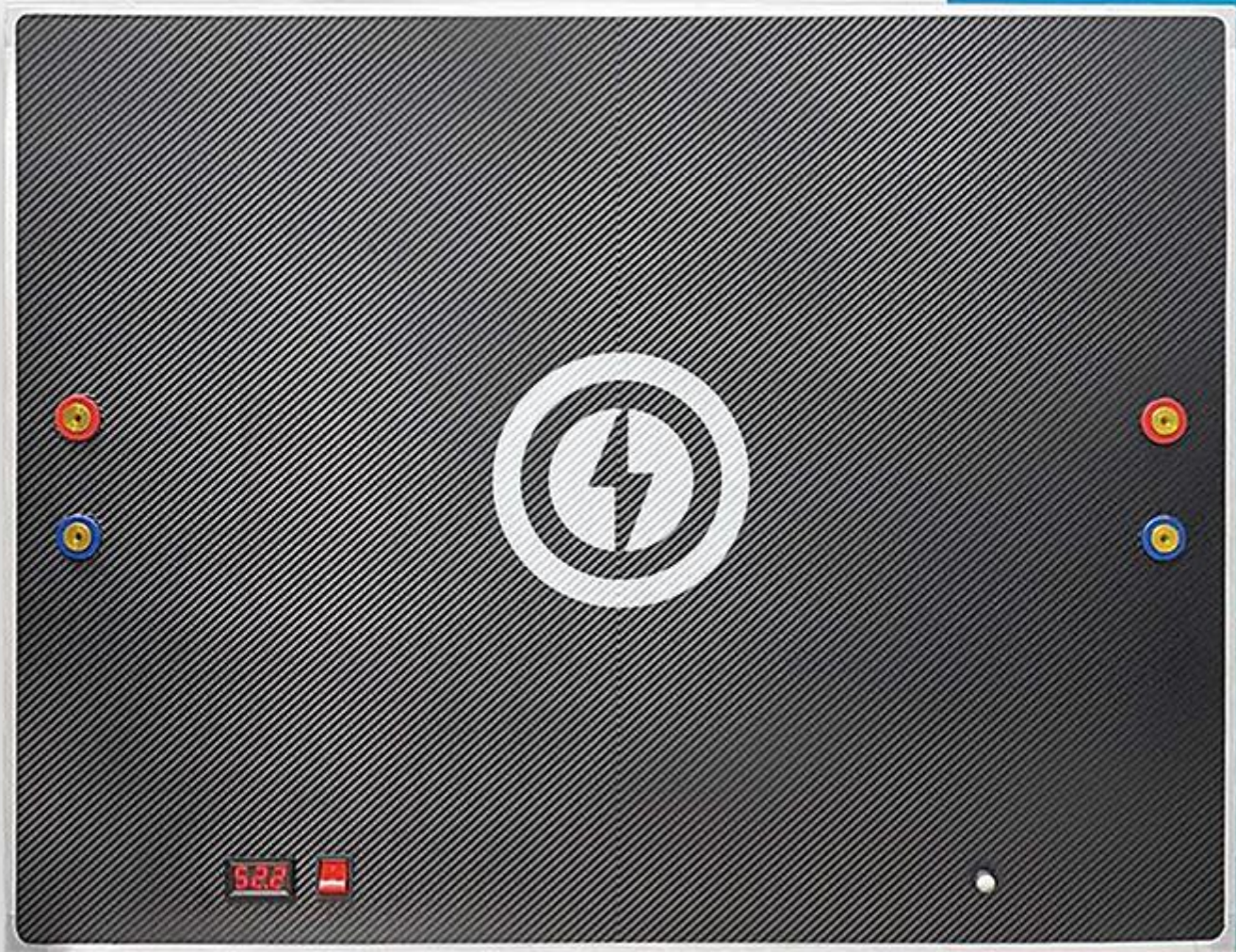




**TEEMP**

ENERGY STORAGE SYSTEMS



**ENERGY  
STORAGE  
SYSTEMS**

2021

Since 2011

## Business areas:

- Production of individual supercapacitors of in-house patented design
- Production of energy storage units based on in-house supercapacitors and lithium batteries
- Design of comprehensive energy storage solutions for transport, the power sector and industry
- Research and development in the field of new materials and technologies to produce supercapacitors and lithium-ion batteries



**180,000**

supercapacitor cells  
produced annually



**70**

employees in R&D  
and production



**36**

patents in the field of electric-  
chemical power sources and  
production technology



**> 7,000 A**

short-circuit operating  
capability



**98%**

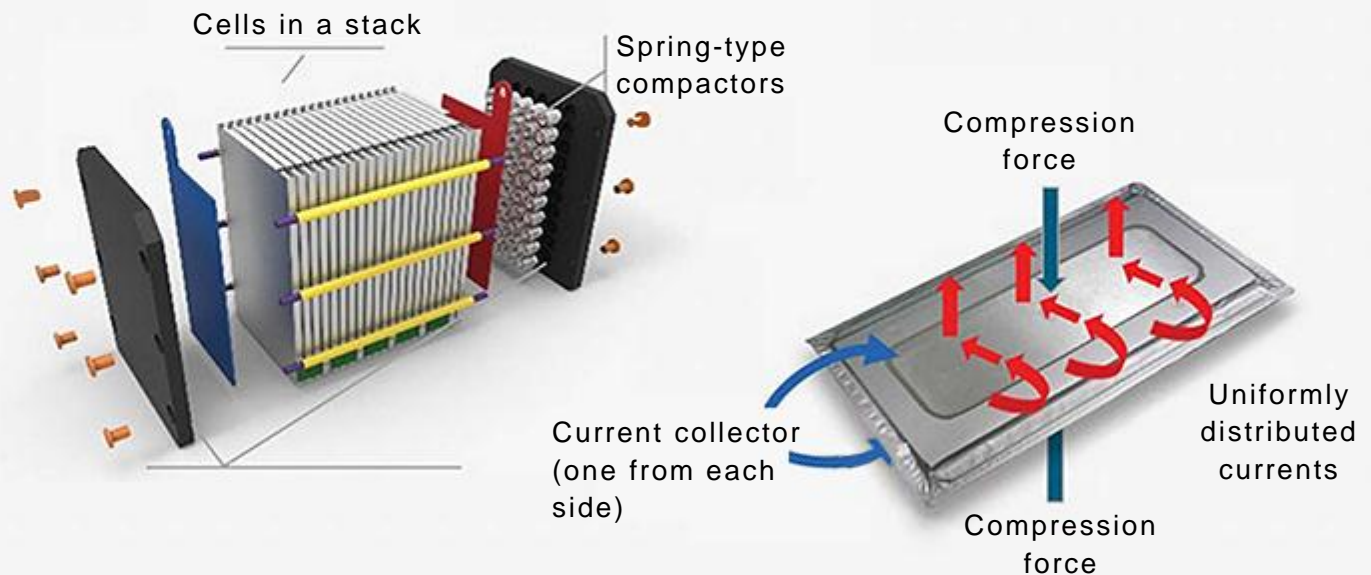
good product yield  
after tests



**Certificate**

of quality management per  
ISO 9001 and GOST RV  
0015-002-2012.

# About the technology



- The patented prismatic structure of the cell, as opposed to the conventional “can” pattern, allows current fields to be distributed over the entire cell ensuring uniform heat emission and lower wear of the active electrode layer
- Cell service life – 1 mln charging/discharging cycles
- Extreme operating modes – from -60°C to +85°C
  - Arctic version – from -60° to +65°C
  - Tropic version – from -20° to +85°C
- The module’s architecture ensures serviceability under current loads up to short circuits;



# Characteristics of TEEMP supercapacitors as compared with analogues

Parameter	TEEMP	Maxwell	LS Mtron	Nesscap	Skeleton	SPSCAP	EATON	loxus
Peak operating voltage, V	2.85	2.85	2.85	2.85	3	2.85	2.85	2.85
Internal resistance, mΩ, not more than	0.25 (0.19)	0.29	0.26	0.26	0.18	0.22	0.23	0.22
Capacity, F (rated)	3,000	3,000	3,000	3,000	3,200	3,000	3,000	3,000
Stored energy, W*h	3.04	3.04	3.04	3	3.6	3.04	3	3.04
Weight, grams, max.	500	510	515	530	530	551	-	510
Maximum peak current, A, not less than	7,500	1,900	2,396	2,270	3,100	2,165	2,400	1,800
Operating temperature range, °C	-40...+65	-40...+65	-40...+65	-40...+65	-40...+65	-40...+65	-40...+65	-40...+65
Leakage current, mA, not more than	4	5.2	5	5.2	11	5.2	5	5

\* Data sourced from official manufacturer websites

# PowerPanel

The only energy storage capable of connecting a supercapacitor panel to provide for impulse loads to extend battery service life.

The ideal solution for a "solar-storage" combined plant: 10 Hevel solar panels and a two-module PowerPanel provide round-the-clock power supply for a rural house.



<b>Voltage:</b>	50 V
<b>Source type:</b>	LFP
<b>Capacity:</b>	40..180 Ah
<b>Discharge current:</b>	1C (40..180 A)
<b>Maximum discharge current:</b>	10C (400..1,800 A)
<b>Overall dimensions:</b>	865x665x60 mm
<b>Mounting options:</b>	wall mount, built-in
<b>Cooling requirement:</b>	not required

## MO-series supercapacitors –

universal modules for a wide range of applications

<b>Voltage variation:</b>	12...300 V
<b>Protection degree:</b>	IP54 and higher
<b>Service life (under rated voltage), charge/discharge cycles:</b>	1,000,000



### Applications:

- Regenerative braking of electric vehicles, cranes, elevators
- Heavy machine starting systems
- Uninterrupted power supplies
- Voltage drop compensation systems
- Additional power systems
- Variable-speed drive power supply maintenance systems
- Wind generator blade incidence angle power supply and control systems

## MO-75V50F module



**Voltage:** 75 V  
**Capacity:** 50 F  
**Internal resistance:** 11.4 mΩ  
**Continuous operating current:** 100 A  
**Maximum pulse current (0.3 s), A:** 2,300  
**Interface protocol:** RS-485/CAN  
**Application:** automatic start/stop system for locomotive diesel engines

## MO-110V18F module

**Voltage:** 110 V  
**Capacity:** 18 F  
**Internal resistance:** 26.6 mΩ  
**Continuous operating current:** 200 A  
**Maximum pulse current (0.3 s), A:** 1,200  
**Interface protocol:** RS-485/CAN  
**Application:** automatic start/stop system for locomotive diesel engines



## MO-162V50F module



**Voltage:** 162 V  
**Capacity:** 50 F  
**Internal resistance:** 21 mΩ  
**Continuous operating current:** 300 A  
**Maximum pulse current (0.3 s), A:** 4,600  
**Interface protocol:** RS-485/CAN  
**Application:** Braking energy recovery system for vehicles (trams, subway cars, hybrid buses)

## MO-225V33F module

**Voltage:** 225 V  
**Capacity:** 33 F  
**Internal resistance:** 36.6 mΩ  
**Continuous operating current:** 100 A  
**Maximum pulse current (0.3 s), A:** 4,600  
**Interface protocol:** RS-485/CAN  
**Application:** Power supply quality improvement systems, short-term uninterruptible power supplies, recovery system



## MO-300V25F module



**Voltage:** 300 V  
**Capacity:** 25 F  
**Internal resistance:** 25 mΩ  
**Continuous operating current:** 100 A  
**Maximum pulse current (0.3 s), A:** 4,600  
**Interface protocol:** RS-485/CAN  
**Application:** Uninterruptible power supply for railway automatics

# "Start" series

## CCC-28V250F system



**Application:** portable system to start machines with 24 V onboard voltage (wheeled and tracked transport vehicles)

**Cold cranking current:** 1,500 A

**Number of cycles:** >100,000

**Charging:** from standard batteries, from mains, from built-in batteries, from generators

**Overall dimensions:** 462x340x170 mm

**Weight:** 19 kg

## CC-12V200F guaranteed start system

**Application:** built-in system to start machines with 12 V onboard voltage

**Cold cranking current:** 900 A

**Number of cycles:** >100,000

**Charging:** from standard batteries and generators

**Overall dimensions:** 272x100x104 mm

**Weight:** 2.7 kg



## CC03-28V250F guaranteed start system



**Application:** built-in system to start machines with 24 V onboard voltage (wheeled and tracked transport vehicles)

**Cold cranking current:** 1,500 A

**Number of cycles:** >100,000

**Charging:** from standard batteries and generators

**Overall dimensions:** 265x168x261 mm

**Weight:** 11 kg

## Overall advantages:

- Ensuring the guaranteed start of internal-combustion engines at temperatures of from -60 to +85°C;
- System charging is provided at batteries discharged to 65%;
- No risk of adverse effect on the plant's electrical system: automatic connection and power output to the starter at the moment of internal-combustion engine start.

# Certificates



# Contacts

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