Pack Type: AP10S9P

Specifications

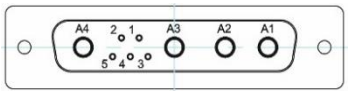
10S9 NCR18650BD Lithium Ion Rechargeable Battery Pack

Front

Back

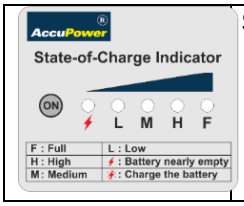
Connector 681S9W4203L001

Connector:
Main line and Interface connector:
D-SUB RCPT 9POS PNL MNT



Battery Box in a compact design Protection Classification IP 54 to DIN EN 60529 (VDE 0470)

Indicator on the front:
Optional with LED energy indicator or LCD-Display



State-of-Charge LED-Indicator

F : Full	L : Low
H : High	: Battery nearly empty
M : Medium	: Charge the battery

Pack Specifications	
Nominal Voltage	36 V
Capacity (Nominal)	27270 mAh ±6%.
Energy	981.72 Wh
Weight	5450 grams ±50g.
Size, Max. (L x W x H) mm	355 x 119 x 91.3 ±1

Operating Specifications	
Operating Voltage	30.0 V to 42.0 V
Charge Voltage	(**Max**. 42.00 V)
Discharge End Volt.	30.0V
Operating Temperature: Discharge Charge	 -20°C to 55°C -10°C to 50°C
Max. Discharge Current Continuous Peak	35,0 A @ 0 to +45°C 25,0 A @ -20 to +55°C 70 A (max. 0.2Sec.)
Max. Charge Current	10A @ (-10°C-50°C) 15A @ (0°C-45°C)

Storage Specifications	
Storage Temperature Rh: (0% ~ 75%) SoC: *State-of-Charge* ≥ 70%	1 year: -20 ~ +25°C(1*) 3 months: -20~ +45°C(1*) 1 month: -20~ +60°C(1*)

Note (1): If the cell is kept as ex-factory status (≤ 30% of charge), the capacity recovery rate is more than 80%.

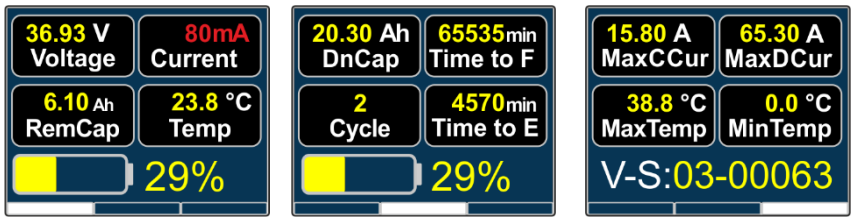
Lithium-Battery Pack with protection electronics (PCM single cells monitoring), protects the battery against overcharge, deep discharge and short circuit, Implemented cell balancing, with interface for service purposes (number of cycles, capacity, temperature, etc.)

Standard charging method

0.5C CC （constant current） charge to Max. 42.00V, then CV (constant voltage Max. 42.00V) charge till charge current decline to ≤ 0.02C

Embedded battery management with data monitoring and displaying

Lithium-Battery Pack with interface for service purposes provide battery information (voltage, remaining capacity, number of cycles, full charge capacity, temperature, average current, etc). This data can be displayed through the interface connection via PC or with the appropriate LCD display unit.



Applications

Automotive
Industrial
Testing equipment
Sport
Medical
and others

Transportation:

Transport according to the current regulations: ADR / RID / ADN / IATA / IMDG
Battery over 100Wh / Class: 9 / UN-Number: UN3480
Shipping name: Lithium ion batteries
Environmental hazards / Marine pollutant: No

Care and safety recommendations:

Never open, short circuit or put in fire. Do not install backwards. Avoid short circuit with metal objects.

ATTENTION:

Please pay attention to following recommendations:

1. **Recharge batteries immediately after receipt**!, the batteries are delivered with low capacity (< 30%) according to IATA DG Regulations!
2. Charge the batteries to the recommended value before storing them for a long time: State Of Charge between 50% ~ 70% depending on the storage time, Store the battery in a dry place, Temperature (0° ~ +25°C), relative humidity should be less than 75% Rh.
3. Please fully charge the batteries before using! Use only the battery charger specified for this battery type.
4. Do not leave battery in charger over 24 hours.
5. Always avoid deep discharge of the battery.
6. Avoid exposure to high temperatures.
7. Do not disassemble or modify the battery, may cause the battery to generate heat, explode or ignite.
8. Dispose properly used batteries. Dispose it according to the applicable recycling regulations. Contact your city recycling coordinator. Thank you

Overcharge/Overdischarge/Overcurrent Safety Circuits:

The controller IC measures the voltage for each cell (or for each parallel battery block) and shuts off a control switch to either prevent overcharging (if the voltage exceeds the specified voltage range) or to prevent over discharging (if the voltage falls below the specified voltage range). Moreover, the voltage of the control switch is measured on both ends and in order to prevent overcurrent, control switches are shut off if the voltage exceeds specifications.

• The Functions of the Safety Circuits (typical functions)

The voltages listed below are typical values and are not guaranteed. The charge voltage varies according to model number.

1. The Overcharge Safety Function

The charge stops when the voltage per cell rises above 4.25 ± 0.03 V.
The charge restarts when the voltage per cell falls below 4.15 ± 0.03 V.

2. The Overdischarge Safety Function

The discharge stops when the voltage per cell falls below 3.00 ± 0.05 V.
The discharge restarts when the voltage per cell rises above 3.4 ± 0.05V.

3. The Overcurrent Safety Function

The discharge is stopped when the output terminals are shorted. The discharge restarts when the short is removed.

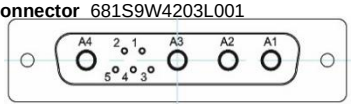
Attention: Please fully charge the batteries before using!!!

ATTENTION! Recharge batteries immediately after receipt:

Due to the new IATA Dangerous Goods Regulations since April 2016, the state of charge condition for air transport must not exceed 30% of the nominal capacity!
If you receive a battery pack with airfreight with 30% charge and it will be sent by air again after storage, the state of charge 30% (this corresponds approximately to an idle voltage for this Battery-pack of 35.43V to 35.71V) must be checked every 2 months and recharged according to 30%.

Connector: Main line and Interface connector for AccuPower 10S9P Battery-Packs:
D-SUB RCPT 9POS PNL MNT

Connector 681S9W4203L001



Mainline Power connector: Power Positive = A1, A2; Power Negative = A3, A4

PIN number 1: POWER +
PIN number 2: SM Clock (SMC)
PIN number 3: SM Data (SMD)
PIN number 4: POWER –
PIN number 5: PRES Pin / Enable Pin
(Enable Pin: Enable PIN pull down to Ground to enable battery (on Ground = ON, Open = OFF)

SM Bus Data (V1.1 konform)
Device address: 0x16 (default)
Bus frequency: 100kHz (default)
Bus voltage: 3.3V

Following information's can be accessed via the SMBus. / Folgende Informationen können über den SMBus abgerufen werden.

The values **"**actual current", "avg. current", "remaining capacity" and **"**full charge capacity" **are scaled down by factor 10** due to high battery power and capacity.

Funktion / Function	Register	Type	Min Value	Max Value	Einheit / Unit
State of charge / Aktueller Ladezustand	0x0D	U1	0	100	%
Remaining capacity / Verbleibende Kapazität	0x0F	U2	0	65535	10 mAh
Full charge capacity / Vollständige Kapazität	0x10	U2	0	65535	10 mAh
Battery voltage / Aktuelle Akkuspannung	0x09	U2	0	65535	1 mV
Average current (smoothed) / Durchschnittlicher Strom	0x0B	I2	-32767	32768	10 mA
Actual current / Aktueller Strom	0x0A	I2	-32767	32768	10 mA
Battery temperature / Akkupack Temperatur	0x08	U2	0	65535	0.1°K
Average time to „Empty" at actual current / Voraussichtliche Zeit bis „Akku leer" bei momentanem Strom	0x12	U2	0	65535	minutes
Average time to „Full" at actual current / Voraussichtliche Zeit bis „Akku voll" bei momentanem Strom /	0x13	U2	0	65535	minutes
Cycle count / Zyklenanzahl	0x17	U2	0	65535	cycles
Serial Number / Seriennummer	0x1C	H2	0x0000	0xFFFF	-

Abbreviations:
U1 unsigned integer of 1byte size
U2 unsigned integer of 2byte size
I1 signed integer of 1byte size
I2 signed integer of 2byte size
H2 unsigned integer in hex format

Die Daten liegen im Little Endian Format vor / the data is provided in little endian format.
Achtung, Bat- und Bat+ darf nicht mit mehr als 100 mA belastet werden (Kurzschlussgefahr) / Attention, Bat- and Bat+ must not be loaded with a higher current than 100mA (Danger of short circuit)

For PC to battery communication you will need a I²C to USB Converter (EV2400 from Texas Instruments) and as PC GUI the "Battery Management Studio" is needed. With this device all battery BMS data could be read out.