HAMEG Instruments

Mainframe HM8001-2

Service-Manual

CE

Hersteller **HAMEG Instruments GmbH**
Manufacturer **Industriestraße 6**
Fabricant **D-63533 Mainhausen**

KONFORMITÄTSERKLÄRUNG
DECLARATION OF CONFORMITY
DECLARATION DE CONFORMITE

HAMEG Instruments

Die HAMEG Instruments GmbH bescheinigt die Konformität für das Produkt
The HAMEG Instruments GmbH herewith declares conformity of the product
HAMEG Instruments GmbH déclare la conformite du produit

Bezeichnung / Product name / Designation:
Grundgerät
Mainframe
Apareille de base

Typ / Type / Type: **HM8001-2**
mit / with / avec: **–**
Optionen / Options / Options: **–**

mit den folgenden Bestimmungen / with applicable regulations / avec les directives suivantes

EMV Richtlinie 89/336/EWG ergänzt durch 91/263/EWG, 92/31/EWG
EMC Directive 89/336/EEC amended by 91/263/EWG, 92/31/EEC
Directive EMC 89/336/CEE amendée par 91/263/EWG, 92/31/CEE

Niederspannungsrichtlinie 73/23/EWG ergänzt durch 93/68/EWG
Low-Voltage Equipment Directive 73/23/EEC amended by 93/68/EEC
Directive des equipements basse tension 73/23/CEE amendée par 93/68/CEE

Angewendete harmonisierte Normen / Harmonized standards applied / Normes harmonisées utilisées

Sicherheit / Safety / Sécurité
EN 61010-1: 1993 / IEC (CEI) 1010-1: 1990 A 1: 1992 / VDE 0411: 1994
EN 61010-1/A2: 1995 / IEC 1010-1/A2: 1995 / VDE 0411 Teil 1/A1: 1996-05

Überspannungskategorie / Overvoltage category / Catégorie de surtension: II

Verschmutzungsgrad / Degree of pollution / Degré de pollution: 2
Elektromagnetische Verträglichkeit / Electromagnetic compatibility / Compatibilité électromagnétique

EN 61326-1/A1 Störaussendung / Radiation / Emission:
Tabelle / table / tableau 4; Klasse / Class / Classe B.

Störfestigkeit / Immunity / Imunitee: Tabelle / table / tableau A1.

EN 61000-3-2/A14 Oberschwingungsströme / Harmonic current emissions / Émissions de courant harmonique: Klasse / Class / Classe D.

EN 61000-3-3 Spannungsschwankungen u. Flicker / Voltage fluctuations and flicker / Fluctuations de tension et du flicker.

Datum /Date /Date
22.07.2004

Unterschrift / Signature /Signatur

G. Hübenett
Produktmanager

General information regarding the CE marking

HAMEG instruments fulfill the regulations of the EMC directive. The conformity test made by HAMEG is based on the actual generic- and product standards. In cases where different limit values are applicable, HAMEG applies the severer standard. For emission the limits for residential, commercial and light industry are applied. Regarding the immunity (susceptibility) the limits for industrial environment have been used.

The measuring- and data lines of the instrument have much influence on emmission and immunity and therefore on meeting the acceptance limits. For different applications the lines and/or cables used may be different. For measurement operation the following hints and conditions regarding emission and immunity should be observed:

1. Data cables
For the connection between instruments resp. their interfaces and external devices, (computer, printer etc.) sufficiently screened cables must be used. Without a special instruction in the manual for a reduced cable length, the maximum cable length of a dataline must be less than 3 meters and not be used outside buildings. If an interface has several connectors only one connector must have a connection to a cable.
Basically interconnections must have a double screening. For IEEE-bus purposes the double screened cables HZ72S and HZ72L from HAMEG are suitable.

2. Signal cables
Basically test leads for signal interconnection between test point and instrument should be as short as possible. Without instruction in the manual for a shorter length, signal lines must be less than 3 meters and not be used outside buildings.
Signal lines must screened (coaxial cable - RG58/U). A proper ground connection is required. In combination with signal generators double screened cables (RG223/U, RG214/U) must be used.

3. Influence on measuring instruments.
Under the presence of strong high frequency electric or magnetic fields, even with careful setup of the measuring equipment an influence of such signals is unavoidable.
This will not cause damage or put the instrument out of operation. Small deviations of the measuring value (reading) exceeding the instruments specifications may result from such conditions in individual cases.

HAMEG Instruments GmbH

Mainframe
HM8001-2

Basic unit for modules from the Modular System Series 8000

Power supply for two modules

DC voltages electronically regulated, floating and short-circuit proof

Power transformer with thermal fuse

Up to 5 mainframes can be stacked

Module HM800 for customized instrument construction available

4 BNC connectors on the rear panel of the HM8001-2 (Option HO801) provide for signal transmission to or from HM8018, HM8021 and HM8030-6 modules

Modular system

HM8001-2 mainframes can be stacked up to 5 units high

Option HO801 – BNC connectors on rear panel

Basic Mainframe HM8001-2

Valid at 23 °C after a 30 minute warm-up period

General information
Mainframe with power supply accommodates 2 modules

Power supply module	
2 x 8 V~ max. 0.5 A each	
2 x 5 V = max. 1 A each	
4 x 20 V = max. 0.5 A each	
Voltages between 5 V and 20 V are programmable from each module (Polarity selectable)	
Available output power:	Max. 36 Watt available for two modules. All DC voltages are electronically stabilized, floating and short-circuit proof.

Miscellaneous	
Power switch (ON/OFF) located between the two modules on the front panel.	
Safety class:	Safety Class I (EN61010-1)
Power supply:	115/230 V~ (50/60 Hz)
Max. permissible line fluctuation: ± 10 %	
Power consumption:	max. 110 W (with overload protection)
Operating temperature:	0° C to + 40° C
Dimensions (W x H x D):	285 x 75 x 365 mm
Weight:	approx. 4 kg
Color:	techno-brown

Calibration

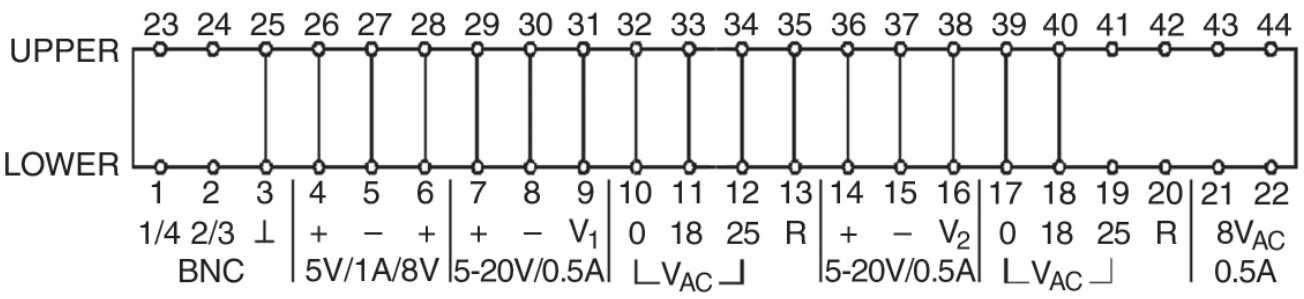
Remove case to calibrate and test the instrument. All voltages for operating the modules are supplied from the multipoint connector contacts in the individual module compartments. The easiest way of testing is by measuring them on inserted high power consumption modules (e.g. HM8030 or HM8035). However, high power consumption can also be simulated using resistors with the following values:

for 2 x 5 V_{DC} = 2 x 5 Ω, 5 Watts
for 4 x 20 V_{DC} = 4 x 40 Ω, 10 Watts

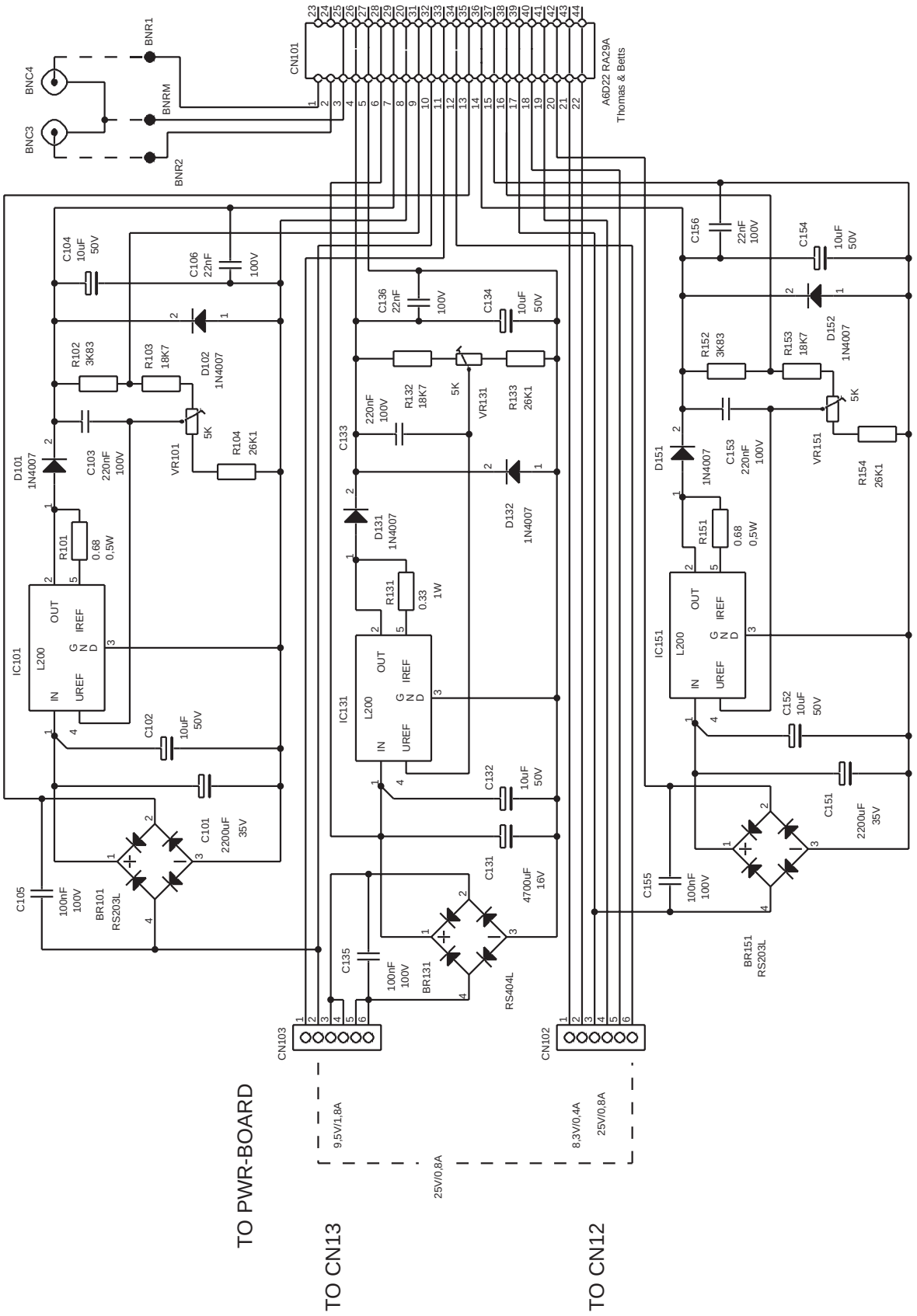
To avoid damaging of the multipoint connector contacts, the resistors should be linked to a corresponding 22 pole connector, onto which the required 1.3 kΩ resistors and the four appropriate wire connectors can be soldered for programming the 4 x 20 V potential. The diagram (page 18) shows the values assigned to the multipoint connector contacts.

The accuracy of the DC voltages is partly dependent on the reference voltage setting and the tolerance of the resistors used for programming. With the 1% accuracy set during manufacture and when using 1% resistors, the max. error is not more than 2%. Variations of the mains/line voltage of ±10% should not affect the supply voltages by more than 0.5%. The highest tolerable hum and noise level is max. 3 mV_{pp}. Only voltmeters with at least 0.1% accuracy should be used for all measurements. These should be connected directly to the multipoint connector contacts, as otherwise voltage drops could influence the test results.

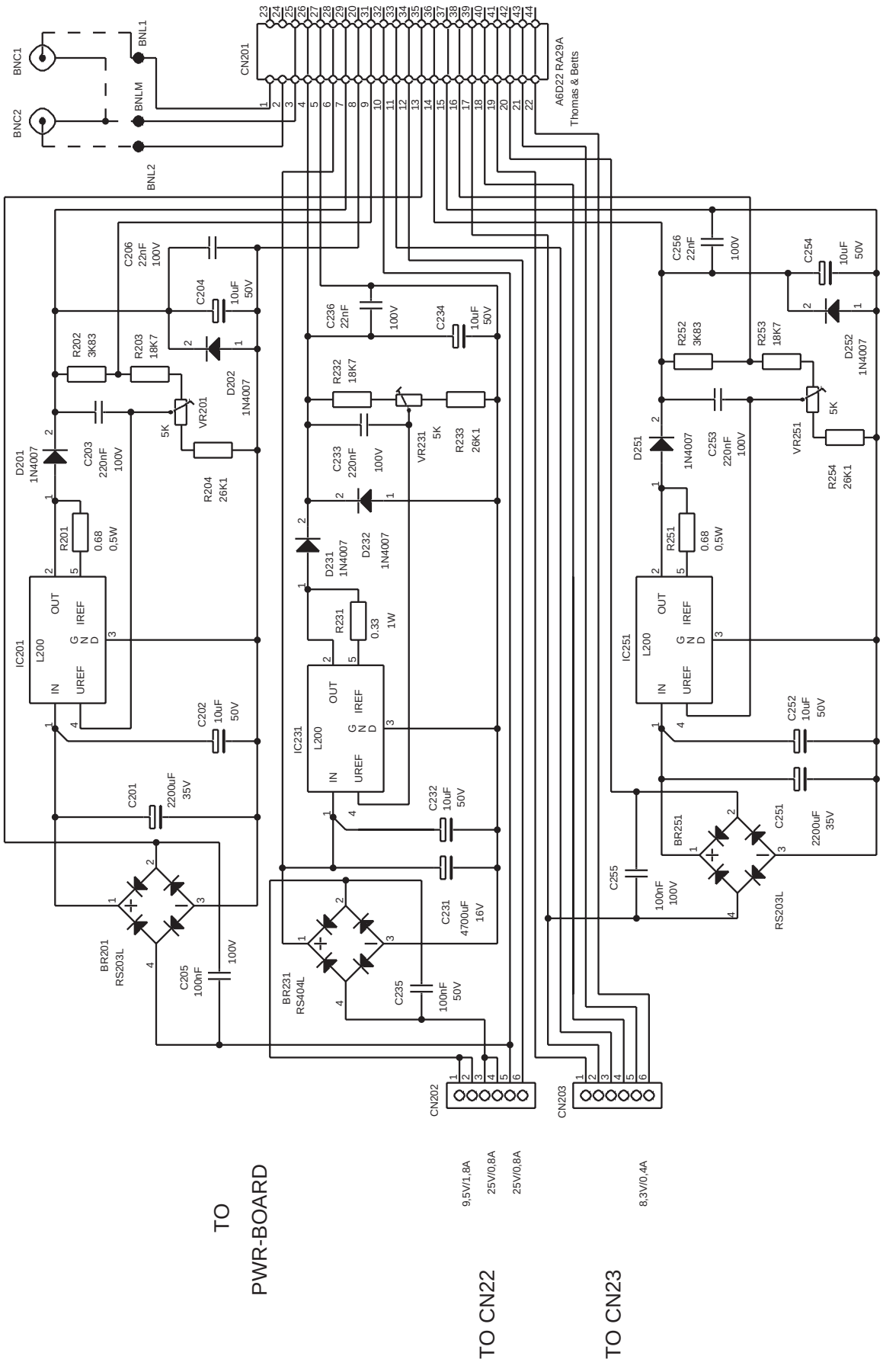
If the specified tolerances are not met, the cause must be located and recalibration of the reference voltages may possibly be necessary.



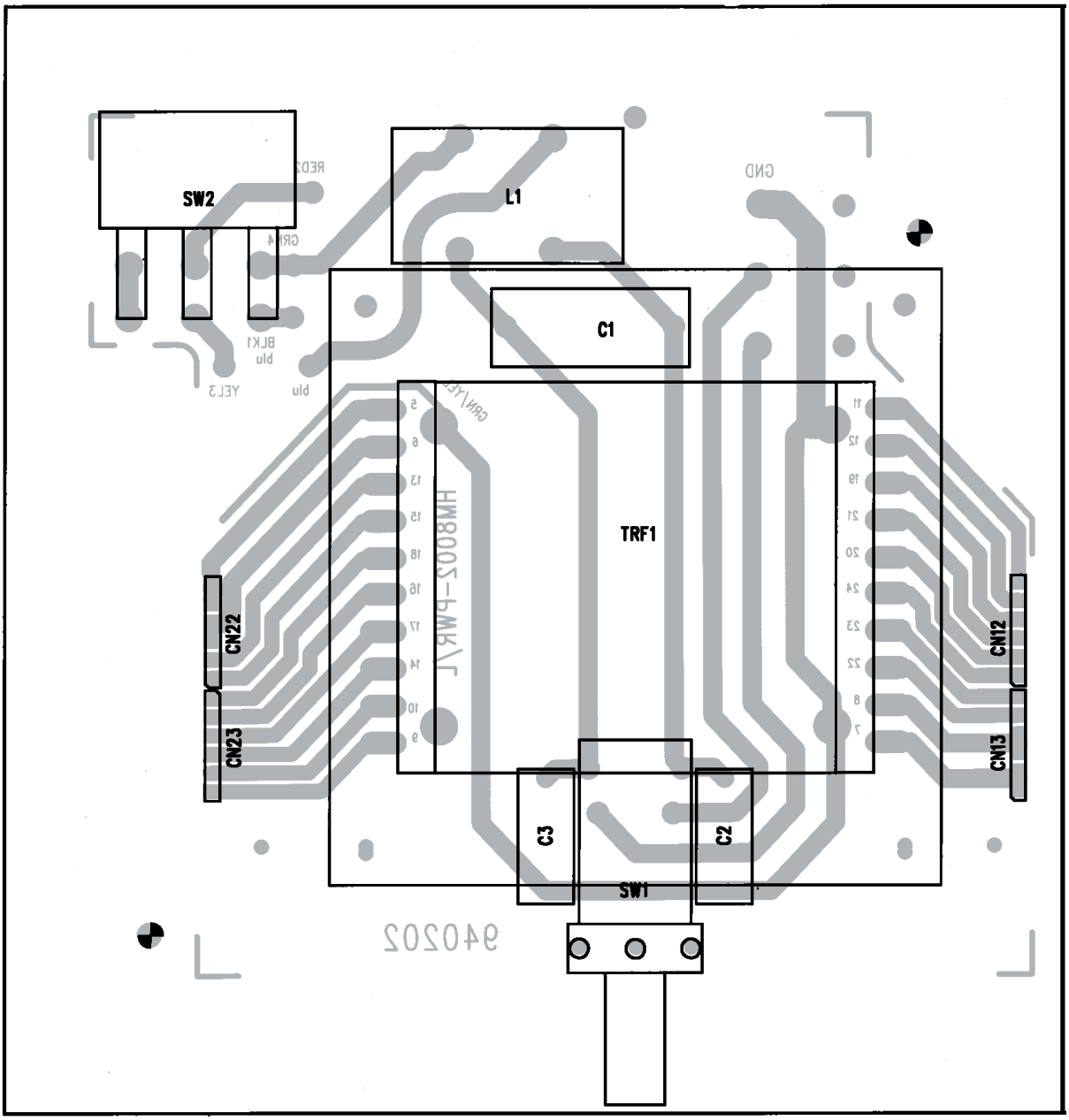
HM8001-2 right board



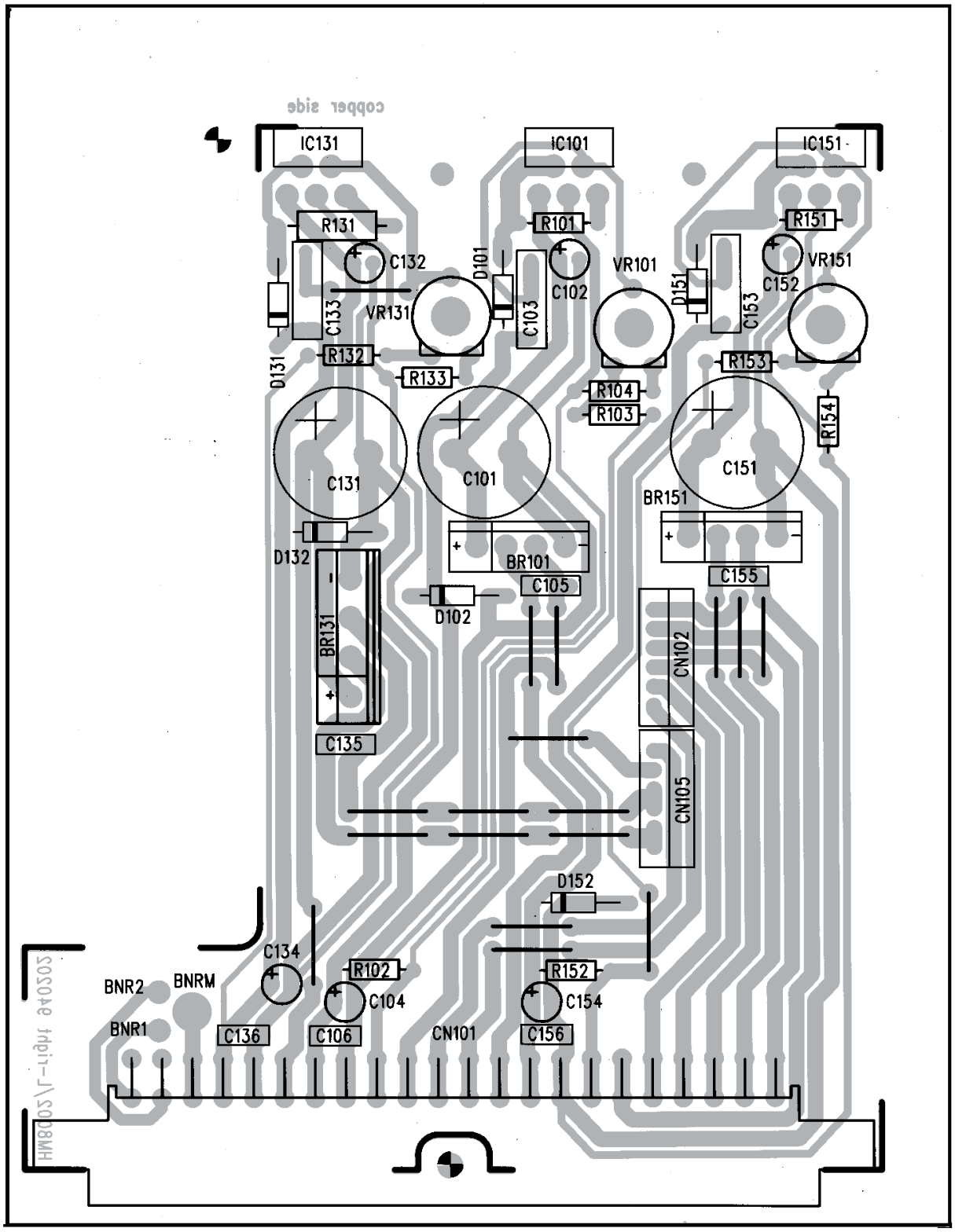
HM8001-2 left board



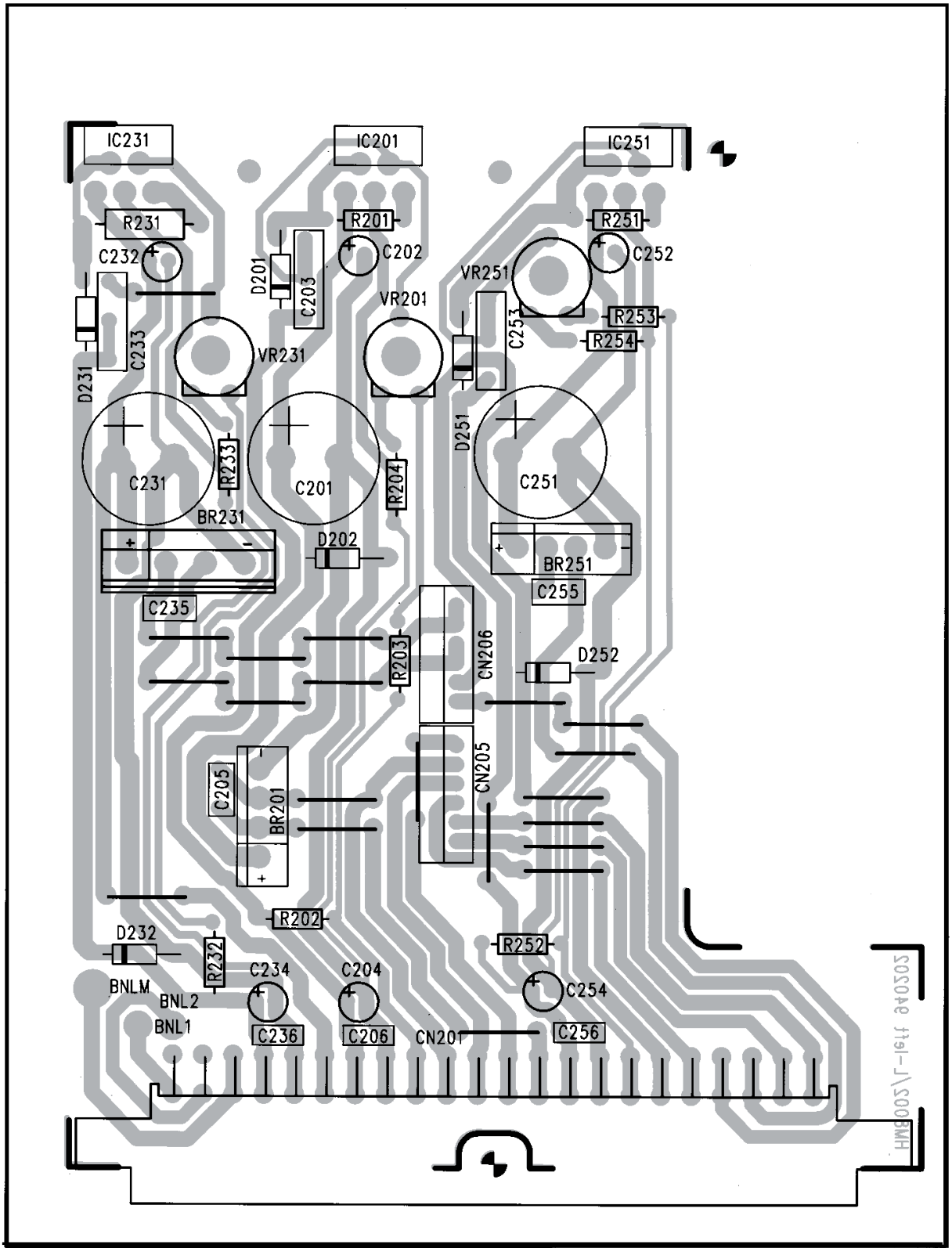
PWR board



Right board


IC131
IC101
IC151
R131
C132
D101
R101
VR101
R151
VR151
C152
C133
VR131
C103
C102
D151
C153
D131
R132
R133
R104
R103
R153
R154
C131
C101
C151
BR151
D132
BR101
C105
C155
D102
BR131
CN102
C135
CN105
D152
C134
R102
R152
BNR2
BNRM
C104
C154
BNR1
C136
C106
CN101
C156

Left board


IC231
IC201
IC251
R231
C232
D231
C233
D201
C203
R201
C202
VR231
VR201
VR251
C253
R251
C252
R253
R254
C231
R233
C201
R204
D251
C251
BR231
D202
BR251
C255
C235
R203
CN206
D252
C205
BR201
CN205
R202
D232
R232
BNLM
BNL2
BNL1
C234
C204
R252
C254
C236
C206
CN201
C256

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4S-8001-02E0 / 27-10-2005-gw

DQS-Certification: DIN EN ISO 9001:2000
Reg.-Nr.: 071040 QM

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