HELMHOLTZ CENTRE BERLIN for Materials and Energy

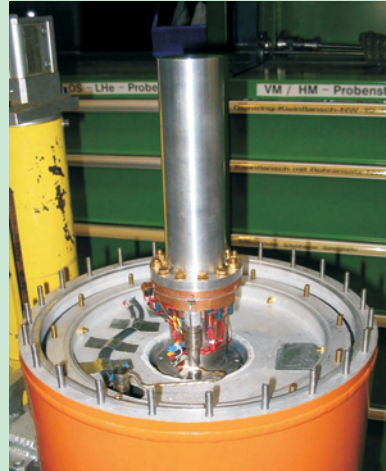Berlin Neutron Scattering Center - Sample Environment Group -
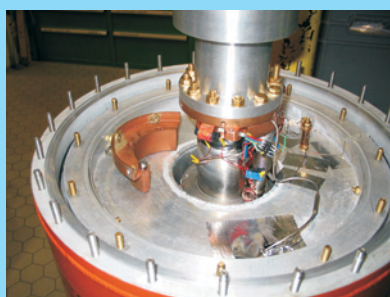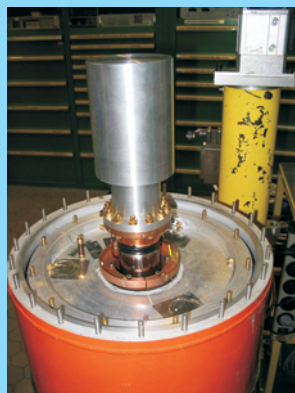
# New Developments on Orange Cryostats

Replacing the Sample Can
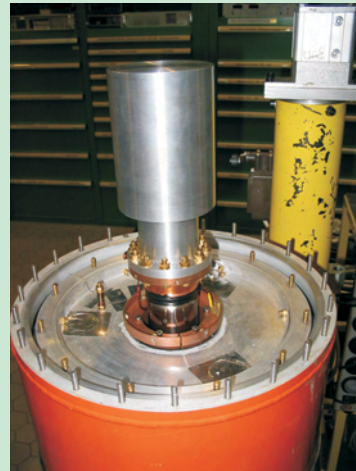
Some Instruments started to use radial collimators so the Instrument Scientists ask for some Eqipment with less aluminium background.
We replaced the lower part of the Sample Space from the standard 50mm diameter to a 86mm Bottle shape can.

Modification for a better Cooldowntime
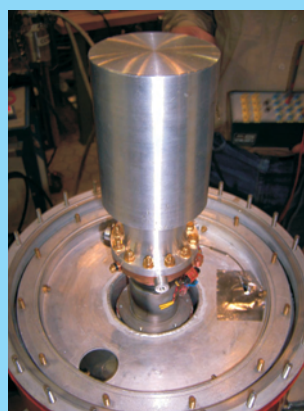
On some Orange Kryostats we noticed a untypical behavior when we did the first cooldown from room temperatur to base temperatur. The cooling stops after 1 hour at 20K. Then it needs another hour to cool down with 100mbar on the pumping line to reach the base temperatur.
We found out that the parts which holds an inner shield have a mass of about 100g of copper, so it needs a long time to cool down.
After removing these parts and mounting the inner shield with some aluminium spacers directly on the VTI, the cooldown time from 300K to base temperature was reduced by 40 minutes. The performance, especially the base temperatur and the Helium consumption, did not change.
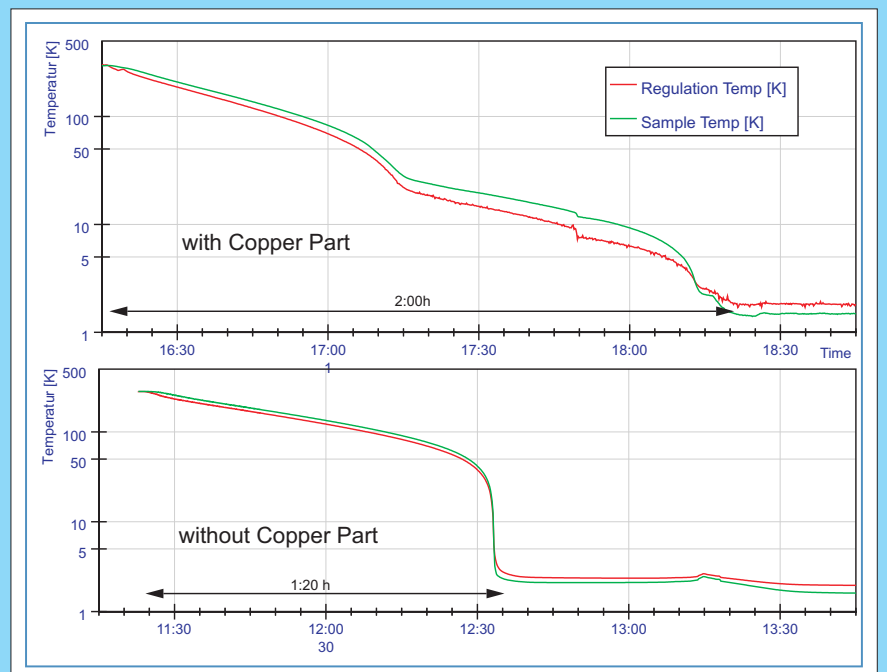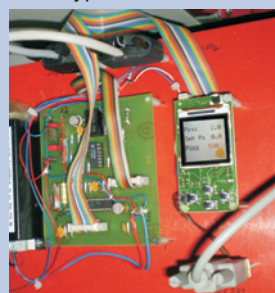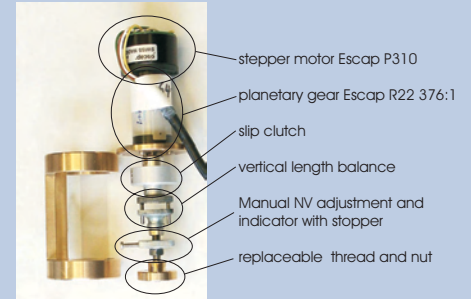
New Needle Valve Controller
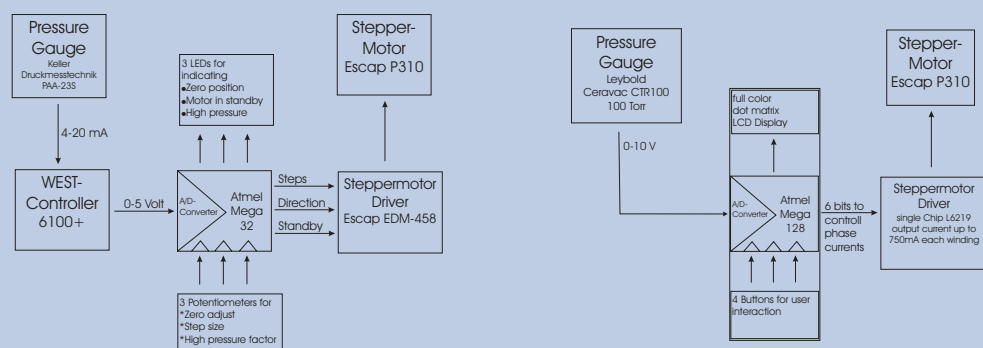
Old Controller

Prototype of New Controller

Needle Valve Motor

ATMEL based Microcontroller
full color (cellphone) LCD Display
8 build-in 10-bit ADC's
4 buttons for user interaction
RS232 for Computer connection
20 free configurable IO Pins
can be programmed in C

- stepper motor Escap P310
- planetary gear Escap R22 376:1
- slip clutch
- vertical length balance
- Manual NV adjustment and indicator with stopper
- replaceable thread and nut

Changes on the new design:

*Chang of the regulation algorithm from PID to two-step control so the motor is less moving.
*The stepper motor driver has no phase controlled modulator and produces less electromacnetic noise.
*Change of the pressure gauge to a more accurate one.
*Simple RS232 protocoll.
*Complete open design so we can implement an absolut position encoder for some special applications.
*The price is about 500€ less against the old controller.