

Variable Temperature Unit / Booster

**Technical manual
BVTB3500**

Version 003

BRUKER

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Description

1

Introduction

1.1

The BVTB3500 is a power booster unit for the digital temperature units BVT3000 and BVT3300. It allows to increase the heating power up to 500 watts. This product is useful for high temperature experiment in NMR or ESR.

This unit is fully controlled by a driving unit temperature. The electronics provides the power to the heater according a command signal issued by the BVT3X00. It can drive heater resistance from 6 to 12 ohms.

When the BVT3500 is activated the power stage of the driving unit is disabled.

System requirements

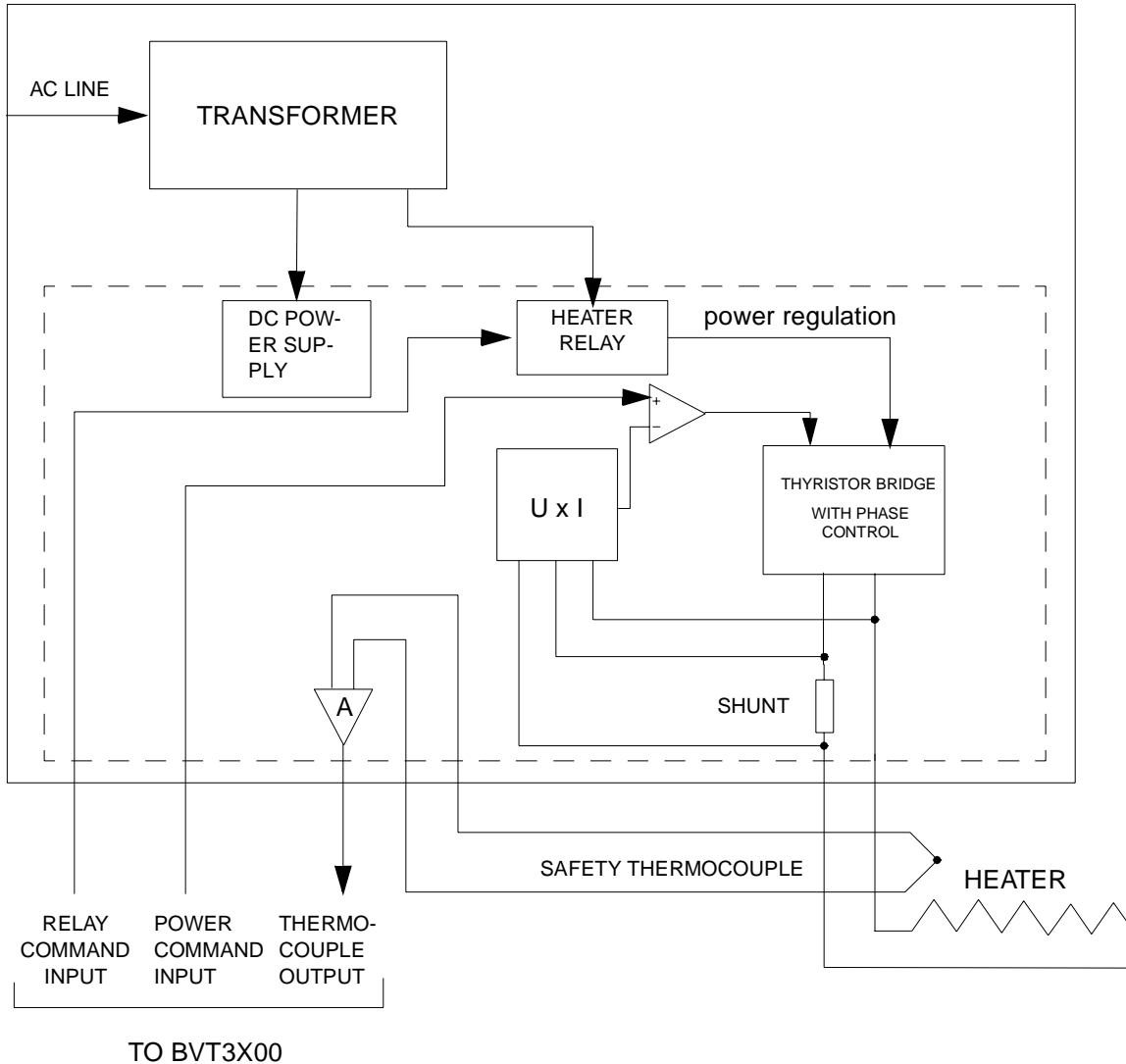
1.2

In order to use this product successfully, the following are recommended as a minimum:

1. a BVT3000 or a BVT3300 temperature unit is required.
2. a cable to link BVT3X00 and BVTB3500 (P/N W1101105).
3. a 500 Watt heater.

Description

Figure 1.1. BVTB3500 block diagram.



BVT3500 main components

1.3

A single printed circuit includes all electronics. A main toric transformer supplies the analog electronics and the thyristor bridge.

The heater is turned on when the relay is closed. When an overheat fault (overheating of heater by missing gas flow or safety thermocouple break for example) occurs the relays turns off and heating is stopped.

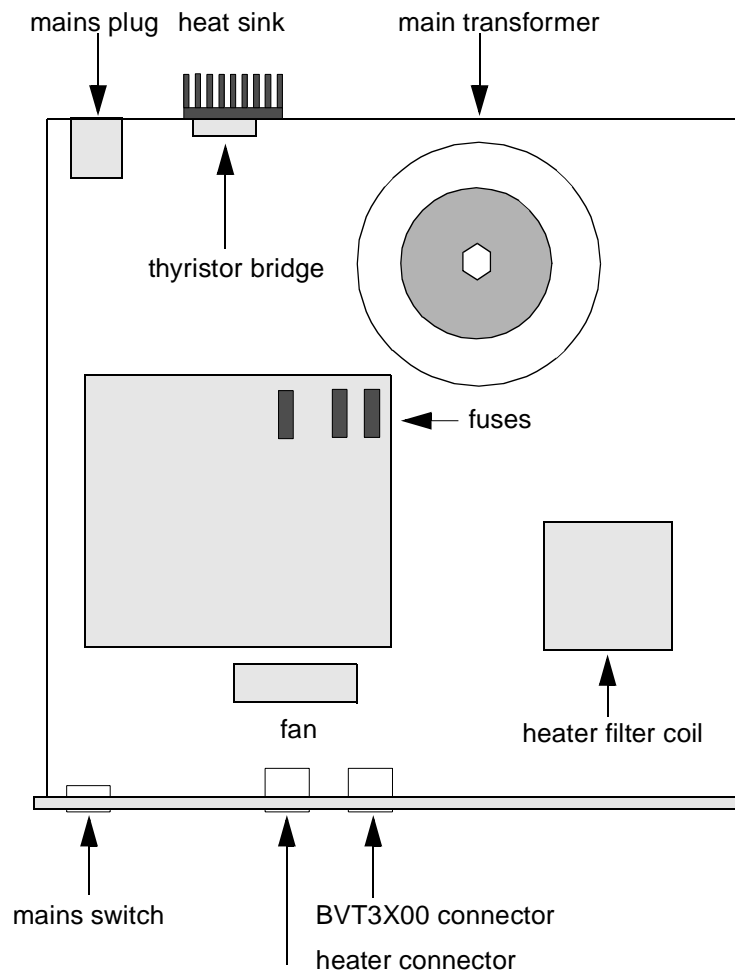
At rear, there is a power supply plug. The thyristor bridge, for heater power control, is placed on the case at rear side with a heat sink. The voltage delivered to the heater is filtered by a coil to reduce voltage ripple.

On the front plate, a led lights when the heater is on.

Parts location

1.4

Figure 1.2. Parts location



Description

Installation

1.5

The BVT3500 must be connected to a BVT3000 or BVT3300 with the cable (P/N W1101105). The heater must be removed from the driving temperature unit and plugged in the BVTB3500. The unit must be powered on.

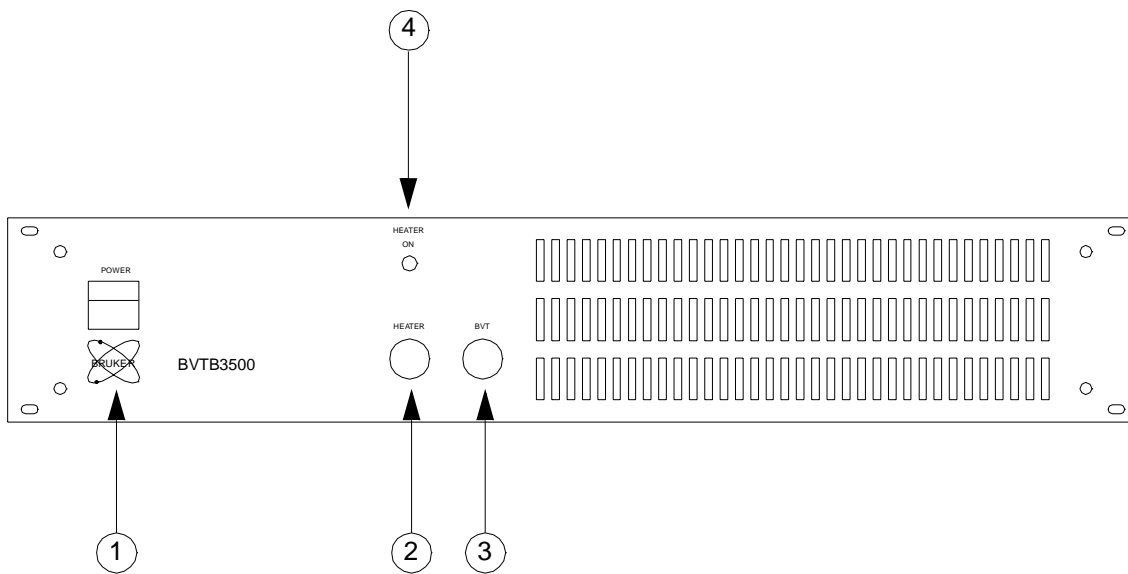
The power booster unit may be installed in the cabinet of the spectrometer or on top of the cabinet.

Do not cover the unit to preserve good ventilation of the enclosure.

On the BVTB3500 front panel, there is:

1. a main switch
2. a heater connector
3. a BVT3000/BVT3300 connector
4. a heater led indicator

Figure 1.3. BVTB3500 front panel



Description

Front panel connectors

1.7

BVT connector

1.7.1

Figure 1.4. BVT connector (front view)

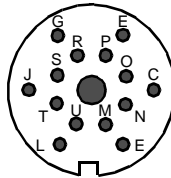


Table 1.1. BVTB 3500 connector pin assignment

PIN	SIGNAL NAME	DIRECTION	COMMENT
A	+5V	I	digital VCC input
C	NC	---	reserved
E	gnd_BTO	I	isolated GND for BTO2000 (reserved)
G	+15 v_BTO	I	isolated +15V for BTO2000 (reserved)
J	NC	---	reserved
L	dgnd	I	digital ground
M	sda	I/O	I2C bus data line
N	scl	I/O	I2C bus clock line
O	power control	I	0 to 10 volt power control input
P	pgnd	I	power ground
R	pgnd	I	power ground
S	thermocouple	O	safety thermocouple output
T	b_relay	I	BVTB 3500 heater relay command input
U	b_connected	O	LOW when BVTB 3500 is powered on

The heater is plugged in this connector. A safety thermocouple is located close to the heater resistance in order to detect an overheating in case of a missing gas flow for example.

Figure 1.5. Heater connector (front view)

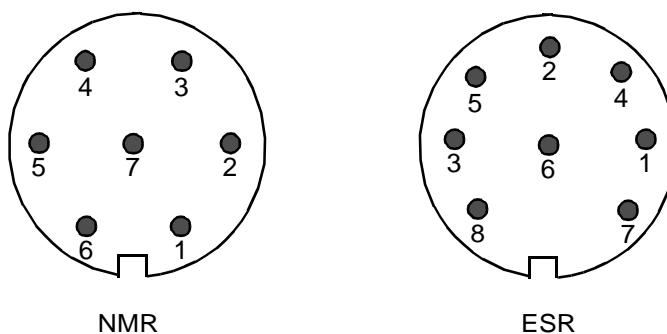


Table 1.2. Heater connector pin assignment

PIN	7 pins NMR	8 pins ESR
1	heater +	heater +
2	heater +	NC
3	security thermocouple +	heater -
4	security thermocouple -	security thermocouple +
5	heater -	security thermocouple -
6	heater -	GND
7	gnd	heater +
8	/	heater -

Description

Technical specifications

2

Specifications

2.1

Heater power:

- 500 W maximum

Heater resistance:

- 6 to 12 ohm.

Driving unit:

- BVT3000
- BVT3300

Weight :

- 13 Kg for basic version without any option.

Dimensions :

- 484 (W) x 88 (H) front plate
- 446 (W) x 86 (H) x 500 (D) stainless steel case

Voltage requirements :

- 220 V + / - 10%, 50/60 Hz 6.3 A fuses on mains.

Power consumption :

- 600 VA maximum at full power.

Input range:

- power command voltage 0 to 10 volt.

operating temperature:

- 0 to 50 °C.

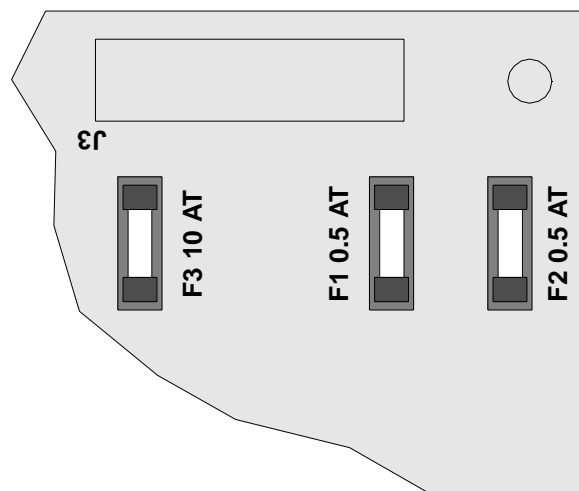
Some important electronic functions are fuse protected. To replace a blown fuse, ensure that power is removed before opening the case. Faulty fuse must always be replaced with the same type.

The fuses are located on the printed circuit.

Table 2.1. Fuses values

Fuses	Value	Protection for
F1	0,5 AT	+15 V
F2	0,5 AT	- 15 V
F3	10 AT	heater

Figure 2.1. fuses location



Schematics

3

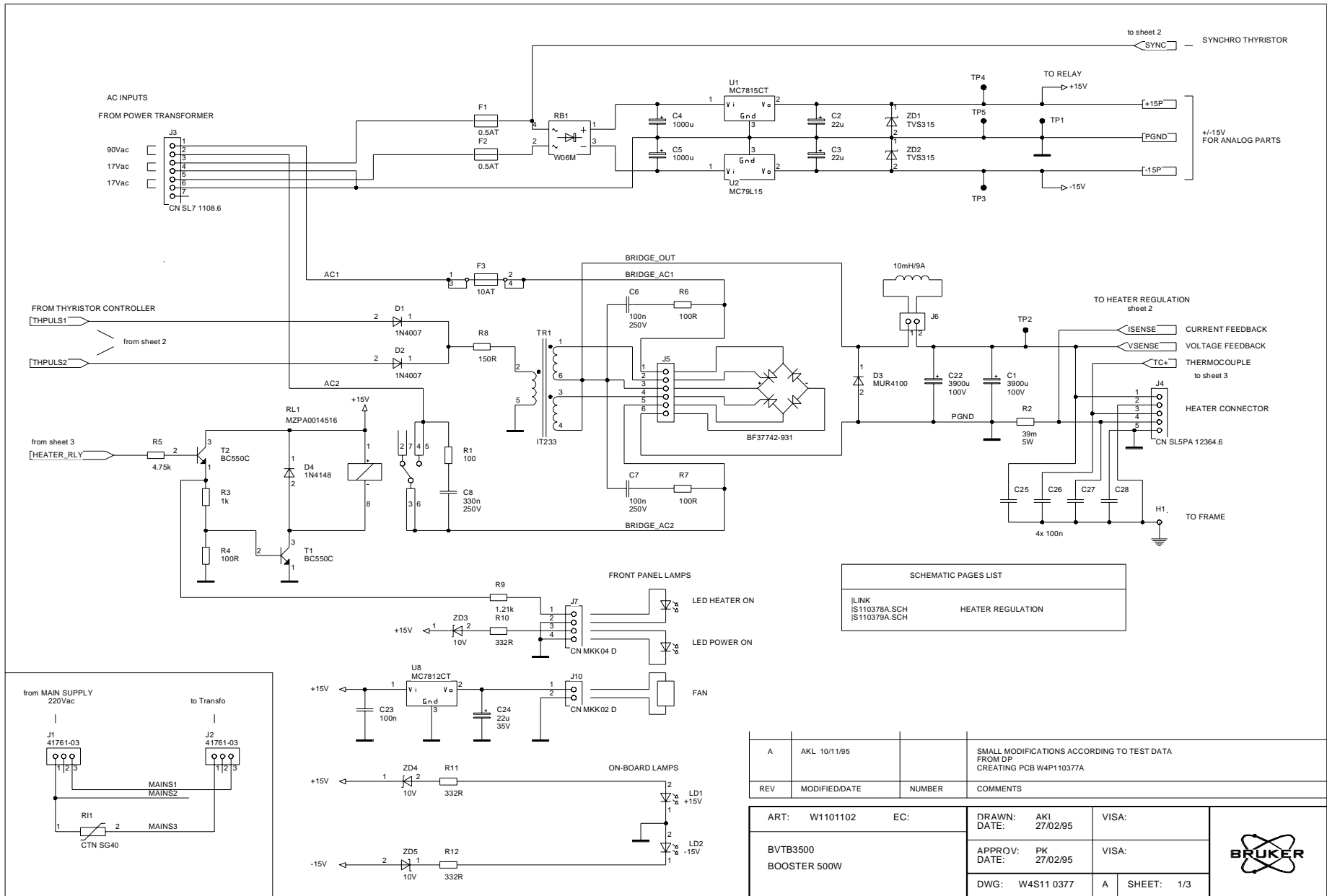


Figure 3.1. BVTB3500 Booster 500W - sheet 1/3



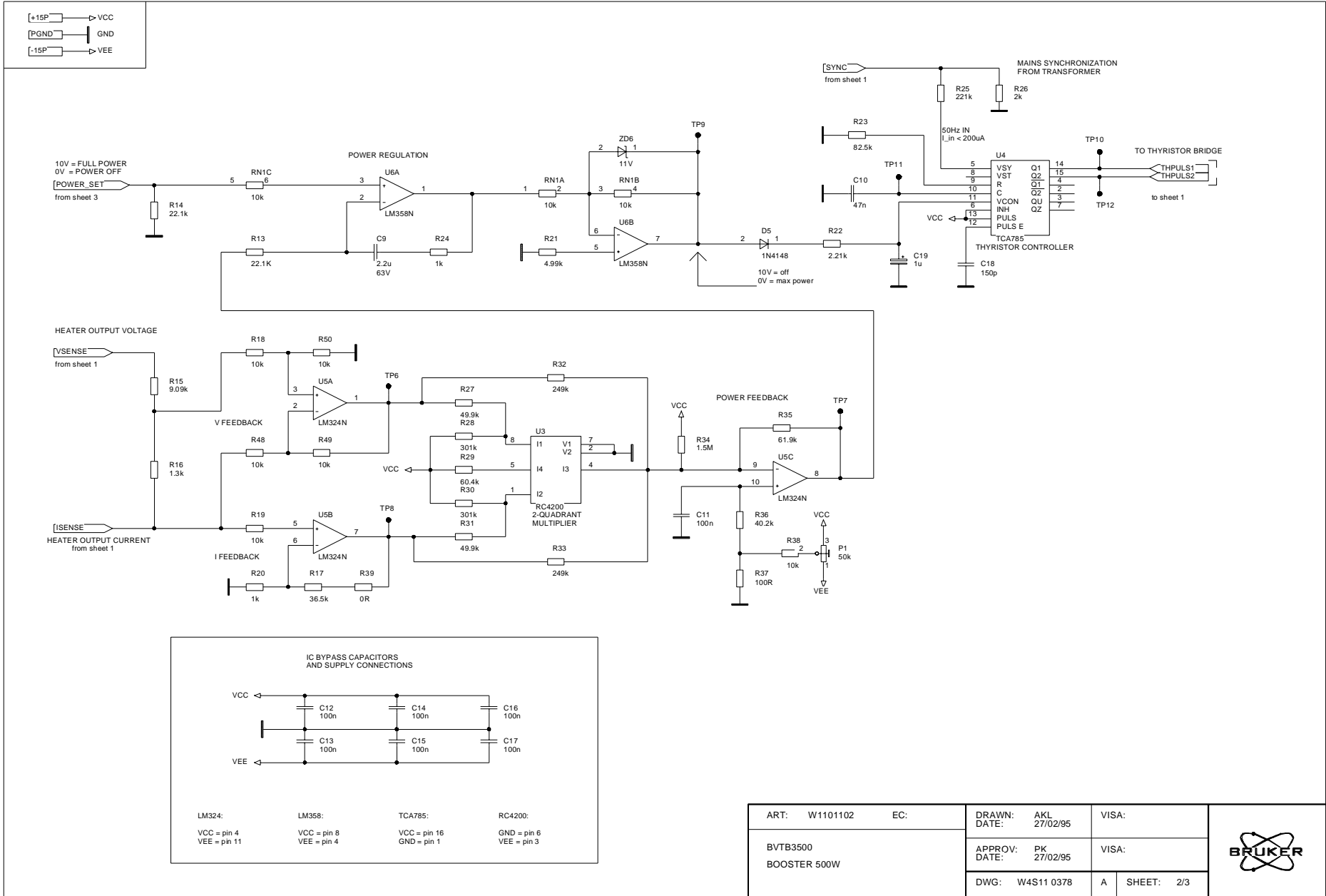
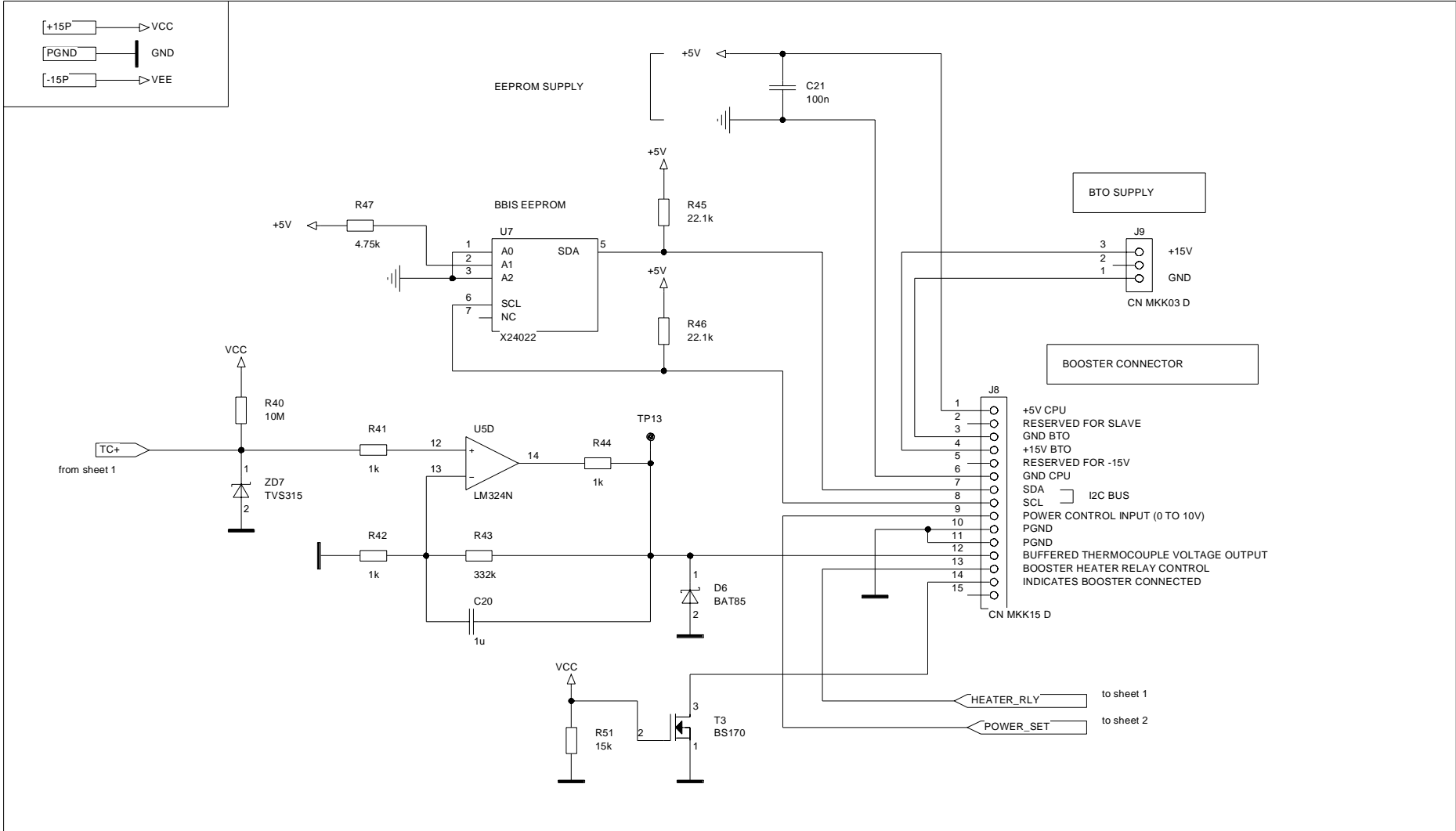


Figure 3.2. BVTB3500 Booster 500W - sheet 2/3

ART: W1101102	EC:	DRAWN: AKL DATE: 27/02/95	VISA:	
BVTB3500 BOOSTER 500W		APPROV: PK DATE: 27/02/95	VISA:	
		DWG: W4S11 0378	A SHEET: 2/3	



IC SUPPLIES	
LM324:	VCC = pin 4 VEE = pin 11
X24022:	+5V = pin 8 DGND = pin 4

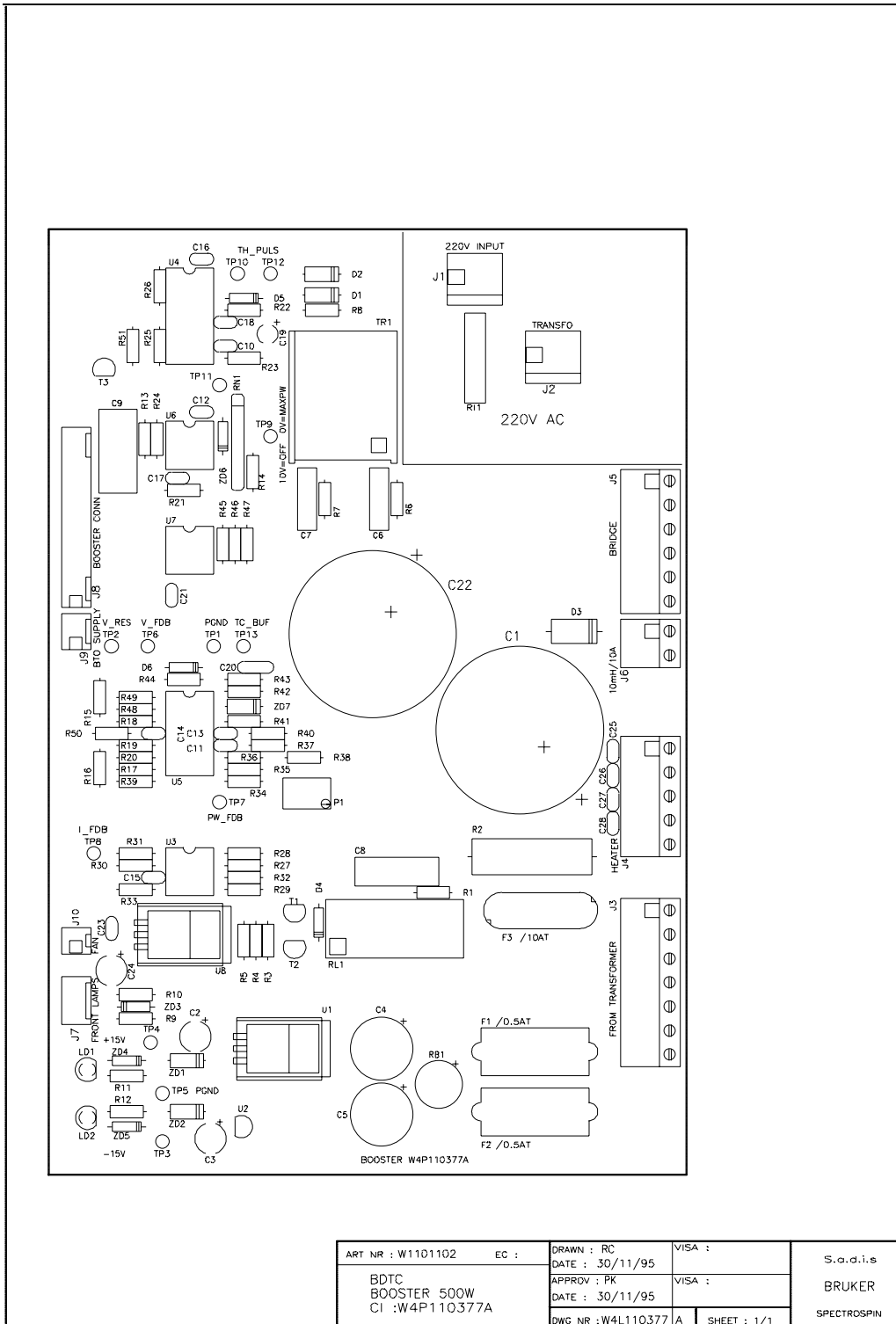
ART:	W1101102	EC:	
BVTB3500		BOOSTER 500W	

DRAWN:	AKL	VISA:	
DATE:	27/02/95		
APPROV:	PK	VISA:	
DATE:	27/02/95		
DWG:	W4S11 0379	A	SHEET: 3/3



Figure 3.3. BVTB3500 Booster 500W - sheet 3/3

Figure 3.4. BVTB3500 Booster 500W - location



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