

## DATA SHEET

# SkelMod 102V

## 88F

- + 102V DC nominal voltage
- + Ultra-low ESR
- + Long lifetime - 1 million duty cycles
- + Integrated Ultracapacitor Management System for effective cell balancing
- + CAN bus communication
- + 19 inch rack system compatible



### SMA102V88FAF TECHNICAL SPECIFICATIONS

### UNIT

### VALUE

#### Electrical

Nominal voltage	V	102
Absolute maximum voltage	V	108
Rated capacitance	F	88
Rated DC 10ms ESR	mΩ	6.2
Rated DC 1s ESR	mΩ	7.6
Specific energy <sup>3</sup>	Wh/kg	4.8
Energy density <sup>4</sup>	Wh/L	4.3
Maximum series voltage	VDC	1500*
Rated maximum peak current (for 1 s duration) <sup>1</sup>	A	2689
Typical short circuit current	kA	21.25
Maximum stored energy <sup>2</sup>	Wh	1271

#### Rated nominal power (DC 10ms ESR):

Power <sup>5</sup>	kW	419.5
Specific power <sup>6</sup>	kW/kg	15.8
Power density <sup>7</sup>	kW/L	14.2

#### Rated practical power (DC 1s ESR):

Power <sup>5</sup>	kW	342.2
Specific power <sup>6</sup>	kW/kg	12.9
Power density <sup>7</sup>	kW/L	11.6

Cells in total	pcs	36
Cell type		SCA3200

#### Life\*

Life at 102 V and maximum operating temperature	Hours	1500
Shelf life @ RT, uncharged	Years	10
Projected cycle life @ RT between 102 V and 56 V	Cycles	1 000 000

#### Temperature

Operating temperature range	°C	-20 to +60*
Storage temperature range	°C	-40 to +50

#### Ultracapacitor management system

Nominal auxiliary supply voltage	V	24
Auxiliary supply voltage range	V	16-33
Constant current consumption at 24V DC	A	0.07**
Cell balancing method		Controlled resistive balancing
Temperature monitor		6 NTC sensors
Voltage monitor		Individual Cell
Communication interface		CAN bus 2.0B

#### Connectors

Power connector	Ø 13.5 mm Trough hole
Signal connectors	D-sub DE-9 Male
	D-sub DE-9 Female
Connector location	Front

**Standards**

International protection marking (for enclosure)  
Isolation protection  
EMC immunity  
EMC emissions

IEC 60529, IP 20  
IEC 62477-1, OVC2, PD2  
IEC 61000-6-2  
IEC 61000-6-3

**Thermal parameters\*\*\***

Thermal resistance given at  $\Delta T$  30 °C ( $R_{th}$ )  
Thermal capacitance ( $C_{th}$ )  
Maximum continuous current (at  $\Delta T$  15 °C)  
Maximum continuous current (at  $\Delta T$  30 °C)  
Maximum continuous current (at  $\Delta T$  40 °C)

°C/W  
kJ/°C  
A  
A  
A

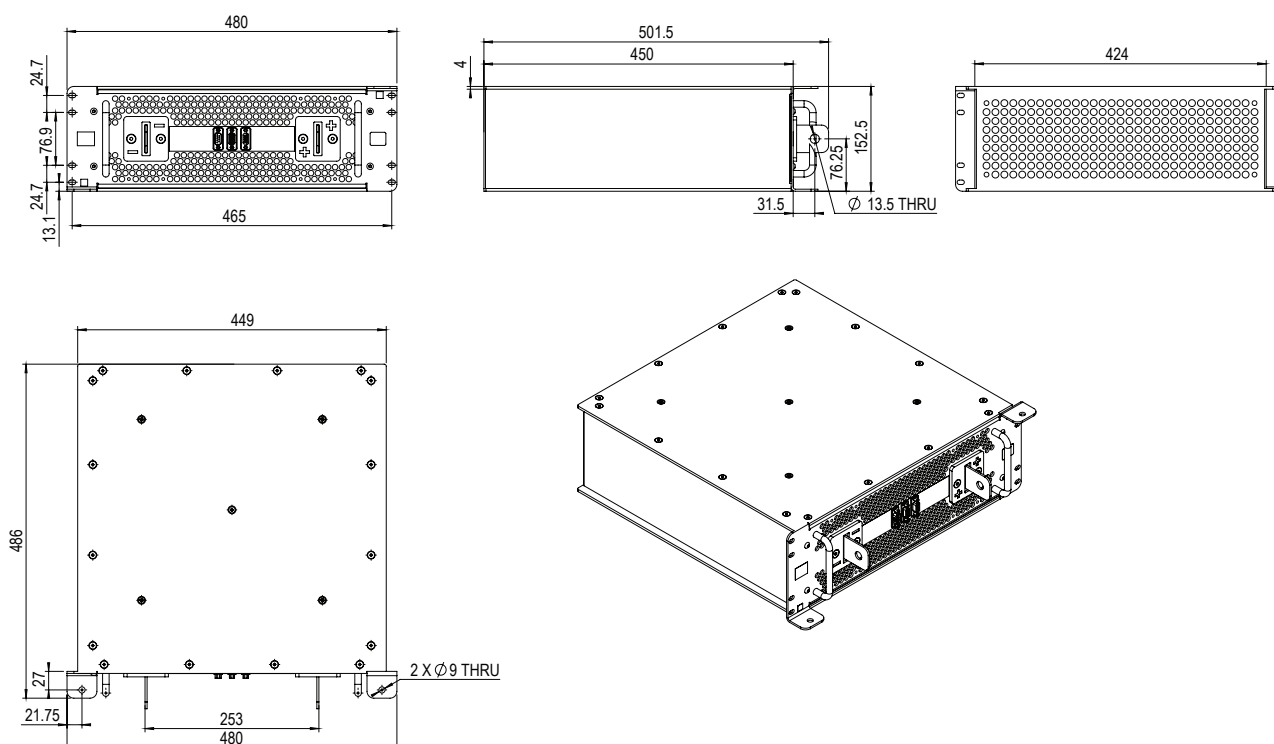
0.065  
25  
172  
245  
281

**Physical parameters**

Typical mass  
Typical volume

kg  
L

26.5  
29.6



\* For maximum series voltage IE32 (EN 60721-3-3) requirements must be followed. For lower temperature contact Skeleton Technologies

\*\* Inrush current for the auxiliary supply: 0.18A

\*\*\* Thermal parameters given for cooling airflow rate of 85CFM

$$1 \text{ Maximum peak current (I}_s\text{)} = \frac{C \times \frac{1}{2} \times V}{C \times \text{ESR} + T_s} \quad 2 \text{ E}_{\text{stored}} = \frac{1}{2} \times C \times V^2 \quad 3 \text{ E}_{\text{specific}} = \frac{\text{E}_{\text{stored}}}{\text{mass}} \quad 4 \text{ P}_{\text{density}} = \frac{\text{P}_{\text{max}}}{\text{volume}}$$

$$5 \text{ E}_{\text{density}} = \frac{\text{E}_{\text{stored}}}{\text{volume}} \quad 6 \text{ P}_{\text{max}} = \frac{V^2}{4 \times \text{ESR}} \quad 7 \text{ P}_{\text{specific}} = \frac{\text{P}_{\text{max}}}{\text{mass}} \quad 8 \text{ R}_{\text{th}} = \frac{\Delta T}{\text{DC I}_s \text{ ESR} \times I^2}$$

**Standard markings**

- + Name of Manufacturer, Part number, Serial number, Rated voltage
- + Rated capacitance, Negative and positive terminals, Warning marking
- + Total energy in watt-hours

**Notes**

- + All information provided on this data sheet and all subsequent ultracapacitors sales and testing are subject to Standard Terms of Service (ToS) available on [www.skeletontech.com](http://www.skeletontech.com), document General Terms of Sale for Skeleton Technologies OÜ

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