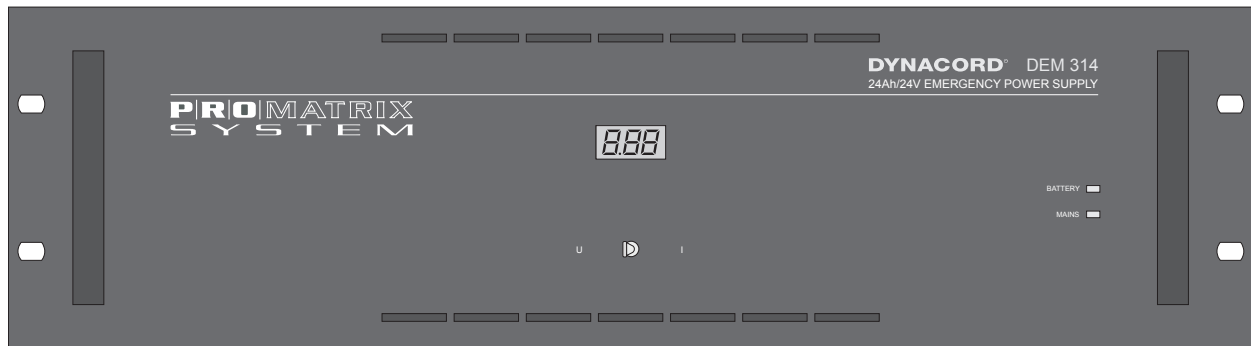


PA module system

DEM 314 Battery Module 24V/24Ah with charging unit 24V/1A



Features of the battery and charging module

- 19" - 3HU battery drawer 24V/24Ah with integrated fully automatic charging unit for continuous battery power supply.
- Temperature-compensated control of charging current and charging voltage.
- IU - charging characteristic
- Exhaustive discharge protection
- Protection against short circuit and polarity reversal
- Mains failure information via floating contact
- Mains and output voltage indication via LED's
- Switchable current/voltage indication via LC display
- Five individual fused outputs, AMP flat-pin plugs 6.3x0.8mm
- Completely maintenance-free lead accumulators with VDS approval and UL certification

The specifications comply with the requirements issued by the „Leistungsgemeinschaft audio and video technology in the ZVEI.

CONTENTS

1. Emergency power supply of alarm devices
2. Commissioning of the battery and charging module
 - 2.1 Fusing of the outputs
 - 2.2 Exhaustive discharge protection
 - 2.3 Mains voltage alteration
3. Instructions for the user
 - 3.1 Operation restrictions
 - 3.2 Handling instructions for the batteries
 - 3.3 Storage and additional charging
 - 3.4 Transport
 - 3.5 Battery service life
 - 3.6 Battery recycling
4. Registrations and standards
 - 4.1 Battery
 - 4.2 Charging unit
5. Test and inspections of alarm devices
6. Glossary
7. Specifications of the battery and charging module DEM 314
8. Circuit diagrams, block diagrams

WEEE Recycling/Disposal Instructions

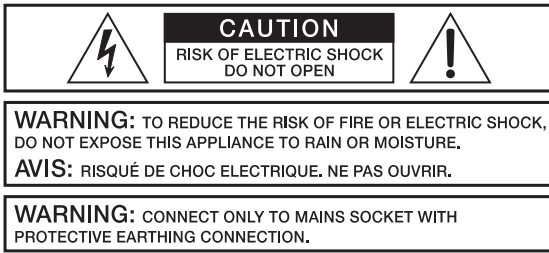


FOR RECYCLING
INFORMATION
CONTACT YOUR
DISTRIBUTOR OR
VISIT OUR WEBSITE

WWW.EVIAUDIO.COM

The Wheelie Bin symbol found on the product or in the manual indicates that this product must not be disposed of with other waste. It is in our category the manufacturer's responsibility to properly dispose of their waste electrical and electronic equipment (WEEE) at the end of its life. Due to the differences in each EU country's management of WEEE, please contact your local distributor. We are committed to facilitate our own electronic-waste-management-system, for the free of charge return of all EVI Audio GmbH products: Telex, Dynacord, Electro-Voice, Midas Consoles, KlarkTeknik and RTS. Arrangements are made with the dealer where you purchased the equipment from, for the returning of all unusable equipment **at no cost**, to the factory in Straubing, for environmental protective disposal.

IMPORTANT SAFETY INSTRUCTIONS



The lightning flash with arrowhead symbol, within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufactures instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Unplug this apparatus during lightning storms or when unused for long periods of time.
13. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
14. Do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the equipment.
15. To completely disconnect this equipment from the AC Mains, disconnect the power supply cord plug from the AC receptacle.
16. The mains plug of the power supply cord shall remain readily operable.

IMPORTANT SERVICE INSTRUCTIONS

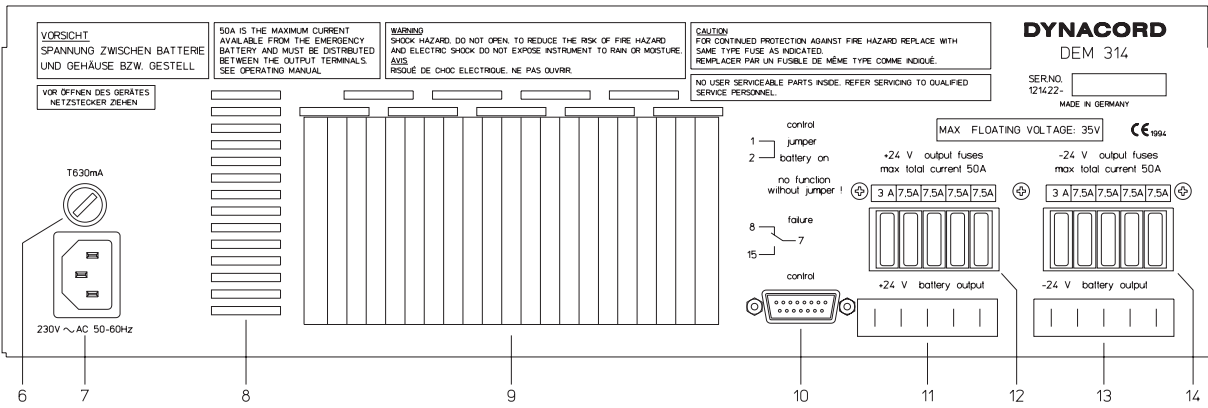
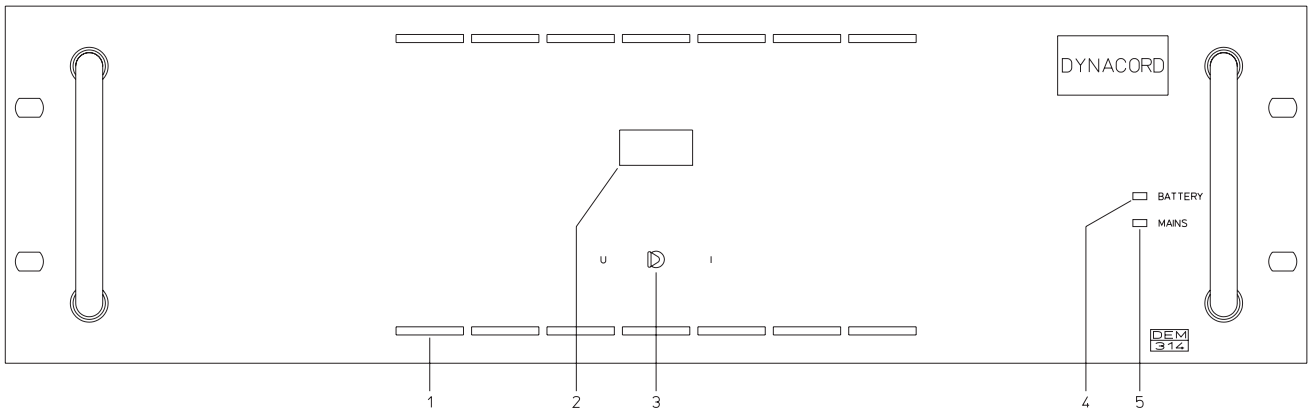
CAUTION: These servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the Operating Instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

1. Security regulations as stated in the EN 60065 (VDE 0860 / IEC 65) and the CSA E65 - 94 have to be obeyed when servicing the appliance.
2. Use of a mains separator transformer is mandatory during maintenance while the appliance is opened, needs to be operated and is connected to the mains.
3. Switch off the power before retrofitting any extensions, changing the mains voltage or the output voltage.
4. The minimum distance between parts carrying mains voltage and any accessible metal piece (metal enclosure), respectively between the mains poles has to be 3 mm and needs to be minded at all times. The minimum distance between parts carrying mains voltage and any switches or breakers that are not connected to the mains (secondary parts) has to be 6 mm and needs to be minded at all times.
5. Replacing special components that are marked in the circuit diagram using the security symbol (Note) is only permissible when using original parts.
6. Altering the circuitry without prior consent or advice is not legitimate.
7. Any work security regulations that are applicable at the location where the appliance is being serviced have to be strictly obeyed. This applies also to any regulations about the work place itself.
8. All instructions concerning the handling of MOS - circuits have to be observed.

NOTE:



SAFETY COMPONENT (MUST BE REPLACED BY ORIGINAL PART)



- | | | | |
|---|-----------------------|----|------------------------------------|
| 1 | Ventilation holes | 8 | Ventilation holes |
| 2 | LC display | 9 | Heat sink |
| 3 | Switch U/I | 10 | Plug connector control |
| 4 | LED indicator BATTERY | 11 | Battery outputs +24V |
| 5 | LED indicator MAINS | 12 | Fuses for the battery outputs +24V |
| 6 | Mains fuse | 13 | Battery outputs -24V |
| 7 | Mains connector | 14 | Fuses for the battery outputs -24V |

1. Emergency power supply of alarm devices

Alarm devices require 2 independent energy sources, both of which must be able to supply the alarm device alone. One of the energy sources must be the general mains supply or a similar network in non-stop operation. The other must be part of the apparatus (e.g. a battery) or an equivalent network fused separately. If the mains power supply is interrupted, the second source of energy must guarantee constant non-stop operation automatically and without interruption.

If the energy source belonging to the alarm device consists of a battery, the user must ensure that the batteries used are suitable for stationary and floating operation.

The power supply for an alarm device must not be used to supply other apparatus or parts. However, electrical equipment which serves to pass on messages may also be powered by the said source.

An automatic charging device is required to charge and maintain the battery. It must be able to charge a battery which is discharged to its discharge voltage up to 80% max. of its rated capacity within 24 hours.

The battery capacity must be sufficient to guarantee the fixed alarm duration at the end of the stored energy time. When selecting new batteries, the user should make sure that their capacity is sufficient to compensate the capacity loss due to natural ageing of the batteries during the prescribed service life.

2. Commissioning of the battery and charging module DEM 314

Observation of the following points is essential:

- The battery may only be connected to the charging unit with the mains switched off and without load (e.g. all consumers are disconnected from the battery)
- The battery must be re-charged immediately after discharging. The battery must not be stored in discharged status. The ability to hold a charge can no longer be reached, if the battery is stored in discharged status over a long period.
- Care must be taken to ensure that the temperature in the rack is always within the allowed temperature range specified in the data sheets.
- The integrated charging unit is designed for connection to 230 V AC. This can be altered to 115 V AC at the mains transformer (see section 2.3 Alteration of the mains voltage). The charging unit must only be connected with a plug which has been installed correctly.
- DC consumers, like power amplifiers, modules etc. are to be connected to the flat-pin plugs +24V Battery Output and -24V Battery Output. For power amplifiers there are 4 flat-pin plug outputs each, for modules (DEM 207), 1 output each.
- Plug connector „Control“. For connection of the consumers with the battery in the plug connector „Control“, a link between pin 1 and 2 must be soldered. The floating contact for mains failure information is accessible at pin 7, 8 and 15 (see circuit diagram).

Note: If there is no connection between pin 1 and 2 in the plug control, the unit will not function!

2.1 Fusing of the outputs

The battery has individually fused outputs to connect the consumers. Thus all departing plus and minus lines are protected against excess current and short circuits. Wires with different cross-sections for consumers with low and high current can be connected to a battery at the same time, providing the fuse values of their individual outputs are chosen accordingly. **The maximum value of the fuses must not, however, exceed 20 A.**

The sum of the currents of all the output fuses in a fuse block must not exceed 50 A.

If the fuse values are changed, the current values printed on the units above the fuse switch are to be covered with the enclosed sticky labels. The fuse values for the appropriate plus and minus outputs must always be the same.

If certain outputs are not used, the fuses are to be removed and the fuse values above the fuse switches are to be covered over with the enclosed blank sticky labels.

The output fused with 3 A is intended to facilitate connection of the control module DEM 207.

The cross-sections of the lines connected must be correctly dimensioned for the fuse value selected. Please note that lines laid in cable channels have a lower permissible current load stability due to lower heat dissipation.

The following is a guideline for bundled lines

Number of lines	Reduction factor
2 bis 5	0.8
6 bis 10	0.7
16 bis 30	0.5

Module type	Current consumption at $U_{bat} = 24V$			Fuse value
	Standby	rated power -10 dB	rated power	
DEM 287 power amplifier 125 W	10 mA	2,5 A	5,7 A	7,5 A
DEM 288 power amplifier 250 W	10 mA	3,5 A	10,6 A	10 A
DEM 289 power amplifier 400W mit NRS 90 144	10 mA	7,0 A	19,7 A	20 A
DPA 4410 power amplifier	2,5 mA	7,5 A	18 A	20 A
DPA 4411 power amplifier	60 mA	7,5 A	18 A	20 A
DPA 4120 power amplifier	2,5 mA	3,74 A	9,1 A	10 A
DPA 4140 power amplifier	2,5 mA	7,1 A	17,3 A	20 A

Table I Fuse values of the battery outputs for connection of power amplifiers

Table II shows the maximum current which can be obtained from the battery. This must not be exceeded. This gives the maximum number of power amplifiers which can be supplied by the batteries.

Battery type	I _{max} in A	max.number of power amplifier*						
		DEM 287	DEM 288	DEM 289	DPA4410	DPA4411	DPA4120	DPA4140
DEM 314	50	8	4	2	2	2	5	3

Table II Maximum current and number of power amplifiers

* The number of power amplifiers which can be directly connected to the battery drawers can be lower than the values specified in Table II (see number of outputs, Section 7, Specifications). The values specified in the Table only refer to the connection of one amplifier type to one battery type. As long as the maximum current extracted does not exceed the value stated, however, various types of amplifier can be supplied by one type of battery.

2.2 Exhaustive discharge protection

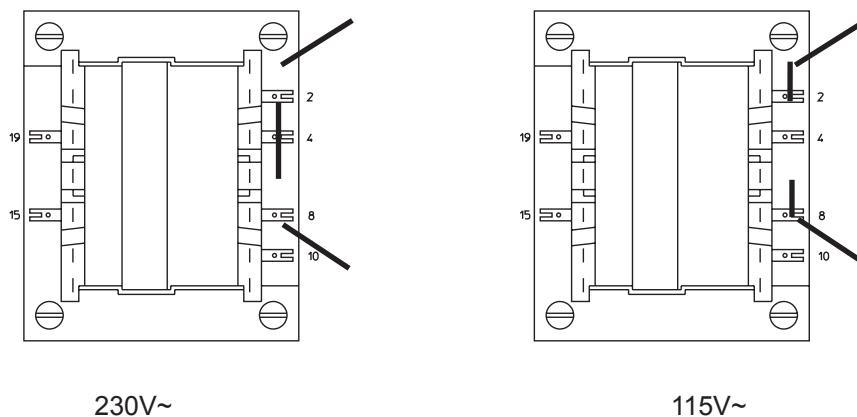
The battery drawer is equipped with an exhaustive discharge protective circuit which is controlled by the battery monitoring unit in the charging device. In case of underflow of the cut-off voltage of 1.75 V/cell * 12 cells = 21 V, measured at the battery poles, the consumer is disconnected from the battery and the charging unit. In this way the battery is safely protected against exhaustive discharge. If the exhaustive discharge protective circuit is activated, the red LED „low voltage“ lights up and the fault is indicated by the collective failure signal. The battery is automatically switched on again once the fault has been remedied, and the LED „low voltage“ goes out.

Note: The exhaustive discharge protection only operates in conjunction with the battery modules DEM315, DEM316 and DEM317.

2.3 Changing the Mains Voltage (only to be performed by qualified personnel)

After being switched over appropriately, the battery and charging module DEM 314 can also be operated on 115V AC mains voltage. Switching over to accommodate the said voltage is performed as follows:

- separate mains connection, control socket and all consumers from the device
- remove lid
- the mains transformer TR 1 - DCN 358 420 is on the left-hand side of the charging unit. To switch over to 115V AC, remove the wire jumper between solder lug 4 and 8 and solder two new wire jumpers between solder lug 2 and 4 and 8 and 10 (see fig.)



- on the inner side of the rear wall there is a silver-coloured label with various mains voltage and fuse values. After switching over the mains voltage to 115V AC, stick the appropriate label on the outer side of the device's rear wall below the mains socket so that it covers the printed value 230V. Furthermore, the mains fuse T630mA must be exchanged for T1.6A. Cover the labelling of the fuse accordingly.
- refit lid.

3. Notes for the user

3.1 Use of the battery is to be avoided in the following locations.

- areas exposed to direct sunlight
- areas with excessive radioactivity, infrared radiation or ultra-violet radiation
- areas with organic solvent vapours, dust, salt or corrosive gases
- areas with abnormal vibration.

3.2 Regulations for battery use

- Do not throw batteries into the fire. Do not place batteries in the proximity of fires.
- Do not short battery poles.
- Do not tamper with or open batteries.
- If the battery has been damaged and diluted sulphuric acid comes into contact with skin or clothing, rinse immediately with plenty of water. If diluted sulphuric acid gets into the eyes, consult a doctor immediately.
- Always re-charge a battery after discharging.
- Never use batteries with different capacities, different degree of discharge or a mixture of old and new batteries together. The manufacturing dates should be within one month of each other.
- Batteries should be stored at as low a temperature as possible. If batteries are stored at normal temperatures, one additional charging procedure is necessary once every six months.

3.3 Storage and additional charging

During storage the capacity is reduced due to self-discharge. The battery should be stored in a cool, dry place.

If the average monthly temperature is between 20°C and 30°C, one additional charging procedure is necessary every 4 months.

If a stored battery is to be used, one charging procedure should always be carried out before use.

3.4 Transport

Avoid excessive jolting or knocks.

Remove the batteries from the housing during transport

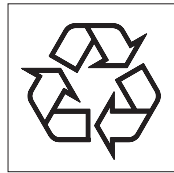
3.5 Battery service life

Generally speaking, the battery service life in standby parallel operation amounts to 3 - 5 years and approximately 260 cycles at 100% discharge depth or more in cyclical operation. The actual service life is reduced if the appropriate operating conditions are not maintained, (i.e. charging, discharging, working temperature and storage).

We recommend charging the battery at an ambient temperature of between 5°C and 35°C to minimize detrimental effects on its service life.

3.6 Battery recycling

The batteries are marked with a recycling symbol as illustrated below. At the end of their service life, the batteries should be returned to the manufacturer or supplier or taken to a special collection centre so that they can be recycled.



4. Registrations and standards

4.1 Battery

— VdS registration

The batteries have been tested and recognized by the VdS (Verband der Sachversicherer) and comply with the following standards:

DIN 57 510 / VDE 0510 Akkumulatoren und Batterien, ortsfeste Batterien

DIN 43 534 „Wartungsfreie“ verschlossene Akkumulatoren mit festgelegtem Elektrolyt

DIN 43 539 part 5 Prüfungen „wartungsfreie“ verschlossene Akkumulatoren mit festgelegtem Elektrolyt

— UL approval

The batteries have received recognition from the Underwriters Laboratories Inc. and have been registered under the number MH 15705.

— IATA classification

The batteries have been cleared by the International Air Transport Association (IATA) for transport in aircraft and have received the classification „leak-proof“.

4.2 Charging unit

— VDE 0871 / plot B

— VDE 0860 / IEC 65

5. Testing and inspecting alarm devices

In order to guarantee that the alarm device is in working condition, qualified personnel must carry out inspections and servicing regularly.

Inspections must be carried out at least once every 3 months at approximately equal intervals to comply with DIN VDE 0833 part 1.

Servicing must be carried out in accordance with the manufacturer's instructions at least once per year.

Annual servicing may be linked with the quarterly inspections if so desired, meaning that all sections of the apparatus are inspected within one year.

For the battery of an alarm device this means: quarterly operational tests and annual malfunction simulations of the operating duration with the consumers.

We recommend carrying out the battery capacity test in accordance with DIN 43 539 part 1, whereby the battery manufacturer's instructions are to be observed.

Please see instructions under section 3.2 on how to treat the batteries.

6. Glossary:

Continuous battery power supply

In this mode, the battery is constantly kept at full charge. It only gives off current if the DC source supplied by the mains fails.

Nominal capacity:

The nominal capacity is the value in ampere-hours for a 20-hour even, uninterrupted discharge with I₂₀ up to the discharge voltage of 1.75 V/cell at a temperature of 25°C.

Capacity:

The capacity of a battery is the amount of electricity which can be extracted under the conditions in question. This depends on the discharge current, the discharge voltage and the temperature.

Service life

For batteries in alarm apparatus and emergency announcement systems, the end of a battery's service life (limit duration of operation) is reached when the capacity is less than 80% of the rated capacity.

Stored energy time

This is the time-span between recognizing a failure in the mains supply and remedying this failure.

Alarm duration

The alarm duration is the time during which the alarm signal is given off.

Emergency announcement duration

This is the time during which announcements are made to clear the building or section of a building.

7. Specifications

DEM 314

7.1 Battery unit

Nominal voltage	24 V
Discharge voltage at 25°C (1)	21 V
Nominal capacity for 20 hr	24 Ah
Nominal discharge current I ₂₀	1.2 A
Capacity for 5 hr (2)	20 Ah
Capacity for 1 hr (3)	14 Ah
Capacity for 1 C (4)	12 Ah
Discharge current for 5 hr (2)	4.1 A
Discharge current for 1 hr (3)	14 A
Discharge current for 1 C (4)	24 A
Max. discharge current	50 A
Standby current at mains failure	150 mA
Number of outputs	5
Internal resistance for 7.5 A output	approx. 50 mΩ

7.2 Charging unit

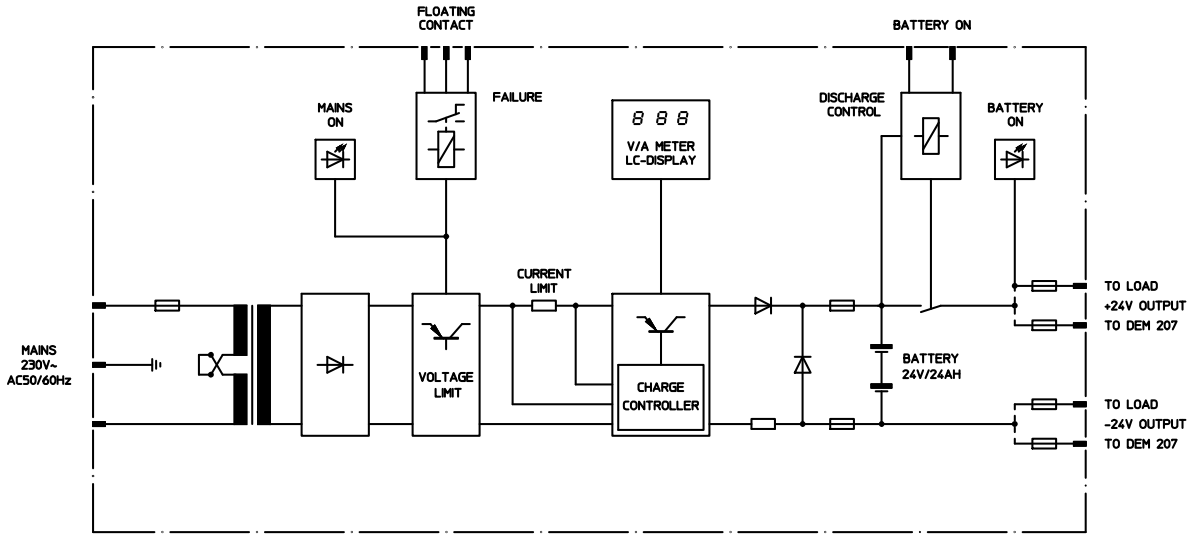
Nominal mains voltage	230V AC 10% 50-60 Hz
Nominal output voltage	24V DC
Charging voltage for 2.3V/cell at 20°C	27.6V DC
Nominal charging current	0.95A
Max. charging current	1 1.1 x I _n
Exhaustive discharge protection/ short circuit protection/ protection against polarity reversal/ I/U charging characteristic	
Internal temp. compensated reference	
Temperature coefficient of the output voltage	-47mV/°C
Ambient temperature	+5°C 40°C
Dimensions (WxHxD)	483 x 370 x 133 mm
Weight approx.	26.6 kg with batteries 8.5 kg without batteries

(1) Discharge voltage at 25°C: 1.75 V/cell x 12 cells = 21.0 V

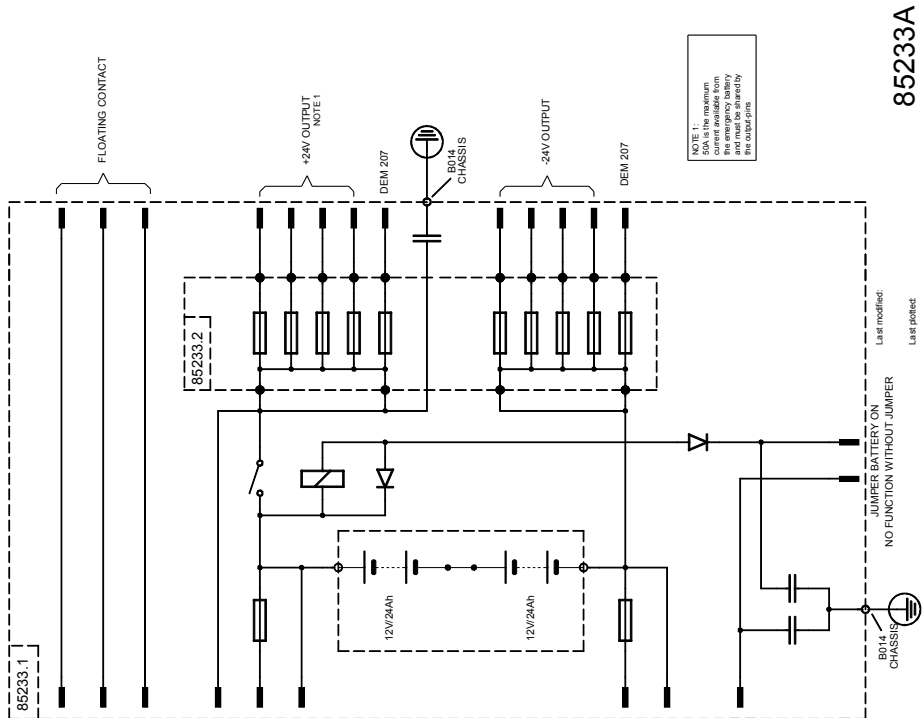
(2) Capacity at 5 hours discharge with discharge current for 5 hr

(3) Capacity at 1 hour discharge with discharge current for 1 hr

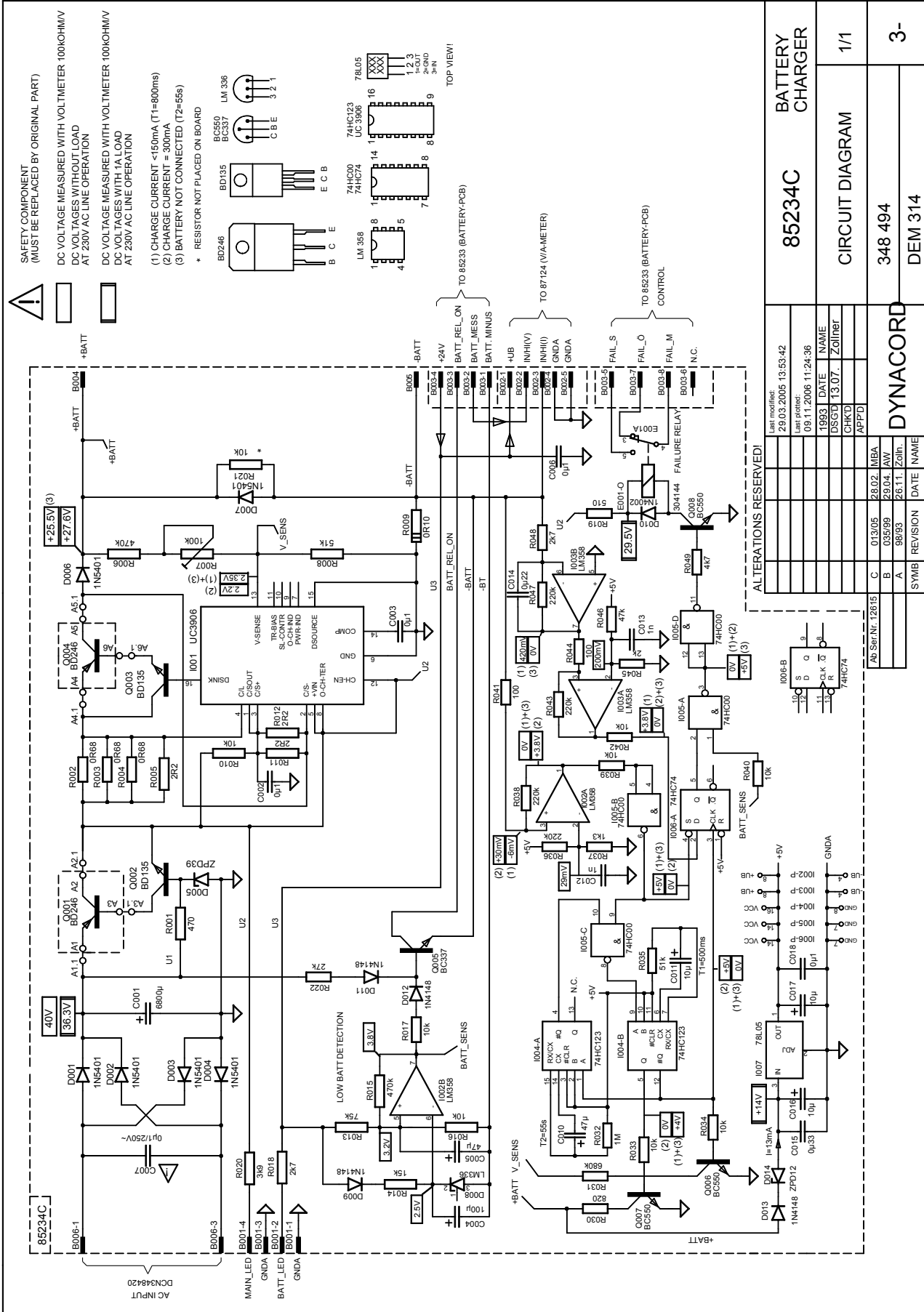
(4) Capacity at discharge with the current in A corresponding with the nominal capacity in Ah

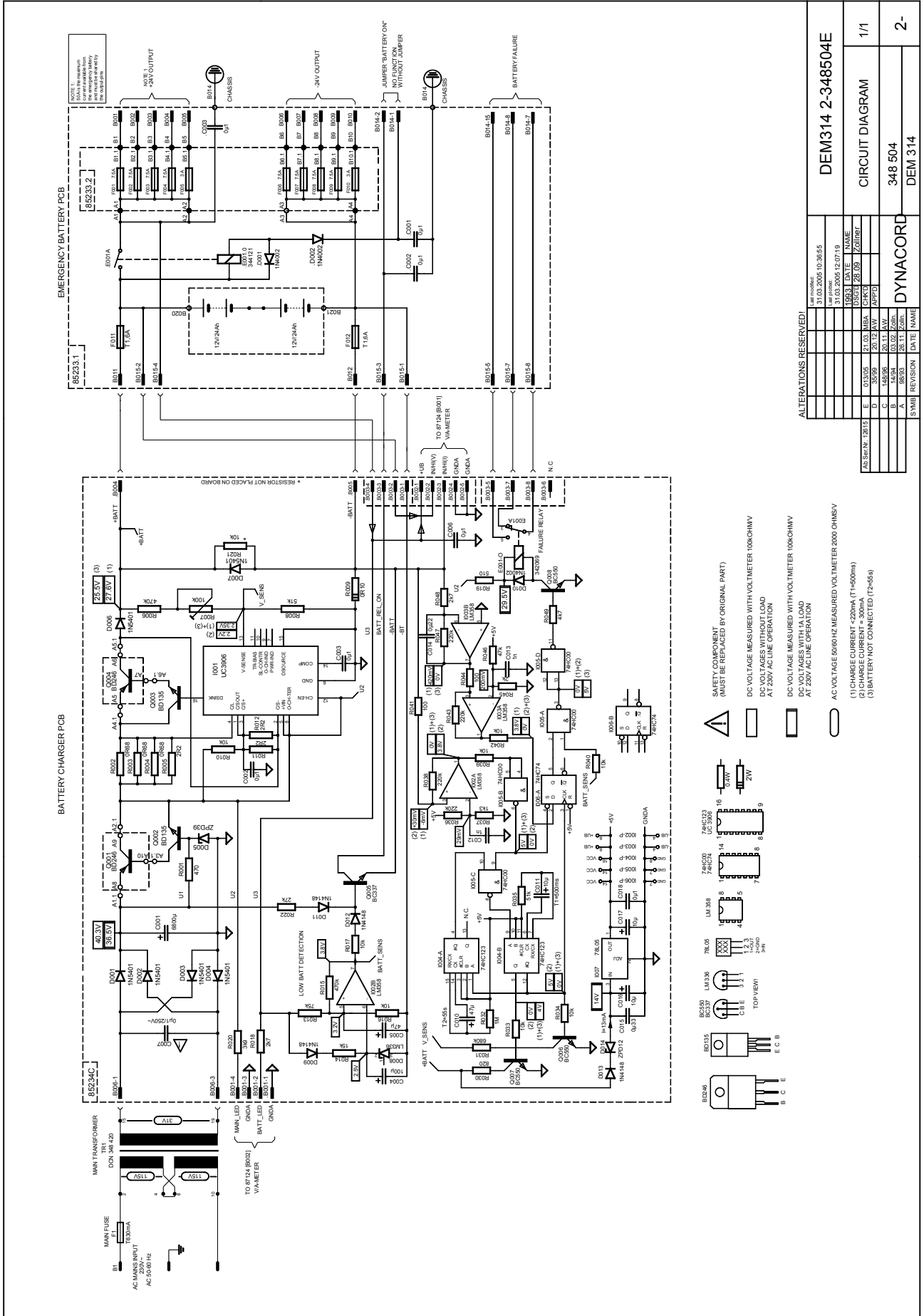


Block-Diagram
347 790



85233A



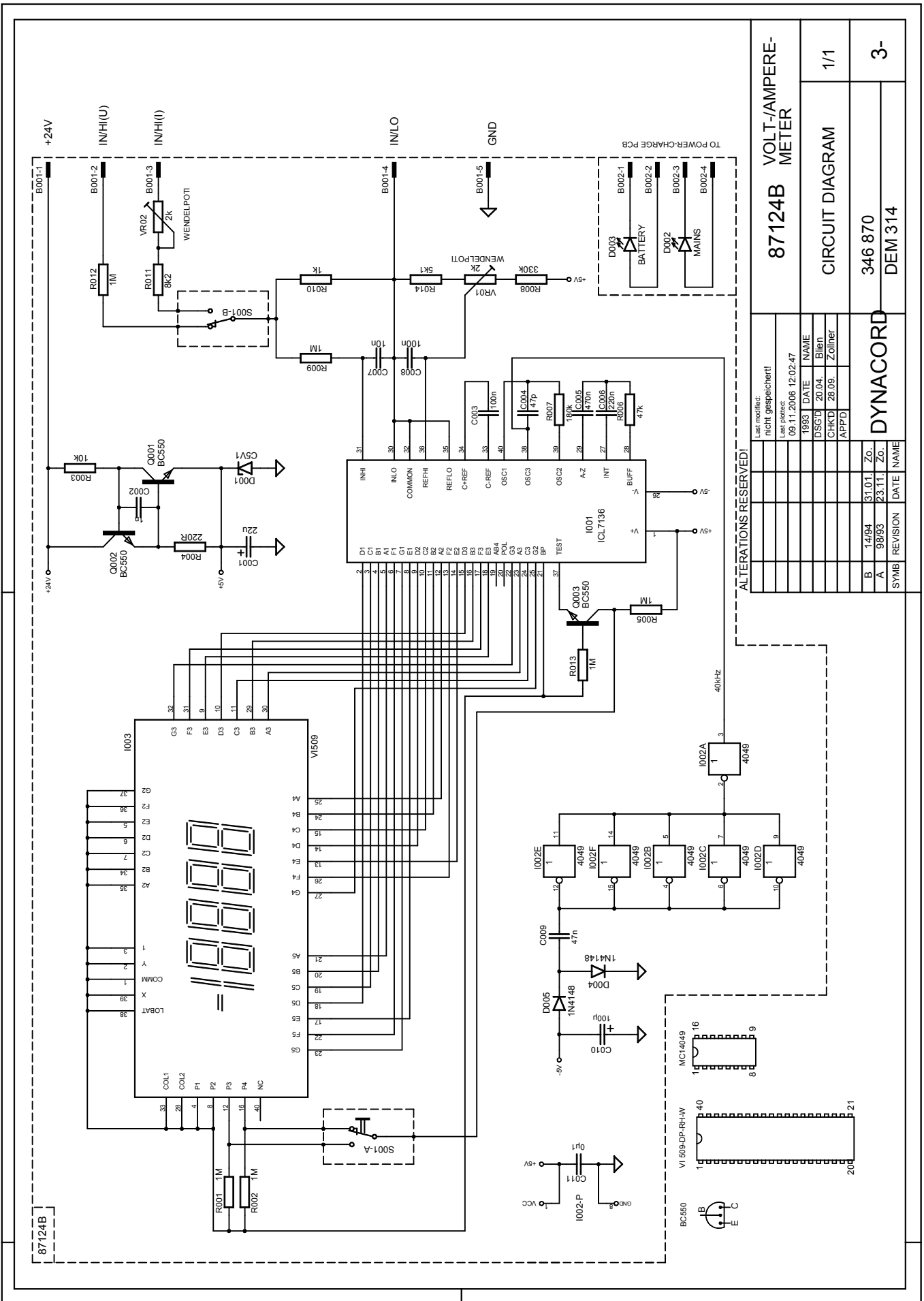


ALTERATIONS RESERVED!

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3	05.03.2005	20.03.06
4	05.03.2005	20.03.06
5	01.03.05	21.03.05
6	30.09.04	20.12.04
7	14.08.04	20.11.04
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DEM314 2-348504E
CIRCUIT DIAGRAM
1/1
348 504
DEM 314

DYNACORD
DATE NAME



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