

VOT3122

## ***CENTRAL BATTERY UNIT***

### ***Installation and maintenance instructions TKT3122***



**KEEP IN A SAFE PLACE FOR LATER USE**

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## 1. Product properties

### 1.1. Manufacturer

Teknoware Oy  
Ilmarisentie 8  
FIN-15200 Lahti  
FINLAND

### 1.2. Type

TKT3122 4 circuits 24V AC/DC

### 1.3. General description

The TKT3122 central battery unit is based on the Teknoware TKT series product family. This family is designed and manufactured according to the EN 50171 standard.

In normal situations, the central battery unit works from the 230VAC electrical network by maintaining the charge in the battery and by feeding the maintained circuits with a voltage of 24VAC. When the mains voltage is interrupted or it drops under 160V, the central battery unit changes to battery use. This connects a voltage of 24VDC to the non-maintained groups and the feed changes to direct-current voltage 24VDC. The battery feed works as long as the network voltage is unavailable or the battery voltage is lowered to the deep discharge limit (19.2V).

All the functions related to the use of the central battery unit can be performed from the control panel that also includes display LEDs to indicate central battery unit status. The panel functions are presented in Appendix 1.

### 1.4. Technical specifications

Mains connection: 230VAC 50Hz 1~  
Output voltage: using mains voltage: 24VAC, with battery use 24VDC  
Battery voltage: 24VDC  
Battery charging time: 12h  
Input power: 300VA  
Use temperature range: +10 – 30°C  
Input fuse: flat fuse 10AT  
Charging fuse: flat fuse 10AT  
Group fuses: flat fuse 10AT  
Battery fuses: flat fuse 15AT

The maximum load capacity of the continuous groups is altogether 250VA.

Central battery unit type	Input from the network	Maintained groups	Non-maintained groups	Total load capacity with 1h and 3h functioning time	Maximum battery capacity
TKT3122	300 VA	4x120W Total 250VA	190W/ group	1h 290W 3h 135W	24 Ah

The central battery unit is equipped with a network fuse F1 10AT in the connecting terminal and with a controller card for the charging circuit fuse F2. The battery fuses are F1 and F3. The fuses for the maintained and non-maintained groups are fuses F4-F7 on a controller card. The charging system of the central battery unit is equipped with temperature compensation of the battery charging voltage which is about 0.06V/°C (5mV/°C/cell).

The lights used with the central battery unit should be suitable both for alternating and direct-current voltage.



## 1.5. Directives and standards

The following directives and standards were respected when designing and manufacturing the central battery unit:

Quality:	ISO 9001:	2000	(certified quality system)
Environment:	ISO 14001:	1996	(certified environment system)
Electrical safety:	72/23/EEC, 93/68/EEC		LVD directive
Device standard:	EN 50171:	2001	Central power supply systems
	EN 50272-2	2001	Safety requirements for secondary battery installations Part 2: Stationary batteries
Electromagnetic compatibility:	89/336/EEC, 92/31/EEC		EMC directive
	EN 50081-1:	1992	Residential, commercial and light industry, generic emission standard
	EN 61000-6-2:	1999	Part 6-2, Generic standards – Immunity for industrial environments

## 2. Functional description

### 2.1. Purpose of the central battery unit

In normal mode, the central battery unit's task is to monitor mains voltage and to charge batteries as well as to feed the maintained light groups. During a power failure, the central battery unit feeds the non-maintained and maintained light groups with the energy stored in the batteries.

Explanations of signal LEDs and buttons are available in Appendix 1.

### 2.2. Group outputs

The central battery unit outputs can be connected to the "Mode" connectors (see Appendix 2) in steps of 2 groups either as maintained or non-maintained groups in the following way:

"Mode" loop connected: maintained luminaire group (continuous)  
 "Mode" loop not connected: Non-maintained group (functions only during a power failure)

### 2.3. Charging

After a power failure or after installing the central battery unit, the central battery unit charges the batteries with standard current. The charging current can be selected from the controller card with a DIP switch. See section 4.1. Setting the charging current.

*Network LED is lit, when the battery is charging*

### 2.4. Mains voltage limits

When the mains voltage drops below 160V, the central battery unit changes to battery use.

*Battery use LED is lit*

When the network supply returns or is higher than 170V, the central battery unit changes back to network use again and starts to charge the batteries.

*Network use LED is lit*



## 2.5. Battery voltage limits

If the battery voltage rises over 28.8V in normal mode, an over-voltage alarm is given.

*Network use LED is lit*

*Over-voltage LED is lit*

If the battery voltage drops below 25.3V in normal mode, an under-voltage alarm is given.

*Network use LED is lit*

*Under-voltage LED is lit*

When the central battery unit is in battery usage mode and the battery voltage falls below 19.2V, the central battery unit goes into deep discharge mode, where the battery discharge is stopped.

*Deep discharge LED is lit*

Deep discharge LED stays lit until reset from the *reset/test* button.

The central battery unit can be changed to battery mode also remotely, if this mechanism is adopted.

*Network use LED is lit*

*Battery use LED is lit*

If the battery is not in place, the charger does not charge, the battery fuse is blown or the battery does not take charging current, the following alarms are displayed on the control panel:

*Network use LED is lit*

*Over- and under-voltage LED lit at the same time*

## 2.6. Alarm relay outputs

Malfunction alarm:

- Alarms, when a malfunction is detected.

Functional alarm:

- Alarms when the central battery unit is in battery use.

## 2.7. Remote control

Remote control on: - Network and battery use LED lit

## 3. System installation

**Only a qualified electrical worker may perform system installation and implementation. No connections in the central battery unit should be made with voltage on!**

System installation takes place according to the electrical design or the electrical work explanation.

In the starting phase, the main switch must be in position 0 and the battery fuses should not be connected. The batteries are placed inside central battery unit. The batteries are connected in series 2x12V to the + (red) and – (black) cables reserved for them. The battery **temperature sensor is placed between the batteries**. Check the battery polarity.

Bring the feed cable to the connectors L, PE and N. After this, connect the maintained and non-maintained groups to CON2 connector GROUPS 1-4. The group fuses are located in the fuses F4-F7 (see Appendix 2, connections). The central battery unit outputs are connected with the "Mode" wire loops (see connections, Appendix 2) by group in steps of two groups, either to form an maintained or a non-maintained group in the following way:

"Mode" loop connected: maintained circuit

"Mode" loop not connected: Non maintained circuit



"Mode" loop directs always two output circuits.

"Mode 1" circuits 1-2

"Mode 2" circuits 3-4

At the factory, all the circuits in the central battery unit are set as maintained in mode. The circuits that are required for non-maintained mode must have the "Mode" wire loop removed from them.

Disconnecting the "Mode" wire loops is performed in the following way: Grab the insulator of the wire loop connector with needle-nose pliers and pull the connector off. The wire loop should not be pulled off the wire or by pressing on the connector, because this may damage the connector.

The alarms and the remote control switch are connected to the connectors presented in Appendix 2. The only allowed light source for the remote control signal light is a LED with power consumption under 30mA.

## 4. Implementation

**Only a qualified electrical worker may execute system installation and implementation.**

**The type label located inside the central battery unit should be marked with the total load capacity connected to the central battery unit and the time at rated load should be marked in the two empty columns.**

At the factory, the central battery unit and the lights are subjected to bleeding, resistance insulation and grounding tests according to the low voltage directive. For the duration of the real-state insulation resistance testing of the cables, the central battery unit network input and group outputs must be short-circuited.

When the necessary installation and cabling checks and tests have been performed, turn the S1 network feed on from the main switch S1 and close the battery fuses F3 and F1.

*"NETWORK USE" LED is lit.*

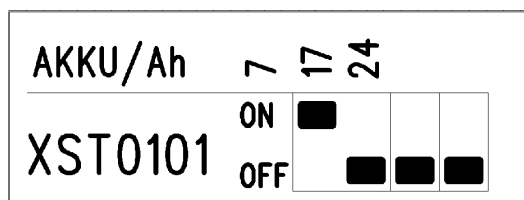
### 4.1. Setting the charging current

The charging current is set if the factory supplies batteries with the central battery unit. If the batteries do not come from the factory, the charging current should be set in the following way:

Set the current from the charging card XST0101 DIP switch as indicated in the instructions.

NOTE! Charging must be set according to the number of ampere hours (Ah) of the batteries used. If the value has not been set correctly, the batteries may be damaged. When all the Dip switches are in the OFF position, the charging current is set for 7Ah batteries. Other battery sizes are according to the label. The label includes 17Ah charging current setting as an example.

**NOTE! ALWAYS SET THE CHARGING CURRENT WITHOUT VOLTAGE!  
ONLY ONE DIP SWITCH CAN BE SWITCHED ON!**



## 5. Use

According to the EN 50172 standard, the user must check the functioning of the maintained lights visually every day. In addition, you must visually check that the central battery unit works without



problems. If the continuous lights connected in the central battery unit do not work and an alarm LED is lit at the central battery unit (see Appendix 1), you should notify the person responsible for servicing the system.

## 6. Maintenance

Maintenance of system should be arranged according to the requirements of the authorities. The maintenance of the central battery unit should be performed according to the EN 50172 standard.

Only a professional electrician may perform maintenance tasks that require opening of the central battery unit or the battery casing.

### 6.1 Maintenance procedures must be executed according to the EN 50172 standard

- The user daily checks that continuous lights are functioning
- tests the functioning of all the lights connected to the central battery unit with battery power every month
- once a year you must test the functioning with battery power for the nominal duration of at least 1h or longer if needed
- tests and inspections made must be reported in the system maintenance manual which must be shown to the authorities when requested

### 6.2. Changing the batteries

Batteries should be changed in the following order:

- take off the central battery unit lid
- disconnect battery fuses F1 and F3 (*Network use LED is lit and the over-voltage and under-voltage LEDs are lit at the same time*)
- turn the main switch S1 to position 0 (display LEDs go out = central battery unit has no voltage)
- disconnect the battery cables from the batteries
- remove the batteries and install new ones
- place the temperature sensor of the batteries between the batteries
- connect the battery cables (*note the polarity and insulation distances*)
- turn the main switch S1 to position 1
- connect the battery fuses F1 and F3
- attach the central battery unit lid

**After changing the batteries and performing a functional test it is normal that the under-voltage LED is lit. If alarms have been connected, the central battery unit gives a malfunction alarm. The under-voltage LED and alarm stops when the battery voltage rises to 25.3V.**

## 7. Removing from use

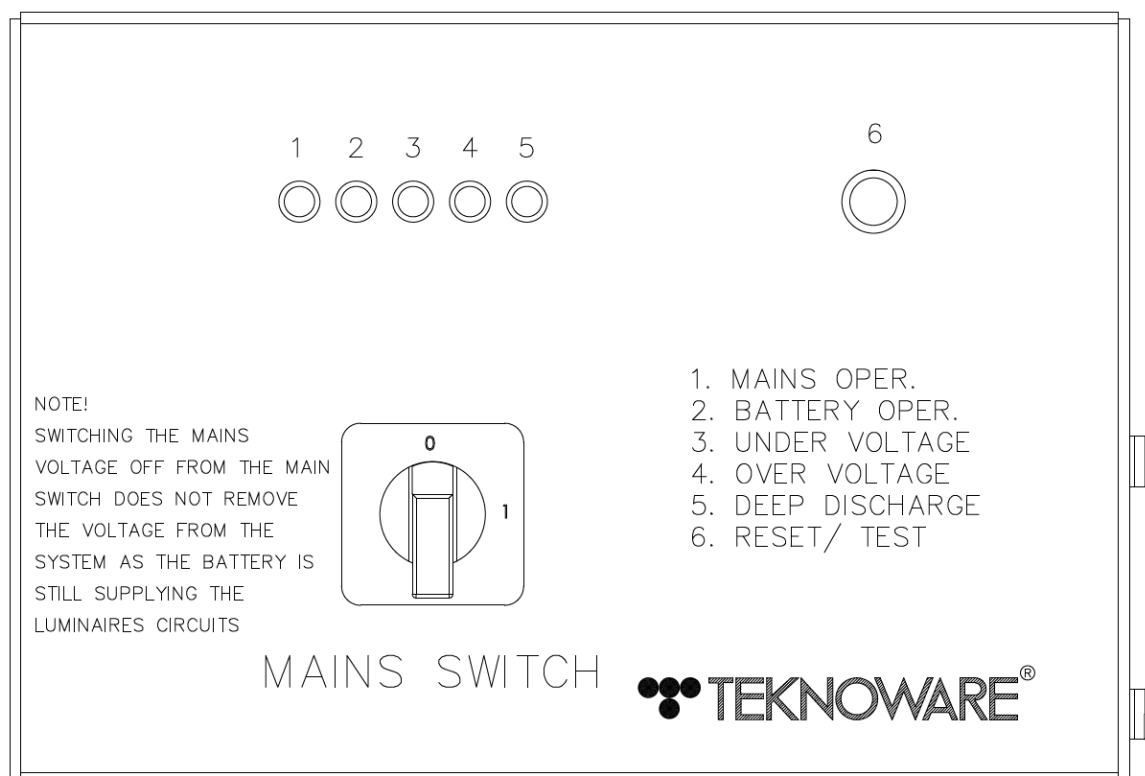
When removing the central battery unit system and its components from use, take the following into consideration:

Batteries and fluorescent lamps are hazardous waste. Metallic parts can be delivered to aluminium or steel waste. Wires, connectors and printed board assemblies are electronics waste. Plastic parts should be sorted according to material markings.



## APPENDIX 1

## Central battery unit control panel



## Explanations of the LEDs:

Signal LED	Explanation:	Normal mode with network use:
MAINS OPER.	- The central battery unit works normally from the mains network. - And the batteries are charged	LED lit
BATTERY USE	- The central battery unit is on battery use	LED is not lit
OVER-VOLTAGE	- The battery voltage is higher than normal (over 28.8V)	LED is not lit
UNDER-VOLTAGE	- The battery voltage is lower than normal (under 25.2V)	LED is not lit
DEEP DISCHARGE	- The deep discharge protection of the battery has tripped (the voltage has dropped under 19.2V during a power failure)	LED is not lit
NETWORK AND BATTERY USE LED IS LIT	- The central battery unit is on battery usage mode (the central battery unit has a remote switch connected, which is turned on or a wire loop is missing from the remote control connectors 7-8)	-
OVER-VOLTAGE, UNDER-VOLTAGE AND NETWORK USE LED IS LIT	- There is a malfunction in the charging circuit (batteries are not charging)	-

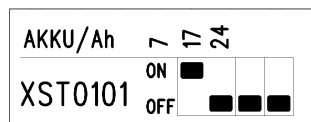
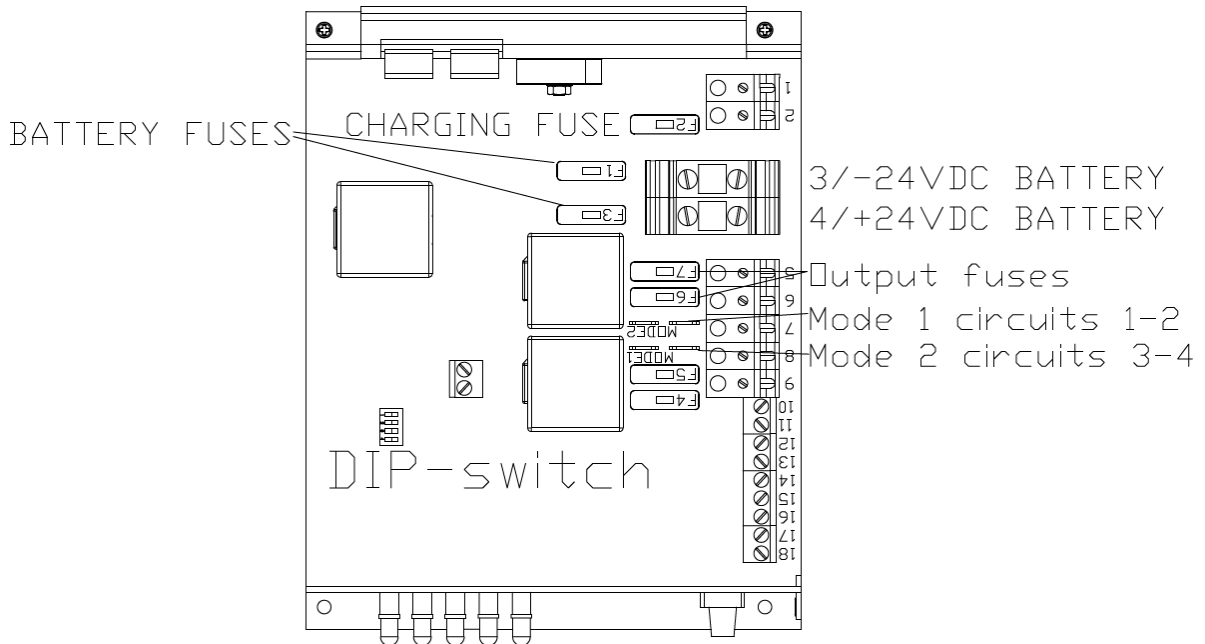
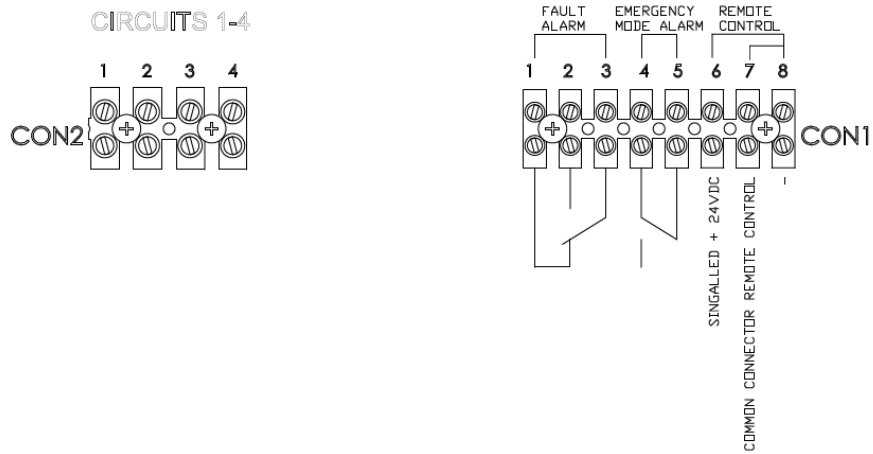
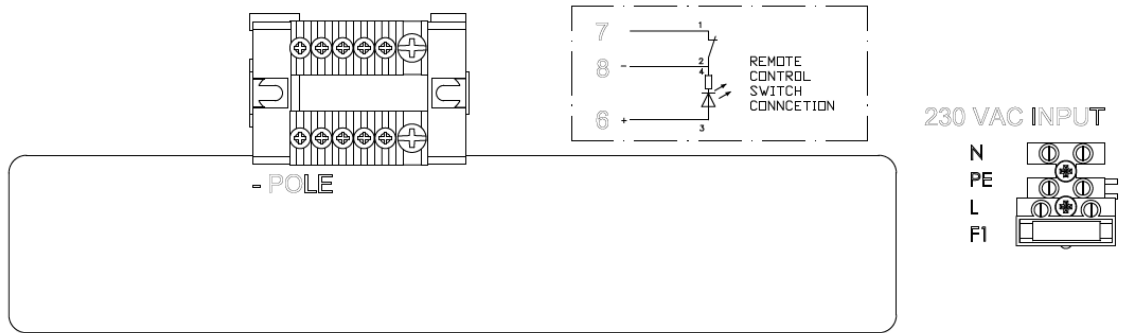
## Buttons

Reset/Test	Deep discharge protection alarm reset by pressing for 1s. / start short-time battery use test (the central battery unit stays in battery use while the button is pressed)
Mains switch	Disconnects the central battery unit network feed. Battery functional test can be performed by turning the main switch to position 0.



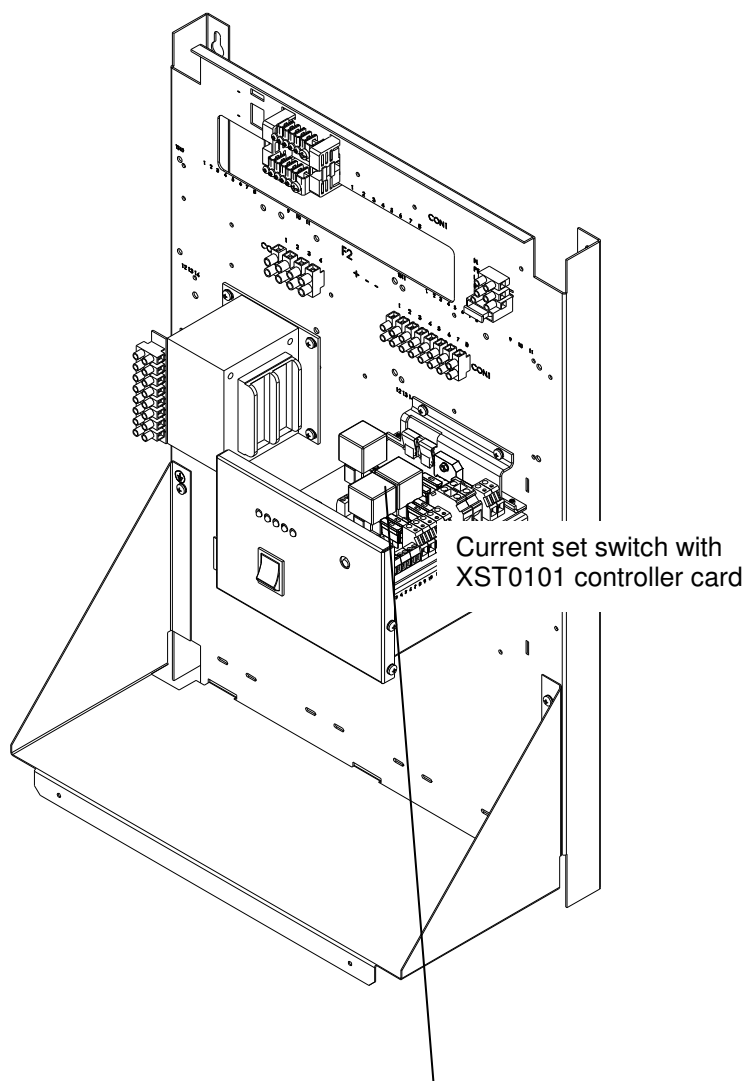
# APPENDIX 2

## Connections and fuses



**APPENDIX 3**

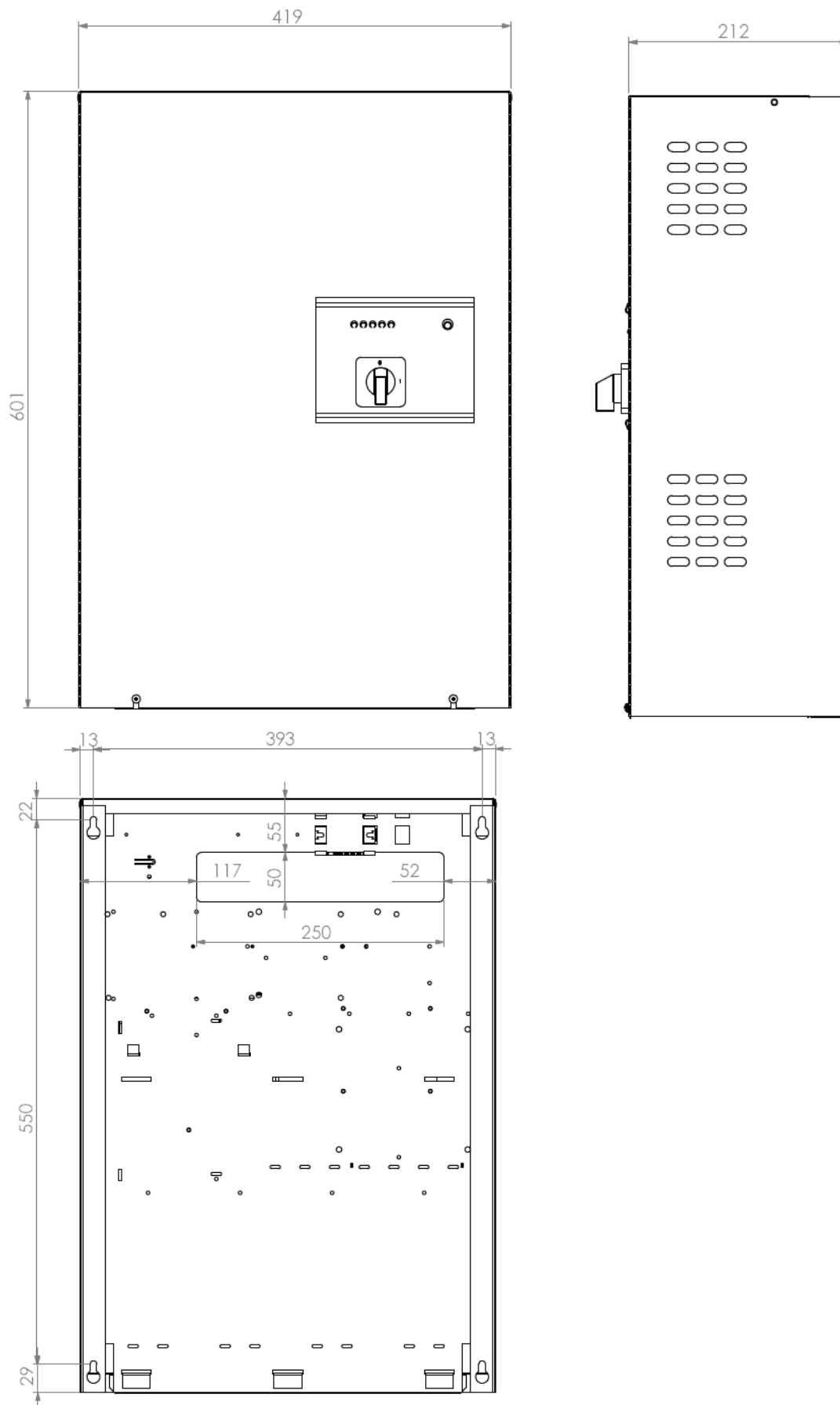
## Part placement



XST0101 controller card with current-setting DIP switch

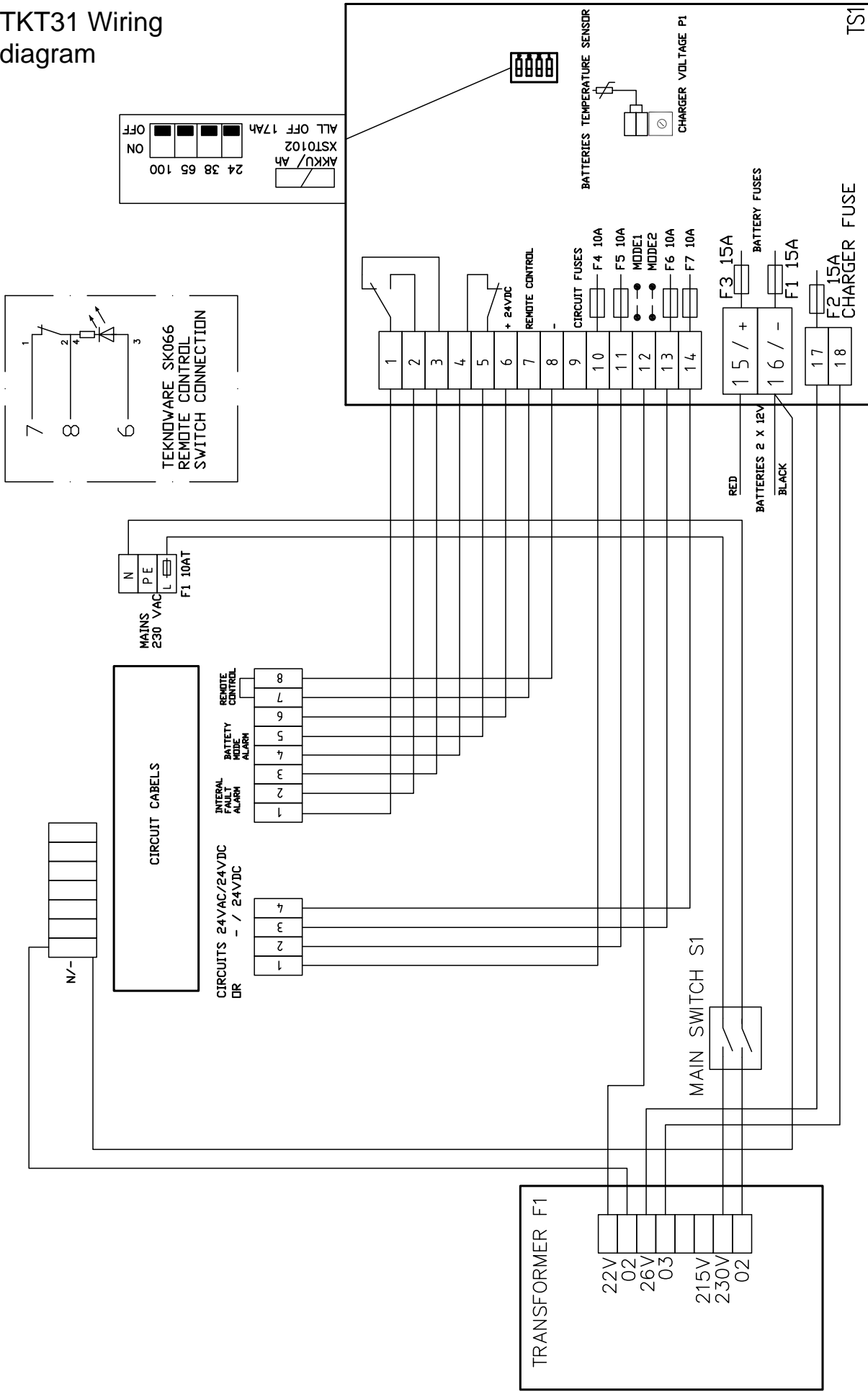
**APPENDIX 4**

Mechanical measurements



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 www.teknoware.fi e-mail: emexit@teknoware.fi

# APPENDIX 5. TKT31 Wiring diagram



Note! Switching the mains voltage of from the main switch does not remove the voltage from the system as the battery is still supplying luminaire circuits. Disconnect also battery fuses F1 and F3 the central voltage is down.

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<b>TEKNOWARE®</b>		Date	04.06.09	By	PHO	Check	App.	Rev	B	SCALE	(A4)	Date	23.06.08	Name	PHO
TKT3122 CENTRAL BATTERY UNIT WIRING DIAGRAM									C			Drawn	23.06.08		
									D			App.			
									E			Old no.		New no.	
									F			DRAWING NO.	4FT3122	Rev. Sheet	B
									G						
									H						