



# NESSCAP® Ultracapacitor Products 48V MODULES

## Features

- 48V modules with rated capacitance of 36F, 66F, 88F, 111F and 166F
- Highest power performance with ultra-low internal resistance
- Integrated UMU (Ultracapacitor Management Unit) for:
  - Individual cell balancing
  - Voltage and temperature diagnosis by logic output
  - Optional CAN or RS communication interface
- Rugged design for harsh environments
- Typical applications:
  - Transportation and automotive
  - Industrial, UPS, DVR, and telecommunications



## Specifications

Rated Capacitance (F)	Internal Resistance (mΩ)		Max Current <sup>1</sup> (A)	Leakage Current (mA)	Stored Energy (Wh)	Specific Energy (Wh/kg)	Nominal Weight (kg)	Part Number
	AC (100Hz)	DC						
Discharge with constant current at 25°C			1 sec discharge rate to 1/2V <sub>R</sub>	72 hours at 25°C	at V <sub>R</sub>	Gravimetric		
36	< 10.8	< 13.0	580	< 1.5	11.8	1.38	8.5	EMHSR-0036C0-048R0S
66	< 8.6	< 10.4	920	< 2.7	21.7	2.17	10.0	EMHSR-0066C0-048R0S
88	< 7.3	< 8.9	1,160	< 3.0	28.9	2.51	11.5	EMHSR-0088C0-048R0S
111	< 6.0	< 7.1	1,460	< 4.2	36.4	2.91	12.5	EMHSR-0111C0-048R0S
166	< 4.8	< 5.6	2,030	< 5.2	54.5	3.63	15.0	EMHSR-0166C0-048R0S

Rated Voltage, V <sub>R</sub>		48.6V DC		
Surge Voltage		51.3V DC		
Capacitance Tolerance		0% / +20%		
Operating Temperature Range		-40 ~ 65°C		ΔCAP  < 5% and ΔESR < 150% of initial value measured at 25°C
Storage Temperature Range		-40 ~ 70°C		
Lifetime	Endurance	1,500 hours at V <sub>R</sub> and 65°C		ΔCAP  < 20% and ΔESR < 60% of specified value
	At Room Temperature	10 years <sup>2</sup> at V <sub>R</sub>		ΔCAP  < 30% and ΔESR < 150% of specified value
Cycle Life		1,000,000 cycles between V <sub>R</sub> and 1/2V <sub>R</sub> using constant current charge and discharge at 25°C		ΔCAP  < 30% and ΔESR < 150% of specified value
Electronics (Ultracapacitor Management Unit)	Balancing	Active Balancing		
	Monitoring	Over Voltage : High and Low signal Temperature : NTC		Requires external 5V DC input, configurable to user specific requirements
	Communications	High/Low Logic signal Optional CAN 2.0B, J1939 or RS485 interface		
	Signal Output	4 pin connector		
Output Terminals	M8 screw holes			
Enclosure	Insulation Coordination	Rated insulation voltage : 1kV DC Or 2.8kV AC (50Hz, 10sec) Rated impulse withstand voltage : 6kV DC		IEC 61287-1 (Cat. : OV II)
	Protection Degree	IP 65 (Dust-tight and protected against water jets)		IEC 60529
	Vibration & Shock Resistance	SAE J2380 : Vibration SAE J2464 : Shock		
	Mounting	8 locations, M8 holes on top and bottom covers		

1 – Warning: this value should not be used as continuous current

2 – Lifetime at room temperature is a provisional value

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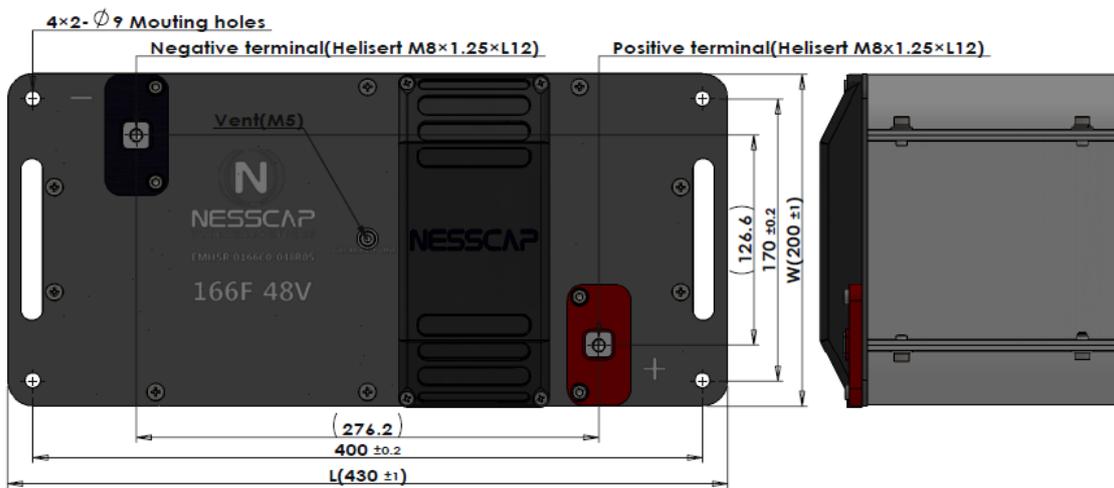
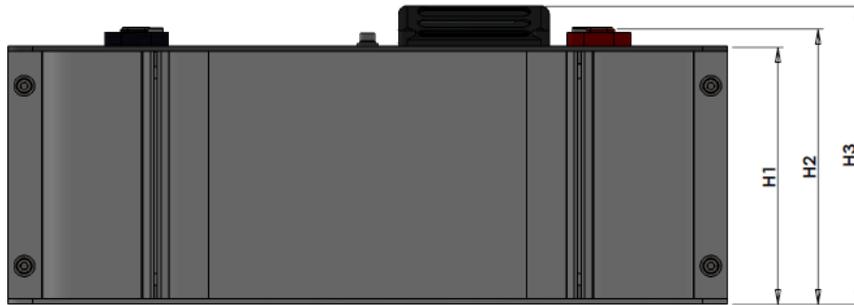
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ISO 9001, 14001, and TS 16949 certified



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## Dimensions



Part Number	Capacitance (F)	Dimensions (mm)				
		L( $\pm 2.0$ )	W( $\pm 1.0$ )	H1(Max)	H2(Max)	H3(Max)
EMHSR-0036C0-048R0S	36	430	200	68.5	80.5	93.5
EMHSR-0066C0-048R0S	66	430	200	91	103	116
EMHSR-0088C0-048R0S	88	430	200	102	114	127
EMHSR-0111C0-028R0S	111	430	200	119	131	144
EMHSR-0166C0-048R0S	166	430	200	155	168	180

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