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## Victron Energy NT-1091

# Victron Energy Orion-Tr Smart DC to DC Charger

## MODEL NT-1091 (24/12V 30A 360W) INSTRUCTION MANUAL

Brand: Victron Energy

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### 1. Introduction and Overview

The Victron Energy Orion-Tr Smart DC to DC Charger is a professional, three-stage charger designed for efficient and safe charging of service batteries in vehicles or boats. It supports both lead-acid and lithium battery types and is compatible with regular and smart alternators. This manual provides essential information for the proper installation, operation, and maintenance of your charger.



Figure 1: Front view of the Victron Energy Orion-Tr Smart DC to DC Charger.

## Key Features:

- Professional 3-stage charging for optimal battery health.
- Dual battery charging capability, ideal for vehicles and boats.
- Built-in Bluetooth for monitoring and control via the VictronConnect App.
- Flexible power solution, suitable for lead-acid and lithium batteries.
- Parallel connection for increased output power.
- Easy installation with screw terminals.
- Remote on/off functionality.
- Engine shutdown detection to prevent draining the start battery.
- Protection against overload, over-temperature, and short-circuit.

## 2. Product Overview Video

Watch this official video for a detailed overview of the Victron Energy Orion-Tr Smart DC to DC Charger, including its features and applications.

Your browser does not support the video tag.

Video: Victron Energy - Orion-Tr Smart DC to DC Charger, Alternator. This video provides an introduction to the product and its capabilities.

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### 3. Setup and Installation

Proper installation is crucial for the safe and efficient operation of your Orion-Tr Smart charger. Follow these guidelines:

- **Mounting:** The unit should be mounted in a well-ventilated area to ensure adequate heat dissipation. Use the provided screws for secure installation.
- **Wiring:** Connect the input and output cables to the designated screw terminals. Ensure correct polarity (+ and -) for all connections. Refer to the wiring diagram in the full manual for detailed instructions.
- **Remote On/Off:** The remote terminal allows for external control of the charger, such as a simple switch or integration with a Battery Management System (BMS) for lithium batteries.
- **Initial Configuration:** Use the VictronConnect app for initial setup and to select the appropriate battery type and charging parameters.

# Key Benefits That Power Every Journey

- ✓ **Bluetooth Smart enabled** - monitor & configure via app
- ✓ **Remote on/off** - flexible control options
- ✓ **Fully programmable** - set your own charge profile
- ✓ **Unlimited parallel connection** - scale up as needed
- ✓ **Compact, rugged build** - IP43 protected and heat-tolerant



Figure 2: Side view of the charger highlighting the input and output terminals for wiring connections.

## Dimensions

### Compact size

Weight:	1.8 kg
Operating temperature:	-20 to +55 °C
Easy to mount:	4 screws



Figure 3: Product dimensions and key features for installation planning.

## 4. Operation

The Orion-Tr Smart charger offers versatile operation modes and smart features:

- **Charging Mode:** The charger utilizes a 3-stage adaptive algorithm (Bulk, Absorption, Float) to ensure efficient and complete charging of your service battery, optimizing its lifespan.
- **Power Supply Mode:** The unit can also function as a stable power supply, providing a constant output voltage independent of the load applied. This is configurable via the VictronConnect app.
- **Input Voltage Lock-Out:** This feature prevents the input battery (e.g., start battery) from being over-discharged. It automatically shuts off the output when the input voltage drops below a user-defined threshold and restarts when the voltage rises above a restart value.
- **Engine Shutdown Detection:** In charger mode, this feature automatically turns the charger on and off based on engine operation, preventing accidental discharge of the start battery when the engine is not running.
- **VictronConnect App:** Monitor live data, adjust settings, and update firmware via Bluetooth using the VictronConnect app on your smartphone or tablet. This provides full control and insight into your charging system.



Figure 4: Example of the VictronConnect app interface for system monitoring.



Figure 5: Example of the VictronConnect app interface for adjusting charger settings.

## 5. Maintenance

To ensure the longevity and optimal performance of your Orion-Tr Smart charger, perform the following maintenance tasks:

- Regularly inspect all cable connections for tightness and signs of corrosion. Tighten any loose connections.
- Keep the unit clean and free from dust, dirt, and debris to ensure proper heat dissipation and prevent overheating.
- Ensure that the area around the charger remains well-ventilated and unobstructed.
- Periodically check for any visible damage to the charger's casing or cables.

## 6. Troubleshooting

If you encounter issues with your Orion-Tr Smart charger, consider the following common troubleshooting steps:

- **No Charging Output:** Verify that the input voltage is within the specified range and that all connections are secure. Check the VictronConnect app for any error codes or status messages.
- **Remote On/Off Issue:** Ensure the remote on/off terminal is correctly configured. If not using a remote switch or BMS, ensure the remote terminal is properly bridged (refer to the full manual for details).
- **Overheating:** Check for obstructions around the unit that might impede airflow. Ensure the ambient temperature is within the operating limits.
- **App Connectivity:** If the VictronConnect app cannot connect, ensure Bluetooth is enabled on your device and the charger, and that you are within range.
- **Persistent Issues:** If problems persist after basic troubleshooting, consult the comprehensive product manual available on the Victron Energy website or contact Victron Energy customer support.

## 7. Specifications

Feature	Detail
Brand	Victron Energy
Model Number	NT-1091
Input Voltage	24 Volts (DC)
Output Voltage	12 Volts (DC)
Current Rating	30 Amps
Power	360 Watts
Product Dimensions (D x W x H)	3.2" x 7.3" x 5.1"
Item Weight	1.8 Kilograms
Color	Blue
Protection Rating	IP43 (when terminals face downward)
Connectivity	Bluetooth

## 8. What's in the Box

The product package typically includes:

- 1x Victron Energy Orion-Tr Smart 24/12-Volt 30 amp 360-Watt DC-DC Charger Non-Isolated (Bluetooth)

## 9. Warranty and Support

**Warranty:** This product is covered by a manufacturer's warranty. Please refer to the official Victron Energy website or the warranty card included with your product for specific terms, conditions, and duration of the warranty.

**Support:** For technical assistance, product inquiries, or troubleshooting beyond the scope of this manual, please visit the official Victron Energy website ([www.victronenergy.com](http://www.victronenergy.com)) or contact their authorized service centers. Ensure you have your product model number (NT-1091) and serial number ready when seeking support.