SampleJet

Installation Guide

Version 4.1

NMR Spectroscopy

Innovation with Integrity

This manual was written by

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P/N: Z31750
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Safety 3

Warnings and Notes in this Manual 3.1

There are two types of information notices used in this manual. These notices highlight important information or warn the user of a potentially dangerous situation. The following notices will have the same level of importance throughout this manual.

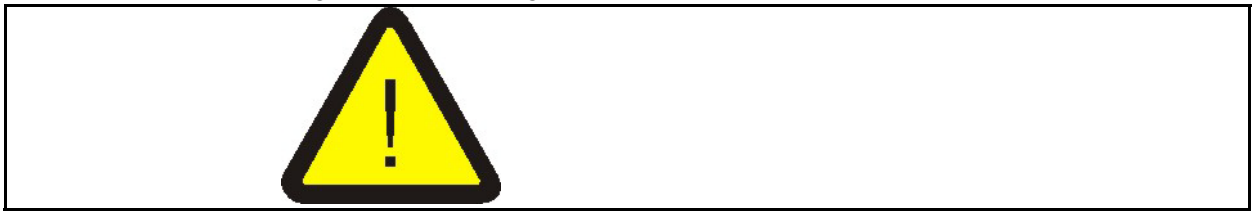
Note: Indicates important information or helpful hints

Warning: Indicates the possibility of severe personal injury, loss of life or equipment damage if the instructions are not followed.

Potentially Hazardous Areas 3.2

The symbols shown below indicate a potentially hazardous area and strong laser (ISO 3864;DIN 40008).

Figure 3.1. Warning hazardous area

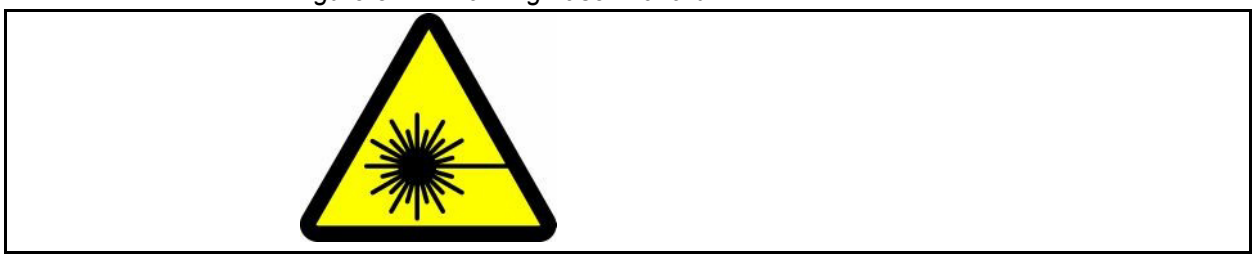


The symbol is placed on the following areas of the SampleJet:

1. On the front cover, just right of the door (side that is away from the magnet).

2. On the rear side left and right (side that is over the magnet). Warning: Keep cover closed unless manual action has to be done.

Figure 3.2. Warning Laser Hazard



The symbol is placed on the following area of the SampleJet:

1. On some versions (ECL < 3.0) of the BST Adapter on top of the magnet. Do not remove any parts until the SampleJet is turned off.

If one of these symbols is missing, please contact Bruker Biospin for a replacement!

Disclaimer *3.3*

- The unit should only be used for its intended purpose as described in this manual.
- Use of the unit for any purpose other than that for which it is intended is done so at the users own risk and invalidates any and all manufacturers warranties.
- Service or maintenance work on the unit must be carried out by qualified personnel.
- Only those persons trained in the operation of the SampleJet should operate the unit.
- Read this manual before operating the unit. Pay particular attention to any safety related information.

Bruker Biospin is not responsible or liable for any injury or damage that occurs as a consequence of non-approved manipulations of the SampleJet.

Emergency Stop *3.4*

The red emergency button on top of the SampleJet is used to disconnect the power supply to all the drives. This will immediately stop any movement of the carousel and the gripper. To turn off the power completely use the switch on the back side of the SampleJet Power Supply.

Site Considerations *3.5*

The SampleJet should be setup in a standard laboratory environment. Maximum room temperature should not exceed the range from 17-25°C with a humidity from 30-80%RH. For more information refer to the Avance spectrometer manual on site planning available from Bruker Biospin.

Before Mounting the SampleJet *3.6*

- Make sure the magnet is firmly secured to its base in order to prevent the instrumentation from tipping over.
- Please check if this magnet needs a „sample changer foot“ to extend the magnet base or a complete new stand to get the desired stability. Contact Bruker Biospin if in doubt.

While Mounting the SampleJet *3.7*

- Lifting the SampleJet up to the magnet requires at least two people (ca. 40 kg). Do not try to do it on your own. You may hurt yourself.
- Beware of the strong magnetic field while working around the magnet. Keep all metal objects, such as tools, screws, or any metallic parts away from the magnet. Remove any mechanical watches or metallic objects while working around the magnet.
- Do not turn the SampleJet on during installation.

During Operation *3.8*

- Use only new sample tubes in the specified diameter range or otherwise the caps may fall off while the system is running.
- Avoid putting hands or objects in the path of the gripperarm or tray when the SampleJet is running, as this may cause personal injury or damage to the equipment. Therefore it is recommended to keep the doors on the front and back side closed during normal operation.
- Be aware that the SampleJet‘s horizontal and vertical axes, the tray or the gripper may start a movement unexpectedly.
- Glass tubes may contain hazardous substances. If a glass tube breaks, refer to the corresponding precautions and cleaning/disinfection instructions. Only trained personnel should be allowed to operate the SampleJet. Staff training is

the responsibility of the owner of the system, Bruker Biospin will not be responsible for damage resulting from improper training.

- The use of nitrogen as an operating resource instead of compressed air may lead to an oxygen deficiency in the laboratory, e.g. through a technical defect (burst in pneumatic hose). It is highly recommended that oxygen warning device(s) be installed in the laboratory.
- Always have the covers closed while working with the system.

Cautions

4

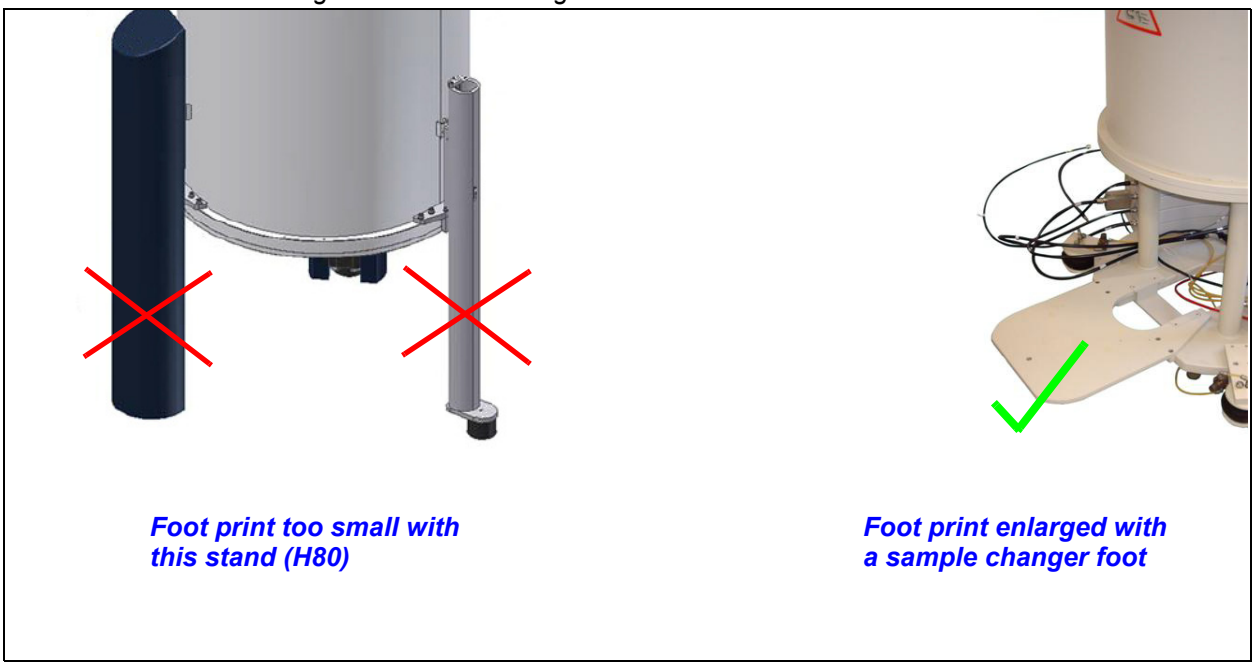
Magnet Stability 4.1

Before mounting the SampleJet, it is important to make sure that the magnet is firmly anchored to its base in order to prevent the magnet from tipping over. Switch off the dampers of the magnet if existing.

Small magnet needs to be equipped with the right stand to hold a SampleJet. Some stands result in a footprint that is too small to ensure stability in extreme situations. For some magnet stands a special samplechanger foot is available to enlarge the foot print. Other magnet stands needs to be exchanged.

If your are not sure, if your magnet stands stable enough contact the SampleJet hotline to reach clarification before the installation.

Figure 4.1. Small Magnet Stand Foot Prints

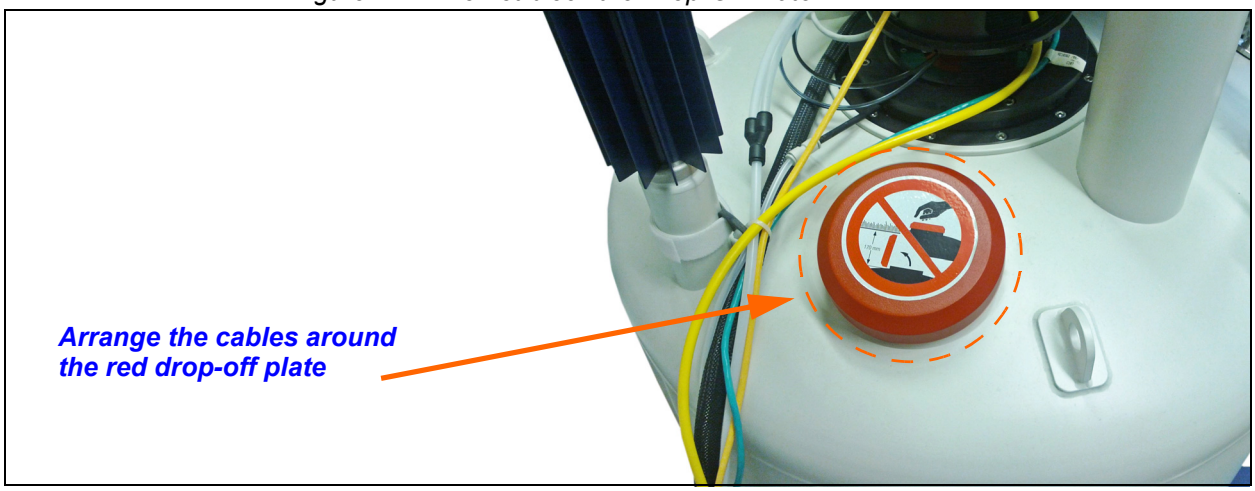


Drop-Off Plate *4.2*

Make sure that the drop-off plate is not blocked by any cables or hoses. Use the Velcro fasteners and cable ties to arrange the cables and hoses around the drop-off plate.

Do not block the drop-off plate! This is a safety valve and must always be in perfect working condition.

Figure 4.2. Do not block the Drop-Off Plate



Mechanical Fastening *4.3*

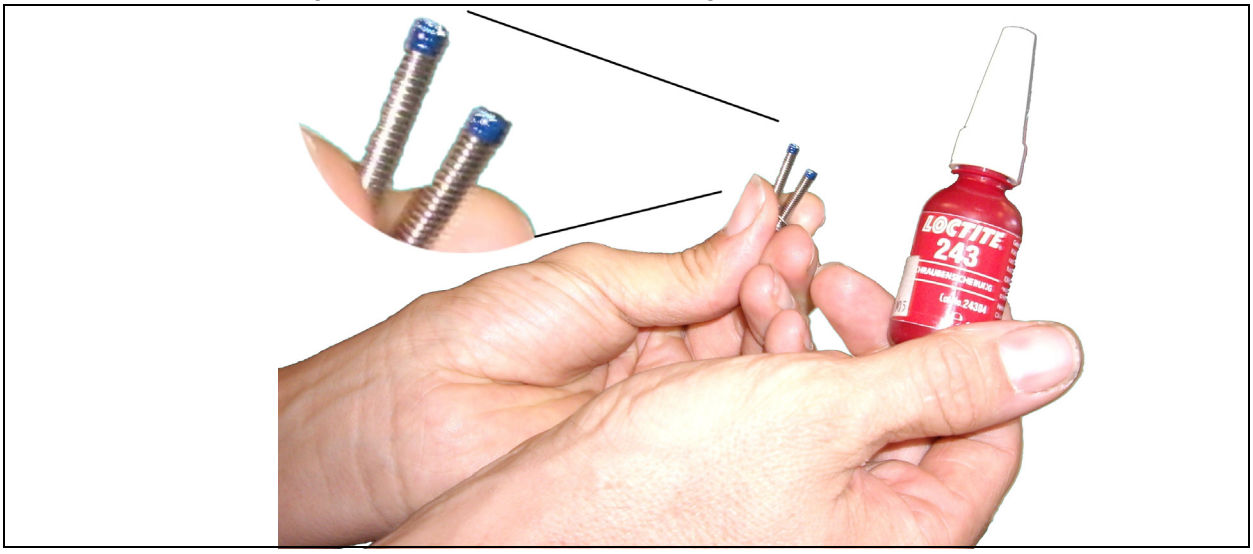
Ensure that the mounting hardware for the SampleJet is mounted properly by taking these precautions:

- Only use the screws delivered with the system
- Use Loctite on the safety relevant screws of the mounting hardware
- Double-check if the mounting hardware holds properly on the magnet before lifting the SampleJet on it.

Screws of the mounting hardware have to be secured with Loctite. Otherwise the vibrations of the drives may loosen the screws!

But do not use Loctite on perspex, the whole cover and the hardware mounted on top of the shim system.

Figure 4.3. Loctite for the Mounting Hardware

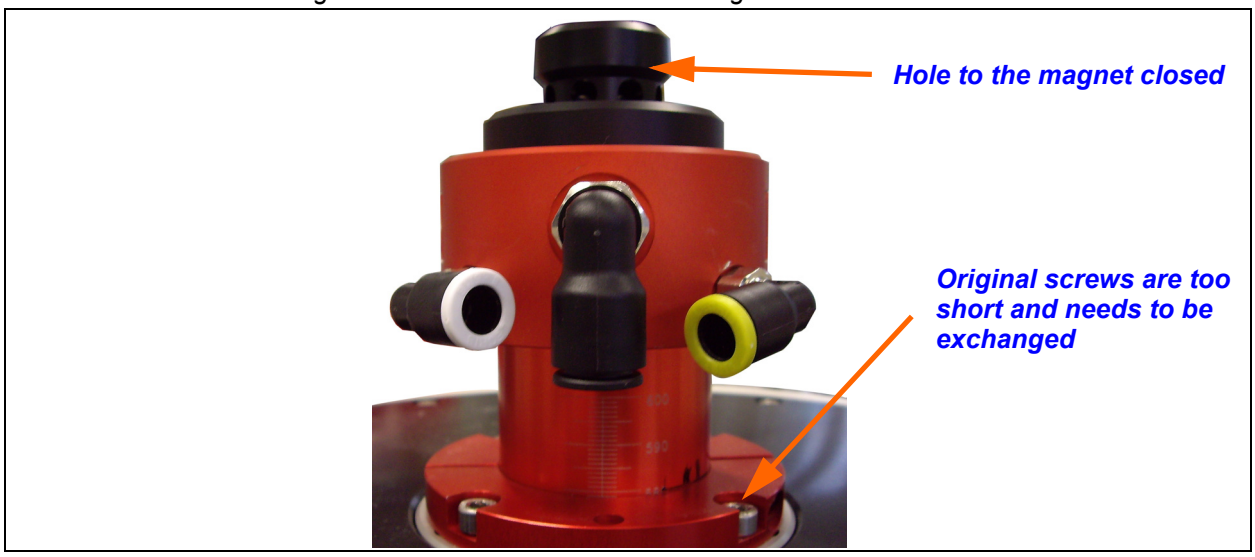


Every SampleJet is delivered with a Tool Kit containing Loctite. Additional Loctite 243 Art. Nr. 45872 is available at Bruker Biospin.

Make sure that the shim system is firmly tightened, in order to prevent it from shifting. Also prevent screws and tools from falling into the BST by closing the top of it with the black protection lid.

Use the delivered screws for the shim systems which have the appropriate length and material. The original screws are too short for the SampleJet mounting hardware.

Figure 4.4. Screws on the BST Flange



Installation Procedure

5

Steps to an Operating SampleJet 5.1

This Manual describes the hardware installation of the SampleJet only. All the topics depending on the firmware version are described in the „Users Manual“.

Table 5.1. Where are the information

Installation depends on	Is described in manual
Hardware	„Installation Guide“ Z31750 (this manual)
Firmware	„Users Manual“ Z31749 (included in the Firmware)

In this „Installation Guide“ Z31750

- Mounting instructions
  Describes how to screw a SampleJet on a Magnet.
- Cooling Installation (option)
  Guide to install a cooling on a SampleJet.

In the „Users Manual“ Z31749

- Initial Configuration
  Setup of software like TopSpin or IconNMR
- Calibration
  The SampleJet has to be calibrated before the first use.
- User Settings
  Configuration of the settings.
- Technical Data
  All specifications of the system

How to get the „Users Manual“ *5.2*

The „Users Manual“ is included in the SampleJet‘s firmware as a „pdf“ file and can be downloaded from the SampleJet. Two preconditions have to be met before this manual can be downloaded.

- The SampleJet has to be on electrical power.
- The SampleJet has to be connected to the spectrometer computer via the ethernet cable

On the spectrometer computer you can connect to the SampleJet home page with a internet browser. To access the SampleJet just enter „http://149.236.99.55“ in a web browser window.

Once the web interface is accessible, the manual is found in the menu „Documentation“ in „Download Manual“.

Mounting Instructions

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Required Tools and Consumables for the Installation 6.1

The SampleJet comes with a Tool Kit (Z107443) which contains all the special tools and consumables. An installation needs some additional standard tools which are listed below. All dimensions of the tools are metric system. Every time a tool is used it is marked in this manual by the „-->“ sign.

Table 6.1. Required Tools

Position	Tool	Remark
1	Screwdriver 2	
2	Screwdriver 4	
3	Crosstip screwdriver 0	
4	Crosstip screwdriver 2	
5	Allen key 2.5	Comes with the Tool Kit
6	Angled allen key 3	
7	Angled allen key 4	
8	Angled allen key 5	
9	Angled allen key 6	Only used with a samplechanger foot
10	Flat spanner 5	Only when removing the carousel
11	Flat spanner 7	Comes with the Tool Kit
12	Flat spanner 13	
13	Flat spanner 16	
14	2 Flat spanner 17	
15	Water level	Comes with the Tool Kit
16	Cutter	
17	Metric Scale	
18	2 Ladders	

Table 6.2. Required Consumables

Position	Consumable	Remark
1	Some medium size cable ties	
2	Loctite 243	Comes whit the Tool Kit
3	Cleaning utilities	sometimes used
4	Rubbing alcohol	sometimes used

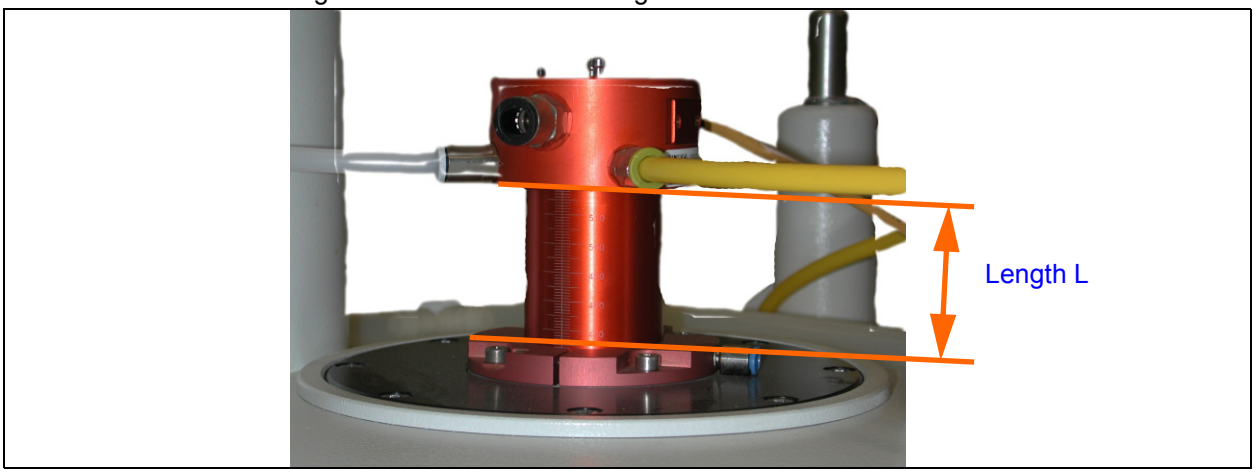
Installations on the Magnet 6.2

Determine which Parts to Use 6.2.1

The SampleJet has always to be on the same height in relation to the BST shim upper part. Since the height of the BST shim upper part is different for every magnet, the height of the mounting hardware has to be adjusted.

As shown in the picture, measure the length L between the top side of the flange and the lower side of the shim system upper part.

Figure 6.1. Measure the height of the BST Tube



Depending on the length L, select the appropriate parts in the table below.

Table 6.3. Determine Parts

length L [mm]	length L [inch]	Thread low 	Thread high 	Distance tube 
		Z73988 / Z73989	Z73990 / Z73991	Z105622
0 - 55	0 - 23/16“	X		X
55 - 120	23/16“ - 43/4“		X	X
120 - 157	43/4“ - 63/16“	X		
157 - 217	63/16“ - 81/2“		X	

Depending on the type of BST flange, different parts have to be used. Measure the height H and the diameter D to determine the proper mounting from the tables below.

Figure 6.2. Diameter of the BST Flange

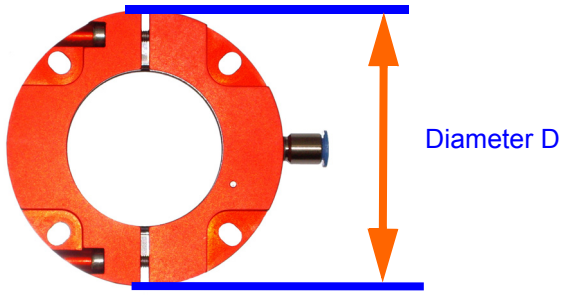


Table 6.4. The SampleJet Spread Ring and Mounting Inserts

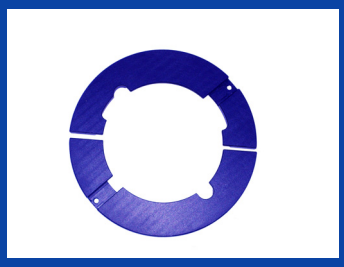
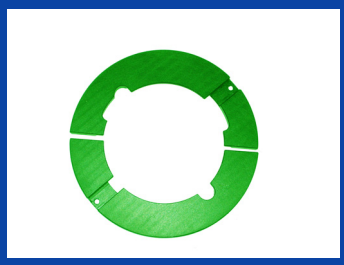
		First hardware version	Second hardware version
diameter D [mm]	**diameter D [inch]**	 **Spread Ring**	   **Mounting Inserts**
85	311/32“	**Use** the spread ring.	User the **blue** insert.
89	31/2“	You **cannot** install the SampleJet with this hardware.	Use the **green** insert.
90	317/32“	**Do not use** the spread ring.	Use the **black** insert.

Figure 6.3. Dimensions of the BST Flange

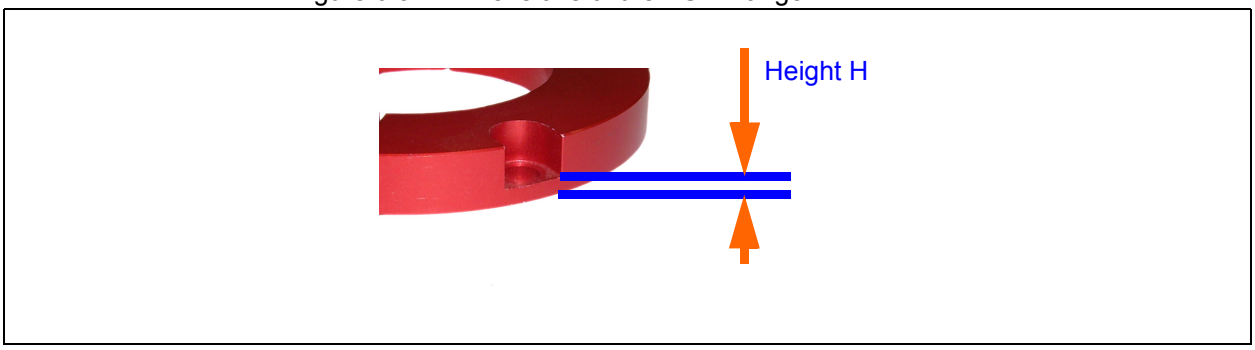


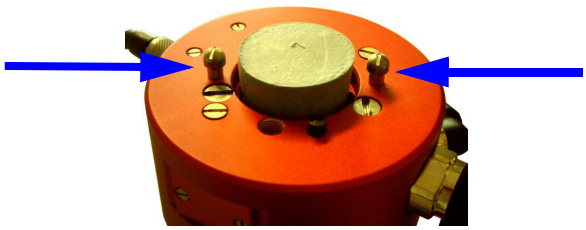
Table 6.5. The SampleJet Space Washers

height H [mm]	height H [inch]	SampleJet Space Washer
<= 3	<= 1/8“	**Use** the 2 space washers.
> 3	< 1/8“	**Don‘t use** the washers.

Preparing the BST Shim Upper Part for Installation 6.2.2

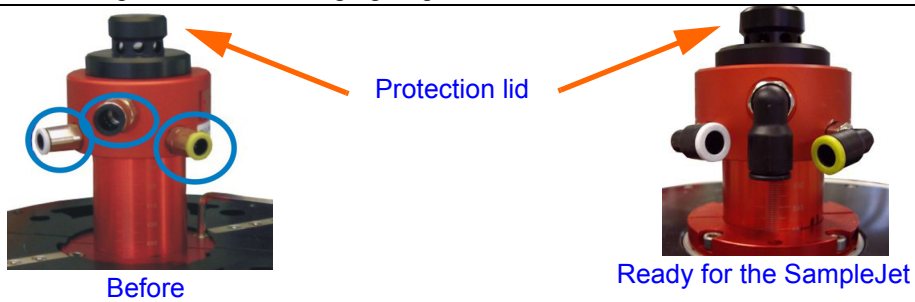
1. Remove the two screws with rounded heads on top of the BST if present.
   --> Screwdriver 2

Figure 6.4. The Screws with Rounded Heads



2. Make sure all the screws on top of the BST are not higher than the BST itself.
   --> Screwdriver 2 and 4
3. Place the protection lid on top of the BST.
4. Remove the connected air tubes and the spinning rate detection cable.
5. Remove the existing air inlets, by screwing them out and replace them with the angled ones, which are shipped with the SampleJet. Use the colored rings from the removed legris with the new legris by pressing them on it.
   --> Flat spanner 13 and 16

Figure 6.5. Exchanging Legris



Adaptation for the SampleJet Mounting Hardware 6.2.3

The BST flange must not be removed completely to install the SampleJet mounting hardware parts. Therefore the shim stack has not to be readjusted.

Skip the parts of the following list which are not necessary. To find out which parts to use check the chapter **"Determine which Parts to Use" on page 19.**

6. Attach the black SampleJet Spread Ring, regarding the proper gap orientation to the flange. This is important to a BST ring with gap‘s to exhaust the BST cooling air.

Figure 6.6. The SampleJet Spread Ring

7. Place the 2 special flattened SampleJet Space Washers into the BST ring if needed. Align it so that it will fit into the countersink, the flat side on the outer-side.

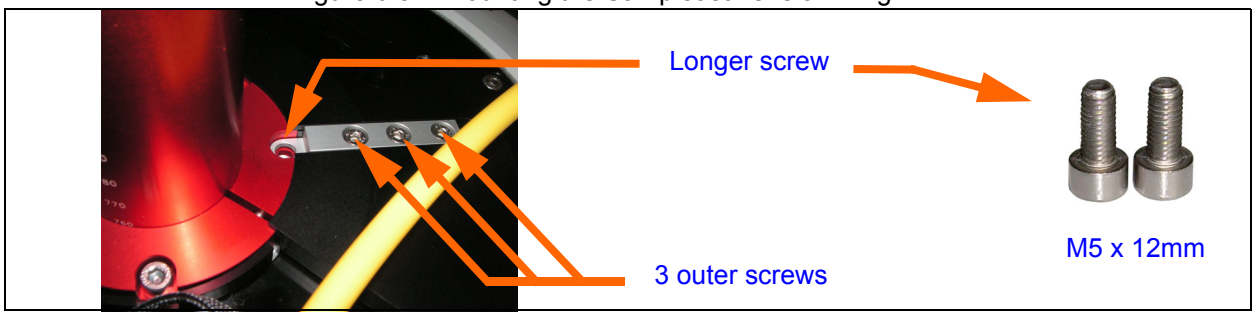
Figure 6.7. The SampleJet Space Washers

Mounting of the SampleJet Mounting Hardware 6.2.4

Tighten the 6 screws described in point 8), 10) and 11) all together. Otherwise you will have problems introducing the screws in point 11).

8. Attach the SampleJet Tension Ring. Make certain that the outer screws are aligned to the front of the magnet, ensuring access to it. **Slightly** tighten the SampleJet Tension Ring with the delivered longer screws to the flange.
   --> Angled allen key 4
9. Firmly tighten the three outer screws if it‘s not done already.
   --> Angled allen key 4

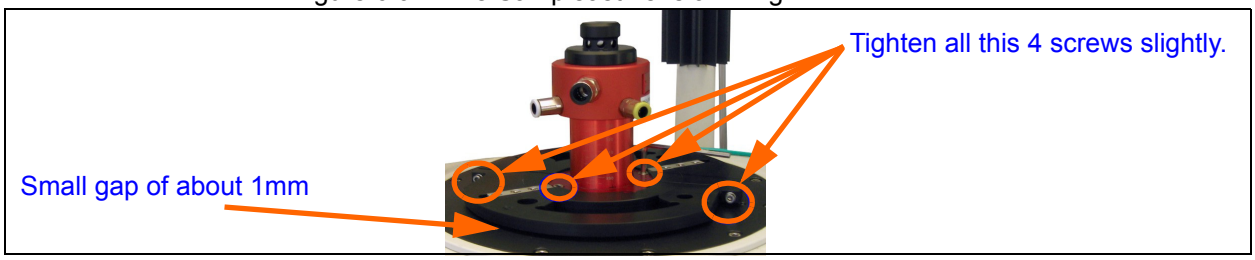
Figure 6.8. Mounting the SampleJet Tension Ring



10. Tighten the 2 screws from the side slightly. Make sure that the resulting gaps on each side are symmetrical.
    --> Angled allen key 3

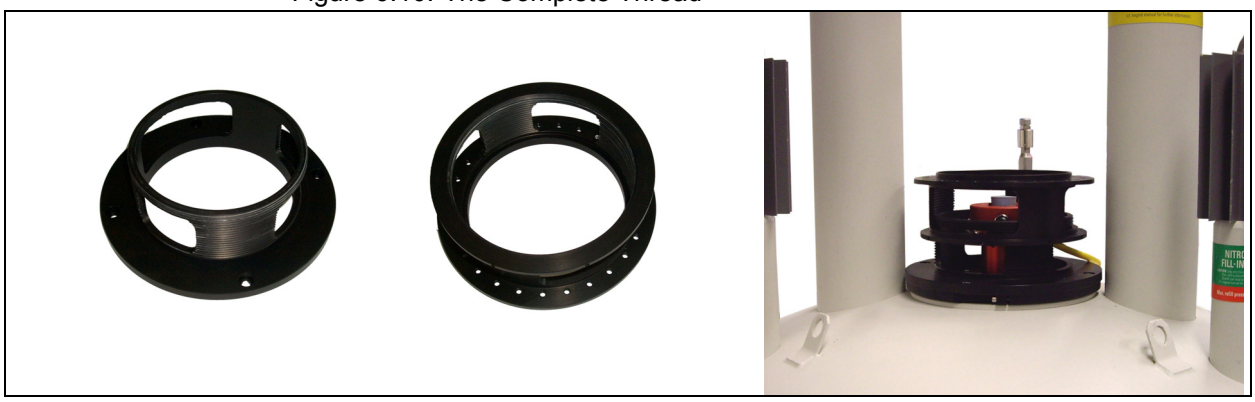
Be informed of the fact that there will be a gap of about 1mm between the top flange of the magnet and the SampleJet Tension Ring.

Figure 6.9. The SampleJet Tension Ring



11. Mount the SampleJet Thread on the SampleJet Tension Ring definitely by firmly tighten the 4 screws and the 4 screws from the **Figure 6.9.** above.
    --> Angled allen keys 3,4,5

Figure 6.10. The Complete Thread

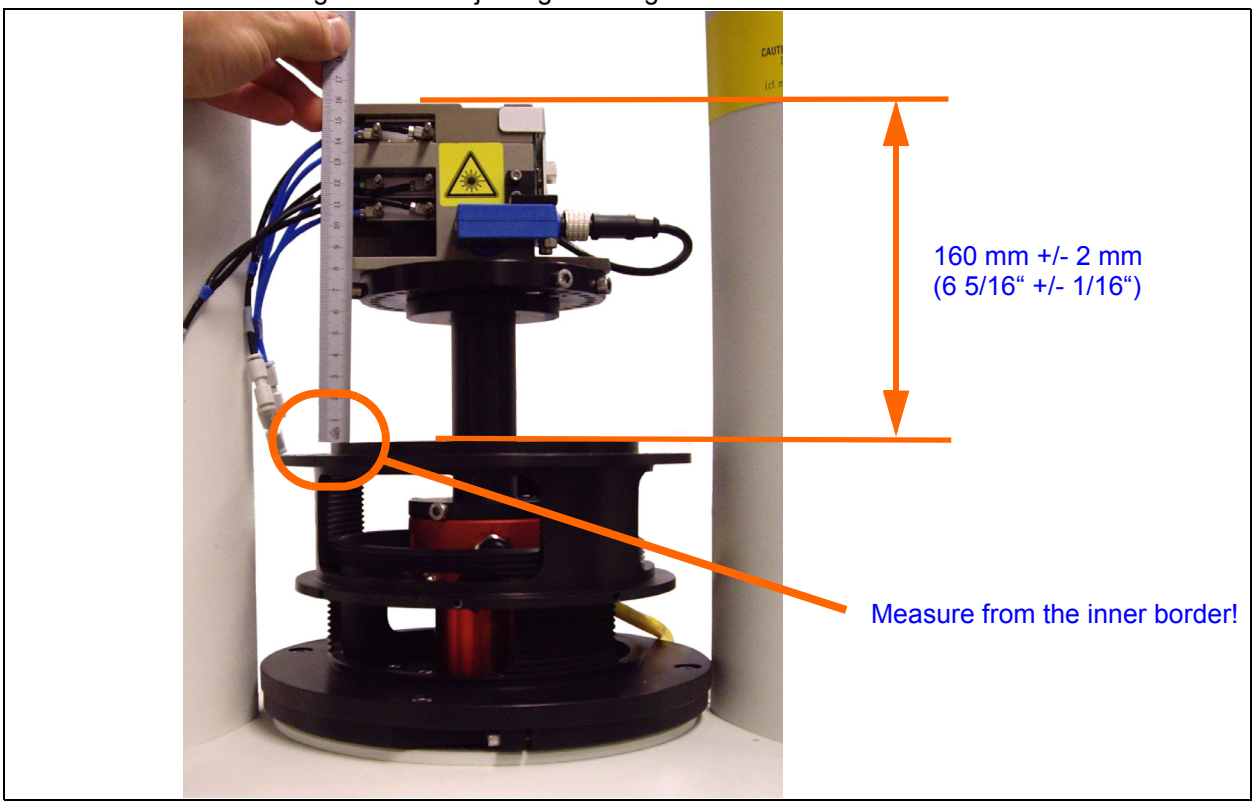


Adjusting the Height of the Thread 6.2.5

12. Place the BST Adapter together with its flange (and if needed with the Distance Tube as on the picture) on top without screwing it.
13. Adjust the thread until the height to the BST Adapter measures approximate 160 mm +/- 2 mm (+/- 1/16“).
    Hint: one full rotation is about 3 mm (1/8“).

Given by the material of the tread the adjusting may produce noise, smoke and smelliness.

Figure 6.11. Adjusting the Height

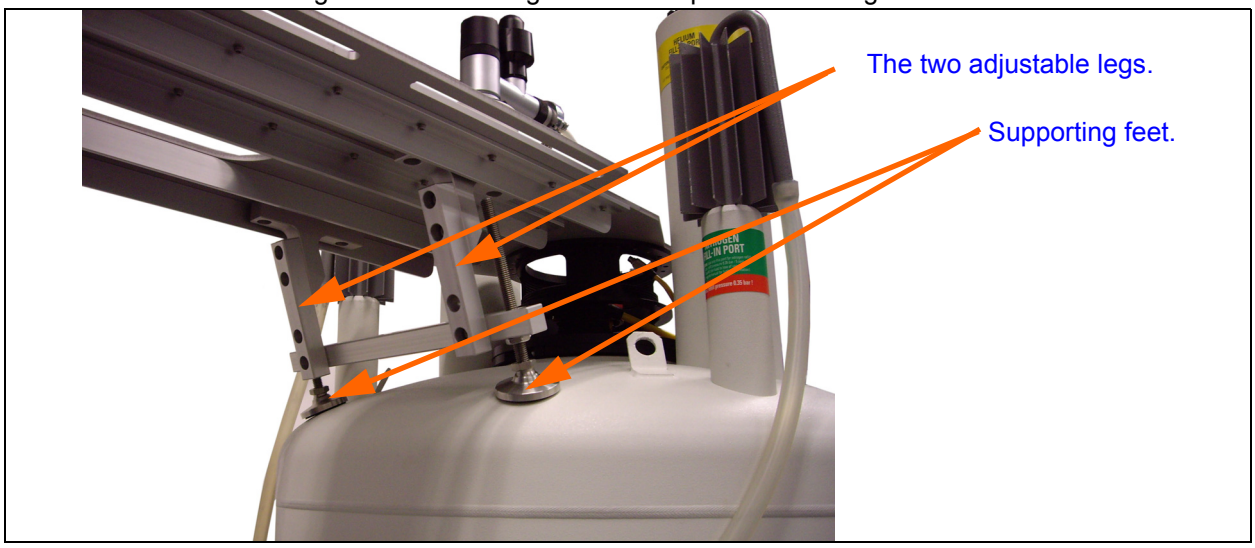


14. Remove the BST Adapter.

Mount the SampleJet Mounting 6.3

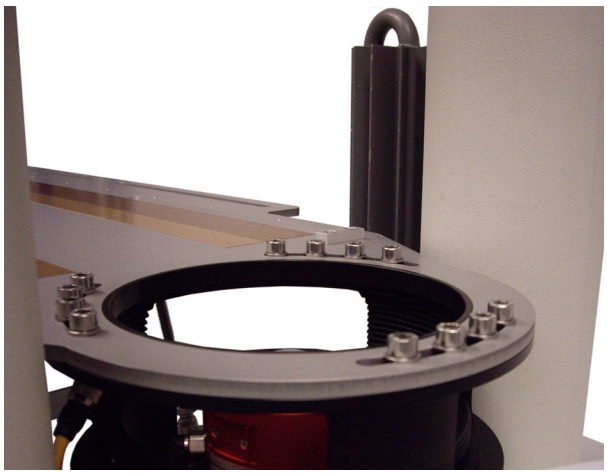
15. Adjust the position of the supporting feet to fit to the diameter of the given magnet. Use the outer most position possible. Depending on the magnet design you have to adjust the legs of the SampleJet Mounting
    --> Angled allen key 5

Figure 6.12. The Legs of the SampleJet Mounting



16. Mount the base plate to the positioning ring with 12 screws.
    --> Angled allen key 5

Figure 6.13. The SampleJet Mounting



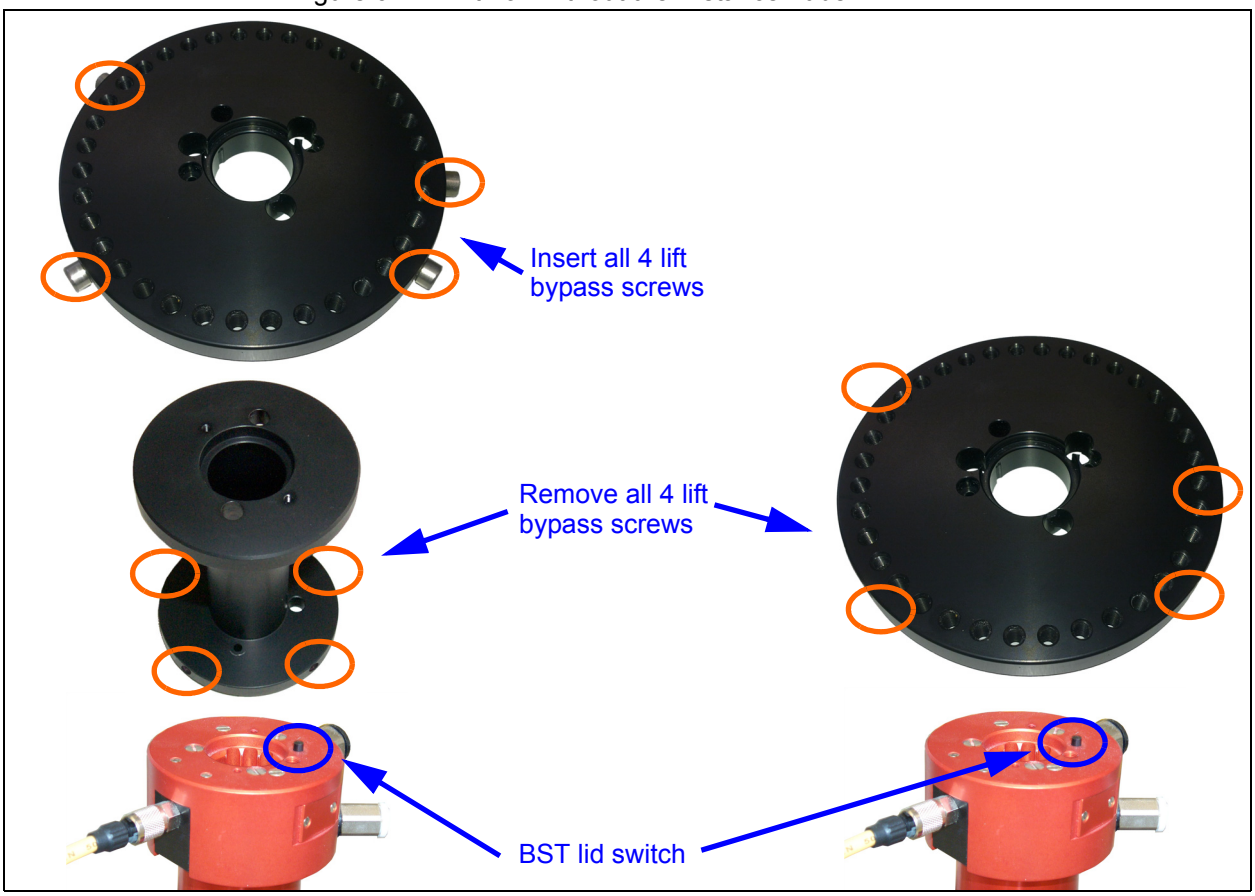
17. Check the level of the magnet. A level can be found in the SampleJet Tool Kit.

18. Turn the two supporting feet until the base plate is leveled relative to the magnet.

19. Lock the nuts to fix the feet.
    --> Flat spanner 17

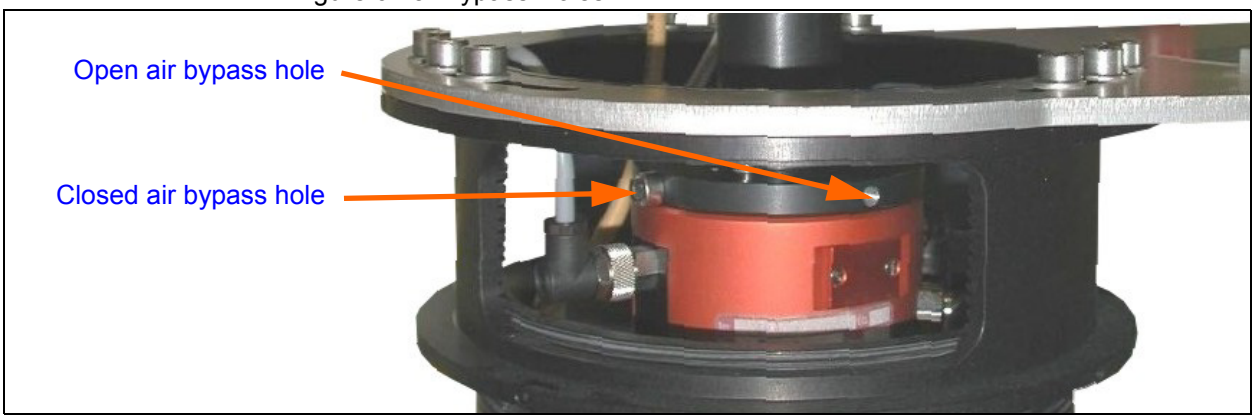
Installing the SampleJet BST Adapter 6.3.1

Figure 6.14. With or Without the Distance Tube



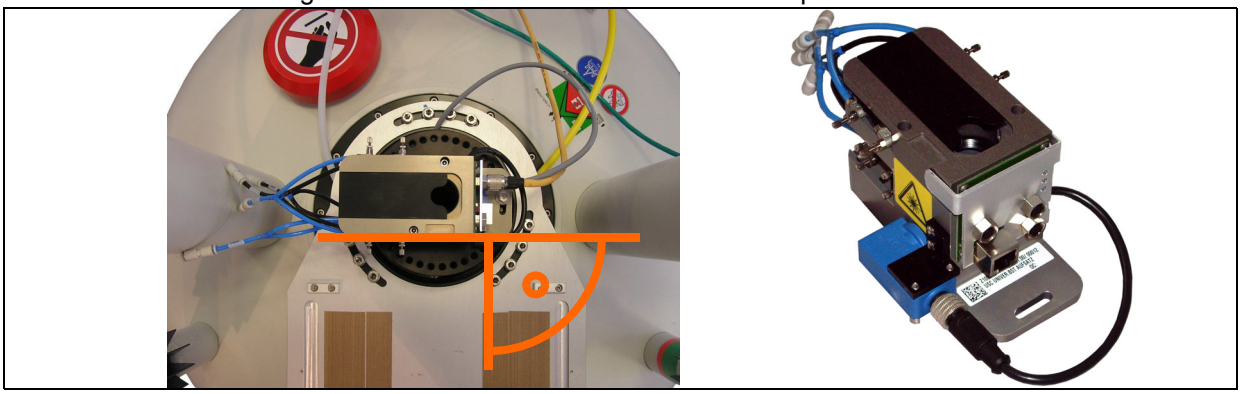
20. Mount the BST hardware as shown either with or without the Distance Tube. Make sure that the bypass screws for the lift gas are placed correctly and that you are not switching the lid switch with the hardware.
--> Angled allen key 2.5 and 4

Figure 6.15. Bypass Holes



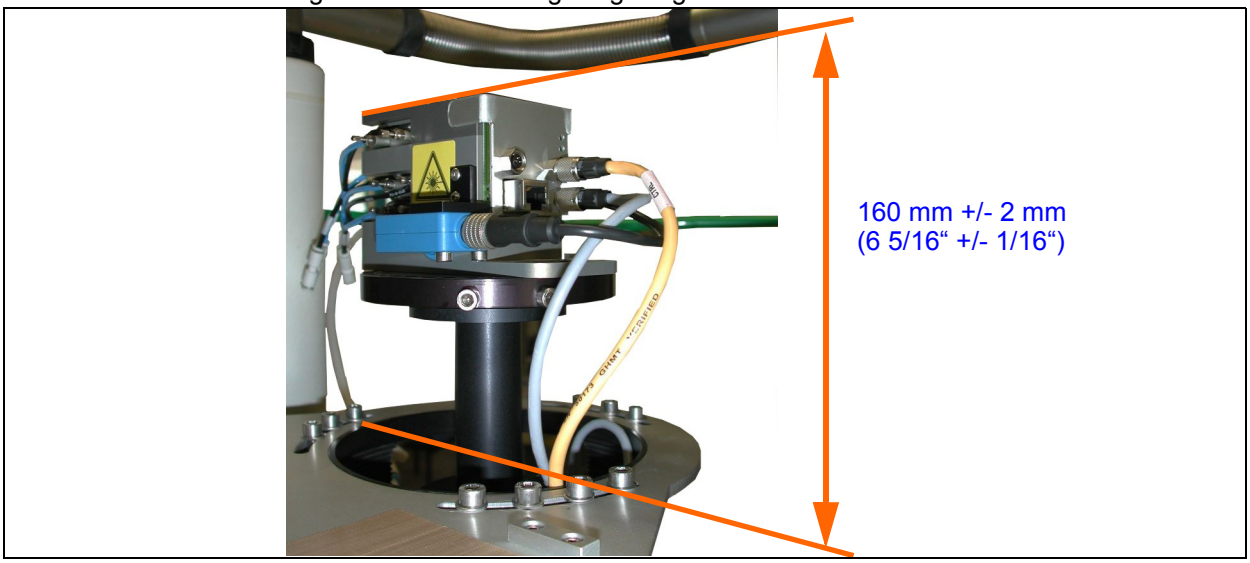
21. Mount the BST Adapter onto the flange and line it up, so that it‘s long side is perpendicular to the line of the two helium towers of the magnet. The connectors on the BST Adapter have to be on the right side.
--> Flat spanner 7

Figure 6.16. The Orientation of the BST Adapter



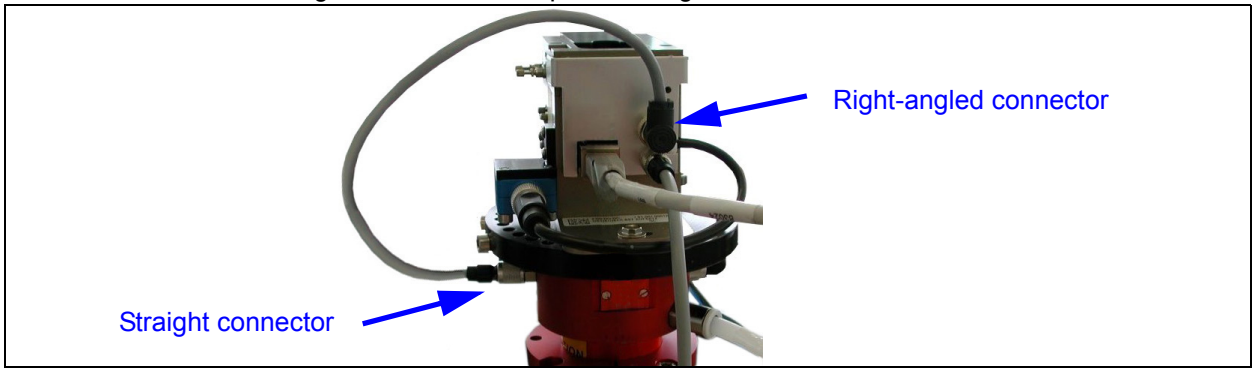
22. Check again the height of the BST Adapter.

Figure 6.17. Measuring Height Again



23. The gray, short cable from the BST to the BST Adapter has a straight and an angled connector to fit an all possible setups. Connect this cable.

Figure 6.18. BST Adapter Cabling



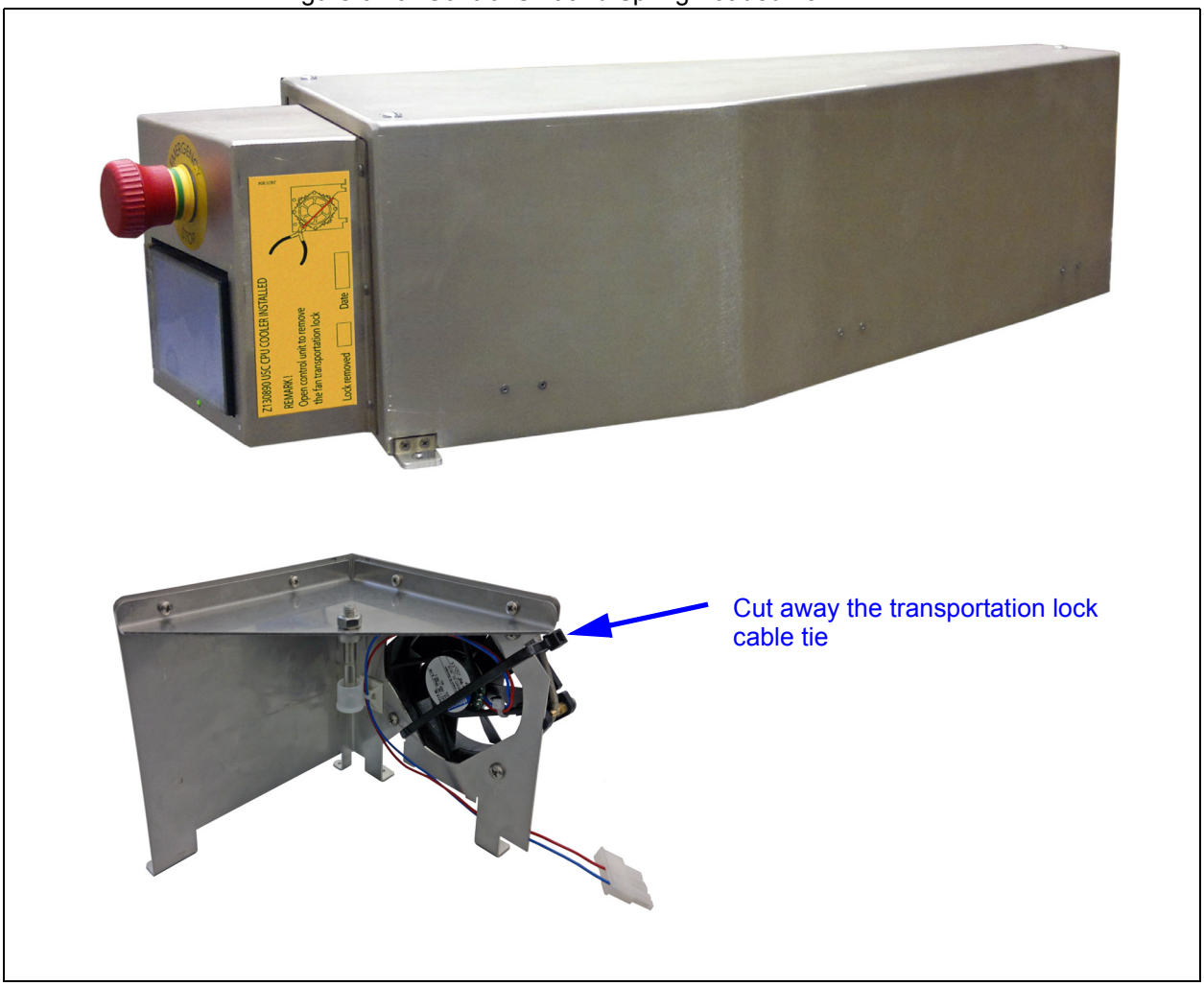
Remove the Fan Transportation Lock 6.4

Newer control units are equipped with a spring-loaded fan to prevent vibrations on the NMR System. Those control units are labelled with a yellow sticker as shown below.

24. For transportation the fan in side the control unit is secured with a cable tie that has to be removed at the installation.

Remove the fan transportation lock inside the control unit and indicate on the yellow sticker that the lock was removed.
The fan is properly working even when the lock was not removed. The customer may then see vibrations in the spectra when running very sensitive experiments.

Figure 6.19. Control Unit and Spring-Loaded Fan



Mount the SampleJet 6.5

The SampleJet weighs about 40 kg, this is why this step needs at least two people.
For safety reasons, two stable ladders are recommended to stand on, while lifting the system up.

25. Remove the transport lock of the Gripper Arm and the Carousel.
26. Arrange the cables in order to prevent stepping over it while carrying the system.
27. For safety, two ladders are recommended in front of the magnet. Check that they are stable enough to carry the additional weight of the SampleJet.

Figure 6.20. Lifting the SampleJet onto the Magnet

28. Lift the SampleJet onto the Mounting Hardware platform.
29. **Always** attach all 4 screws! (The original screws have a length shorter than 11mm, to prevent the screws from digging into the turntable.)

Figure 6.21. Fixing the SampleJet on the Platform

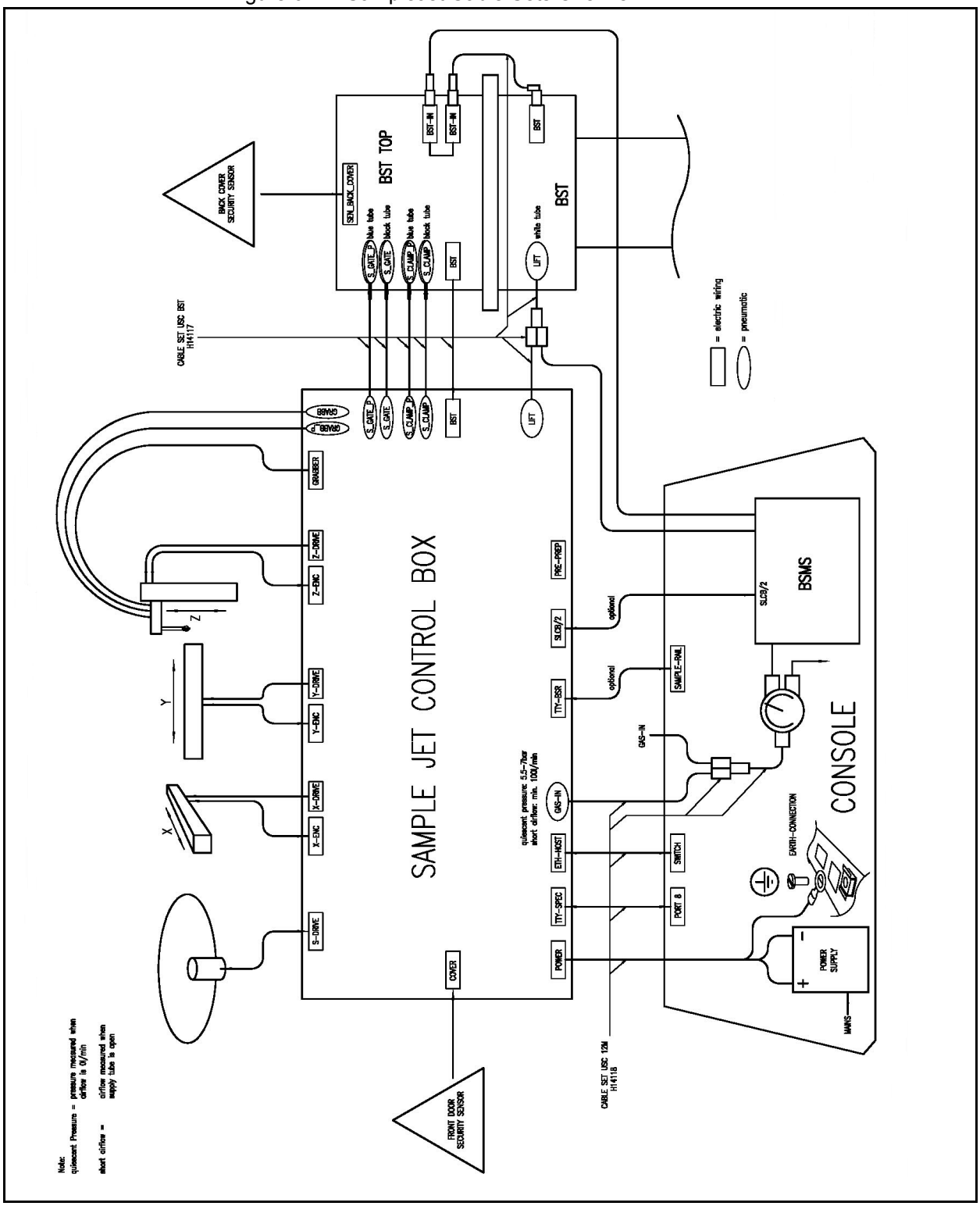
30. Move the SampleJet towards the BST until the limit is reached. Fasten the 4 screws. The SampleJet is now mechanically mounted.

Clean the area around the SampleJet Carousel. Swarf can damage the teeth of the Carousel Drive.

Install the SampleJet Cable Set 6.6

Connecting the Hoses and Cables 6.6.1

Figure 6.22. SampleJet Cable Sets Overview



Connecting the SampleJet BST Adapter 6.6.2

The necessary cables and hoses to connect the SampleJet to the BST Adapter are already mounted on the SampleJet side.

Use the openings on the SampleJet Thread to lead through the cables and hoses. Otherwise the SampleJet Cover can't be closed correctly.

31. Layout the black cable loom under the SampleJet to the BST Adapter.
32. Connect the RJ45 plug to the BST Adapter.
33. Connect the round plug from the BSMS which leads usually to the BST upper part, to any free plug on the BST Adapter.
34. Join the 2x2 black/blue hoses together. Use the labels on it to figure out the allignement.

Figure 6.23. Cables and Hoses on the BST Adapter

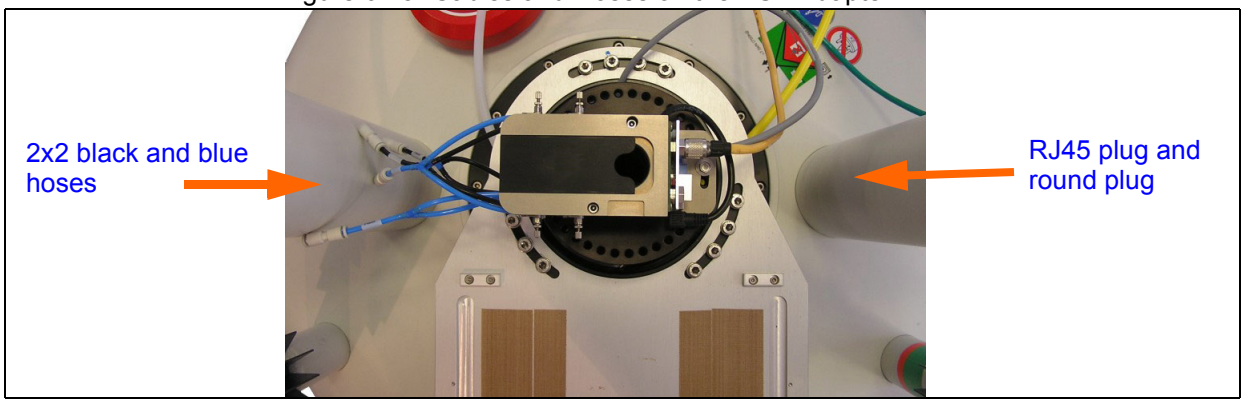
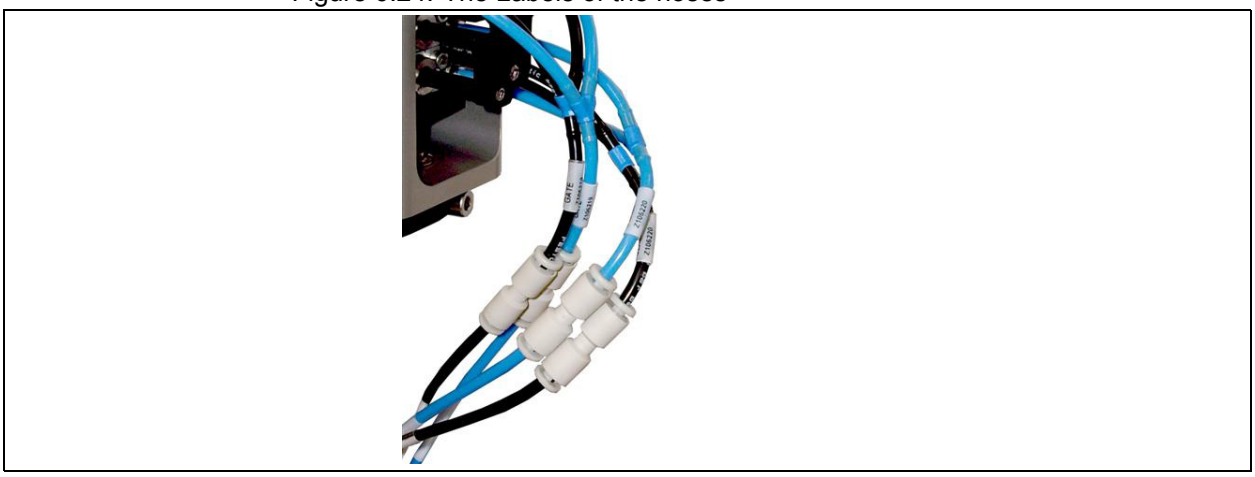
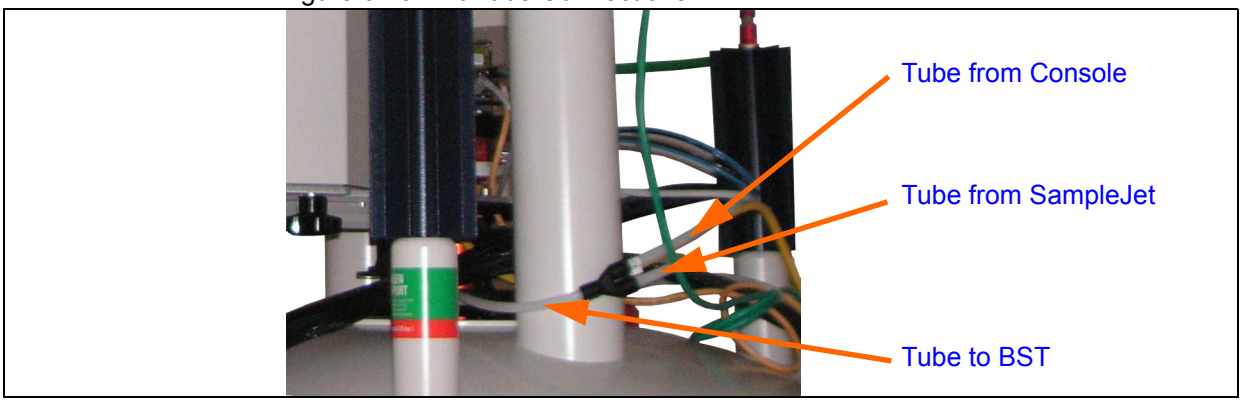


Figure 6.24. The Labels of the hoses



35. Connect the air tubes to the BST. Insert a **Y** or **T** legris to the white air tube for lift function. Put the tubes to BST from underneath through the opening and connect them.

Figure 6.25. Lift Tube Connections

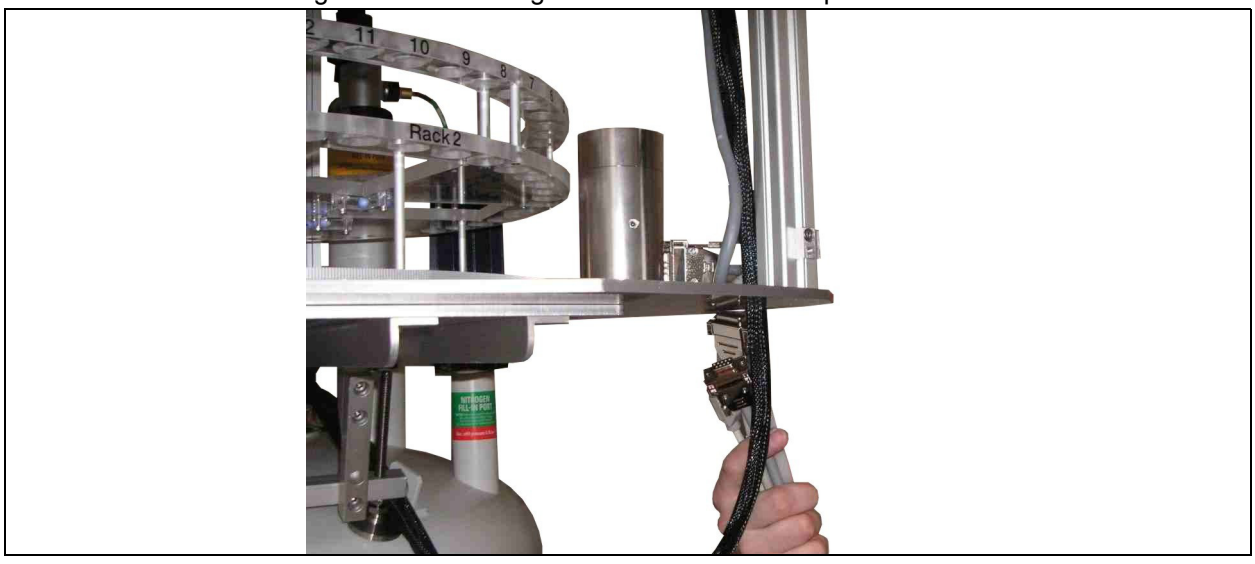


Connecting the SampleJet to the Console 6.6.3

The necessary cables and hoses to connect the SampleJet to the Console are part of the SampleJet Basic Kit.

36. Open the back cover of the Spectrometer Console.
37. Install the Ethernet Switch if no switch is already installed.
38. Lay out the long, black cable loom from the magnet to the console, so it is parallel to other cables going on top of the magnet. Use the side where the hoses and cables have the same length to direct to the magnet.
39. Insert the cable into the opening in front of the SampleJet.

Figure 6.26. Inserting the Cable into the SampleJet



40. Connect the plugs into the corresponding connectors on the SampleJet Control Unit.

Please read the labels on the SampleJet Control Unit carefully, because some plugs fit into several connectors.

41. Use cable ties to attach the cable loom to the magnet and inside the SampleJet.
42. Insert the lacing cord cable into the console similar to the BSMS cable.
43. Connect the ETH_HOST plug into any port on the ethernet switch.
44. Place the SampleJet Power Supply inside the console if there is some free space. The power switch on the back side should be accessible.
45. Connect the power and screw the grounding wire to the chassis.

Figure 6.27. The Power Supply

46. Connect the TTY_SPECT cable to any free connector on the tty panel of the AQS rack or on the IPSO.
47. Connect the GAS_IN hose to the console using a **Y** or **T** legris. The SampleJet needs at least 5.5 bar, so it has to be connected before the pressure reduction unit in the console.
48. Close the back cover of the console.

Install the SampleJet Cover 6.7

Don‘t use Loctite for the cover it will damage the pyrex front.

49. Attach the side covers.
    --> Angled allen key 2.5

50. Put the top cover onto the 4 posts.

51. The opening of the door can be changed if the lab setup requires this. The switch needs also to be modified and relocated when doing this.
    --> Angled allen key 2.5
    --> Crosstip screwdriver 2

Figure 6.28. Changing the Orientation of the Door

52. Hook in the rear cover over the back of the SampleJet by the centre of the magnet.

Carousel 99/5 Installation

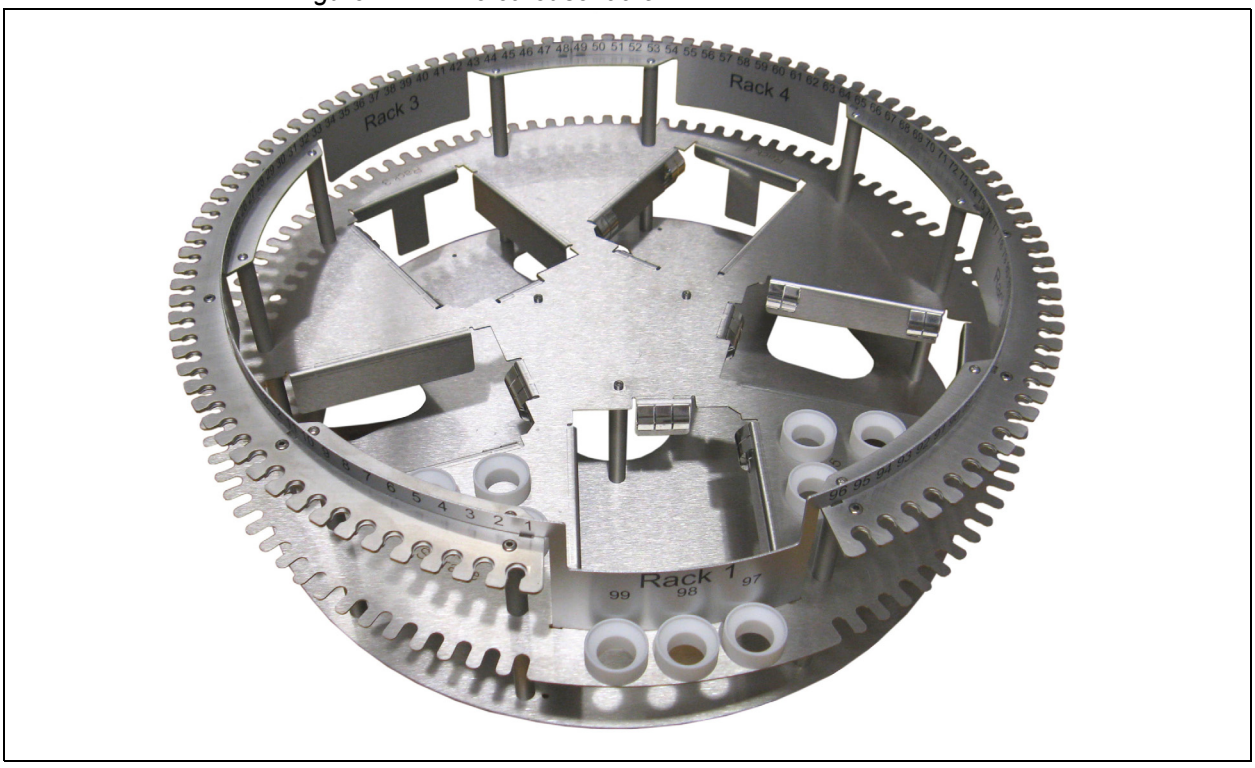
7

Introduction 7.1

This chapter describes how to install the Carousel 99/5 on a SampleJet equipped with an other carousel.

For additional information about the Carousel 99/5 refer to the SampleJet Users Manual (included in the SampleJet firmware).

Figure 7.1. The carousel 99/5



Important Remarks 7.2

The new hardware needs to be set on the web interface and calibrated before it can be used. If you are operating or calibrating the system with a different hardware in the „System Configuration“ the gripper may be destroyed during calibration.

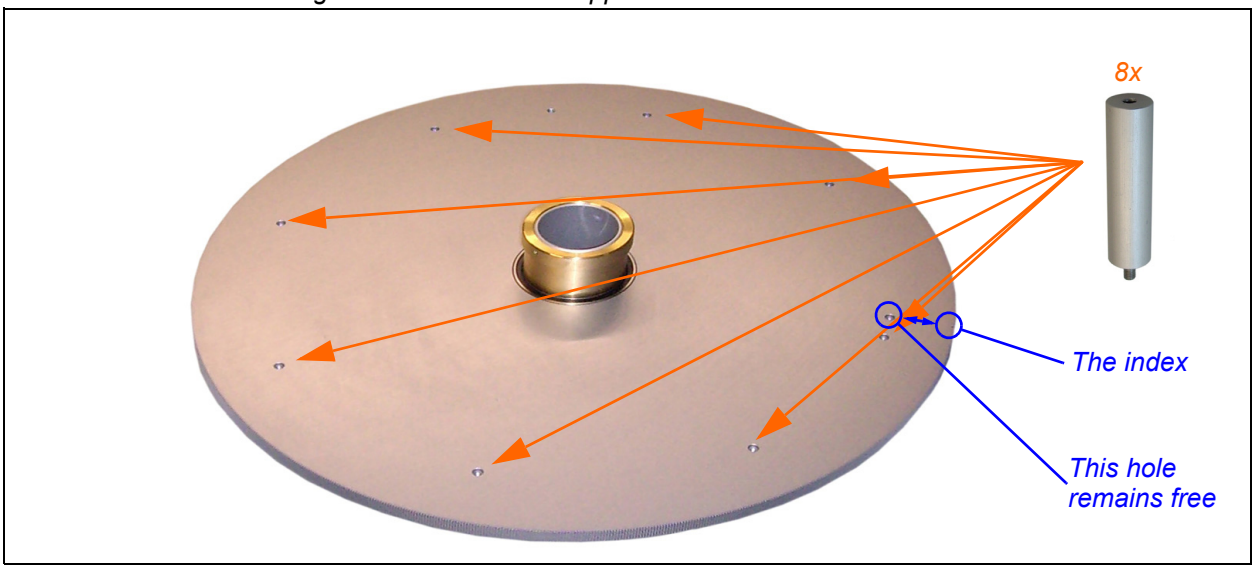
Before operating the SampleJet make sure the installed carousel is set in the „System Configuration“ list and calibrated with a firmware version 7 or newer.

Remove an Existing Carousel and the Cover 7.3

1. First remove the cover on the right side.
   --> Allen key 2.5
2. Then remove the existing carousel. Be very carefully with the aluminium spacer, the screws are thin and may break.
   --> Allen key 2.5 and flat spanner 5 (do not try to remove it with a pliers!)

3. Place the 8 supports on the rotating table.
   --> No tool needed

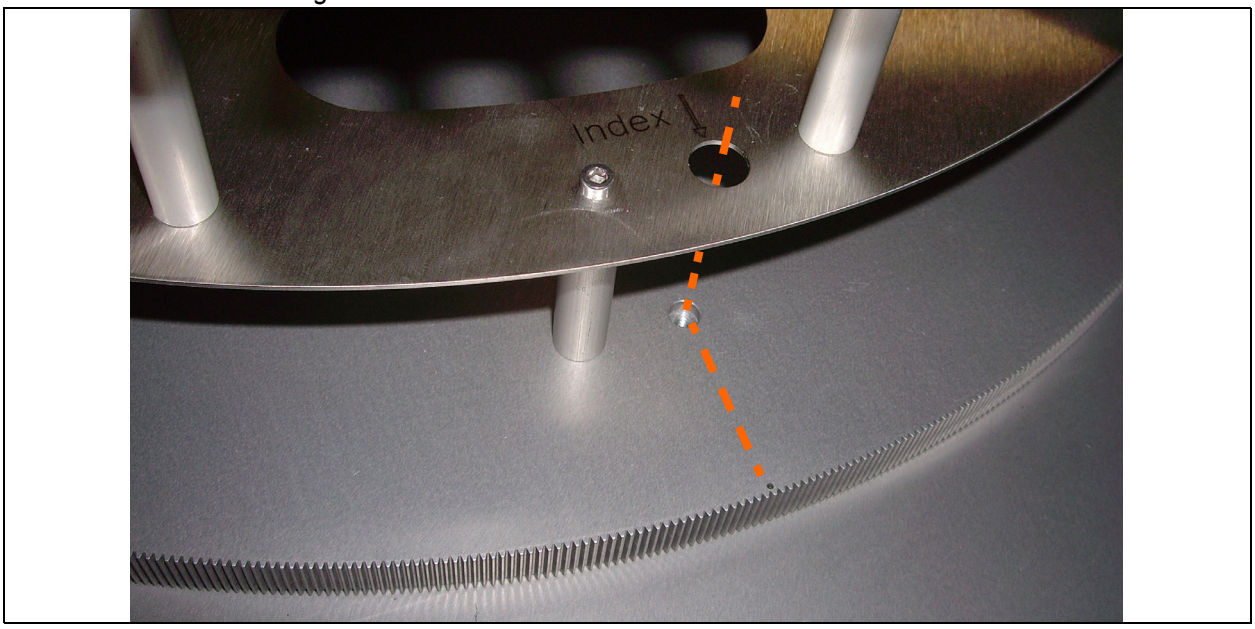
Figure 7.2. Place the supports



4. Place the carousel on the supports and turn it until the „index“ arrow is pointing to the index of the rotating table.

5. Screw the carousel to the supports.
   --> Allen key 2.5

Figure 7.3. The Orientation of the Carousel



Cooling Installation (Option) 8

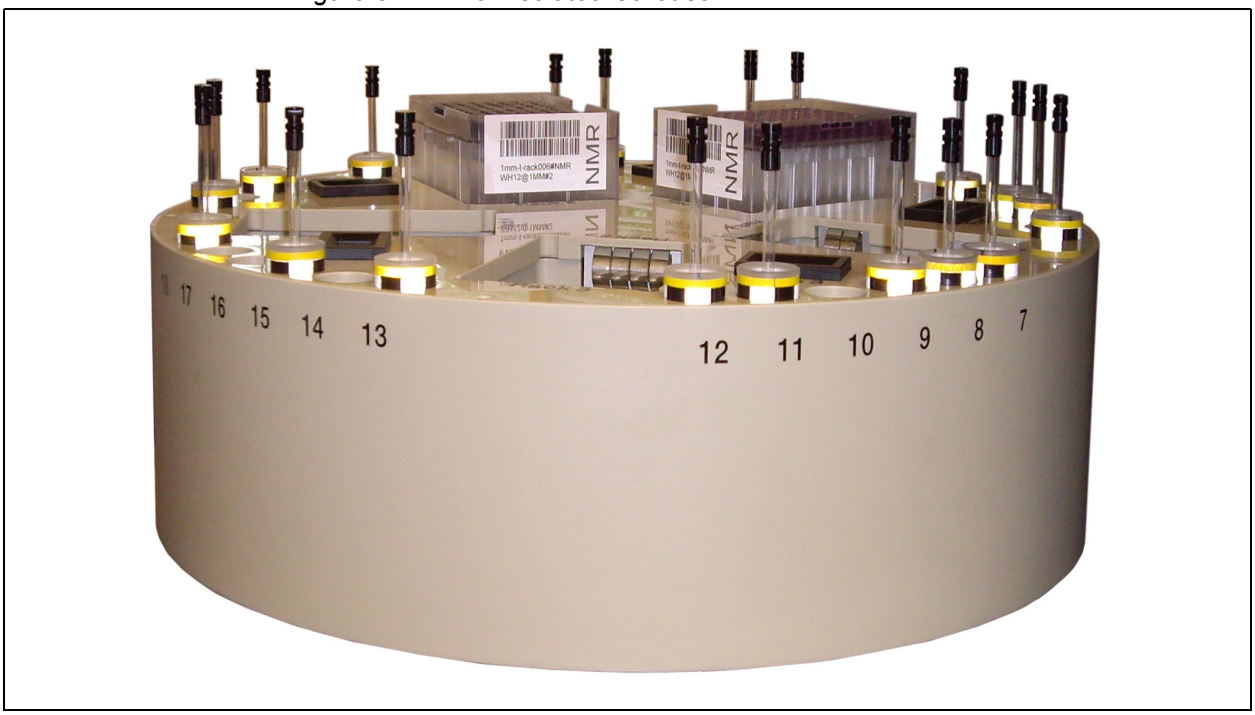
Introduction 8.1

SampleJet delivered with a cooling option are always coming in their standard configuration. This means that the standard carousel 99/5 is installed and needs to be replaced with the cooled carousel. Installing the cooling option is therefore always an upgrade of a current system.

The cooling option consists of an insolated carousel replacing the existing carousel, a kit to connect the cooler and preheating unit. The cooling option requires its own BCU I cooler.

For additional information about the cooling and the pre-heating refer to the SampleJet Users Manual (included in the SampleJet firmware).

Figure 8.1. The Insolated Carousel



Important Remarks *8.2*

Connect the cooling to compressed air when ever possible.
If the cooling is connected to nitrogen the concentration of oxygen in the air may drop to a critical value and the room needs a proper ventilation and an alarm system indicating low oxygen concentration.

Make sure that the dew point of the supplied cooling gas is according to the specification of the cooler. If this is not the case install a gas dryer to achieve requirements. Otherwise the cooling may get clogged by ice.

Never operate a cooled SampleJet without a SampleJet preheating unit.
Cooled tubes may get wet from the ambient humidity and can bring water into the probe head. This may destroy the probe or disturb the NMR measurement.

Before operating the cooling make sure the carousel cooled and the preheating unit are in the „System Configuration“ list and both calibrated with a firmware version 7 or newer. If not, the gripper may be destroyed during operation or calibration.

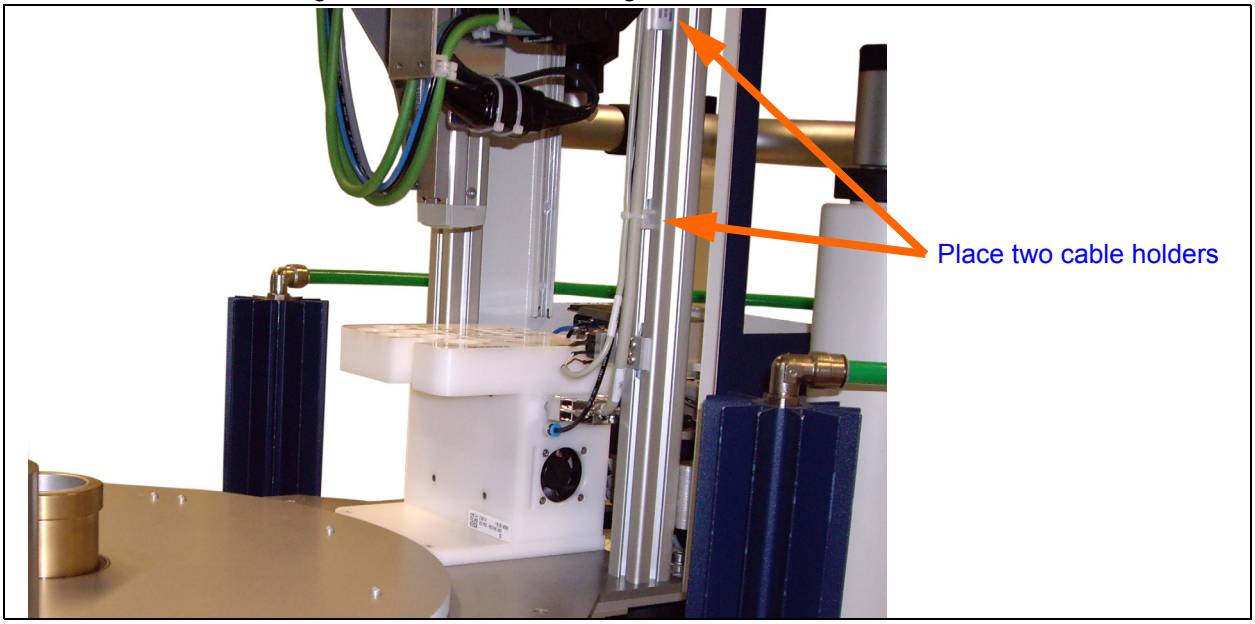
Remove Cover and Existing Carousel *8.3*

6. Remove the cover on the left and right side.
   --> Allen key 2.5
7. Then remove the existing carousel. Be careful with aluminium spacer, the screws are thin and may break.
   --> Allen key 2.5

Installing the Pre-Heating *8.4*

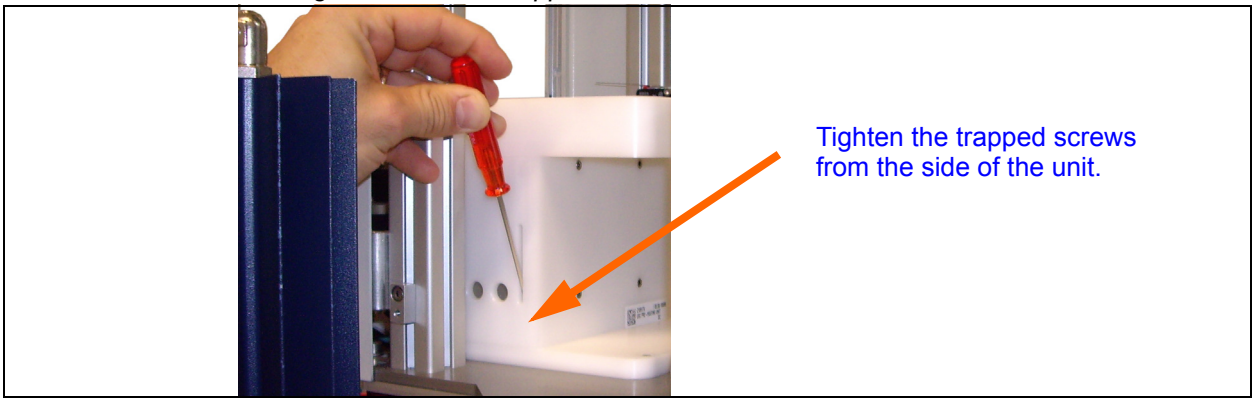
8. If not present (from the rear door switch option) put two holders on the rear right leg of the aluminium frame.
   --> Allen key 2.5

Figure 8.2. The Pre-Heating Unit



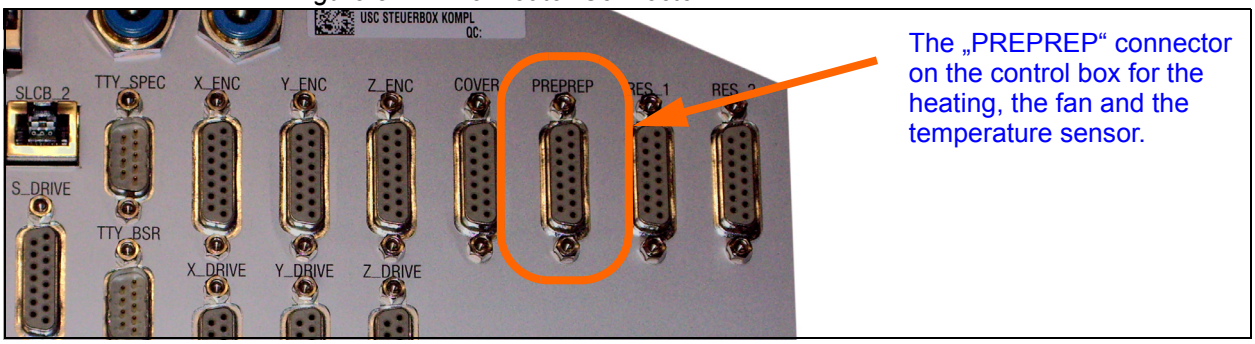
9. Screw the pre-heating unit to the base plate. 2 of the 4 screws are trapped inside the unit and can only been tighten with a ball head allen key. This tool can be found in the SampleJet tool kit.
   --> 2.5 ball head allen key

Figure 8.3. The Trapped Screws.



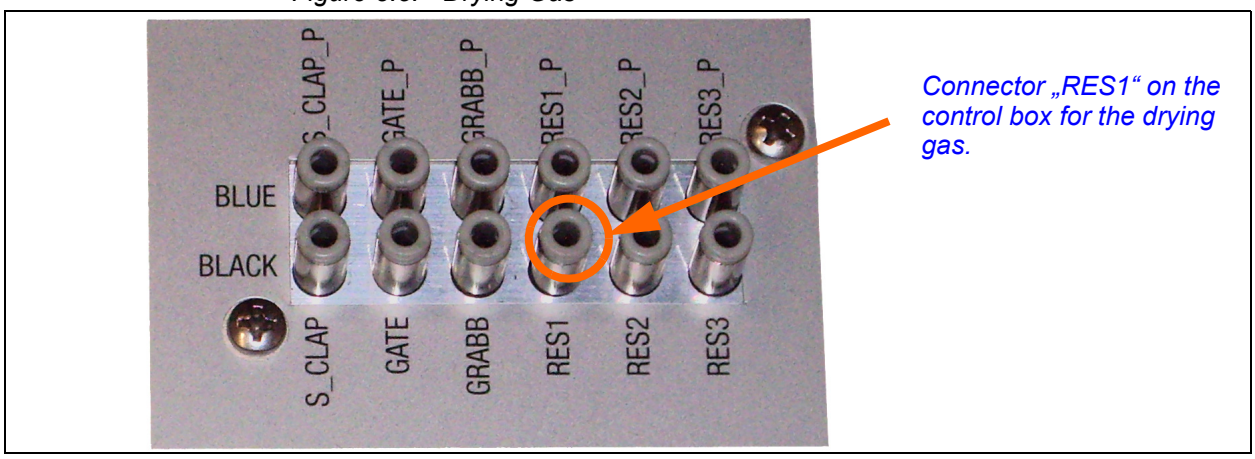
10. Connect the cable from the control box to the pre-heater unit.

Figure 8.4. Pre-Heater Connector



11. Connect the drying gas hose from the control box to the pre-heater.

Figure 8.5. Drying Gas



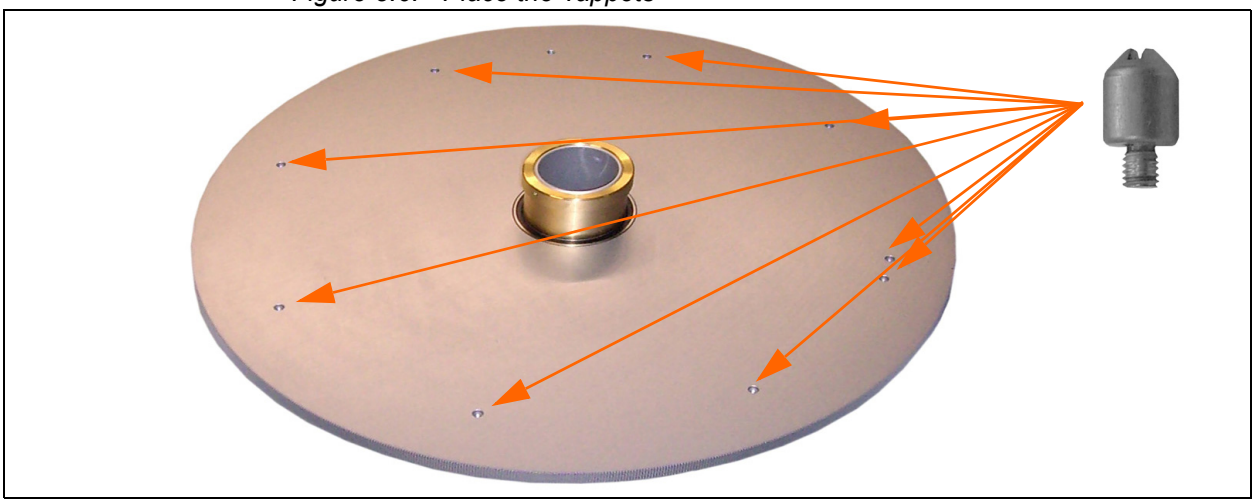
12. Fix the cables with some cable ties on the holders.

Make sure the hose and the cable are not moved the energy chain when it is moving.

Installation of the insolated Carousel 8.5

13. Place the 9 tappets on the rotating table.
    --> Screwdriver 2

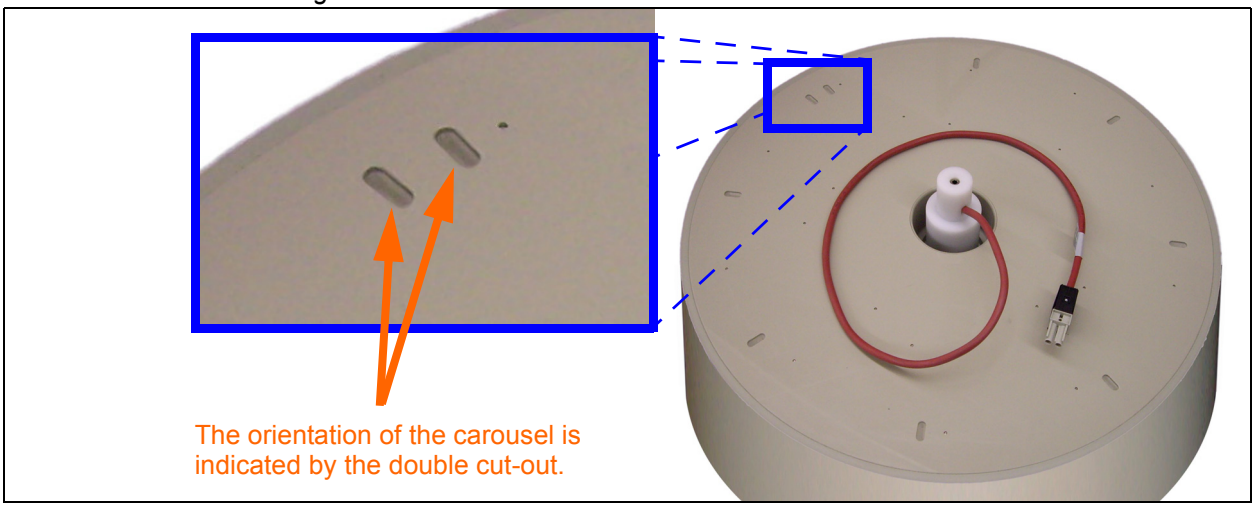
Figure 8.6. Place the Tappets



14. Feed the cable through the hole in the center and place the carousel on the table. Take care of the proper orientation. The carousel will not be screwed to the SampleJet.

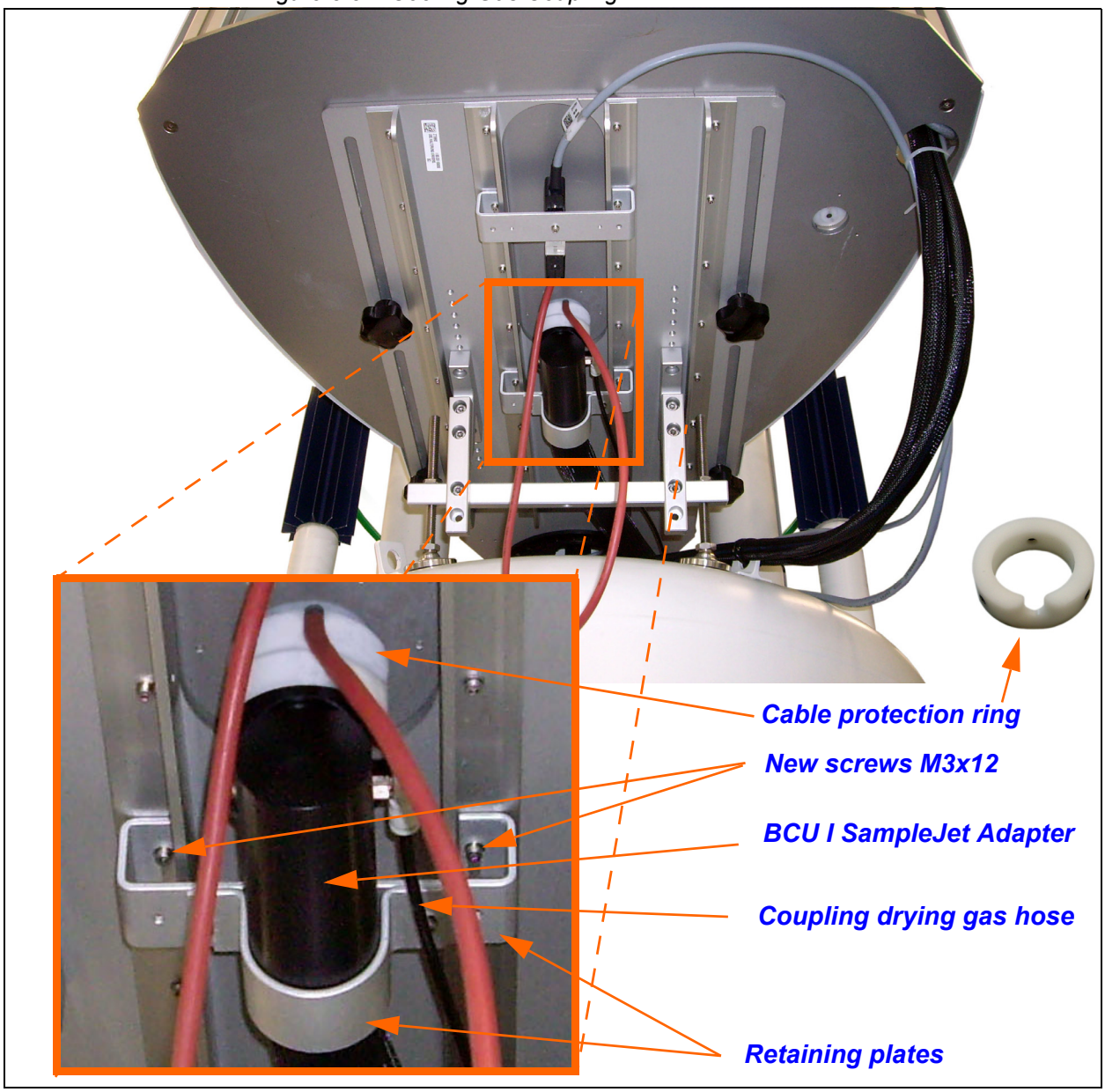
Pay attention to the red power cable when placing the carousel inside the SampleJet. If the cable is getting jammed between the carousel and the SampleJet, the cable may be damaged by the weight of the carousel.

Figure 8.7. Bottom View of the Carousel



Connect the BCU I SampleJet Adapter *8.6*

Figure 8.8. Cooling Gas Coupling



15. Put the cable protection ring in place by slightly adjusting on of the 3 headless screws.
    --> Allen key 2.5
16. Mount the BCU I adapter SampleJet with the two retaining plates to the SampleJet. The slots for the screws on the retaining plates should point to the magnet center. Replace the existing screws with the longer ones.
    --> Allen key 2.5

Figure 8.9. The BCU I SampleJet Adapter

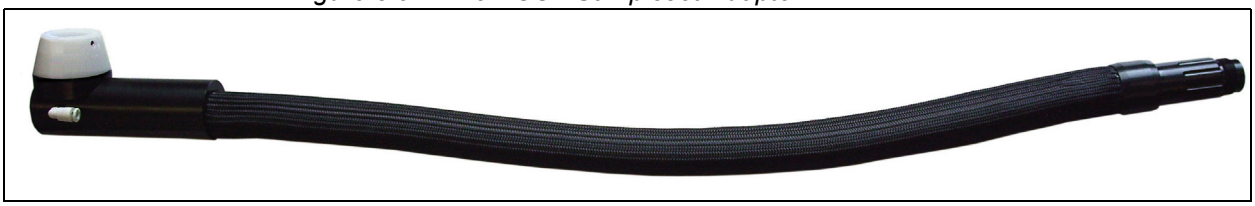
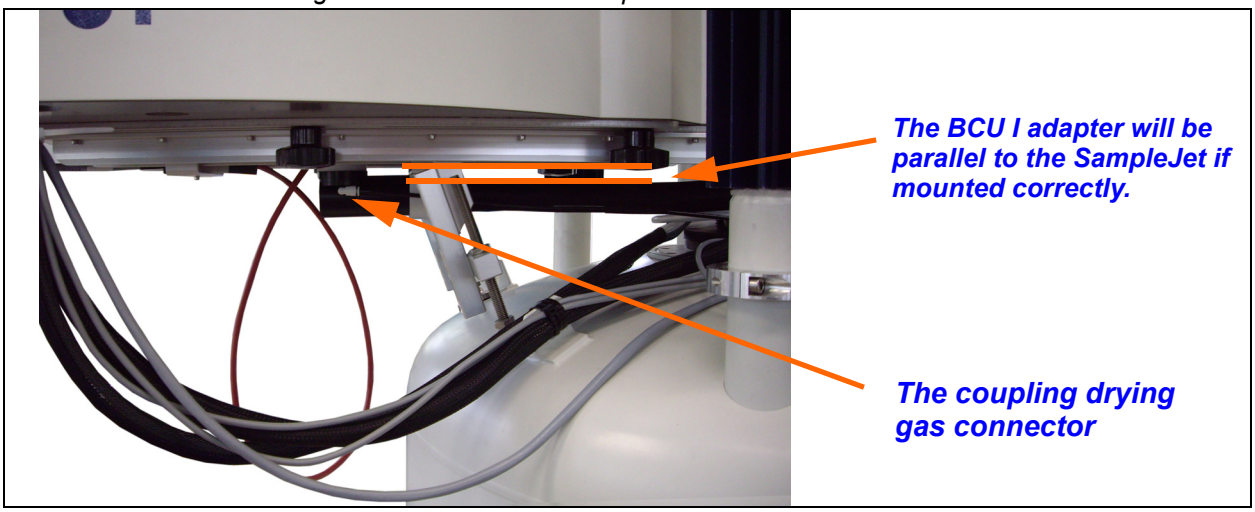
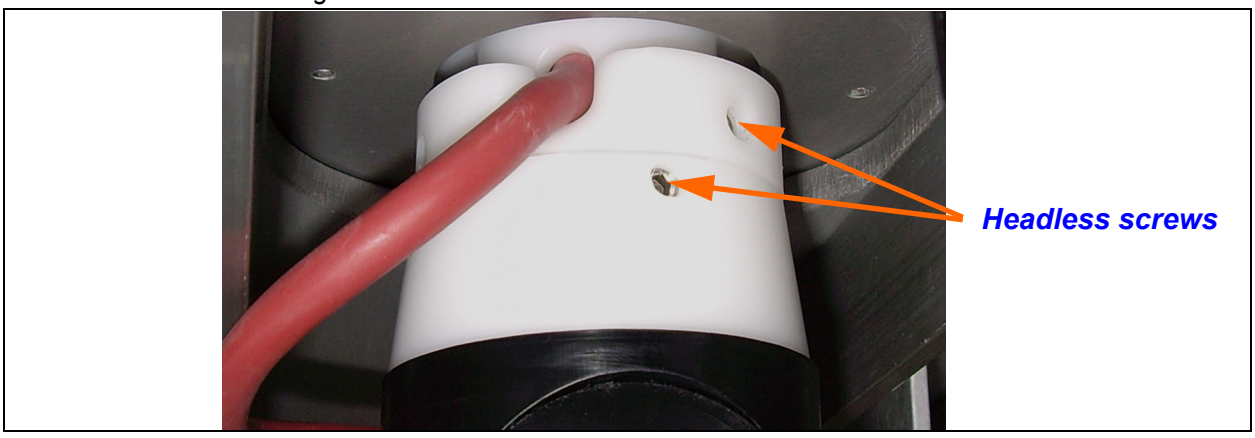


Figure 8.10. The BCU I Adapter Mounted



17. The BCU I adapter is parallel to the bottom plate of the SampleJet if the coupling is inserted entirely.

Figure 8.11. Headless Screws



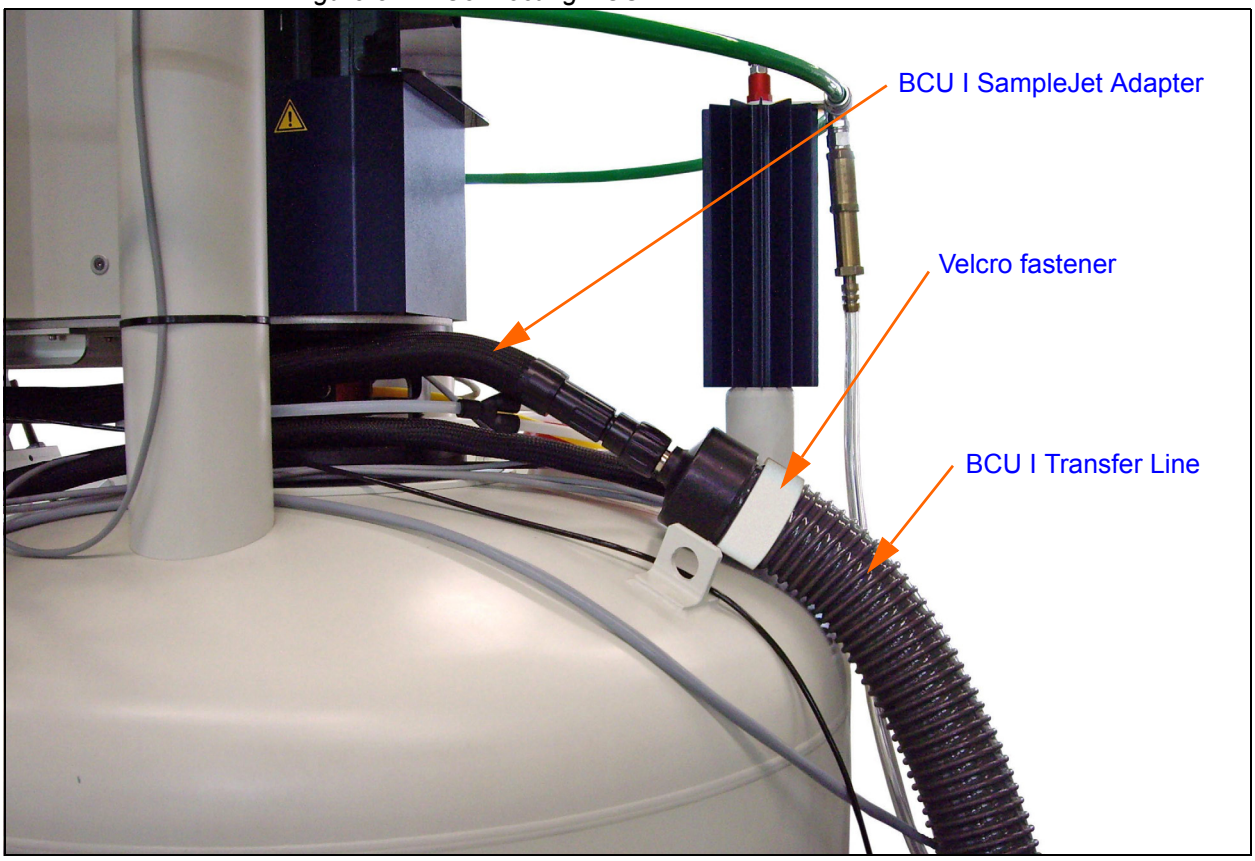
18. Smoothly tighten the 3 headless screws of the cable protection ring and the 3 headless screws of the coupling.
    --> Allen key 2.5

Do not tighten the headless screws of the coupling too much. The coupler will be deformed and can leak.

Installing the BCU I -40/50 *8.6.1*

19. Remove the transport securing screws underneath the BCU I.
20. Situate the BCU I and connect the transfer line to the BCU I SampleJet Adapter.
21. Secure the transfer line with the Velcro fastener and some cable ties on the magnet as shown . Make sure that the transfer line is not pulling on the adapter and do not cover any drop of plates.
    --> Velcro fastener and cable ties

Figure 8.12. Connecting BCU I

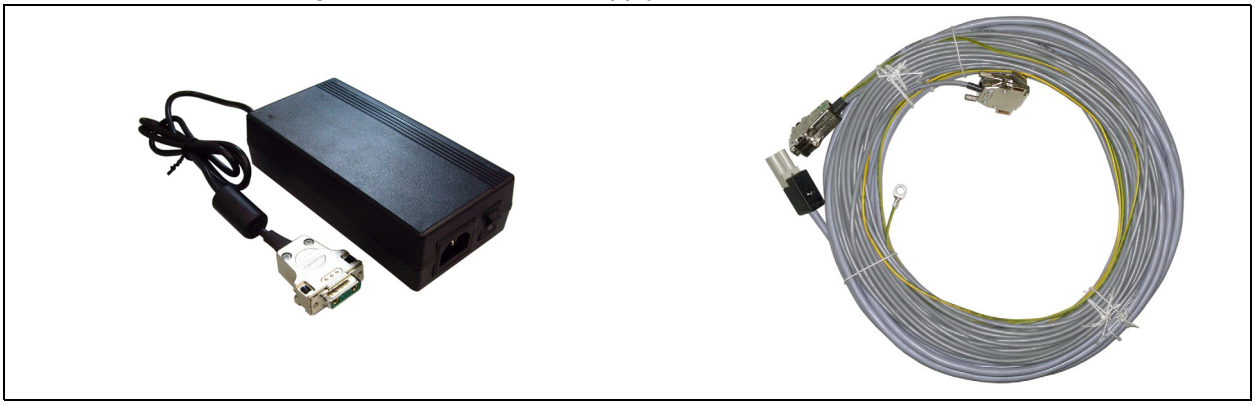


The Power Supply for the Carousel 8.7

The power supply is powering the temperature control in the carousel by heating the rack slots to a constant low temperature. The power supply is connected also to the BCU I to remotely switch the cooler on and off together with those heaters inside the carousel.

The power supply cable on the carousel is protected by the firmware from being wrapped around the gas coupling. If the firmware should fail the connector will be pulled out and protects the cable.

Figure 8.13. The Power Supply and Cables

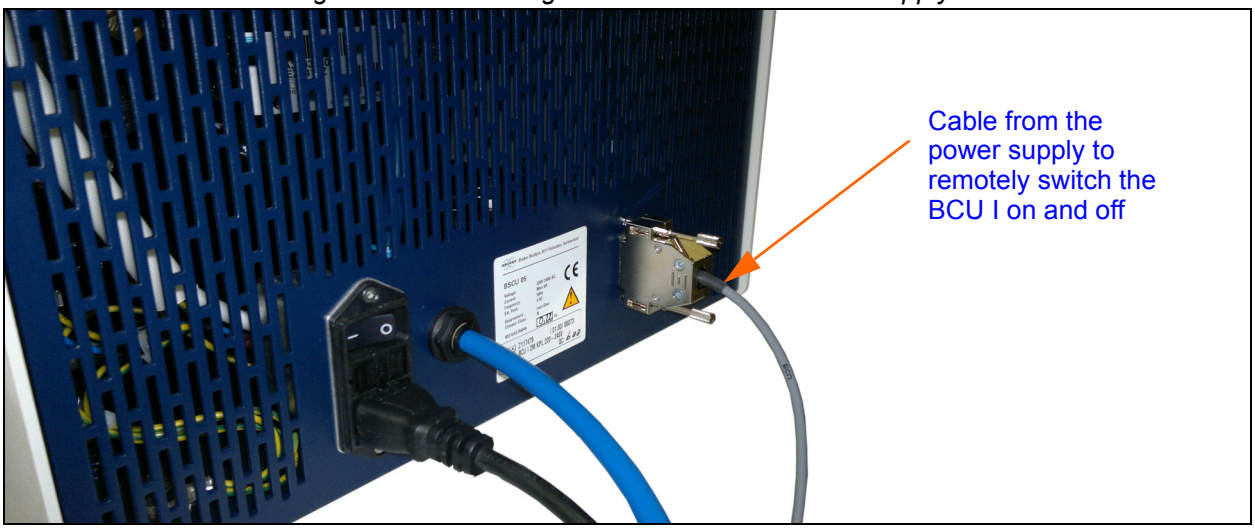


22. Place the power supply into or on the console next to the SampleJet power supply. (Make sure the customer can distinguish the two power supplies)
23. Connet the cable to the power supply and the ground cable to the grounding point on the console.
24. Connect the mains cable to the power supply. It can be plugged in on an outlet on the console if available or directly on the wall.

The Remote Control Connection 8.7.1

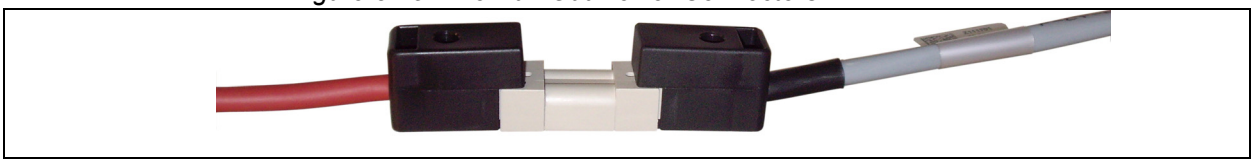
25. Connet the remote control cable on the BCU I.

Figure 8.14. Switching the BCU I with the Power Supply



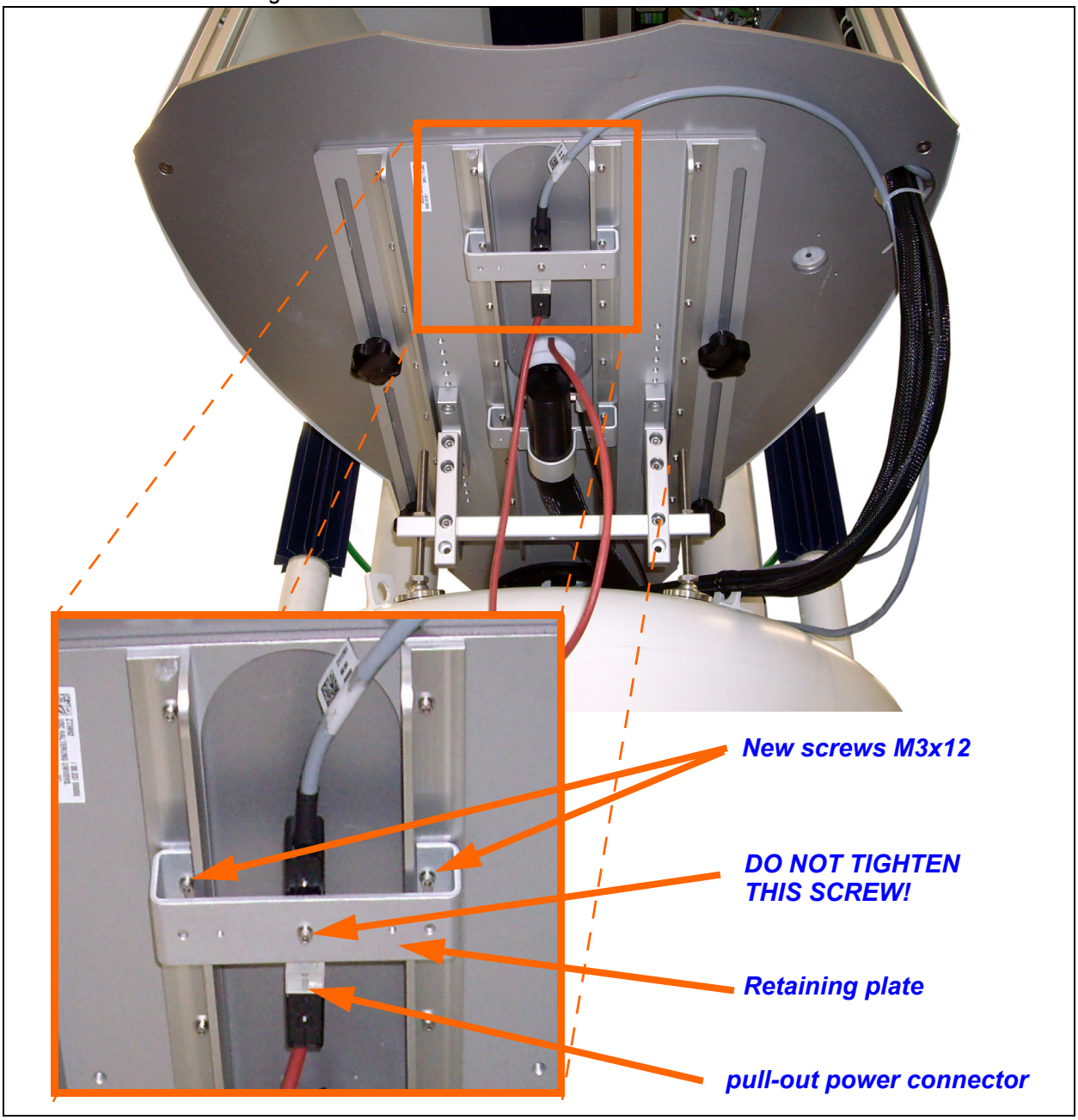
The Power Connector *8.7.2*

Figure 8.15. The Pull-Out Power Connectors



26. Install the power cable from the console to the carousel and connect the power connector.

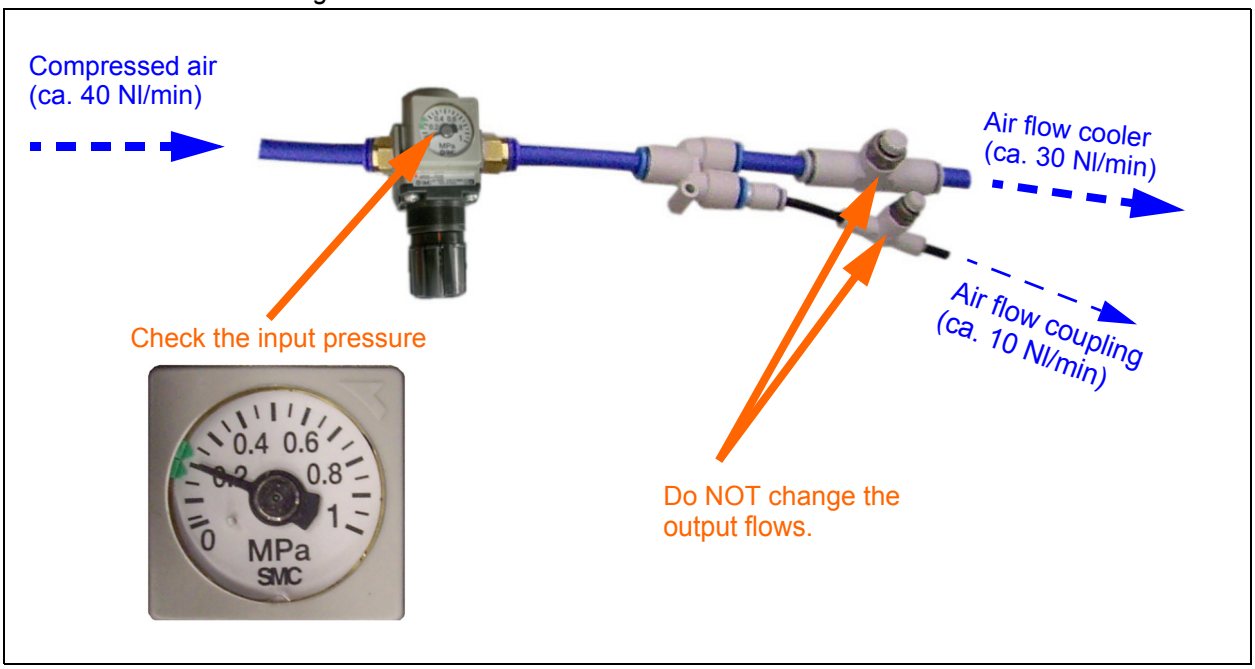
Figure 8.16. Power Connector for the Carousel



27. Mount the connector loosely on the retaining plate. The connectors need to swing to both sides.
    --> Allen key 2.5
28. Mount the retaining plate underneath the SampleJet. The slots for the screws on the retaining plates should point to the magnet center. Replace the existing screws with the longer ones.
    --> Allen key 2.5

Gas Supply *8.8*

Figure 8.17. Gas Flow Reduction



29. Connect the cooler and the coupling to their gas flow reductions and supply system with compressed air.
30. Check if the input pressure is set to 2 Bar (0.2 MPa).

Power Up and Check the Function *8.9*

The new carousel needs to be indicated to the SampleJet and calibrated before doing any tube transportation. This is described in the SampleJet „Users manual“.

31. Switch on the BCU I with the mains switch on the back of the cooler.
32. Switch the BCU I to position „Remote“.
33. Power up the power supply and check if the displays on the Carousel 30 / 5 Cooled are showing room temperature. The BCU I should start simultaneous with the power supply.

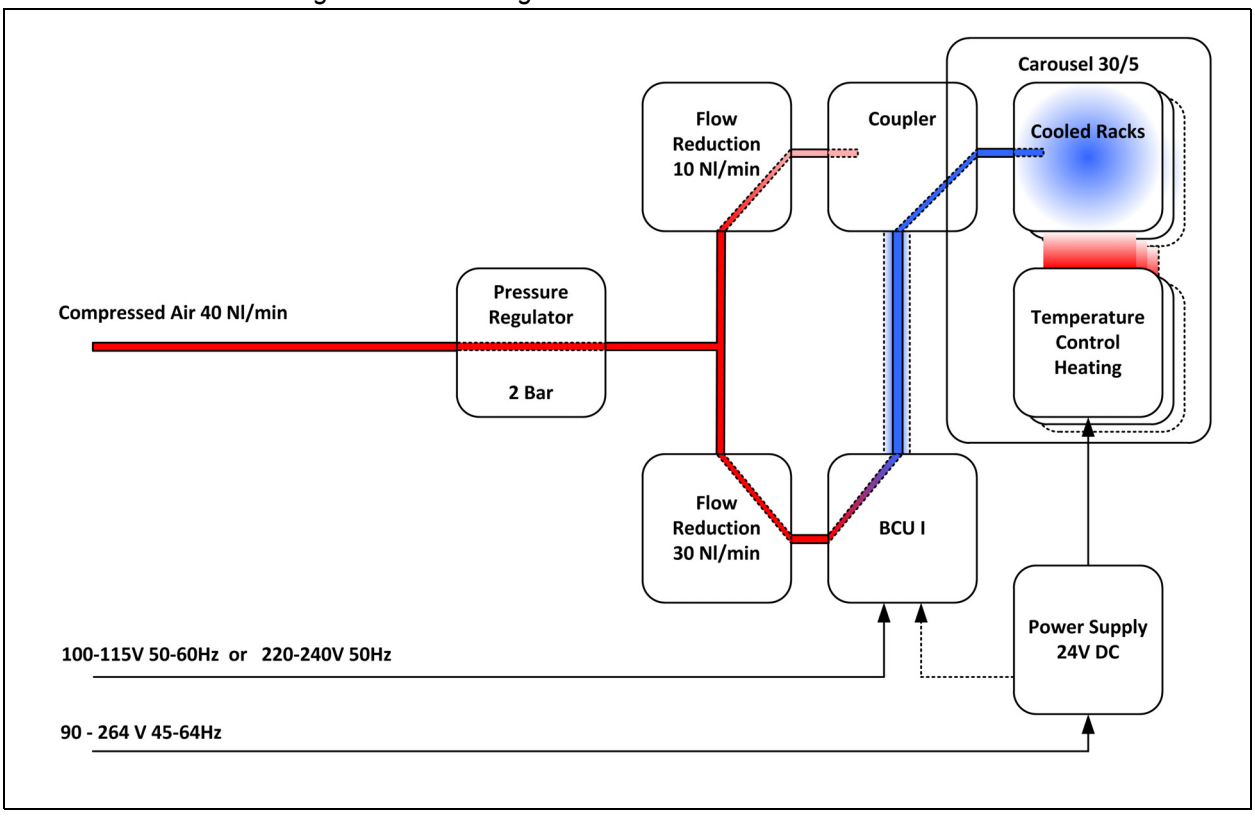
Figure 8.18. The BCU I Switched to Remote

34. After approximately one hour the temperatures of all the 5 rack slots in the carousel should show the same stable temperature.

The temperature and their limitations are indicated in the SampleJet „Users manual“.

Cooling Overview *8.10*

Figure 8.19. Cooling Overview



Cooling Installation (Option)

User Training 9

Introduction 9.1

After the installation of the SampleJet the customer has to learn some basic knowledge about the SampleJet. All these important things and the often used procedures are listed below.

Procedures to be done by the customer are all described in the SampleJet „User Manual“. In this chapter you will find only references to the „User Manual“.

Basic Operations 9.2

The user has to be informed about the basic operations:

- How to start the web interface and log in.
- How to access the menu on the display on the SampleJet.
- How to handle an error.
- The function of the emergency button (it just switches the drives off, the power is still on!).
- The „busy“, „idle“ and „error“ state of the SampleJet.
- How to change between the modes „manual“, „openshop“ and „rack“
- Knowing the function of the shuttles, special spinners and the tube caps.
- How to insert racks and openshop samples.
- How to run the SampleJet from Topspin and IconNMR.

Don‘t do... 9.3

The following points are important.

- Never interrupt a „busy“ state.
- Never apply any forces to the drives.

Basic Service *9.4*

These basics can be done by the customer.

- Calibrating the device.
- Replacing a gripper.
- Cleaning the SampleJet.
- Storing the system data and the log files.
- Loading new Firmware.

After Sales Service *9.5*

Inform the customer about how to get help and information.

1. Contact information of the local Bruker Biospin representative.
2. If this will not solve the problem refer to the „Contact“ chapter in every SampleJet manual.

Acceptance Test 10

Introduction 10.1

This chapter describes the tests which are done at the customer site at the end of the installation. The test shows the customer the proper function of the SampleJet.

- Web interface
- Spinner Mode / Topspin or XwinNMR
- Shuttle Mode / IconNMR
- Emergency stop
- Automated change of operating modes
- Code reading (if a camera is installed)
- Pre-heating (if a pre-heating unit is installed)
- Remote control (if a remote control is installed)
- Light and door switches (installed on every newer system)

Web interface 10.2

Try to access the SampleJet web interface with a browser.

Spinner Mode / Topspin or XwinNMR 10.3

Use „SX“ command from Topspin or XwinNMR to insert a tube from the openshop ring. Then remove the tube with the „sx ej“ command.

Shuttle Mode / IconNMR 10.4

Set up jobs in IconNMR for tubes without a spinner. Take holder numbers higher than 120 and make sure you see at least one complete sample change cycle.

Emergency Stop 10.5

Test the emergency stop by typing in a „sx“ command in Topspin and stop the action by hitting the emergency stop. Restart the application by releasing the emergency button and do an error recovery to bring the system in the idle state again.

Automated change of operating modes *10.6*

Perform a automated change from the „spinner“ mode to one of the „shuttle“ modes and back to the „spinner“ mode.

Code reading *10.6.1*

Read at least one matrix code from a cap or shuttle. If the customer works with bar codes, then read a bar code in addition.

Pre-heating *10.7*

The pre-heating dries the cold and therefore fogged sample tubes. Check if the drying gas flows by putting some short tubes in the heater and switch the heater on. The tubes are moving a little bit when there is a gas flow.
Then check if a chosen target temperature can be reached.

Remote Control *10.7.1*

Try to rotate the storage in both directions.

Light and Door Switches *10.7.2*

Both switches, front and back door, have to be tested. If you open a door, the light should turn on.

Equipment Clearance 11

Information Regarding Service 11.1

After the complete NMR system has been installed and hand over to the customer it is potentially contaminated. This has to be considered whenever Bruker employees are working on NMR systems after the initial installation. Here some examples:

- Service (planed or unplanned)
- Repair (customer or factory site)
- Disposal
- Transfer
- Upgrade (NMR system or its sub components)
- Exchange (egg. loan return)

It is strongly recommended to all Bruker employees to get an equipment clearance through the form ***"Safety and Repair Declaration" on page 60***for work at the customer site. For any hardware leaving the customer this form must be used and attached to the delivery notes on the package exterior.

The customer has to accept and sign a photocopy of the "Safety and Repair Declaration" form on page 60 or a newer version of the Bruker form ZFQS0083, before any service work can be carried out on the SampleJet.

Safety and Repair Declaration [1] *11.2*

Equipment Clearance Form for Service, Repair, Disposal or Transfer:

Use this form, whenever a probe or another unit situated in a magnet room or an analytical instrument might be exposed to hazardous substances by customers, when it is to be returned to Bruker.

Whenever a customer returns a system or its components to Bruker, e.g. for repair, upgrade, loan returns, exchange, etc., the customer accepts the following obligation:

It is the explicit responsibility of the customer to make sure that the returned products are absolutely free of any hazardous substances. In case of omission to do so, Bruker will hold the customer liable for any resulting injuries and/or damages, caused to employees of Bruker and/or to other persons exposed to the hazardous substances. The customer is further liable for all damage caused to Bruker, e.g. decontamination, security measures, etc. The customer is finally liable for all other direct and/or indirect damages caused to Bruker by the hazardous substances.

❑ I ACCEPT THIS OBLIGATION

The repair declaration, completed and signed by the safety representative, has to be attached to the returned product. The declaration must be attached to the delivery note on the package exterior. Any returned product without a properly completed and duly signed declaration cannot be repaired. If we think that there is a risk of damage because of a contaminated returned product, we must dispose the hazardous material at the expense of the customer.
The safety & repair declaration form may be signed by a Bruker service engineer if the system was never operated by the customer (e.g. prior to completion of the installation).

The customer/signatory confirms that the returned product is absolutely free of any hazardous substances (e.g. toxic, corrosive, explosive, biologically dangerous or radioactive)..

PRODUCT PART NO:	SERIAL NO:
FAULT DESCRIPTION (reason for return):	
DATE FAILURE OCCURED:	SYSTEM ORDER NO. /DISPATCH NO:

COMPANY/INSTITUTE:	SIGNATURE:
NAME:	
MAILING ADDRESS:	.....
CITY/POSTAL CODE:	DATE:
COUNTRY:	.....
EMAIL:	

1 This form is a corrected copy of the original ZFQS0083 form, version 03

Bruker Biospin Contact 12

General Questions 12.1

Submit your inquiries regarding SampleJet sales and service to your local Bruker Biospin representative. Use the following address to acquire further information.

Contact for Sales Information 12.2

For further technical assistance, please do not hesitate to contact us directly at:

Bruker Biospin AG
SampleJet Info
Industriestrasse 26
8117 Fällanden
Switzerland

Phone:[+41] 44 825 98 80

E-mail: samplejet-info@bruker.ch

Contact for Additional Technical Assistance 12.3

For further technical assistance, please do not hesitate to contact us directly at:

Bruker Biospin AG
SampleJet Service
Industriestrasse 26
8117 Fällanden
Switzerland

Phone:[+41] 44 825 98 90

E-mail: samplejet-service@bruker.ch

FTP: ftp://ftp.bruker.ch/pub/NMR/download/SampleJet/

Bruker Biospin Contact

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