

Soft Nickel Capacitor (SNC)

High Power Module for Wayside Applications

Soft Nickel Capacitor (SNC) modules, also known as asymmetric supercapacitors or ultracapacitors, are specifically designed for high power requirements

SNC modules are extremely robust, high performance products that are unaffected by temperature extremes. The use of aqueous electrolyte provides for an extremely safe system that does not require any electronics.

Features

- High power
- Maintenance-free
- Very long life
- Excellent safety
- Abuse resistant
- Very low self discharge
- Reliable and robust design with no electronics.

Benefits

- Asymmetric Nickel-Carbon design
SNCs have more energy compared to symmetric supercapacitors due to the intrinsic two-fold increase in capacitance.
- Proven robustness and safety of alkaline technology
The simple and rugged design is perfectly compatible with the road/rail environment.
- Durability and maintenance-free operation
SNCs are designed to last the life of most heavy industrial equipment.
- Performances at very low temperature
SNCs will provide enough power even at temperatures as low as -40°C.



SNC module	SNC 12-1200	SNC 24-300	SNC 12-2000	SNC 24-500
Mechanical characteristics				
Length (mm)	369	369	396	396
(in)	14.5	14.5	15.6	15.6
Width (mm)	181	181	206	206
(in)	7.1	7.1	8.1	8.1
Height (mm)	215	215	270	270
(in)	8.5	8.5	10.6	10.6
Weight (kg)	21	21	28.5	28.5
(lbs)	46.4	46.4	62.9	62.9
Electrical characteristics				
Capacitance	1200 F	300 F	2000 F	500 F
Rated voltage	12 V	24 V	12 V	24 V
Maximum voltage	16 V	32 V	16 V	32 V
Minimum voltage	4 V	8 V	4 V	8 V
Internal resistance	0.003 Ω	0.009 Ω	0.003 Ω	0.009 Ω
Max Current 1.5 s	1602 A	1779 A	1602 A	1779 A
Energy stored within operating voltage window	4 - 14.5 V 110 kJ	8 - 29 V 110 kJ	4 - 14.5 V 190 kJ	8 - 29 V 190 kJ
Energy stored within a typical starting voltage window	6.5 - 13 V 70 kJ	13 - 26 V 70 kJ	6.5 - 13 V 120 kJ	13 - 26 V 120 kJ
Maximum operating power ¹	18 kW	24 kW	18 kW	24 kW
Leakage current ²	20 mA	10 mA	30 mA	15 mA
Operating conditions				
Operating temperature range	-40 to 50°C (-40 to 122°F)			
Storage temperature range	-60 to 70°C (-76 to 158°F)			
Cycle life	300 000			

¹ Max power measured at rated voltage

² Leakage current measured after 48 hours at 14 V for the 12 V modules and 28 V for the 24 V modules



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Dedicated to high power wayside applications

SNC modules are designed to provide the high power needed for switch machine operations. Typically the SNCs will work in conjunction with batteries and can be recharged from the 12 V battery circuit. This arrangement has several benefits:

- Optimizes and reduces the size of the batteries

With SNC modules installed, a dedicated 24 V battery bank and charger are no longer required. The battery requirements for a typical control point, crossover or end of siding location can be reduced, along with the physical space requirements of the enclosure.

- Results in less space required

The SNC modules and DC/DC converter require minimal space compared to traditional 24 V battery / charger systems.

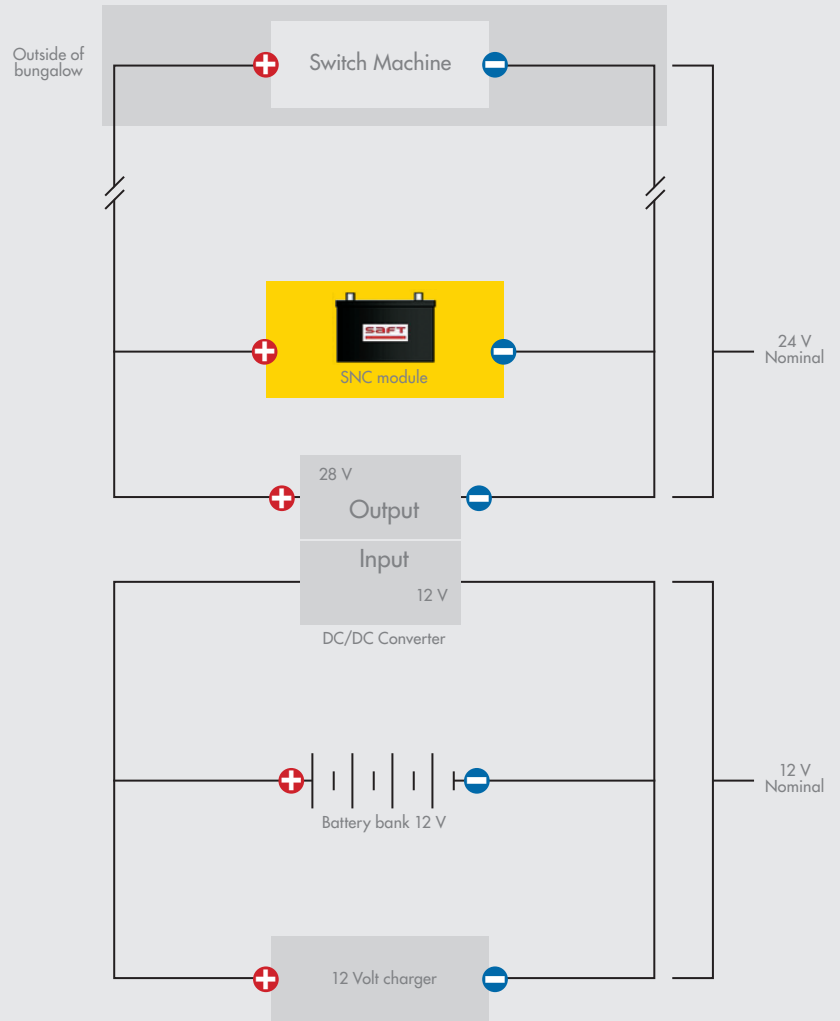
- Allows multiple and continuous operations

The SNC module is continually recharged from the existing operating battery through the DC/DC converter so that it is always ready for the next switch machine operation.

- Eliminates added maintenance

Since the switch machine power comes from the SNC modules, which are maintenance-free, the amount of battery maintenance for each location is reduced.

Example of a typical supercap interconnection diagram for switch applications



- The existing operating battery will continually recharge the SNC module through the DC/DC converter.
- Since the required energy to charge the SNC module is very small, even a nearly discharged battery can provide enough energy to charge the SNC.



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Industrial Battery Group
12, rue Sadi Carnot
93170 Bagnolet - France
Tel. : +33 1 49 93 19 18
Fax : +33 1 49 93 19 64
www.saftbatteries.com

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