

Bruker BioSpin

BCU-Xtreme ●

External Temperature Controller
Technical Manual

Version 001

think forward

NMR Spectroscopy

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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.

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

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© January 25, 2010: Bruker BioSpin

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Device Information

1

Introduction

1.1

This document contains technical information about the "BCU-Xtreme External Temperature Controller" (P/N:W1215349).

The temperature of the gas delivered by the BCU-Xtreme (P/N:W1212749) may be too cold for some experiments or some NMR probes, requiring strong heating of the cold gas. The new External Temperature Controller Device (P/N:W1215349) was designed to gradually adjust the outlet temperature of the BCU-Xtreme from -80°C to nearly 0°C. It is compatible with all BCU-Xtreme manufactured until 2010.

Safety

1.2

The device is slightly magnetic. The controller must always be handled and installed at a safe distance from a magnet.

Controller Installation

1.3

The controller is delivered with several meters of 6mm and 8mm HDPE plastic hoses which are connected to the BCU-Xtreme. Optimal controller placement is near the BCU-Xtreme or on top of the cooling unit.

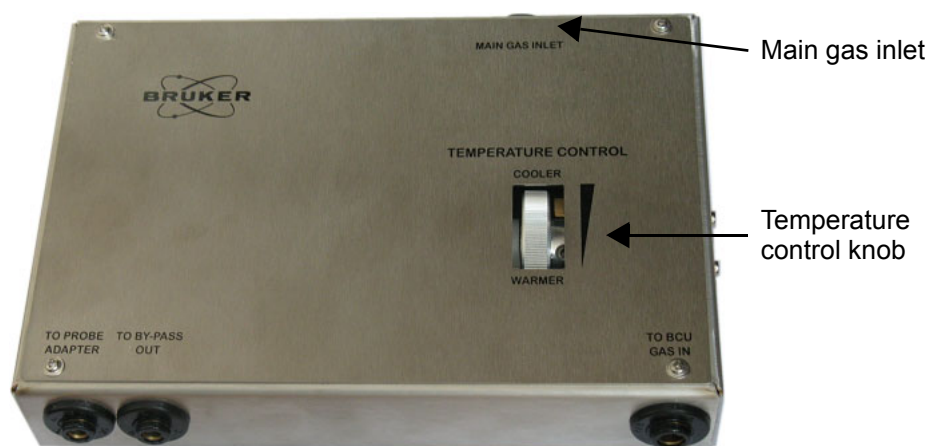


Figure 1.1. External temperature controller device top view

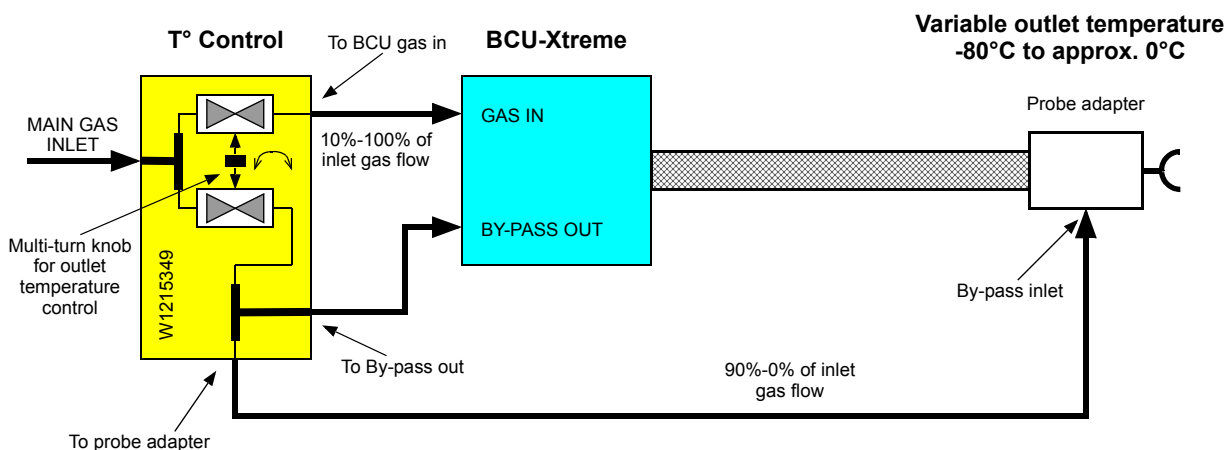


Figure 1.2. Connections of Controller

Hoses Connections

1.4

1. Connect the dry gas supply hose from the temperature control unit BVT or MAS unit to the **"MAIN GAS INLET"** port of the device with 8mm tubing.
2. Connect a piece of 8mm tubing between port **"To BCU GAS IN"** and **"GAS IN"** of the BCU-Xtreme.
3. Connect a 6mm tubing between port **"To By-PASS"** and **"to BY-PASS OUT"** of BCU-Xtreme.
4. Connect a 6mm tubing between port **"To PROBE ADAPTER"** and **"PROBE ADAPTER"** of BCU-Xtreme.



[Check all hoses connections for leaks.](#)

Device Operation

1.5

The outlet temperature control knob is located on the lid.

The knob allows you to gradually adjust the outlet temperature from -80°C to approximately to 0°C . The knob actuates a couple of valves that divide the inlet gas flow between the BCU-Xtreme and the adapter located at the end of the transfer line. The cold gas mixed with room gas at temperature gives the desired result.

The gas flow delivered to BCU-Xtreme can be varied between 10% to 100% of the device inlet gas flow and the gas flow to the BCU-Xtreme adapter varies inversely from 90% to 0%.



Warning : A minimal gas flow (> 1l/min) must always pass through the BCU-Xtreme, otherwise an error occurs and the compressors will be stopped.

When the temperature control knob is turned completely towards "**WARMER**" position, there is still a fraction of the gas flow that passes through the BCU-Xtreme. However, if the gas flow through the BCU-Xtreme is too low it causes the shutdown of the compressors. If this happens, turn slightly back the knob towards position "**COLDER**" to increase the gas flow through the BCU-Xtreme.

When the knob is fully in "**WARMER**" or "**COLDER**" position do not force or damage may occur to the gas mixer valves.

Getting Started

1.6

It is recommended to place the temperature knob in the intermediate position between "**COLDER**" and "**WARMER**" and then start the operation of the BCU-Xtreme to avoid startup problems (low gas flow).

Wait 20-30 minutes until the cooling power is steady. The outlet temperature can be changed with the control knob after the initial cooldown phase.

If the BCU-Xtreme is used even after a longer stop, there is no need to readjust the knob position before restarting the unit.

Technical Specifications

1.7

Table 1.1. Device specification

Dimensions	Height : 60 mm Width : 160 mm Length : 240 mm	Stainless steel enclosure
Weight	800 grs	
Inlet gas flow	10 l/min minimal up to 50 l/min	If the inlet gas flow is too low, the BCU-Xtreme may be shutdown
Gas connections	8 mm and 6 mm	Quick coupling type
Inlet gas pressure	5 bar max.	Dry air or dry nitrogen gas
Temperature control range	-80 °C to 0 °C approx.	With BCU-Xtreme (P/N:W1212749)

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