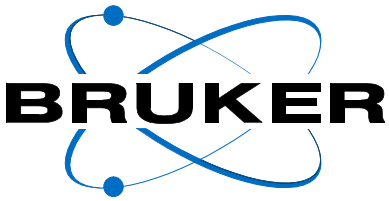


BMCM

Manual Control Module for VTU
User Manual

Version 002

The information in this manual may be altered without notice.

BRUKER accepts no responsibility for actions taken as a result of use of this manual. BRUKER accepts no liability for any mistakes contained in the manual, leading to coincidental damage, whether during installation or operation of the instrument. Unauthorised reproduction of manual contents, without written permission from the publishers, or translation into an other language, either the entire manual or a part of it, is forbidden.

This manual describes the units as they are at the date of printing. On request, the manufacturer shall supply circuit diagrams, lists of components, descriptions, calibrating instructions and any other information for use by qualified personnel of the user, in charge of repairing the parts of the unit which have been stated by the manufacturer to be "repairable". Such supply shall in no event constitute permission to modify or repair the units or approval of the same.

This unit is not designed for any type of use which is not specifically described in this manual. Such use may be hazardous.

This manual was written by

KRENCKER Patrick

Wissembourg, France

P/N: Z31463
DWG-Nr: 1170.002

Contents

Contents

Index

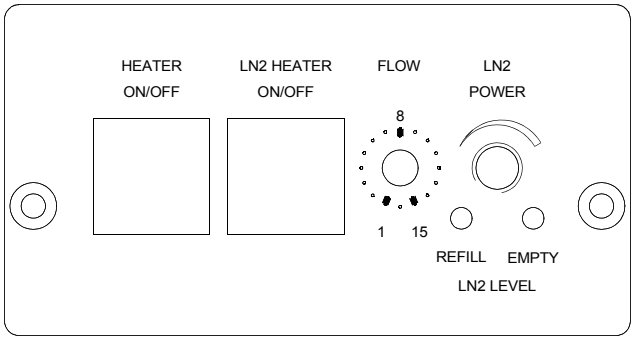
Index

Introduction 1

Front panel 1.1

The BMCM (W1101240) is an electronic module which allows to control manually the main functions of the temperature unit. It can be used with a BVT3000 or a BVT3300.

Figure 1.1. BMCM Front panel



Sub-assemblies 1.2

The following functions of the temperature unit can be controlled :

Probe Heater 1.2.1

The left push button turns on the main probe heater. The probe heater is on when the green led lits.

LN_2 Evaporator Heater 1.2.2

The right push button turns on the LN_2 evaporator heater. The LN_2 evaporator heater status is indicated by a green led in the button. The status of the LN_2 level sensors are indicated by two red leds on the bottom. The LN_2 heater power level is set with the rightmost potentiometer.

Gas Flow Control *1.2.3*

The knob «FLOW» selects manually stepwise the gas flow from 0 to 2000 l/h.

Table 1.1. Gas flow control

Knob position	Liter/hour
0	0
1	135
2	270
3	400
4	535
5	670
6	800
7	935
8	1070
9	1200
10	1335
11	1470
12	1600
13	1735
14	1870
15	2000

Requirements 2

Hardware 2.1

The BMCM can be used with NMR or EPR Variable Temperature Units. See the ECL level table below.

Table 2.1. VTU ECL Requirement

Type	P/N	ECL
BVT3300 NMR	W1100939	05
BVT3000 NMR	W1101095	03
BVT3000 EPR Console	W1101180	02
BVT3000 Table Top	W1101181	02

Firmware 2.2

The BMCM module works fully only with the firmware version 2.7 (970219 or later). An older firmware works but it is not possible to change the gas flow in real time with the flow knob on front plate. To change the gas flow you must select a new flowrate and then switch off and on the temperature unit to update the flowrate.

New firmware installation 2.3

When the variable temperature unit is equipped with an older firmware version, please follow these instructions to download the new firmware with a PC:

Connect the serial port (COM1) of a PC to the RS232 connector of the temperature unit. Use the standard serial cable which is delivered with the temperature unit.

Switch on the main power of PC and temperature unit.

Copy the files LOADER.EXE and AP970219.HEX from the floppy disk to the PC hard disk.

From the hard disk, run LOADER.EXE AP970219.HEX AAAA and follow the instructions given by the program.

Requirements

BMCM Module installation

3

CAUTION : Before any operation, disconnect the main power cord of the temperature unit.

1. On the temperature unit, unscrew the front plate located under the inscription "Auxiliary sensors".
2. Remove the BMCM cover and disconnect the four flat cables from the printed circuit.
3. Insert the module in the front panel and fasten it with the two screws.
4. Connect the cables as follows. See appendix 1. ***"Manual control Board" on page 22***, 2. ***"Evaporator / Exchanger Board" on page 23*** and 3. ***"Main Board" on page 24***.

- Connect the flat cable (W1101213) between J7 on BMCM board and J1 on evaporator or exchanger board.
- Connect the flat cable (W1101212) between J8 on BMCM board and J13 on main board.
- Connect the four wire flat cable (W1101211) between J1 on BMCM board and J7 on main board.
- Connect one of the end of the five wires flat cables (W1101210) to J9 on the BMCM board. The other end of the cable must be connected to the printed circuit which is delivered with the BMCM module. Remove the JP6 to JP9 jumpers on main board and plug the interface board on the jumpers JP6 to JP9. An arrow on the small printed circuit indicates the orientation toward the front panel of the temperature unit.
- Install the cover on the BMCM module

BVT3000 Temperature Controller Configuration

4

Sensor selection 4.1

The BVT3000 can be used with different temperature sensors :

- Thermocouple T, K or E
- BTO2000 (T thermocouple with external CJC at 0 C°)
- PT100

Warning: Never connect two sensors at a same time on the BVT3000.

Eurotherm 902 configuration 4.2

The EUROTHERM 902 controller must be configured to work with the right type of sensor.

The configuration is done with the Eurotherm 902 controller keypad (or by software in the EDTE program).

Proceed as follows :

1. Switch off the main power.
2. Press the two left most buttons :   together while powering on the BVT3000.
3. The messages **CONF** and **UCONF** appear on the display.
4. Press the scroll button  until ICONF is displayed.

5. Press the left button  until C1 appears.

6. Now press the increment button  or decrement  button :

   The 4 digit code is displayed. This code must be changed to select the new sensor.

Table 4.1. Eurotherm 902 sensor code

sensor	code C1
T thermocouple internal CJC	0004
K thermocouple internal CJC	0003
E thermocouple internal CJC	0012
PT100	0024
BTO2000	1004

7. With the left selection button  , select the blinking digit to be modified and change the value with the increment button  or decrement button  . When the correct code has been selected press the scroll button :  C2 will be displayed.

8. Now Press the selection button  . ICONF appears. Press the scroll button  until LEAVE appears. Press the left  selection button again. Configuration is now complete and the temperature is displayed.

Parameter selection *4.3*

1. Depress button  until OPER appears.
2. Push button  until INST appears. The INST menu allows you to read and/or modify the Pb, Ti Td, cbl, cbh and Hl values.
3. Push button  Pb appears. To scroll the list, push button  .

Table 4.2. Mnemonics explanations

Pb	Proportional band
Ti	Integral time
Td	Derivative time
cbl	Cutback low
cbh	Cutback high
Hl	Heater output limit (0-100%)

4. To read and/or modify one of these parameters, select the mnemonic to modify and push button  or  . The value displayed is the used value. To change it, push button  to increment or  to decrement. When value is correct, push button  the next mnemonic of the list will be displayed. To leave this menu, push button  INST appears. Push button  until you leave the parameters menu.

Target Temperature Setting *4.4*

1. Push button  until SP or W appears, SP or W is the Set Point parameter.

2. Adjust the target temperature by pushing  or  .

Eurotherm Self Tune *4.5*

Preparing the self tune

Before processing a self tune, verify that Ti, Td, cbl and cbh are not set to OFF. If one of these parameters are set to OFF it will not be modified by the self tune. Select the target temperature before starting the self tune. The target temperature must be at least 10° above room temperature.

Processing the self tune

1. Depress button  until OPER appears.
2. Push button  SP1 or SPR appears.
3. Push button  until St or A-T appears. St or A-T is the self tune mnemonic.
4. To process a self tune push both buttons  and  at the same time.
5. On the up right corner of the eurotherm front panel display, "A-T" or ''S-T'' appears indicating that the self tune is activated.
   Turn on the BVT3000 heater by pushing the "heater power" button on the BMCM module.
6. The self tune process is finished when the "A-T" or ''S-T'' indication disappears. It takes a few minutes to complete the self tune process.

BVT3300 Temperature Controller Configuration

5

Sensor selection 5.1

The BVT3300 can be used with different types of sensors :

- Thermocouple T (factory set)
- BTO2000
- PT100 sensor

Warning : Never connect two sensors at a same time on the BVT3300.

Eurotherm 847 configuration 5.2

The EUROTHERM 847 controller must be configured to work with the right type of sensor.

To access the configuration mode, a switch located inside the 847 controller must be closed.

The switch must be closed only during the configuration mode.

Proceed as follows :

1. Switch off the main power.
2. Unscrew the EUROTHERM controller front plate.
3. Remove the module out of its cabinet.
4. The switch WB1 is located on the left side at the rear of the module.
5. Close the switch.
6. Insert the controller module and screw the front panel.

7. Switch on the main power.
8. Press the button PAR until «Sn» appears. («Sn» is the mnemonic for sensor). Then select the sensor type, press the up ▲ or down ▼ key until the correct sensor appears.

Table 5.1. Eurotherm 847 sensor selection

Sensor type	Sn
T Thermocouple internal CJC	t tc
BTO2000	t tc
PT100	rtd3

If the sensor is a thermocouple or a BTO2000 you must select also the type of CJC (Cold Junction Compensation). Press the par PAR key until CJC appears and select with the up and down key.

Table 5.2. CJC selection

Sensor type	CJC
T Thermocouple	int (internal)
BTO2000	0°C (external at 0°C)
PT100	X (don't care)

- When the configuration is finished, switch off the main power, remove again the controller and open the switch.
- Close the controller and switch on the power supply.

Parameter selection 5.3

To access the configuration mode, a switch located inside the 847 controller must be closed (see previous section).

We suppose that the internal switch is closed.

1. Pushing the button PAR allows the user to scroll through parameters.

   Only six of them can be modified by the user. Modifying one of the other breaks the factory warranty.

2. The parameters the user is allowed to change are the following :

ProP	Proportional band
Int.t	Integral time
dEr.t	Derivative time
H PL	Heater output limit (0 to 100%)
Sn	Sensor type
CJC	Cold junction compensation

3. Press button PAR until the parameter to be modified appears. To chose a new type of sensor, CJC or to modify the value of the parameter press button ▲ or ▼. When the value is correct push button PAR until the measured temperature appears.
4. Open the internal switch as explained in the previous section.

Self tune 5.4

1. Before starting a self tune, please verify that parameters Prop, Int.t, and dEr.t are not equal to 0. Also verify that H PL contents the correct value.
2. Push button PAR until «tune» appears.
3. To start a self tune, push button ▲ or ▼ and then, switch on the heater power.

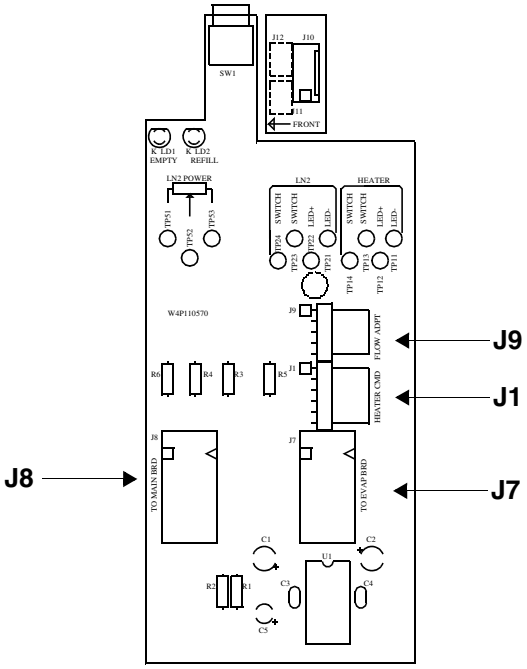
Target temperature selection 5.5

The lower part of the display shows the selected target temperature.

Target temperature can be modified by pushing button ▲ or ▼.

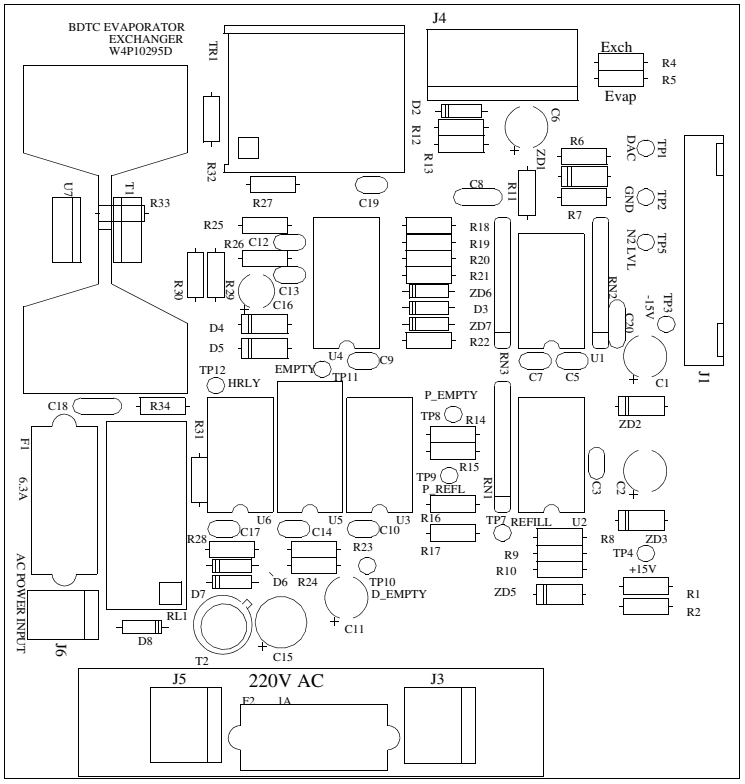
Appendix 6

Figure 6.1. Manual control Board



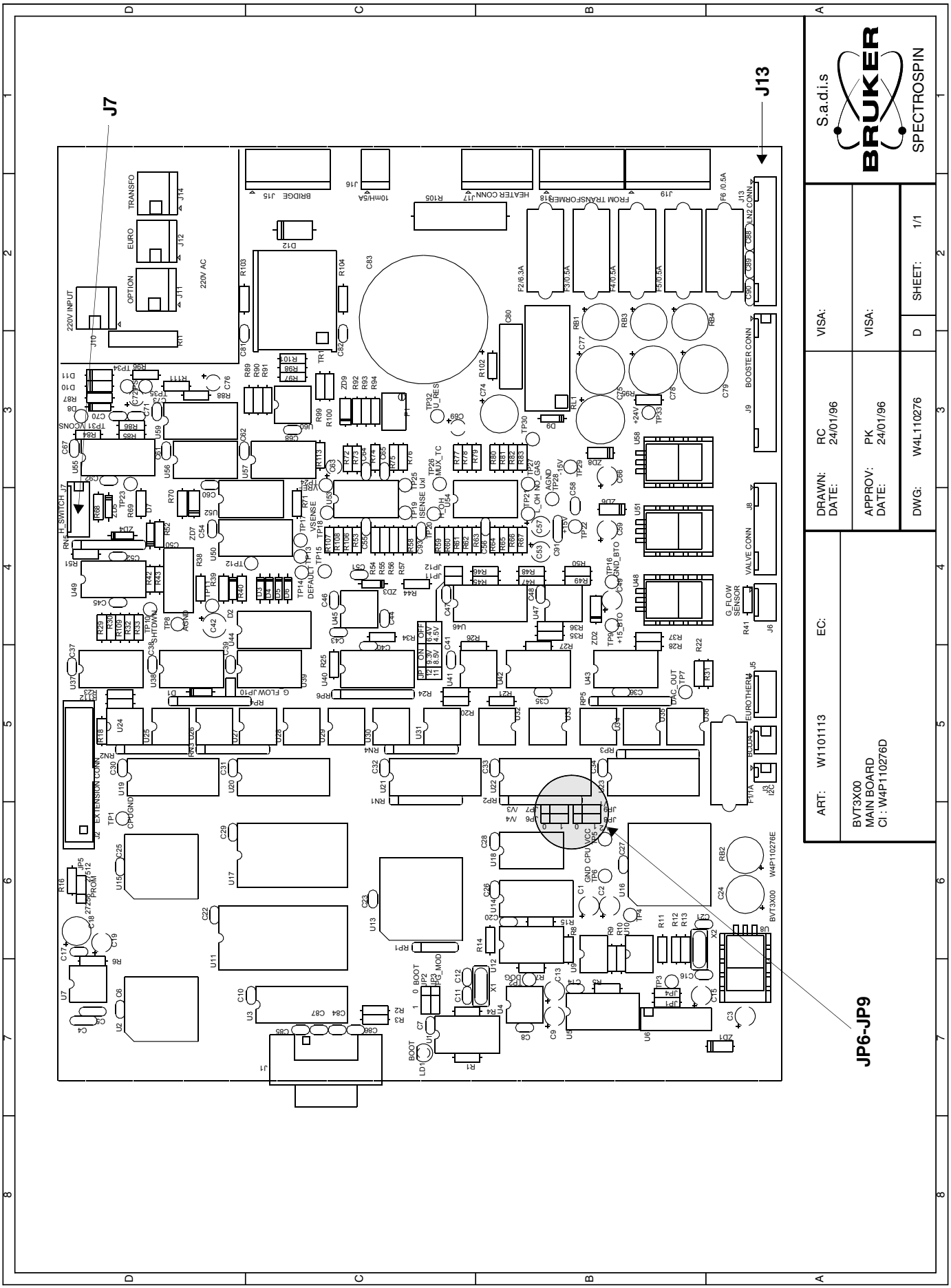
ART: W1101235 EC:		DRAWN: RC DATE: 30/04/97	VISA:		S.a.d.i.s BRUKER SPECTROSPIN
BVT3X00 MANUAL COMMAND CI : W4P110570		APPROV: RC DATE: 30/04/97	VISA:		
		DWG: W4L110570	-	SHEET: 1/1	

Figure 6.2. Evaporator / Exchanger Board



ART: W1100957 or W1101049 EC:	DRAWN: RC DATE: 22/09/94	VISA:	S.a.d.i.s BRUKER SPECTROSPIN
BDTC EVAPORATOR / EXCHANGER CI : W4P10295D	APPROV: RC DATE: 22/09/94	VISA:	
	DWG: W4L10295	D SHEET: 1/1	

Figure 6.3. Main Board



Figures

Figures

Tables

Tables