

## ULTRACAPACITOR-BASED SPACE TECHNOLOGY THAT STARTS YOUR ENGINE

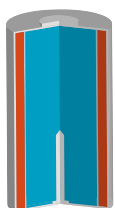
### MORE STARTING POWER

ULTRACAPACITORS HAVE  
MULTIPLE BENEFITS OVER  
BATTERIES

#### 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)

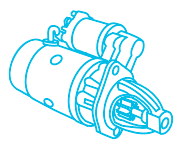
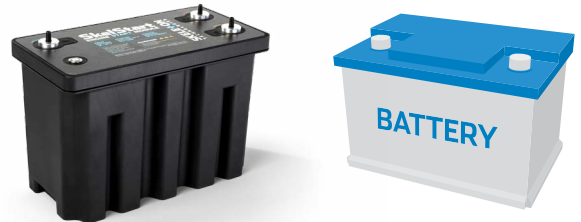


- + SLOW CHARGING  
AND DISCHARGING
- + LOW POWER
- + HIGH ENERGY
- + TEMPERATURE SENSITIVE
- + SHORT LIFETIME



# 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**



The same technology is used by the European 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.

# 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.

## FUEL CONSUMPTION DECREASE

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

## 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

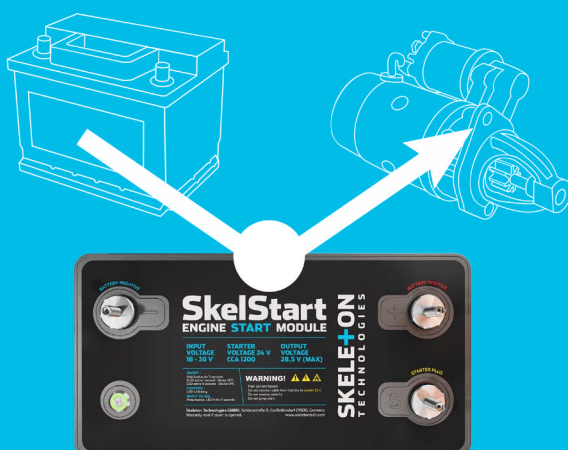
## NO HASSLE - ONE TIME INVESTMENT

- + Lifetime 1M cycles (10+ years), 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.



## SKELSTART EASY INSTALLATION

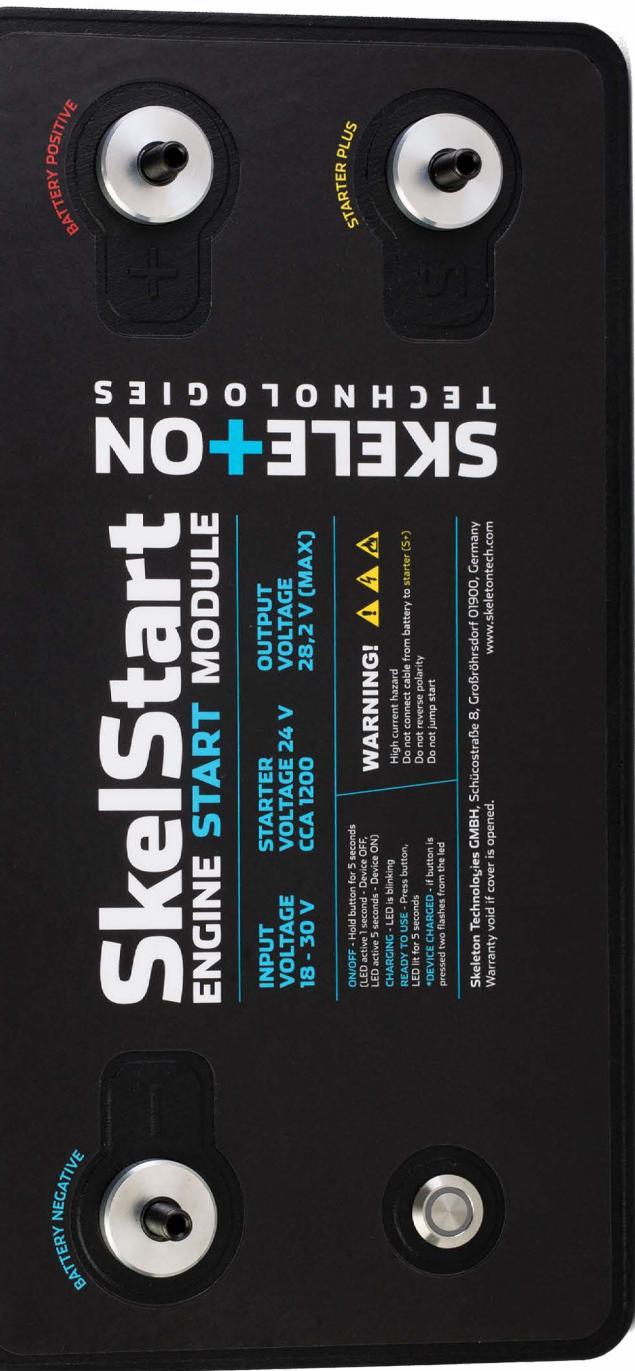
Skelstart is installed between the batteries and the starter, which means the batteries are disconnected from the starter.

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

## ENGINE START MODULE

24V



## SPECIFICATIONS

SkelStart 24V	Unit	
Cold Cranking Amps (CCA)	A	1218
Maximum Peak Current (0,4 sec current)	A	4460
Peak Power	kW	109.6
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	18-30
Continuous input voltage range with specified charge time	V	23-30
Recharge time (from 0 V)	min	8.5
Operating temperature	Deg °C	-40 - +65
ESR IEC	mOhm	1.79
Standby current draw	mA	<10
Dimensions	mm	328 L x 171 W x 241 H
Weight	kg	8