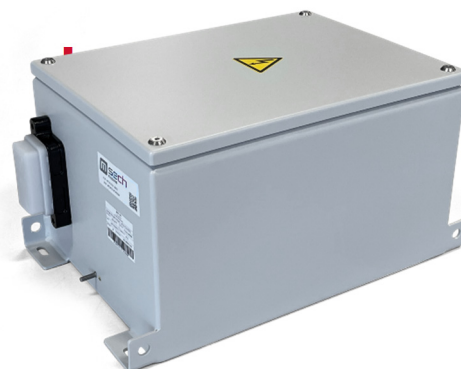


Product Datasheet

348V 6F module

- Rated voltage 348VDC
- 6.2F capacitance
- Resistive cell balancing
- Based on 360F hermetically sealed cells
- Robust and vibration proof design
- Typical use for wind turbine pitch-systems



ELECTRICAL SPECIFICATIONS

Type	M12S-348-0006
Rated Voltage V_R	348 V
Surge Voltage V_S^1	359 V
Rated Capacitance C^2	6.2 F
Capacitance Tolerance 3	0% / +20%
DC ESR ²	<120 mΩ
Leakage Current I_L^4	<62 mA
Constant Current ($\Delta T = 15^\circ\text{C}$) ⁶	TBD, cell 25 A
Max Current I_{Max}^7	TBD, cell 329 A
Short Current I_S^8	2.9 kA
Stored Energy E^9	104 Wh
Energy Density E_d^{10}	3.0 Wh/kg
Usable Power Density P_d^{11}	3.6 kW/kg
Impedance Match Power Density P_{dMax}^{12}	7.2 kW/kg

THERMAL CHARACTERISTICS

Type	M12S-348-0006
Working Temperature	-40 ~ 65°C
Storage Temperature ¹³	-40 ~ 70°C
Thermal Resistance R_{Th}^{14}	TBD °C/W
Thermal Capacitance C_{Th}^{15}	TBD J/°C

LIFETIME CHARACTERISTICS

Type	M12S-348-0006
DC Life at High Temperature ¹⁶	1500 hours
DC Life at RT ¹⁷	10 years
Cycle Life ¹⁸	1'000'000 cycles
Shelf Life ¹⁹	4 years

SAFETY & ENVIRONMENTAL SPECIFICATIONS

Type	M12S-348-0006
Safety	RoHS, REACH
Vibration	IEC60068-2-6
Shock	IEC60068-2-28, 29
Environmental Protection	IP54
Rated impulse voltage (IEC 60664-1)	4 kV
Insulation resistance	>100 MΩ

MONITORING AND CELL VOLTAGE MANAGEMENT

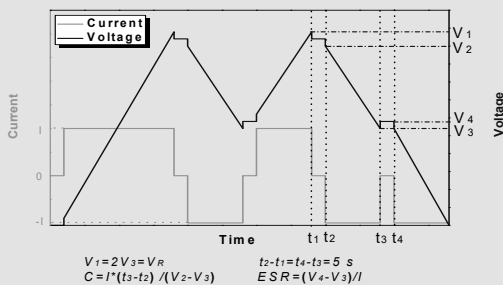
Type	M12S-348-0006
Cell Voltage Management	Passive balancing
Temperature monitoring	PT100 sensor

PHYSICAL PARAMETERS

Type	M12S-348-0006
Mass M	35 kg
Terminals ²⁰	Connector Harting, 6 – 16mm ²
Dimensions ²¹ Length	500 mm
Width	320 mm
Height	330 mm
Module Fixation Holes ²¹	4 x Ø11mm

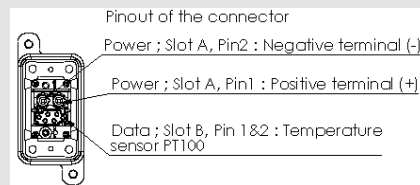
NOTES:

- Surge voltage V_S : Absolute maximum voltage, non-repetitive. The duration must not exceed 1 second.
- Capacitance C : The test current is 0.075 A/F, if the calculated current is >100A, then apply 100A.

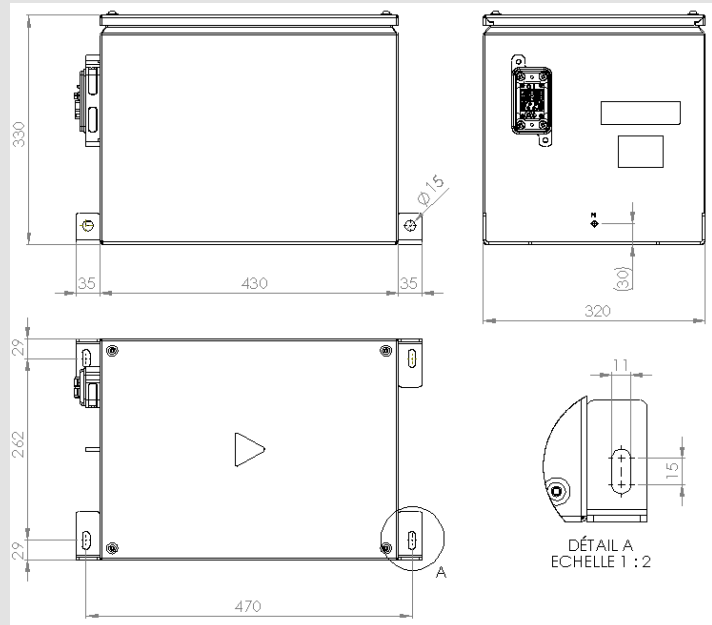


- Capacitance tolerance: Typical tolerance is +5%~+10%.
- Leakage current measurement procedure: 1) Charge the capacitor to the V_R with a constant current (0.075 A/F, if the calculated current is >100A, then apply 100A). 2) Hold the voltage at V_R for 72h. 3) The current to maintain V_R after 72 h is the leakage current.
- Self-discharge rate measurement procedure: 1) Charge the capacitor to V_R with a constant current (0.075 A/F, if the calculated current >100A, then apply 100A). 2) Hold the voltage at V_R for 3h. 3) Floating for 72h. 4) Measure the voltage after 72 h.
- Max constant working current: $I_{MCC} = \sqrt{\Delta T / (ESR * R_{Th})}$
- Max current: $I_{Max} = 0.5C * V_R / (\Delta t + ESR * C)$, discharge from V_R to $V_R/2$ in 1 second.
- Short current: $I_S = V_R / ESR$
- Stored energy: $E = 0.5C * V^2 / 3600$
- Energy density: $E_d = E / M$
- Usable power density: $P_d = 0.125V_R^2 / (ESR * M)$
- Impedance match power density: $P_{dMax} = 0.25V_R^2 / (ESR * m)$
- Storage temperature: Storage in discharge state.
- Thermal resistance: $R_{Th} = \Delta T / P$, where $P = ESR * I^2$
- Thermal capacitance is indicated for the whole module.
- DC life at high temperature: Hold the module charged at rated voltage at 65°C for 1500h. The capacitance shall be >80% of the rated value, the ESR shall be <200% of the rated value.
- DC life at RT: Hold the module charged at rated voltage at room temperature RT, the capacitance shall be >80% of the rated value, the ESR shall be <200% of the rated value.

- Cycle life: Charge and discharged the module in the range between V_R and $V_R/2$. 5 seconds waiting period between charge and discharge. The constant test current is 0.075 A/F (if the calculated current >100A, then apply 100A).
- Shelf life: Discharged and no load applied at RT.
- Harting connector – No: 09 40 006 0311/09 14 006 0371/09140022741/09140063001



- Dimensions and position of fixation holes: See below drawing



Notes:

Standard markings:

- Name of manufacturer, part number, serial number
- Rated voltage and capacitance, negative and positive terminals, warning marking
- Stored energy in watt-hours

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