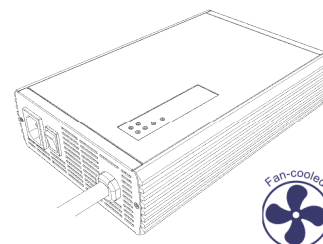


## Datenblatt | Datasheet

 **Nova-650F Serie:** High-End Batterieladegeräte mit 4-stufigen Ladekennlinien für Lithium- und Bleiakkus. Auf Anfrage sind auch kundenspezifische Ladekennlinien möglich.

 **Nova-650F Series:** High-End battery chargers with 4-step charge profiles for Lithium- and Lead-Acid batteries. Customized charging profiles available on request.



| Akkutypen   Battery Types                                        | LFP Akku   LFP Battery<br>(3.2V/cell nom.)                                                                                                                                                      |       |       |       | Li-Ion Akku   Li-Ion Battery<br>(3.6V/cell nom.) |       |       |       | Blei/Säure Akku<br>Lead/Acid Battery |                               |     |     |     |
|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|--------------------------------------------------|-------|-------|-------|--------------------------------------|-------------------------------|-----|-----|-----|
| Zellen in Serie   Cells in series*                               | 4S                                                                                                                                                                                              | 8S    | 14S   | 16S   | 7S                                               | 10S   | 12s   | 14S   | 6S                                   | 12S                           | 18S | 24S |     |
| Spannung nom.   Voltage nom.                                     | -                                                                                                                                                                                               | 25.6V | 44.8V | 51.2V | 25.2V                                            | 36.0V | 43.2V | 50.4V | -                                    | 24V                           | 36V | 48V |     |
| DC Ausgang   DC Output*                                          |                                                                                                                                                                                                 |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| Ladesschlussspannung<br>Charge-end voltage                       | ±1%                                                                                                                                                                                             | -     | 28.8V | 50.4V | 57.6V                                            | 29.4V | 42.0V | 50.4  | 58.8V                                | siehe Tabelle 3   see table 3 |     |     |     |
| Ladestrom max.<br>Charge Current max.                            | ±5%                                                                                                                                                                                             | -     | 22A   | 12.5A | 11A                                              | 22A   | 15A   | 12.5A | 11A                                  | -                             | 20A | 14A | 10A |
| Nennleistung   Rated Output                                      | 35A / 650W max.                                                                                                                                                                                 |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| Wirkungsgrad max.   Efficiency max.                              | >91% @ 230VAC                                                                                                                                                                                   |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| Restwelligkeit   Ripple                                          | <1%                                                                                                                                                                                             |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| Rückstrom   Back Current                                         | <1mA                                                                                                                                                                                            |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| Ladekabel   Charge Cable                                         | 2-adrig, 1.3m ±0.1m mit offenen Enden   1.3m ±0.1m 2-core cable with open ends                                                                                                                  |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| AC Eingang   AC Input                                            |                                                                                                                                                                                                 |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| Eingangsspannung   Input Voltage                                 | 100...240 VAC / 50...60Hz                                                                                                                                                                       |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| Netzbuchse   Power socket                                        | IEC 60320 C14                                                                                                                                                                                   |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| Leistungsaufnahme   Power Consu.                                 | 720W                                                                                                                                                                                            |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| Netzkabel & Stecker<br>Power Cord & Plug                         | 1.5 m ±0.1 m mit CEE7/7 auf IEC 60320 C13 Stecker   1.5 m ±0.1 with CEE7/7 to IEC 60320 C13 plug                                                                                                |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| Gehäuse   Enclosure                                              |                                                                                                                                                                                                 |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| Werkstoff   Material                                             | Metallgehäuse, lackiert   Metal housing, painted                                                                                                                                                |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| Abmessungen / Gewicht<br>Dimension / Weight                      | 235 x 158 x 66 mm / ca. 2.5kg                                                                                                                                                                   |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| LED-Anzeigen   LED-Indicators                                    | Netz-, Error-, Laden-, Akku-Voll Anzeige   Power-, Error-, Charging-, Battery-Full Indicator                                                                                                    |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| Elektrische Schutzklasse<br>Electrical protection class          | I  Schutzerdung   protective earthing                                                                        |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| IP-Schutzart   IP-code                                           | IP20                                                                                                                                                                                            |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| Einsatztemperaturbereich<br>Working temperature range            | -20°C to +40°C, <78% relative Luftfeuchtigkeit, nicht-kondensierend<br>-20°C to +40°C, <78% relative humidity, non-condensing                                                                   |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| Kühlung   Cooling                                                | Leistungsabhängiger Lüfter   load-dependant fan                                                                                                                                                 |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| Besonderheiten   Special Features                                |                                                                                                                                                                                                 |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| 4-Stufen Ladeprofil*<br>4-Step Charge Profile*                   | Innovative Ladekennlinien für Lithium-Akkus und Bleiakkus<br>Innovative charging characteristics for Lithium batteries and lead-acid batteries                                                  |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| Ladeparameter   Charge Parameter                                 | Ladeprofilanpassung via IR-Schnittstelle (werkseitig)   Charge Profile configurable via IR-Port (factory made)                                                                                  |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| Ladefreigabe   Charge Enable**                                   | Anschluss für Ladefreigabe,- sperre   Port for Charge Enable / Disable                                                                                                                          |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| Wegfahrsperre   Ignition-Lock**                                  | Anschluss für Wegfahrsperre (potenzialfreier Kontakt)   Port for Ignition-Lock (Dry-contact)                                                                                                    |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| CAN-Bus**                                                        | CAN-bus Protokoll nach Kundenvorgabe   CAN-bus protocol according to customer specification                                                                                                     |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| Automat. Batterie Weckfunktion***<br>Automat. Battery Wake-up*** | Nach dem Einschalten aktiviert das Ladegerät das BMS durch definierte Spannungsimpulse<br>After "Power-on", the charger activates the BMS with pre-defined voltage pulses                       |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| Geräteschutz****<br>Device Protection****                        | Eingang: Sicherung; Ausgang: Übertemperatur-, Kurzschluss-, Überlast- und Verpolungsschutz<br>Input: Fuse; Output: Over temperature-, short circuit-, overload- and reverse polarity protection |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |
| Zertifizierungen   Certification                                 | CE                                                                                                                                                                                              |       |       |       |                                                  |       |       |       |                                      |                               |     |     |     |

\* Abweichende Werte/Versionen auf Anfrage | Different values/versions on request

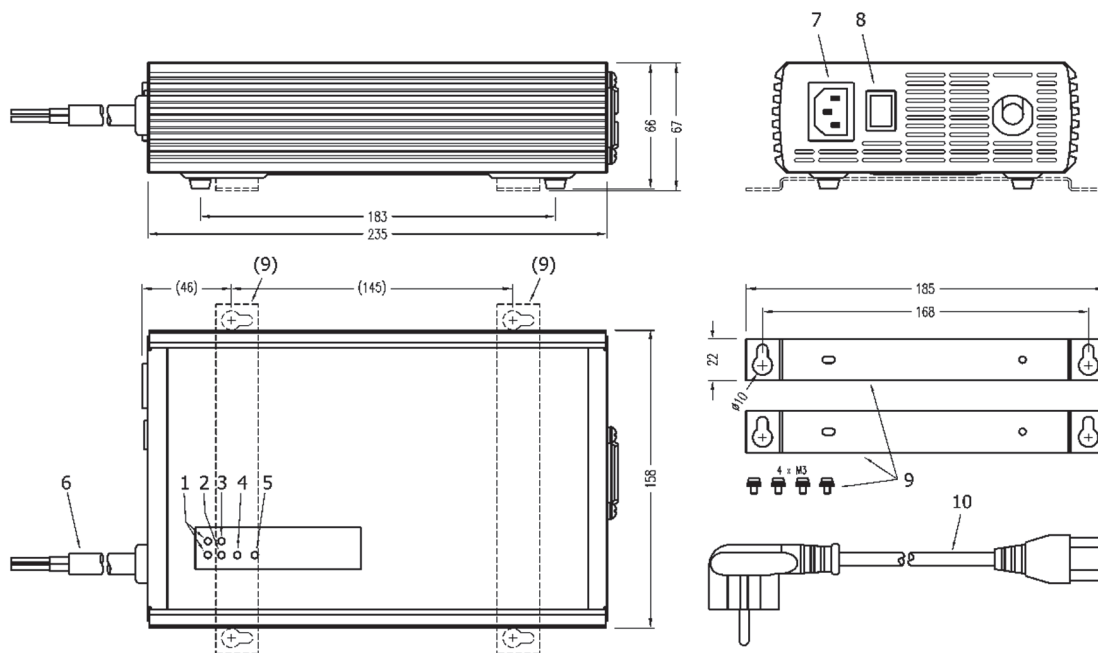
\*\* Optional

\*\*\* Nur bei Lithium-Versionen | For Lithium versions only

\*\*\*\* Kein Verpolungsschutz bei aktivierter Wake-up Funktion! | No reverse polarity protection with activated wake-up function!

Achtung: Spezifikationen des Akkuherstellers sind vorrangig zu beachten! | Attention: Specifications of the battery manufacturer take priority!

## Zeichnung | Drawing



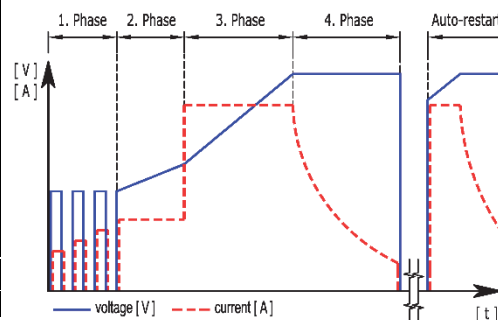
## Legende | Legend

|                                        |                                             |                                       |
|----------------------------------------|---------------------------------------------|---------------------------------------|
| 1   IR-LEDs                            | 4   Lade LED (gelb)   Charging LED (yellow) | 7   Netzbuchse   Power socket         |
| 2   Fehler LED (rot)   Error LED (red) | 5   Voll LED (grün)   Full LED (green)      | 8   Ein-Aus Schalter   On-Off switch  |
| 3   Power LED (grün)   green           | 6   Ladekabel (DC)   Charging cable (DC)    | 9   Montage set   Wall bracket set    |
|                                        |                                             | 10   Netzkabel (AC)   Power cord (AC) |

## Ladeprofile | Charge Profiles\*

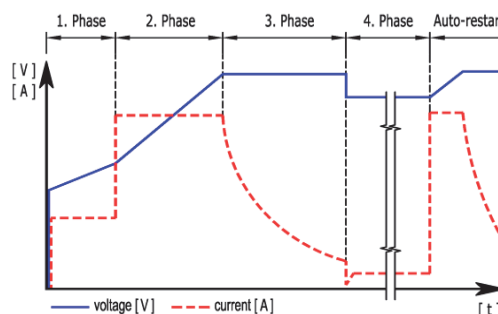
### - für Lithium Akkus | - for Lithium Batteries

| Tabelle 1   Table 1 |       | 1. Phase<br>[pulsing]     | 2. Phase<br>[CC]     | 3. Phase<br>[CC]               | 4. Phase<br>[CV]                   | Auto-restart<br>[--]                              |
|---------------------|-------|---------------------------|----------------------|--------------------------------|------------------------------------|---------------------------------------------------|
|                     |       | Auto wake-up              | Soft-start           | Bulk                           | Absorption                         |                                                   |
| Ladespann. max.     | Lilon | 3.8V/cell                 | 3.8V/cell            | 4.2V/cell                      | 4.2V/cell                          | Neustart nach<br>30 Tagen oder<br>Spannungsabfall |
| Charge volt. max.   | LFP   | 3.2V/cell                 | 3.2V/cell            | 3.6V/cell                      | 3.6V/cell                          |                                                   |
| Ladestrom max.      |       | 50% I <sub>max</sub>      | 50% I <sub>max</sub> | I <sub>max</sub>               | I <sub>max</sub>                   | Restart after 30<br>days or voltage<br>drop       |
| Charge current max. |       |                           |                      |                                |                                    |                                                   |
| Ladestrom min.      |       | 25% I <sub>max</sub>      | 25% I <sub>max</sub> | 50% I <sub>max</sub>           | 5% I <sub>max</sub>                | ↓                                                 |
| Charge current min. |       |                           |                      |                                |                                    |                                                   |
| Nächste Phase @     | Lilon | 2.0V/cell<br>or 70 pulses | 3.0V/cell<br>or 4h   | U = U <sub>max</sub><br>or 20h | I ≤ 10% I <sub>max</sub><br>or 10h | 3.8V/cell                                         |
| Next phase @        | LFP   | 2.0V/cell                 | 2.5V/cell            |                                |                                    | 3.4V/cell                                         |



### - für Blei/Säure Akkus | - for Lead/Acid Batteries

| Tabelle 2   Table 2 |      | 1. Phase<br>[CC]     | 2. Phase<br>[CC]     | 3. Phase<br>[CV]                   | 4. Phase<br>[CV]                        | Auto-restart<br>[--]                              |
|---------------------|------|----------------------|----------------------|------------------------------------|-----------------------------------------|---------------------------------------------------|
|                     |      | Soft-start           | Bulk                 | Absorption                         | Float                                   |                                                   |
| Ladespann. max.     | Gel  | 2.3V/cell            | 2.36V/cell           | 2.36V/cell                         | 2.25V/cell                              | Neustart nach<br>30 Tagen oder<br>Spannungsabfall |
| Charge volt. max.   | AGM  | 2.3V/cell            | 2.43V/cell           | 2.43V/cell                         | 2.25V/cell                              |                                                   |
|                     | Wet  | 2.3V/cell            | 2.46V/cell           | 2.46V/cell                         | 2.30V/cell                              | Restart after 30<br>days or voltage<br>drop       |
|                     | Cal. | 2.3V/cell            | 2.50V/cell           | 2.50V/cell                         | 2.30V/cell                              |                                                   |
| Ladestrom max.      |      | 50% I <sub>max</sub> | I <sub>max</sub>     | I <sub>max</sub>                   | 5% I <sub>max</sub>                     | ↓                                                 |
| Charge current max. |      |                      |                      |                                    |                                         |                                                   |
| Ladestrom min.      |      | 25% I <sub>max</sub> | 50% I <sub>max</sub> | 5% I <sub>max</sub>                | 0.1A                                    | 2.15V/cell                                        |
| Charge current min. |      |                      |                      |                                    |                                         |                                                   |
| Nächste Phase @     | Gel  | 1.9V/cell            | 2.35V/cell           | I ≤ 10% I <sub>max</sub><br>or 10h | Keine Um-<br>schaltung<br>No switchover | 2.15V/cell                                        |
| Next phase @        | AGM  | 1.9V/cell            | 2.42V/cell           |                                    |                                         | 2.15V/cell                                        |
|                     | Wet  | 1.9V/cell            | 2.45V/cell           |                                    |                                         | 2.15V/cell                                        |
|                     | Cal. | 1.9V/cell            | 2.49V/cell           |                                    |                                         | 2.15V/cell                                        |



### Ladeschlussspannung für Blei/Säure Akkus Charge-end voltage for Lead/Acid batteries

| Tabelle 3   Table 3 |                   | 12V   | 24V   | 36V   | 48V   |
|---------------------|-------------------|-------|-------|-------|-------|
| Type                | Gel**             | 14.2V | 28.4V | 42.6V | 56.8V |
|                     | Vlies   AGM       | 14.6V | 29.2V | 43.8V | 58.4V |
|                     | Nass   Wet        | 14.8V | 29.6V | 44.4V | 59.2V |
|                     | Kalzium   Calcium | 15.0V | 30.0V | 45.0V | 60.0V |

\* Kundenspezifische Profile auf Anfrage | Customized profile on request

\*\* Standardeinstellung | Default settings

Achtung: Spezifikationen des Akkuherstellers sind vorrangig zu beachten! | Attention: Specifications of the battery manufacturer take priority!