

D5713 Microcontrolled monitor SCR series chargers.

D5713 microcontrolled monitor SCR chargers are designed to meet the standard requirements of battery chargers for use in substations or other demanding situations. The D5713 charger is especially intended for unmanned sites, charging batteries for switchgear tripping, communications or station control applications. Monitoring is through a full range of easy to set alarms with relay outputs. The chargers have a regulated and filtered output suitable for charging both flooded and valve regulated sealed Lead acid batteries or flooded Nickel Cadmium batteries. The power rectification section uses a robust analog SCR design which operates independently of the alarm and control facilities to provide a failure tolerant total system.

General description.

The D5713 series chargers are single-phase or three phase fully controlled, thyristor rectifier types which comprise the following major power elements:

1. Stepdown power transformer

The transformer steps down, isolates and provides the low voltage output to the rectifier bridge. The transformer is constructed and tested to AS60076 (Power Transformers).

2. Rectifier bridge

The rectifier bridge consists of thyristors, diodes, a free-wheeling diode and a blocking diode to prevent backfeed from the battery to the charger and allow parallel operation. The rectifier bridge is air cooled.

3. Filter inductor

This inductor filters the output current from the bridge rectifier

4. Smoothing capacitor group

This smoothing capacitor filters the dc supply voltage to 1% rms/dc (without batteries).

5. Blocking diode

The blocking diode prevents backfeed from the battery bank to the charger and simplifies parallel operation with other chargers.

Control of the charger output is achieved through full wave phase control firing of the thyristors in the rectifier bridge. The firing circuits are designed to operate correctly with poor quality AC input and provide good voltage regulation over a wide range.

Battery chargers and Switchgear trippers

Standard Features

- Constant voltage current limited charging.
- Easy alarm setting.
- AC circuit breaker.
- Digital charger voltmeter and ammeter.
- Choice of analog or digital meters.
- Batt Hi, Batt Lo, Charger fail, Earth fault alarms standard.
- AC phase detection and shutdown.
- High voltage shutdown (optional).
- Battery monitoring by periodic test (optional).
- Reverse polarity protection.
- Phase control with high noise immunity.
- Temperature compensation.
- Automatic lamp test.
- Wide range of other factory options.
- Independent alarm and output systems - fault tolerant operation.
- Robust, surge protected SCR control.
- Available in a wide range of cabinet configurations.
- Australian designed and made.

Simple alarm level setting system.

The D5713 alarm board allows a technician to simply set and forget voltage alarm levels into the microcontroller. No external test power supply is required and the charger functions as normal while the alarms are being set. It works as follows

1. Press the button for the alarm function to check.
2. Measure the scaled simulation voltage between the two test points on the board.
3. Adjust the single voltage setting potentiometer to the desired voltage x 0.1 (so 58V hi volts = 5.8V)
4. Release the button - alarm is loaded. Values are non volatile and stored in memory for years.



POWER CONVERSION SPECIALISTS

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The D5713 alarm system operates independently of the phase control for the battery charger and the charger will continue to operate in the unlikely event that the alarm system is disabled.

The D5713 system is fully featured with alarms for

1. AC voltage low *
2. AC phase bad (for 3 phase systems). D5713 chargers also have inbuilt missing phase detection in the gate drive circuits and will not operate with a missing phase or incorrect phase rotation.*
3. Charger fail - detects lack of internal* charging voltage
4. Battery high. *
5. Battery low. *
6. Earth fault (preset for approx 9mA positive or negative to ground—can be disabled). *
7. Battery auto test (option). This is a periodic test which reduces the charger output voltage and checks that the battery can support the load. *
8. High voltage shutdown (option). Switches off the battery charger with a separate contactor—recommended for valve regulated battery operation.
9. Low voltage disconnect (option). Low voltage disconnect is used to prevent overdischarge of batteries.

Alarms marked with * have separate “C” form relay contacts rated at 24V AC, 110V DC 1A. A summary alarm is also provided.

Other options can be simply programmed in—check with factory.

Constant voltage, temperature compensated charging.

The D5713 battery charger is a constant voltage current limited charger where a closely regulated voltage is delivered to the battery. Boost or equalize charging options suitable for valve regulated (sealed) lead acid batteries, flooded lead acid batteries and flooded Nickel Cadmium batteries can also be provided. The output of the charger is temperature compensated and is factory set to suit the type of battery the charger is operating with.

The D5713 charger range is available in 19” rack or floor mounted cabinets. The cabinets can contain the charger, battery and an integrated DC distribution panel and are available in a wide range of finishes and materials.



A 50V 50A D5713 battery charger used at an unattended terminal substation.

D5713 Charger performance specification.

- (1) Input voltage: 100V/110V/120V/220V/240V/380V/415V/440V +/-10% 50/60Hz. (Specify input)
- (2) Input phases : <3KW 1Φ >3KW 3Φ (3 Actives + Earth)
- (3) Full load continuous output: 10A/15A/20A/25A/30A/40A/50A/60A/70A/100A/150A/200A/250A/300A/400A
- (3) Float voltage at full load output: 27.6V (24V system), 34V (30V system), 36V (32V system), 40.5V (36V system), 54V (48V system), 122V (110V system), 132V (125V system), 260V (240V system).
- (5) Regulation at float: +/-1%
- (6) Ripple at any load, without battery: <1.0% rms for 1 Φ, <1% rms for 3 Φ (50Hz—10Khz)
- (7) Temperature derating (above 40 degrees C): derate 2%/degree C above 40 degrees C ambient.
- (8) Efficiency at full load: >80% <3KW, >85% >3KW
- (9) Cooling: Natural convection
- (10) Powerfactor at full load. 1Φ > 0.7 lag, 3Φ>0.8 lagging.
- (11) Power Conversion method - Thyristor full wave conversion.