

SkelStart

24V

**MORE
STARTING
POWER**

ULTRACAPACITORS HAVE
MULTIPLE BENEFITS OVER
BATTERIES



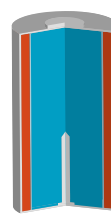
ULTRACAPACITOR-BASED SPACE TECHNOLOGY THAT STARTS YOUR ENGINE

ULTRACAPACITORS USE ELECTRIC FIELD (FAST)



- + ALMOST INSTANT CHARGING AND DISCHARGING
- + HIGH POWER
- + LOW ENERGY
- + NOT TEMPERATURE SENSITIVE
- + LONG LIFETIME

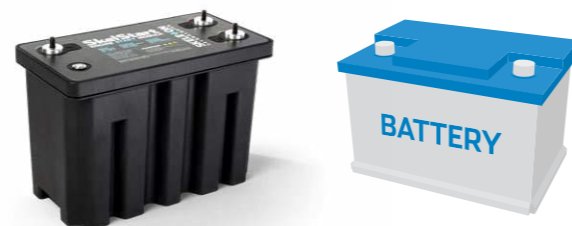
BATTERIES USE A CHEMICAL REACTION (SLOW)

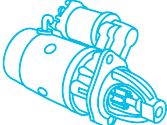






- + SLOW CHARGING AND DISCHARGING
- + LOW POWER
- + HIGH ENERGY
- + TEMPERATURE SENSITIVE
- + SHORT LIFETIME

THE SKELSTART ENGINE START MODULE ALWAYS PROVIDES THE STARTING POWER, WHILE BATTERIES HANDLE ALL THE OTHER LOADS.

ADVANTAGES & DISADVANTAGES



-  **HIGH POWER (FOR STARTING)**
-  **HIGH ENERGY (FOR HOTEL LOADS)**
-  **ZERO TO FULL IN MINUTES**
-  **LONG LIFETIME (1 000 000 CYCLES)**
-  **WORKS IN EXTREME TEMPERATURES**

| | |
|---|---|
| ✓ | — |
| — | ✓ |
| ✓ | — |
| ✓ | — |
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WHAT DOES IT MEAN FOR THE USER?

RELIABLE STARTING

- + Much higher peak power than batteries can provide
- + Temperature won't affect starting power
- + Starting power even with „dead“ batteries – If SkelStart energy is used, it needs only 18V to be recharged again. SkelStart will be fully charged in few minutes.

BATTERY LIFETIME INCREASE

- + Starting power doesn't come directly from batteries
- + More energy stored by the end of the work day
- + Battery lifetime will be increased 1.5 – 2x

FUEL CONSUMPTION DECREASE

- + No need for idling to charge the batteries
- + Measured example: Idling fuel consumption from 6% to 2% = 400L/year

NO HASSLE - ONE TIME INVESTMENT

- + Lifetime 1M cycles, no maintenance needed
- + Warranty 6 years

REAL LIFE USE CASE:

“I used to idle my truck almost every day while I was cooking or watching TV - just to avoid surprises the next morning. Having SkelStart is like having an ace in my back pocket - whatever the weather, or the status of my batteries, I can still start the truck. I can also feel the engine cranking much faster now. I got SkelStart installed on a 2011 Scania R620 that I plan to replace in few years - thankfully SkelStart has a long lifetime and 6 years of warranty, so I can just install it to my next truck.”

- Rainer, Lundens Frakt. Göteborg, Sweden.



The same technology is used by the Space Agency, which means it has been tested in the harshest environment possible - SPACE.

SkelStart is based on Skeleton Technologies' industry-leading SkelCap ultracapacitors, which have the highest power and energy density on the market. This advantage carries over to SkelStart, making it the most powerful engine start module on the market.



SKELSTART EASY INSTALLATION

Skelstart is installed between the batteries and the starter, which means the batteries are disconnected from the starter.

Skelstart will always provide the starting power for the engine, and the batteries will only need to provide energy for lights, air conditioning, heating, etc.

SkelStart

24V



SPECIFICATIONS

| SkelStart 24V | Unit | |
|---|--------|-----------------------|
| Cold Cranking Amps (CCA)* | A | 1206 |
| Maximum Peak Current (0.4 sec current) | A | 4353 |
| Peak Power** | kW | 104 |
| Charged full voltage | V | 28.2 |
| Energy | Wh | 35 |
| Rated Capacitance | F | 320 |
| Individual Cell Capacitance | F | 3200 |
| Charging current | A | 16 (max) |
| Continuous input voltage range | V | 18-32 |
| Continuous input voltage range with specified charge time | V | 23-32 |
| Recharge time (from 0 V) | min | 10 |
| Operating temperature | Deg °C | -40 to +65 |
| Standby current draw | mA | <10 |
| Dimensions | mm | 328 L x 171 W x 241 H |
| Weight | kg | 8.5 |

* Based on 1s ESR

** Based on 10ms ESR