



Instruction manual

NCPA1301G20001
(C-TEC 4815 P)

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1 General

1.1 General safety information



NOTE:

Read the instruction manual before installing or using this device. All instructions given in the manual must be observed. If they are not followed, all warranty claims are likely to be forfeited!



WARNING

Commissioning and maintenance work on this device may only be carried out by a qualified electrician. Improper handling of the voltages or capacitors may lead to electrical arcing and cause serious burns.



DANGER

All work on the device must be carried out with no voltages present. Observe the five safety rules. Supply and outlet cables must be adequately dimensioned and fuse protected. Non-observance of this warning carries the risk of electric shock and electrical arcing that can cause severe burns.



WARNING

Applying a short circuit to capacitors with a voltage across them carries the risk of intense heat generation and electrical arcing, which can cause severe burns.



NOTE:

The relevant VDE regulations, particularly DIN VDE 0100 and EN 60204, must be observed.



NOTE:

In the event of a fault we recommend that you return the unit to the manufacturer.

1.2 Brief description

The DC buffer module of the **C-TEC 4815 P** series is equipped with integrated ultracapacitors for accumulating energy. During normal operation this capacitor is charged by an internal charger which is supplied by an external, regulated DC power supply. If the DC supply is interrupted, energy of the ultracapacitors is released in a unregulated process (49 to 38 V DC). The load is supplied by the buffermodul until the voltage is ≤ 38 V. The buffering time depends on the state of charge of the capacitor and discharging current. As further function the **C-TEC 4815 P** can provide more current for a certain time.

The DC-UPS shows the following features:

- Maintenance-free due to durable ultra capacitors
- Microcontroller based charging and discharging of the ultracapacitors
- Inputvoltage-signal via potential-free contact and LED
- Short overload possible
- Vibration secured wiring via spring loaded plugs
- Wide working temperature range -40°C till 60°C

1.3 Intended Use

The **C-TEC 4815 P** has been designed and developed for the industrial and plant engineering sector. The **C-TEC 4815 P** must be installed by qualified electricians only.

If the **C-TEC 4815 P** is operated outside the scope of its intended use, the voltage supplied by the **C-TEC 4815 P** supported protection cannot be guaranteed.

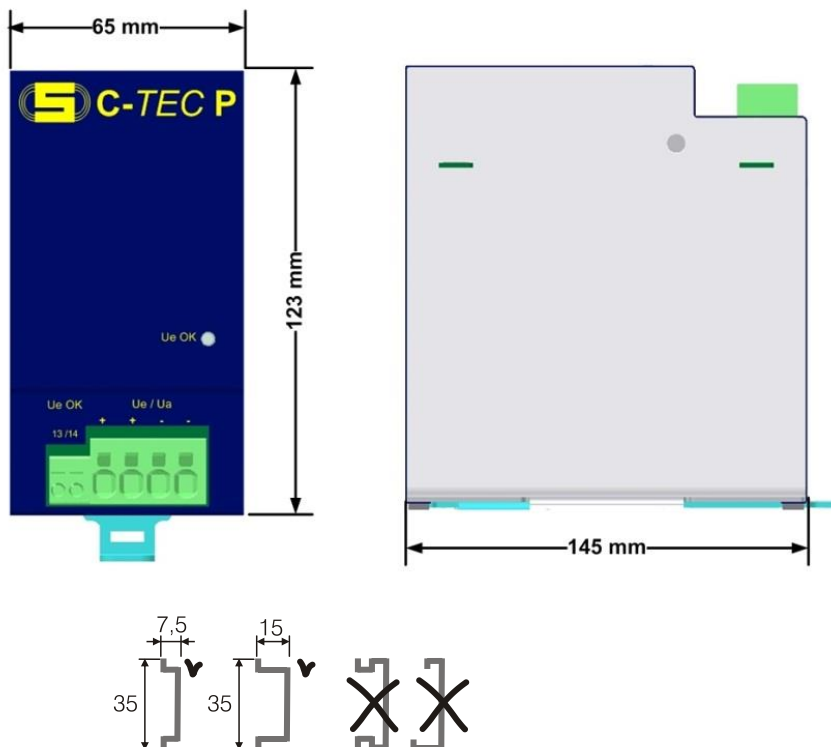
2 Installation and Connection

2.1 Installation

The DC buffer module has to be mounted to ensure the required cooling. A minimum distance of ≥ 40 mm has to be maintained between the vent opening and adjacent units. Installation has to be done to ensure sufficient ventilation. The ambient temperature specified must not be exceeded. Max. altitude without derating is 2000 m above sea level. In case drilling chips can get on respectively inside the unit, the unit has to be covered during assembly. **(Risk of short circuit!)**

	NOTE The unit should be covered during installation to prevent borings falling on top of or entering the interior. Risk of short circuit.
	NOTE This device is designed to be fitted into a permanent installation. It should only be operated in dry conditions. The module is designed to withstand pollution level 2.
	NOTE Please note the max. permissible load of your DIN rail acc. to EN 60715

The device will be mounted on a DIN rail.



2.2 Connection

Before installation the data of the DC supply have to be compared with the data on the type plate and checked for compliance. Connection according to the indications of the terminals (see simplified diagram and configuration).



Terminals			Connection
Designation	Max. tightening torque/Nm	Cable cross section/mm ²	
Ue + / Ua -	Spring clamb terminal	1,5 – 10,0	Input voltage / consumer
Ue OK 13 relay input 14 relay output	Spring clamb terminal	0,2 – 4,0	Message contact mains message (potential-free relay contact)

Dimension the cable cross section of the supply and output cables according to EN 62368-1 table G.5; see also the table above.

If the system is constructed according to EN 62368-1 and supply cables leave the room (building wiring), observe section 6.5.3 of EN 62368-1



WARNING

Only SELV or PELV voltage sources (according to EN 60204-1) are permitted for supplying the device.
Failure to observe this may result in electric shock with fatal consequences



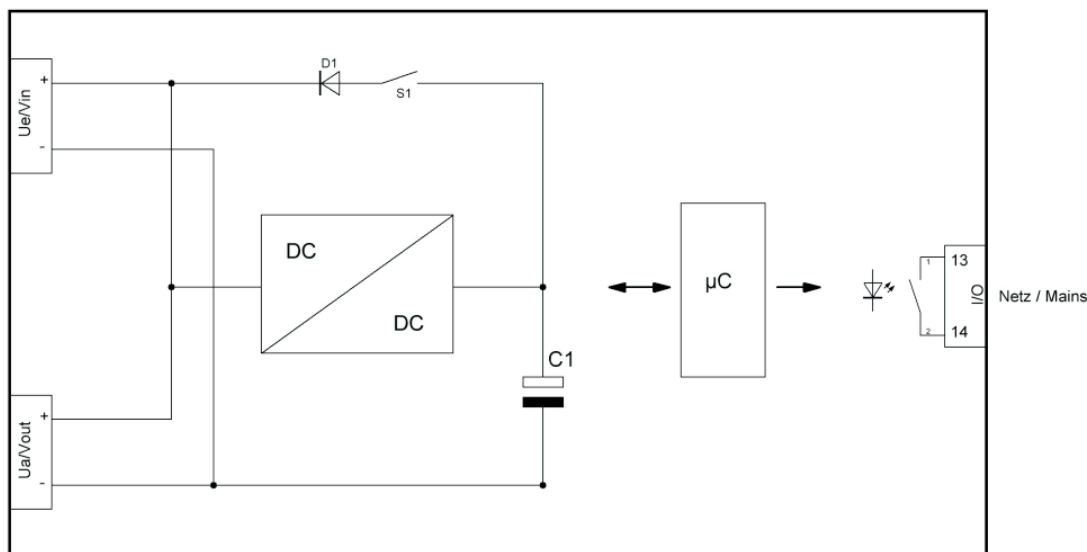
ATTENTION

When connecting the terminals, check that the nominal voltages and polarities are connected correctly. Not observing this warning carries the risk of intense heat generation and electrical arcing, which can cause severe burns!



In case of overload, the DC output current is composed of the max. current of the buffering module and the current from the supplying DC mains. To avoid overloading of the DC output circuit external protection is required!

2.3 Circuit diagram



3 Operation

The **C-TEC 4815 P** will be connected parallel to the load. The unit is supplied with energy from the input voltage (Terminal Input / Output) to charge the capacitors. Charging the ultracapacitor is only possible if the input voltage is ≥ 44 V DC. If a high load current is required at the same time, the charging time will increase. If the input voltage is 43,2 V DC the device is in standby mode. In this status the LED 'Ue OK' is on and the relay is energized.

Operating status:

Standby mode	: $U_e > 43,2$ V DC
Charging mode	: $U_e > 44$ V DC
Buffer mode	: $U_e < 43,2$ V DC

3.1 Mains operation

Mains operation is indicated by the LED Ue OK and the closed contact 13/14

3.2 Back-up operation

If the power supply fails or the voltage falls below the minimum input voltage (21.6 V DC), the unit switches to buffer mode. The green LED 'Ue OK' goes out, the relay drops out (see principle circuit diagram).

Buffertime (typical)

I_{output}	0,5 A	1,0 A	1,5 A	2 A	3 A	5 A	8 A	10 A	15 A
Device									
C-TEC 4815 P	74,9 s	39,9 s	24,2 s	18,0 s	11,8 s	6,9 s	3,9 s	3,0 s	1,8 s

4 Maintenance

The device does not include any components that require maintenance by the user.
The device should be regularly cleaned.

5 Decommissioning

Disconnect the power supply. The 'Input / Output' connection remain energized until the capacitor is discharged to 38 V DC.



ATTENTION

Do not break or make any electrical connection while the UPS is in operation. Not observing this warning carries the risk of electrical arcing, which can cause severe burns.

6 Technical Data

Nominal input voltage	48 V DC $\pm 10\%$ SELV/PELV (EN 60204-1)
Input voltage range	43,2...52,8 V DC
Min. input voltage for Charging mode	44 V DC
Nominal input current	18 A
Max. Inrush surge current	66 A
Max. charging current	3 A
Nominal output voltage (mains operation)	48 V DC $\pm 10\%$
Output voltage (Buffer operation)	49 V ... 38 V DC $\pm 2 \%$
Nominal output current	15 A
Short-circuit current	200 A
Overload capacity (nominal value)	65 A for 14 ms, 200 A for 1,5 ms
Max. Power loss 'worst-case'	10 W (Charging Mode max. 40 s), 20 W (Discharging Mode) 2 W (Standby)
Efficiency	>90%
Parallel connection	No
Series connection	No
Energy content	1,2 kJ
Max. load digitale output	60 V DC / 1 A
Buffer time	39,9 sec @ 1 A / 1,8 sec @ 15 A
Degree of protection	IP20
Operating temperature	-40 ... 60 °C
Storage temperature	-40 ... 60 °C
Relative humidity	95% non-condensing
Max. altitude (without derating)	2000 m above sealevel
Dimensions (H x W x D)	123 mm x 65 mm x 145 mm
Weight	0,8 kg

7 Standards and regulations

Total unit	EN 50178 EN 61010-1 / EN 61010-2-201 / EN 62368-1
Emission EN 61000-6-4	EN61000-6-4 Emission standard for industrial environments EN55011 Industrials, scientific and medical (ISM) radio-frequency equipment
Interference immunity EN 61000-6-2	EN61000-4-2 (statically unloading / ESD) air discharge 8kV / contact discharge 6kV EN61000-4-3 (electromagnetically fields) 10 V / m 80 - 2000 MHz 3 V / m 1400 - 2700 MHz EN61000-4-4 (fast transient) DC IN, DC OUT 2 kV miscellaneous 1 kV EN61000-4-5 (current load / Surge) DC IN 0.5kV EN61000-4-6 (conducted fault-free / Cond. Rf) 10 V 150 kHz - 80 MHz
Environment tests	EN 60068-2-6 and EN 60068-2-27
Pollution degree	II