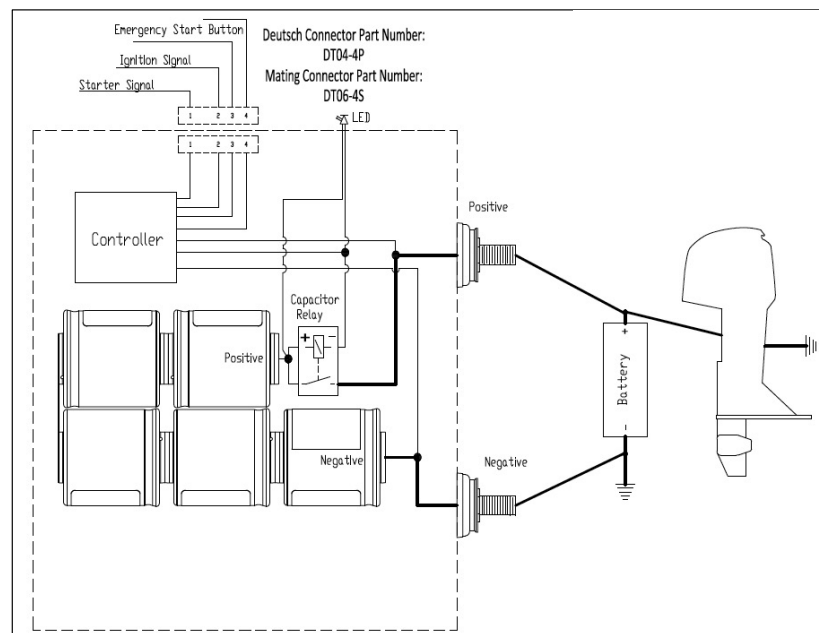


Figure A1: Typical Boat Key-Switch Schematic
For use with MKSMXXX00 Models



Standard KBI KSM Kompact wiring diagram schematic

Wiring and Installation Diagrams

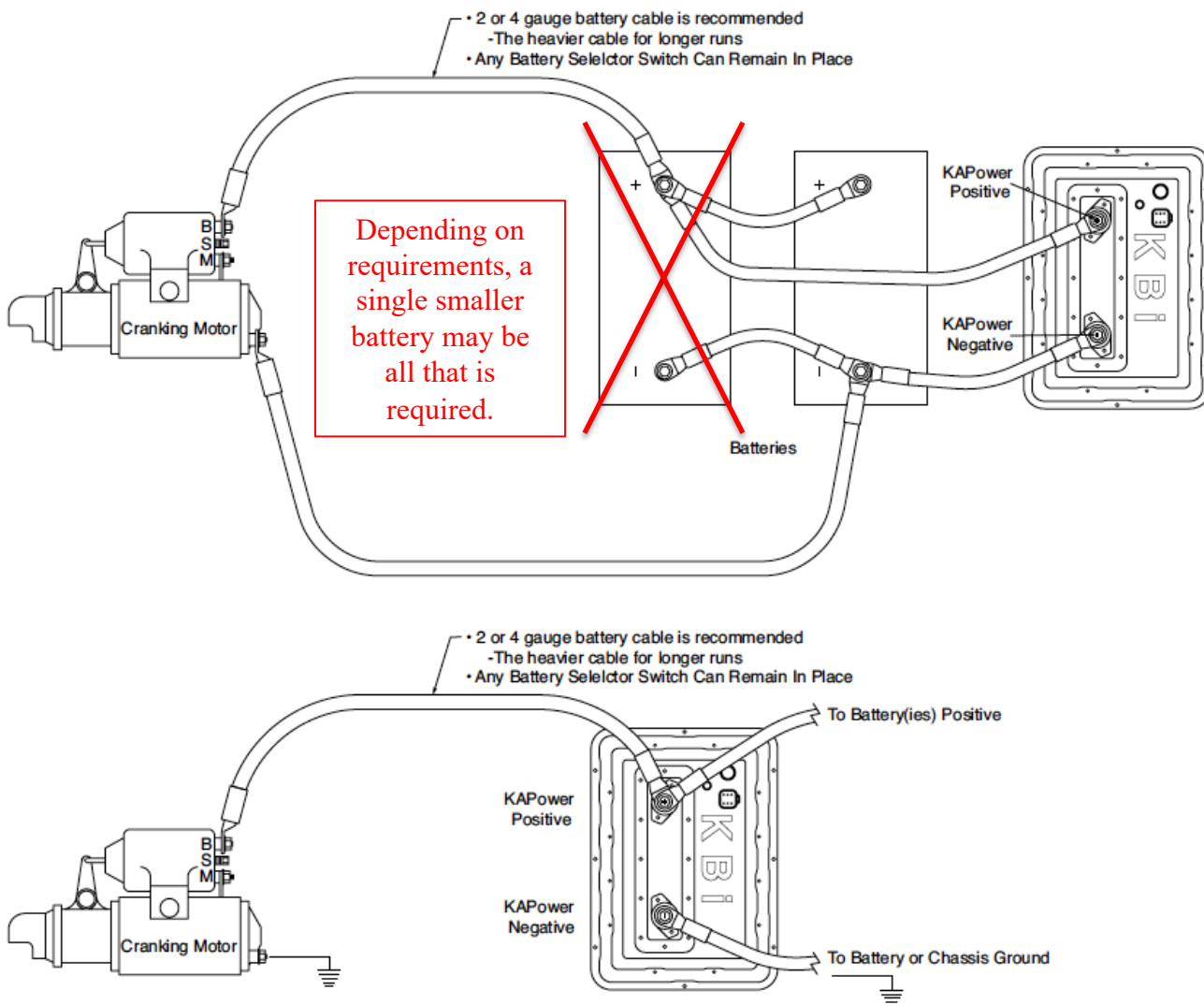


Figure 1: Typical Cable Installations

Battery Cable Installation Diagrams, continued

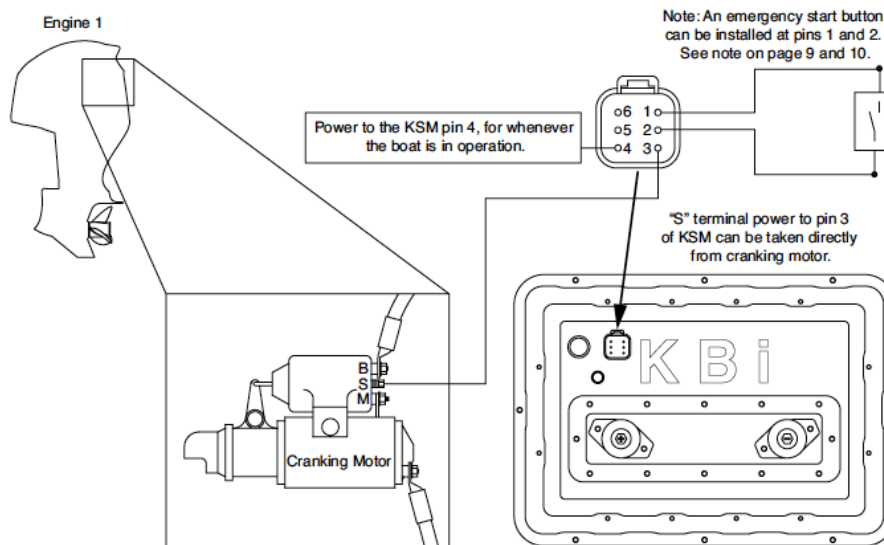


Figure 5A: Boat Operation

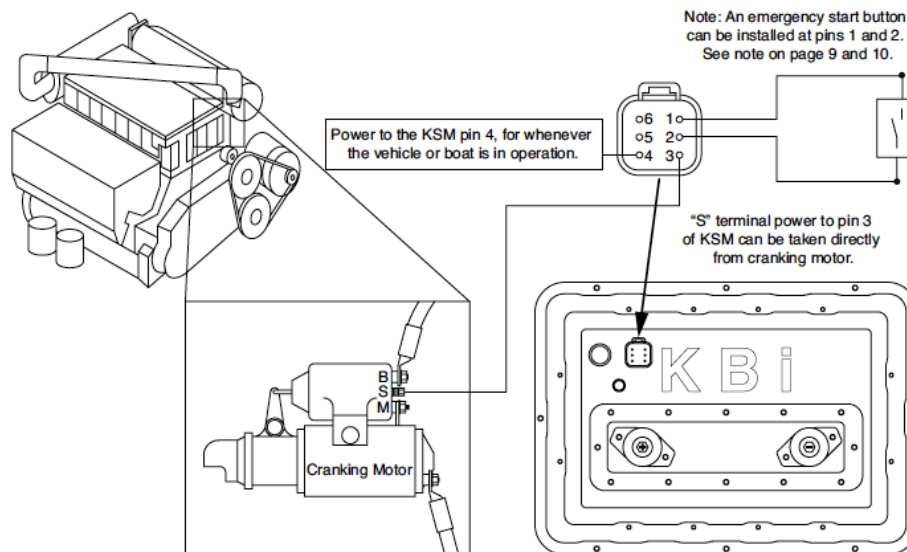
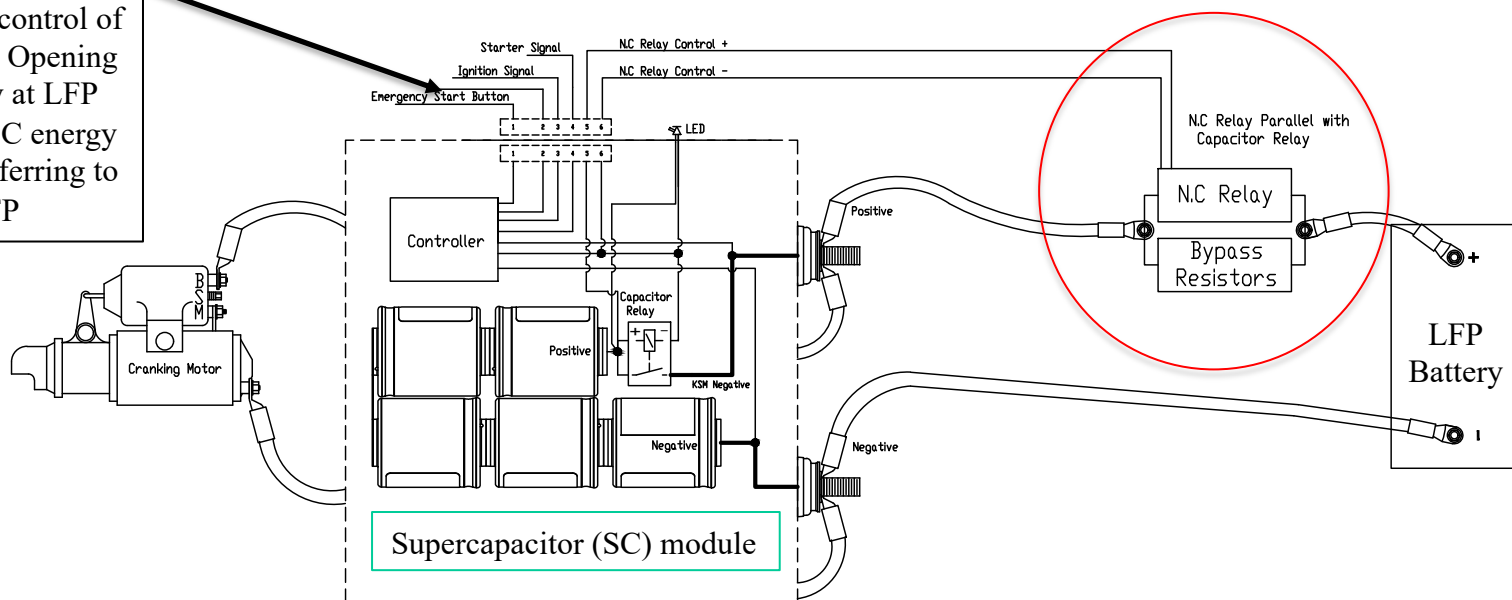


Figure 5B: RV or Inboard Boat Operation

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PROPRIETARY & PATENT PENDING.**

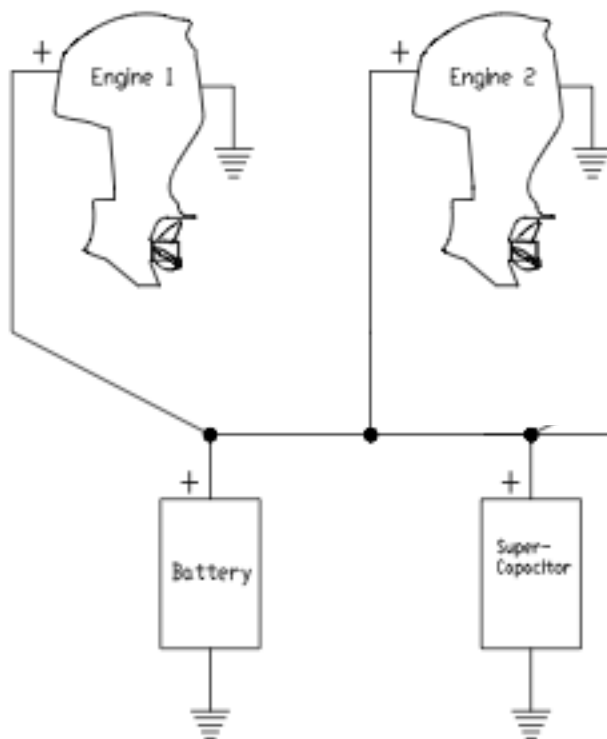
If necessary, add
DPST, NO/NC,
Momentary
Push Button switch
to Emergency Start
circuit for control of
NC Relay. Opening
NC relay at LFP
prevents SC energy
from transferring to
LFP

Remove Lithium-Ion battery from cranking event using KBi controller.



- 1) KBi controller closes the contactor in the SC module when starter motor “S” terminal circuit is live.
- 2) Simultaneously the same signal closing the SC contactor is sent to the Normally Closed relay at LFP battery. Opening the NC relay.
- 3) The bypass resistor is only active, providing essential current to the electrical system during engine starting events, which are typically less than five (5) seconds long.
- 4) Other devices rather than a resistor (PWM circuit) may be used to limit the amount power, current supplied by the LFP battery.

- Twin engine Kompact accessory kit available.
 - Contact KBI for details.



Note:
All Grounds Common