

# PWR11 MODEL 110VDC 60A BATTERY CHARGER CATALOGUE



**POWER**  
ELEKTRONİK®  
Endüstriyel Güç Sistemleri  
Industrial Power Solutions

**POWER**SOLAR® **POWER** ENGINEERING

*Güç her zaman, her yerde*

*Power anytime, anywhere*



220 Vdc

125 Vdc

110 Vdc

48 Vdc

30 Vdc

24 Vdc



Battery Chargers are designed in accordance with international IEC/EN 60146-1-1 standards

[www.powerelektronik.com.tr](http://www.powerelektronik.com.tr)

# DEFINITIONS AND SYSTEM INFORMATIONS

## WHAT ARE INDUSTRIAL RECTIFIERS - BATTERY CHARGERS?

Rectifier Products are used in utility HV (High Voltage), MV (Medium Voltage) and LV (Low voltage) energy control and automation systems to meet the needs such as relay control, breaker control, communication, automatic control and emergency lighting in case of power cut or recovery. These are products designed to be battery supported.

## HOW DOES INDUSTRIAL RECTIFIER WORK?

Industrial Rectifiers takes 1 Phase or 3 Phase AC mains energy, reduce it to the desired level with the help of Stepdown transformer, and at the same time provide the necessary energy to the thyristor circuits in the rectifier circuit by providing galvanic isolation. The DC energy coming out of the rectification unit is filtered and converted into smoother and cleaner DC energy.

With the help of the rectifier software, this DC energy charges the batteries according to float-boost-equalizing charging modes and provides the necessary continuous energy to DC loads. In case of grid power failure, it provides all of its DC energy needs from the batteries. Batteries continue to supply DC loads for a pre-calculated period of time (such as 4,6,8,12 hours) in accordance with the programmed discharge level. When the grid is restored, the discharged batteries begin to recharge.

## WHERE ARE INDUSTRIAL RECTIFIERS - BATTERY CHARGERS USED?

- » In power plants (Hydro, Thermal, Wind, Geothermal, Biomass, Natural Gas, etc.)
- » HV High voltage transmission and downcomer centers
- » MV Medium voltage transformers and distribution centers
- » Metro stations energy control centers
- » In control and command centers of all kinds of pipeline stations
- » DCS, Scada automation systems

## WHY ARE THERE 24, 30, 48, 110, 125, 220 VDC TYPES?

The coil control voltage of electrical equipment such as relays and breakers that industrial rectifiers will control is designed at different voltages by different manufacturers.

Generally, low voltage 24VDC rectifier is used for low power consuming DC loads.

Since it is designed as 48Vdc, 110Vdc and 220Vdc to make compact designs at lower currents for DC control equipment that draws higher power-current, the rectifier design is also installed in accordance with this DC voltage.

## HOW TO SIZING RECTIFIER BATTERIES?

In industrial rectifiers, battery types can sometimes be lead acid or Nickel-Cadmium type depending on need, sometimes preference, and sometimes specifications.

While OPZV tubular plate batteries are preferred in instant high current needs, OPZS and VRLA types are preferred in systems that require a long discharge time. Ni-Cd batteries can be preferred where high performance for many years and less temperature effects are desired. When calculating battery capacities, the required DC energy is determined by extracting the load profile (current and duration information) and using the IEEE battery calculation method.

## IN WHICH CASES ARE RECTIFIERS USED AS REDUNDANT BACKUP?

Especially in facilities where power outages may lead to critical consequences, in case one of the one of rectifier fails, it is preferred to use the other rectifier-battery set in parallel with backup to continue to supply DC energy needs without interruption.



- ▶ **16-Bit DSP control**
- ▶ **Graphic LCD screen**
- ▶ **5 control button**
- ▶ **Lower than 5% ripple**
- ▶ **Dry relay contacts for SCADA monitoring**
- ▶ **Over temperature protection**
- ▶ **Overload protection**
- ▶ **Programmable auto Boost Charge function**
- ▶ **Programmable Float Charge function**
- ▶ **Instantly input-output and battery voltage-current viewing**
- ▶ **Transformer and Thyristor based digital controlled rectifier technology**
- ▶ **Voltage and current full controls**
- ▶ **Dropper diode DC voltage regulation**
- ▶ **Front access**
- ▶ **Input voltage tolerance  $\pm 15\%$  1-ph 200/230/240 VAC**
- ▶ **Input Frequency 50 Hz/60 Hz  $\pm 5\%$**
- ▶ **Input Surge and fuse protections**
- ▶ **Special multimeters for input/output/battery voltage-current monitoring**
- ▶ **Output voltage 110VDC nominal**
- ▶ **DC+ and DC - leakage protection**
- ▶ **Output short circuit protection**
- ▶ **Status and alarm LEDs**
- ▶ **Optional high IP protections**
- ▶ **Double safety door protection**
- ▶ **Mimic diagram**

SEISMIC BATTERY RACK DESIGN- METAL SHEET

2950 mm

600 mm

500 mm

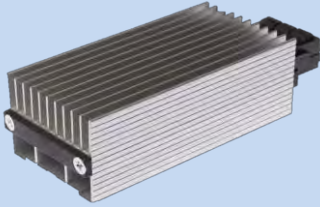
SEISMIC FIXING BRACKET

SEISMIC FIXING BRACKET

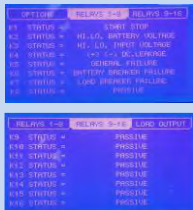
SEISMIC FIXING BRACKET

110VDC BATTERIES 55 CELL 2V OPZS 200





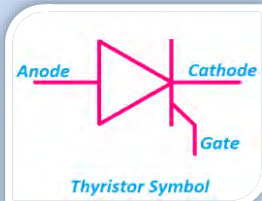
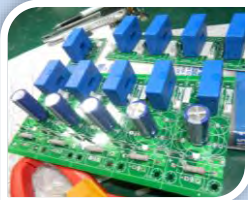
Condensing Protection by Heater



Programmable  $2 \times 8 = 16$  Scada Dry Relay Contacts



Additional AC-DC Volt-Amp Meter



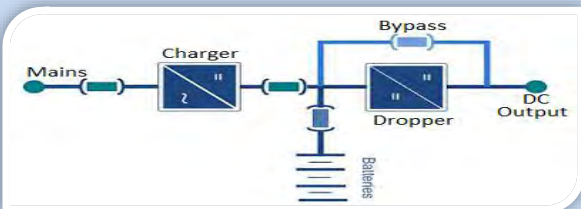
Industrial Control and Design  
Thanks to Transformer and Thyristors



16 Pcs Alarm and Status LED Indicator



AC & DC Surge Arresters protections



2-Stage Dropper diode function



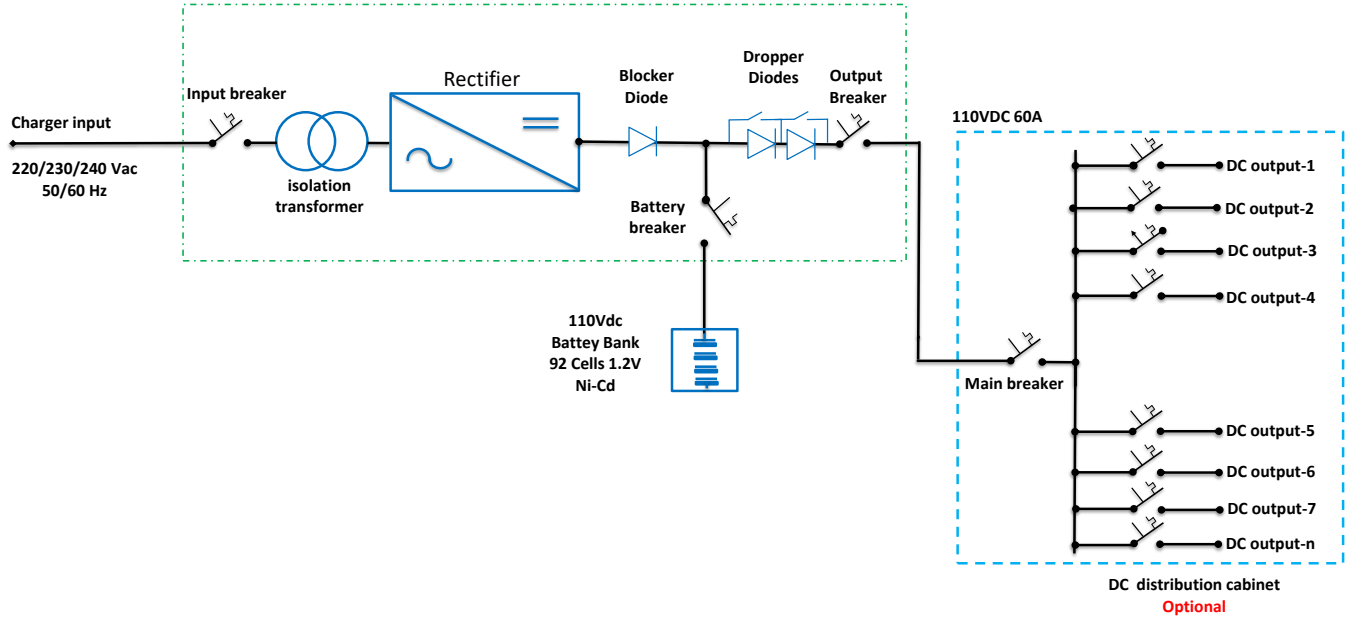
» VRLA  
» GEL  
» OPZV  
» OPZS  
» NI-CD

Able to charge kind of battery types  
and battery test scheduling function

## 1-PH INDUSTRIAL BATTERY CHARGER SYSTEM DESIGNS

PWR11 MODEL 110VDC 60A

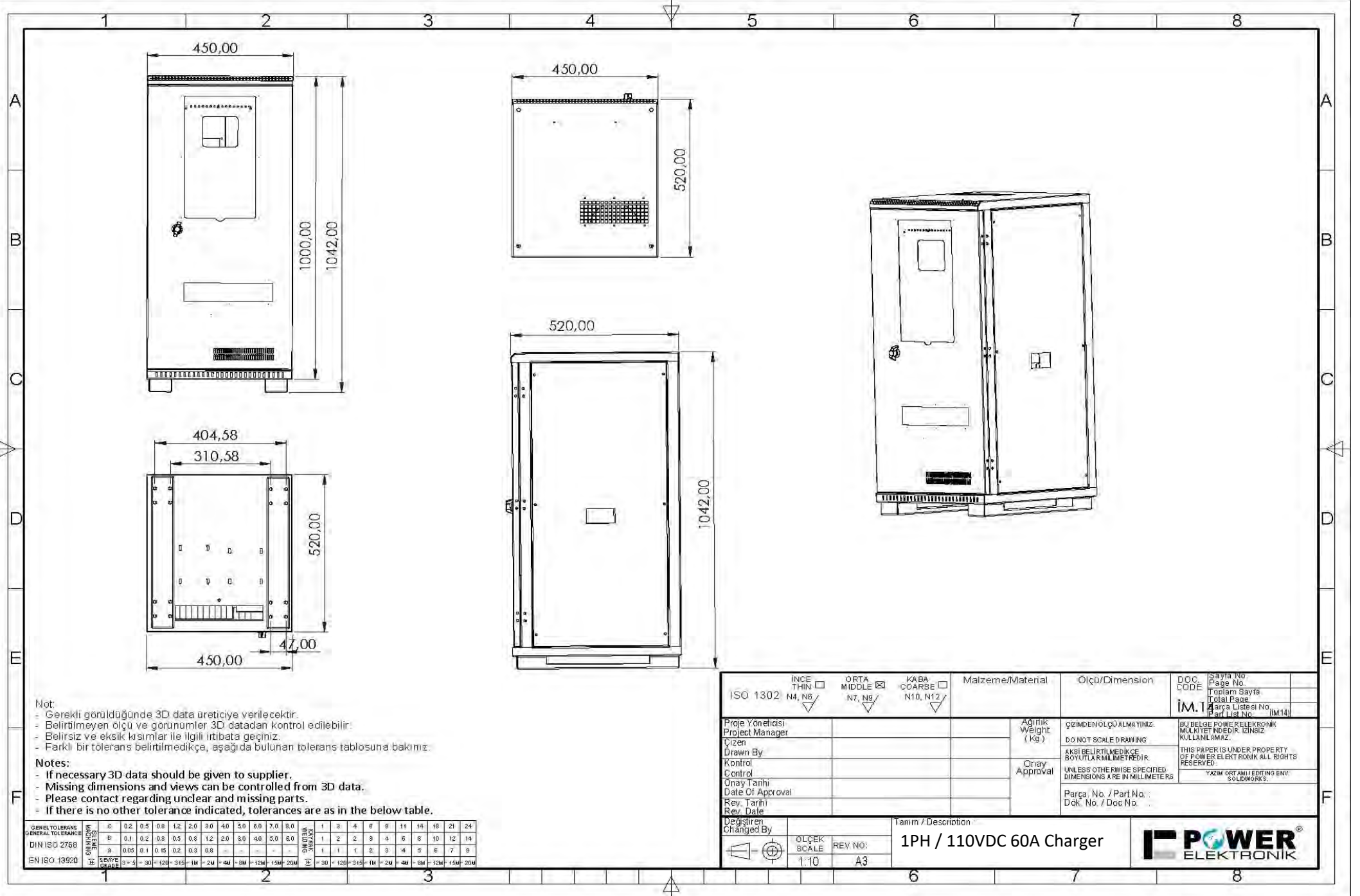
### General Single Connection Line Diagram



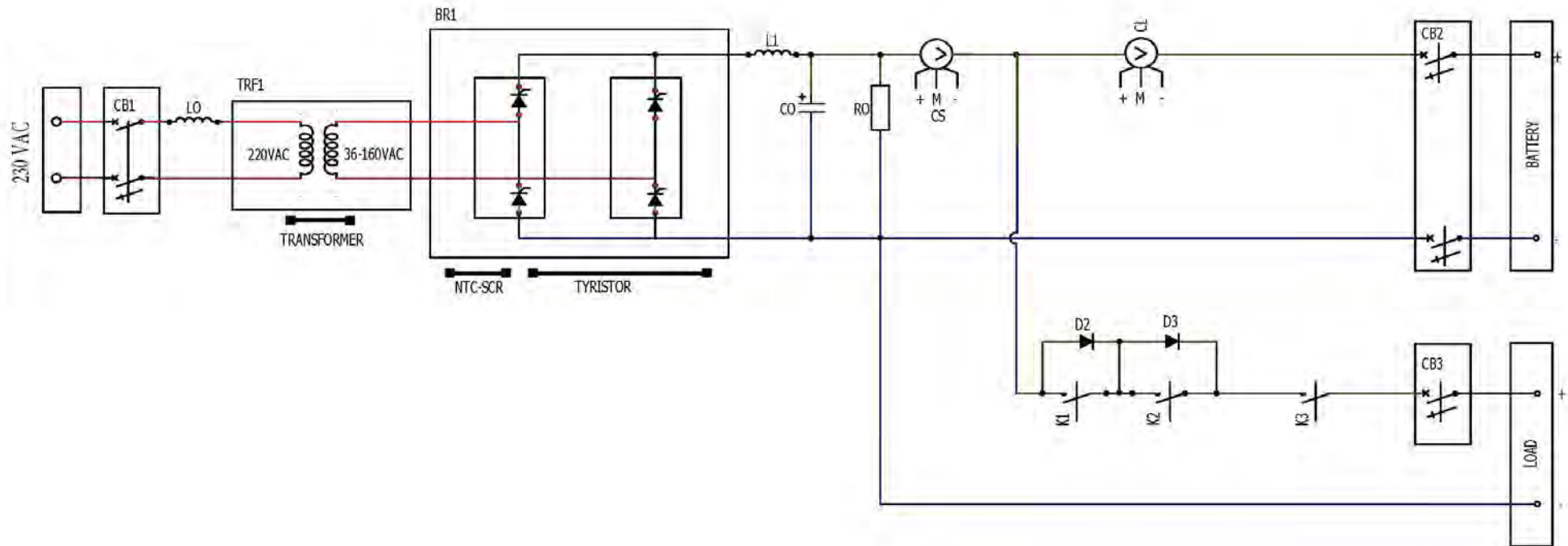
### General Battery and rack informations



# BATTERY CHARGER CABINET CUBICAL DRAWING



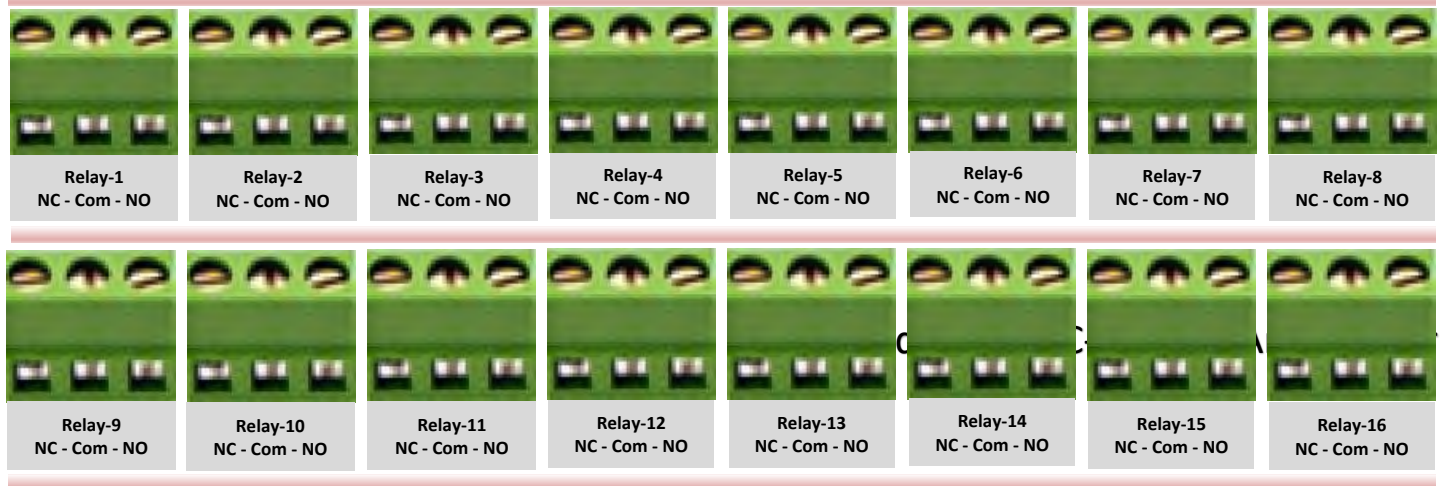
# RECTIFIER ELECTRICAL SINGLE LINE DIAGRAM



|  |         |              |                   |       |       |       |       |                    |        |              |              |  |
|--|---------|--------------|-------------------|-------|-------|-------|-------|--------------------|--------|--------------|--------------|--|
|  | DRAWING | EBRU DOĞAN   | REVIZION MAKING   | ----- | MODEL | PWR33 | PROJE | TEDAŞ MLZ 2018-065 | DATE   | 18.03.2019   | PAGE         |  |
|  | CONTROL | KAYHAN KABİL | REVIZION NO/ DATE | ----- | POWER |       | INPUT | 220VAC             | OUTPUT | 24-48-110VDC | CONFIRMATION |  |

## BATTERY CHARGER PROGRAMMABLE SCADA DRY RELAY OUTPUTS

| OPTIONE |          | RELAYS 1-8              | RELAYS 9-16 |
|---------|----------|-------------------------|-------------|
| K1      | STATUS → | START STOP              |             |
| K2      | STATUS → | HI, LO, BATTERY VOLTAGE |             |
| K3      | STATUS → | HI, LO, INPUT VOLTAGE   |             |
| K4      | STATUS → | (+) (-) DC LEAKAGE      |             |
| K5      | STATUS → | GENERAL FAILURE         |             |
| K6      | STATUS → | BATTERY BREAKER FAILURE |             |
| K7      | STATUS → | LOAD BREAKER FAILURE    |             |
| K8      | STATUS → | PASSIVE                 |             |
|         |          | RELAYS 1-8              | RELAYS 9-16 |
| K9      | STATUS → |                         | PASSIVE     |
| K10     | STATUS → |                         | PASSIVE     |
| K11     | STATUS → |                         | PASSIVE     |
| K12     | STATUS → |                         | PASSIVE     |
| K13     | STATUS → |                         | PASSIVE     |
| K14     | STATUS → |                         | PASSIVE     |
| K15     | STATUS → |                         | PASSIVE     |
| K16     | STATUS → |                         | PASSIVE     |



### Available Dry Relay Definitions

#### 1. START STOP:

Indicates the operating status of the Rectifier. When the start button on the front panel is pressed, the dry contact warns you.

#### 2. OVERHEAT:

Whenever the heat reaches to the limit that defined in the menü, this dry contact gives warning.

#### 3. INPUT CIRCUIT BREAKER IS OFF:

Whenever the input circuit breaker is off; this dry contact gives warning.

#### 4. BATTERY CIRCUIT BREAKER IS OFF:

Whenever the batter circuit breaker is offi this dry contact gives warning.

#### 5. LOAD CIRCUIT BREAKER IS OFF:

Whenever the load circuit breaker is off, this dry contact gives warning.

#### 6. HIGH BATTERY VOLTAGE:

Whenever the voltage reaches to the "Vo High Limit" value, defined in the menu, this dry contact gives warning .

#### 7. LOW BATTERY VOLTAGE:

Whenever the voltage reaches to the "Vo Low Limit" value, defined in the menu, this dry contact gives warning.

#### 8. BATTERY VOLTAGE HIGH + LOW:

Controls both situations above in a single dry contact.

#### 9. FAN ERROR:

Whenever the limits on the "Fan Error" menu is reached, the dry contact gives warning.

#### 10. BATTERY LINE DISCONNECTED:

Whenver the device is "ON" and there is a disconnection on the battery cables, the dry contact gives warning.

#### 11. REVERSE BATTERY LINE:

Indicates that the Battery connection is wrong. This warning is advised to be kept on the dry contact choices. Must be checked! Before the device is turned on.

#### 12. BATTERY GENERAL ERROR:

Dry contact warns you whenever there is an Error about the Battery.

#### 13. (+) DC LEAK:

(+) DC Leakage warning.

#### 14. (-) DC LEAK:

(-) DC Leakage warning.

#### 15. (+) /(-) DC LEAK:

(+) or (-) DC Leakage warning together.

#### 16. MAINS ON/OFF:

Provides a dry contact information about the presence of the mains voltage.

#### 17. MAINS HIGH:

If the mains voltage is higher than the value Vi HIGH LIMIT set on the MENU, dry contact gives warning.

#### 18. MAINS LOW:

If the mains voltage is higher than the value Vi LOW LIMIT set on the MENU, dry contact gives warning.

#### 19. MAINS HIGH + LOW:

In the case of the mains voltage out of the set values, dry contact gives warning.

#### 20. BOOST CHARGE:

Indicates that the Rectifier is in the fast charging mode.

#### 21. FLOAT CHARGE:

Indicates that the Rectifier is in the normal charging mode.

#### 22. GENERAL ERROR:

If this option is chosen, whenever one of the errors above is ocured, dry contact gives warning .

# PWR11 INDUSTRIAL BATTERY CHARGER



## 110VDC 60A BATTERY CHARGER TECHNICAL TABLE

### Rectifier Input:

|                             |                                                    |                                            |                                        |      |
|-----------------------------|----------------------------------------------------|--------------------------------------------|----------------------------------------|------|
| Voltage                     | 230                                                | VAC                                        | -%15                                   | +%15 |
| Current                     | 54                                                 | A                                          |                                        |      |
| Frequency                   | 50                                                 | Hz                                         |                                        |      |
| Input Fuse                  | 63                                                 | A                                          | Special value                          | No   |
| Configuration               | <input checked="" type="checkbox"/> Single Charger | <input type="checkbox"/> Redundant Charger | <input type="checkbox"/> Not Specified |      |
| Input Isolation transformer | Yes                                                |                                            |                                        |      |

### Load Output:

|                                 |                       |                    |                   |        |            |
|---------------------------------|-----------------------|--------------------|-------------------|--------|------------|
| Voltage                         | 110                   | Vdc                | Max. Load Voltage | 121,00 | by dropper |
| Current                         | 60                    | Amp                |                   |        |            |
| Dropper                         | Yes                   |                    |                   |        |            |
| Ripple                          | < 5 % Without Battery | < 1 % With Battery |                   |        |            |
| Voltage Regulation:             | ± %1                  | rms                | * battery mode    |        |            |
| Output Breakers                 | 1 x 63A MCCB          |                    |                   |        |            |
| Additional Distribution Breaker | 1 Pcs 60A + 2 Pcs 32A |                    |                   |        |            |

### Battery and Charging:

|                       |                 |                       |                        |
|-----------------------|-----------------|-----------------------|------------------------|
| Battery Block Voltage | 1.2V x 92 cells | Battery Brand         | ALCAD                  |
| Battery Type          | Ni-Cd           | Battery Strings       | Ni-Cd :92 Cells        |
| Charging Current      | 1 to 60         | Amper                 | Battery Breaker ampere |
| Float Charge Voltage  | 121,00          | V/Cell                | 63A                    |
| Boost Charge Voltage  | 132,00          | V/Cell                | Battery placement      |
| Battery test voltage  | 110,00          | V/Cell                | Battery capacity       |
| Load Current Limit    | 60              | A                     | 10 to 300              |
| Charge Characteristic | DIN 41773       | Battery sizes         | ah                     |
|                       |                 | L X H X W             | Unknown                |
|                       |                 | Battery unit weight   | mm                     |
|                       |                 | Battery Configuration | kg                     |
|                       |                 |                       | 1 string per charger   |

### Cabinet:

|                    |                                        |                 |             |
|--------------------|----------------------------------------|-----------------|-------------|
| Cabinet type       | Stand Floor                            | Control and LCD | Graphic LCD |
| Cooling            | Fan cooling with thermostat controlled | Door stop       | Right       |
| Cable Entry        | Bottom Entry                           | LCD language    | English     |
| Label              | Grey - Pasted                          | Color           | RAL 7035    |
| Cabinet Lighting   | Yes                                    | Locking         | Lockable    |
| Cabinet dimensions | WxDxH: 400 x 450 x 1100 mm             | Weight          | 120         |
|                    |                                        |                 | kg          |

### General Values:

|                              |                         |                   |               |
|------------------------------|-------------------------|-------------------|---------------|
| Operating Temperature Range  | -5 /+50 °C              | IEC Standard      | IEC 60146-1-1 |
| Condensing resistance Heater | Yes                     | Noisy             | <65 dB        |
| Storage temp. Range          | -25 /+55 °C             | Humidity          | <90%          |
| Communication                | RS232,dry relay, RS 485 | Isolation Voltage | 2kV           |
| Altitude                     | Max. 1000m NN           | Protection degree | 1 min         |
|                              |                         |                   | IP21          |

### Protections:

|                              |                                     |                     |                                     |                 |                                     |
|------------------------------|-------------------------------------|---------------------|-------------------------------------|-----------------|-------------------------------------|
| DC Low-High protection       | <input checked="" type="checkbox"/> | Overload            | <input checked="" type="checkbox"/> | Over Temp       | <input checked="" type="checkbox"/> |
| Phase Failure                | <input checked="" type="checkbox"/> | DC± to GND Leakage  | <input checked="" type="checkbox"/> | Reverse Battery | <input checked="" type="checkbox"/> |
| Input Mains Surge protection | <input checked="" type="checkbox"/> | DC Surge protection | <input type="checkbox"/>            | Emergency Stop  | <input checked="" type="checkbox"/> |

### Lamp Indicators:

|        |          |           |       |      |            |           |         |        |             |             |               |           |            |               |             |               |
|--------|----------|-----------|-------|------|------------|-----------|---------|--------|-------------|-------------|---------------|-----------|------------|---------------|-------------|---------------|
| 16 Pcs | Mains ON | Mains OFF | Start | Stop | Mains High | Mains Low | DC High | DC Low | +DC Leakage | -DC Leakage | Current Limit | Fan Fault | Over Temp. | Battery Fault | Temp. Comp. | General Fault |
|        |          |           |       |      |            |           |         |        |             |             |               |           |            |               |             |               |

### Notes & Options :

- » Dry Relay contacts included
- » Dropper diode function is included
- » RS 485 RTU Communication included
- » Blocker diodes included
- » Input AC Breakers included
- » Output DC Breakers included
- » Battery DC Breaker included