




SampleCase

Installation Guide

Version 01



This manual was written by

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1 Introduction

1.1 General Description

The SampleCase is an easy to use sample changer for standard NMR applications. No leader/stairs climbing for tube submission is necessary anymore since users can operate the system very convenient from floor level.



1.2 SampleCase Benefits

- 24 holders for various type of NMR tubes
- Very easy handling
- System operation from floor level
- Full integration in Topspin / IconNMR
- One button sample submission
- Fits all shielded Bruker standard bore magnets from 300 – 900 MHz (contact Bruker for installation specifications on other magnets)



Figure 1.1: The carousel with the 24 holders

1.3 SampleCase Overview

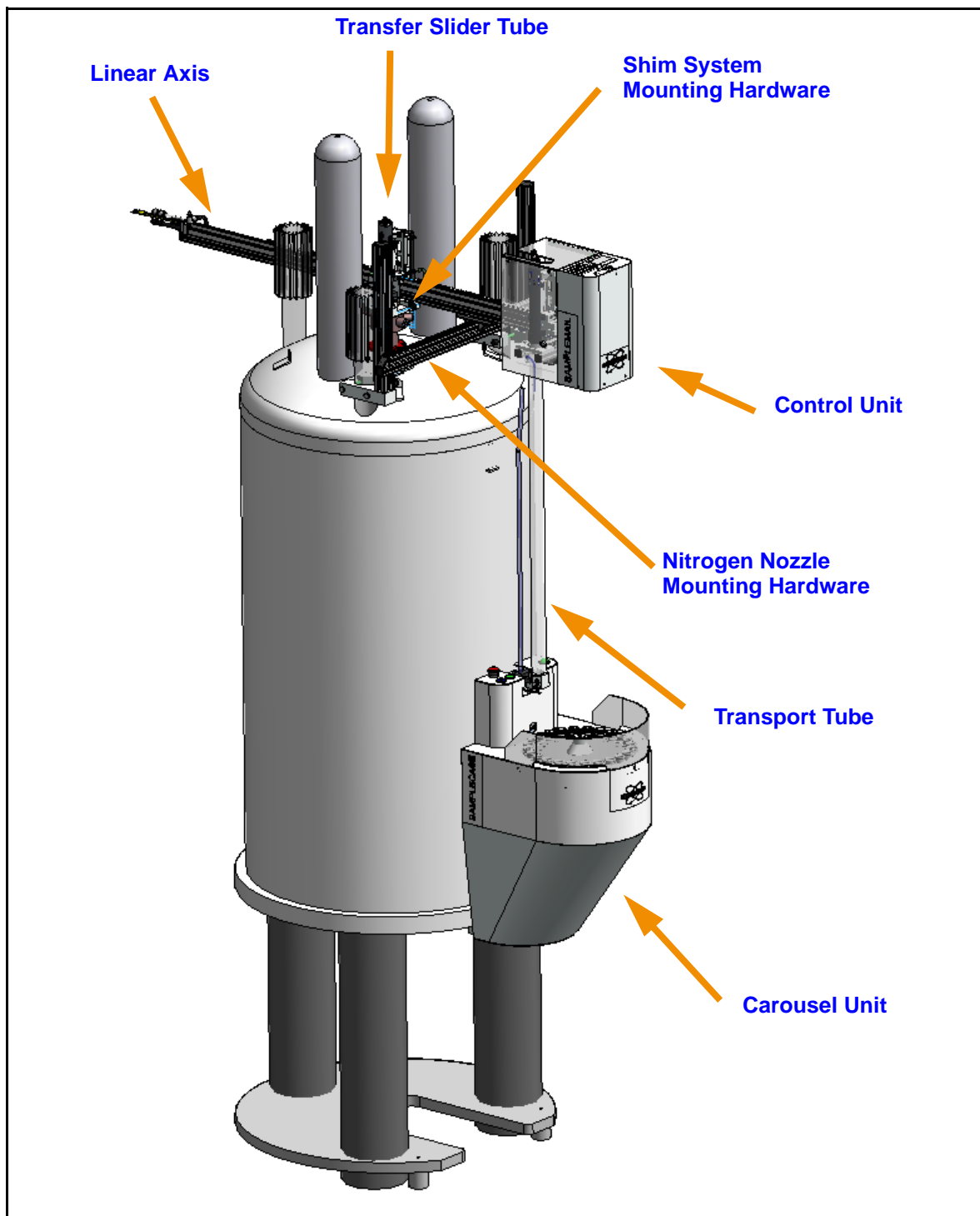


Figure 1.2: The SampleCase mounted on a magnet

2 About

2.1 This Manual

This manual is intended to be a reference guide for service technicians. It provides detailed information about the user level maintenance and service and overall use of the Bruker device.

The figures shown in this manual are designed to be general and informative and may not represent the specific Bruker model, component or software/firmware version you are working with. Options and accessories may or may not be illustrated in each figure.

This manual describes parts and procedures relevant to the device version it is delivered with. For older hardware, please refer to the manual supplied at the time.

2.2 Policy Statement

It is the policy of Bruker to improve products as new techniques and components become available. Bruker reserves the right to change specifications at any time.

Every effort has been made to avoid errors in text and figure presentation in this publication. In order to produce useful and appropriate documentation, we welcome your comments on this publication. Support engineers are advised to regularly check with Bruker for updated information.

Bruker is committed to providing customers with inventive, high quality products and services that are environmentally sound.

2.3 Disclaimer of Liability

- 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 SampleCase should operate it.
- Read this manual before operating the unit. Pay particular attention to any safety related information.

NOTICE

Disclaimer

Bruker is not responsible or liable for any injury or damage that occurs as a consequence of none-approved manipulations on the SampleCase.

- ▶ Read the manual carefully before working on/with the SampleCase.

2.4 Symbols and Conventions

Safety instructions in this manual are marked with symbols. The safety instructions are introduced using indicative words which express the extent of the hazard.

In order to avoid accidents, personal injury or damage to property, always observe safety instructions and proceed with care. See an index of the safety instructions in the chapter "[Warning Signs](#)" on page III in the appendix.



DANGER

This combination of symbol and signal word indicates an immediately hazardous situation which could result in death or serious injury unless avoided.



WARNING

This combination of symbol and signal word indicates a potentially hazardous situation which could result in death or serious injury unless avoided.



CAUTION

This combination of symbol and signal word indicates a possibly hazardous situation which could result in minor or slight injury unless avoided.

NOTICE

This combination of symbol and signal word indicates a possibly hazardous situation which could result in damage to property or the environment unless avoided.



This symbol highlights useful tips and recommendations as well as information designed to ensure efficient and smooth operation.

2.5 Safety Symbols on the Device

All safety symbols on the device are described in the "[Safety Symbols](#)" on page 53.

3 Mounting

3.1 About the Installation

If you are not familiar with the general SampleCase system please read first the Sample-Case Users Manual (see [appendix E "References"](#)). There you will find also the software configuration that needs to be done after the installation.

The axes are pre-adjusted from the factory to a certain magnet type. The adjustment may be void, if the system needs to be installed on a magnet unlike the one on the order. For these cases refer to the chapter "[Presettings](#)" on [page 37](#) before doing the installation.

In any case the "[Hardware Adjustment Magnet Side](#)" on [page 42](#) and the "[Hardware Adjustment User Side](#)" on [page 43](#) needs to be checked after the installation

Check the following table for the correct installation sequence:.

Step	Action	See...
(1)	Adjust track length if required (read above).	"Track Length" on page 38
2	Install the N2 mounting hardware	"N2 Mounting Hardware" on page 19
3	Install the axis	"Axis Installation" on page 22
4	Mount the carousel unit	"Carousel Unit" on page 25
5	Insert the transport tube	"Transport Tube" on page 28
6	Connect all cables and hoses	"Cabling and Tubing" on page 31
7	Attach the covers	"Covers" on page 35
8	Check the factory-set adjustments	"Presettings" on page 37

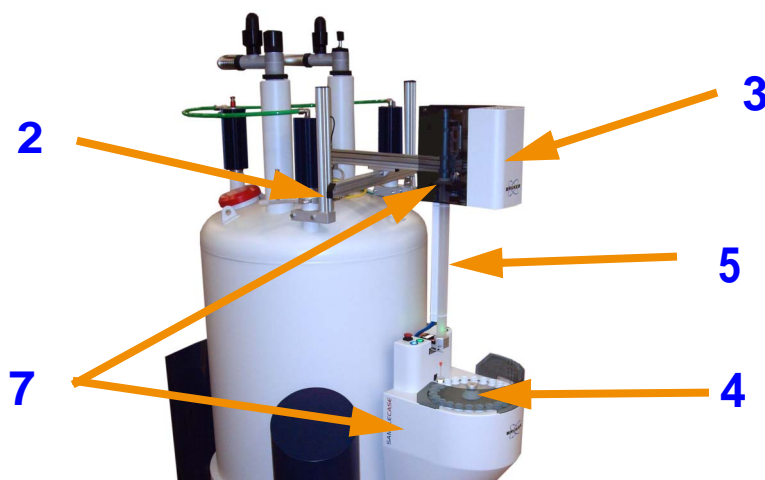


Table 3.1: Installation overview

3.2 Precautions

WARNING



Use suitable ladder or platform

For bigger magnets one or more ladders or platforms are needed. Working at an elevated level above ground always bears the risk of falling.

- ▶ Do only use approved climbing aids.
- ▶ Wear non-slip shoes.

CAUTION



System may be moving after switching on gas supply

As soon as the gas supply is switched on and the system is under pressure parts may start moving immediately.

- ▶ Keep hands and head off the system when switching gas supply on.



Figure 3.1: Switching on gas supply

CAUTION



De-energize the system for service.

Actuators could move without any warnings as long as the system is supplied with compressed gas.

- ▶ Switch off gas supply when doing service actions that are not require gas pressure.

NOTICE

The magnet needs to be leveled.

All the mounted hardware will be tilted with respect to the BST if the magnet is not leveled prior to the installation.

- ▶ Check the tilting of the magnet (dampers off, as during the installation) with a level on the very top of the BST.

NOTICE

Do not press in the sealing on the axis

The black sealing lips on the axis can be easily be pressed in when the axis is not under pressure. You may have problems to put the sealing back in place.

- ▶ Avoid touching the sealing while holding the axis in hands.

The black sealing lips on the pneumatic axis can be pushed inside when the axis is not on pressure. The axis will then leak when the system is set under pressure. For shipping the hoses on the axis needs to be disconnected, because pressure differences during flights or at different altitudes may also shift the sealing.

In some cases the sealing will pop back when the axis is connected to compressed gas. If this does not help, move the slider to bring the sealing back to its initial position. Depending on the location on the axis some hardware needs to be removed to bring the slider to the leaking area.

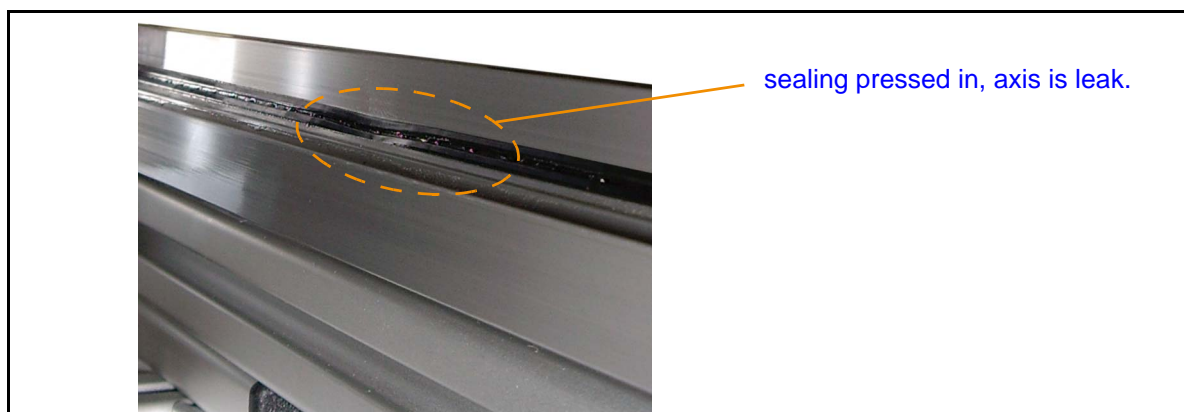


Figure 3.2: Pushed in axis sealing

3.3 Required Equipment

Equipment	Sizes	Remark
Metric Allen keys	2, 2.5, 3, 4, 5	
Metric wrenches	8, 10, 13	
Slot screw driver	2 (middle size)	
Phillips screw driver	1 (small)	
Hose cutter	6mm / 8mm	
Level	200mm	Comes with the device
Torx key	T25	Comes with the device
Tube cutter	30mm	Comes with the device
Tube cutting insert	25mm	Comes with the device
Sharp blade	small	Comes with the device
Cable ties (30pcs.)	200mm	Comes with the device
Velcro strap (2pcs.)	250mm	Comes with the device
Special grease	20ml	Comes with the device, for maintenance only

Table 3.2: Required tools



Figure 3.3: Included equipment (incomplete)

3.4 Determine Orientation and Carousel Position

[1] The best setup of the SampleCase needs to be found depending on the setup of the NMR system in the lab.

⚠ WARNING



Do not cover the drop off plate.

Neither the axis nor the cables and hoses are allowed to cover the drop off plate since this serves as a over pressure valve for the magnet and is safety relevant.

- ▶ Consider the drop off plate when choosing the orientation of the axis.
- ▶ Use the velcro straps (included in the delivery) to fix the cables and hoses beside the drop off plate
- ▶ Use the safety sticker for the drop off plate (included in the delivery) to label this warning on the drop off plate itself (if sticker is not already there).

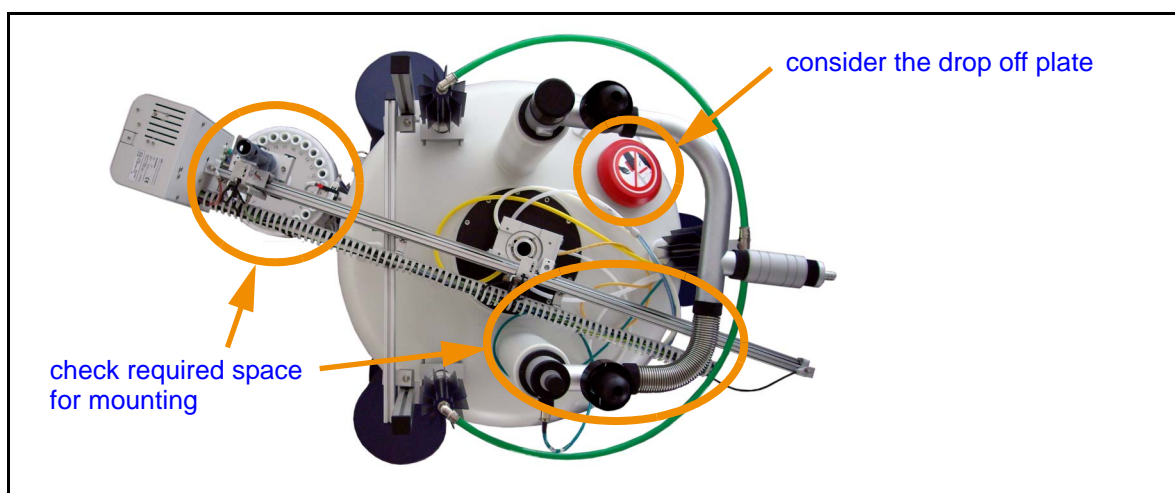


Figure 3.4: Orientation of the axis

- [2] If the transfer slider is travelling underneath any helium or nitrogen connections a minimum clearance is needed for the NMR tube.

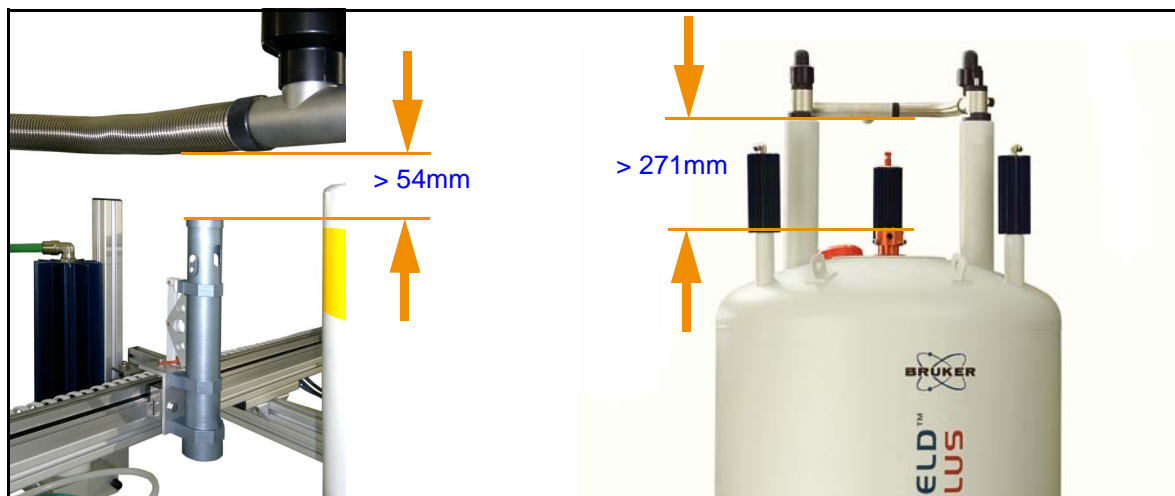


Figure 3.5: Clearance for the slider

- [3] Determine the position for the carousel. Place the carousel either “high” or “low” to have it in the best position for users. The “low” position may interfere with connections to the probe (transfer lines). On bigger magnets and on magnets with the flange in the middle of the dewar the carousel is easier accessible when mounted in the lower position.

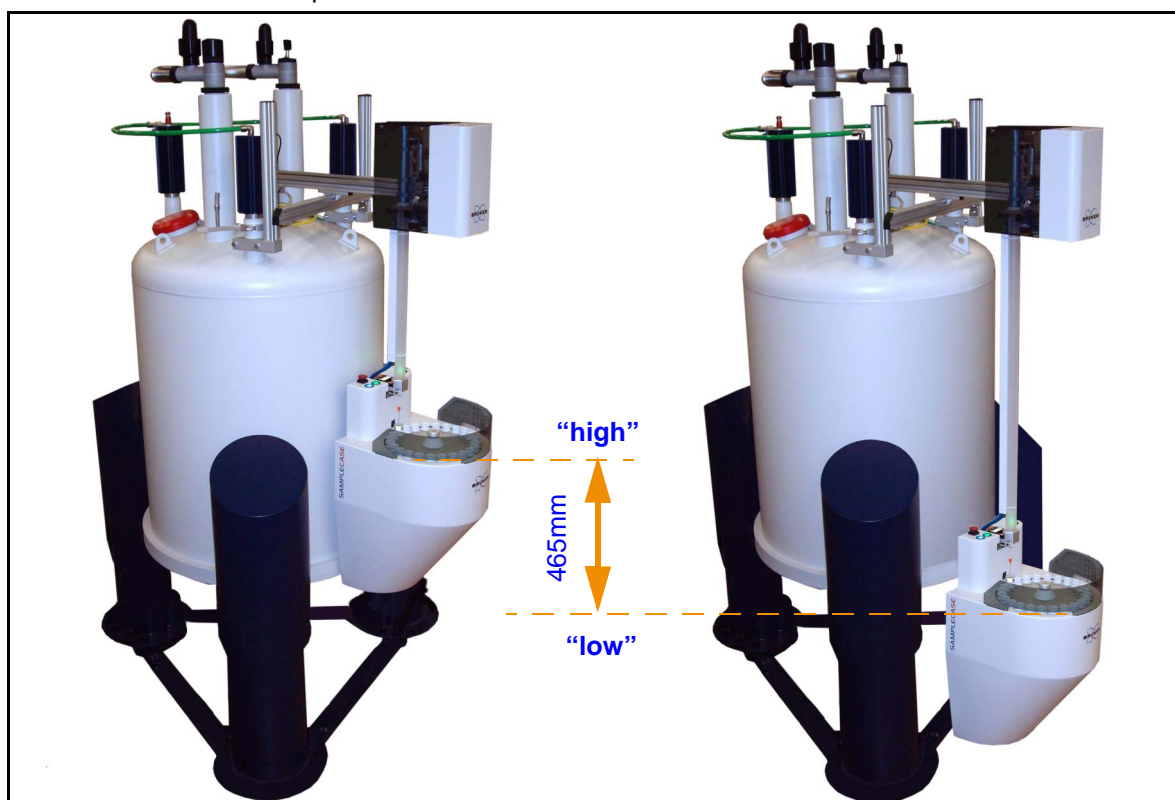
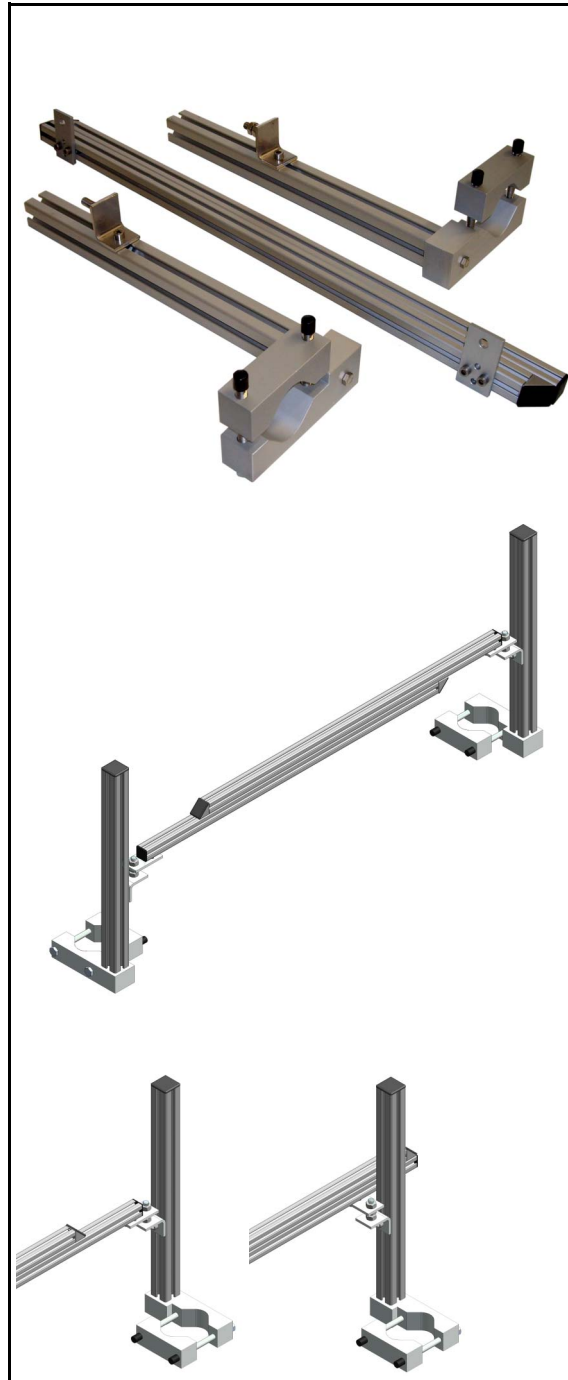


Figure 3.6: Possible carousel positions relative to the magnet flange.

3.5 Installation

3.5.1 N2 Mounting Hardware



[4] Start the installation by mounting the N2 mounting hardware to the nitrogen ports. This hardware is very flexible in order to fit on every magnet and can be mounted in different ways.

For bigger magnets the two parts of the horizontal connection bar can be extended to reach the distance between the nitrogen towers. For this, the black diagonal end plates needs to be removed.

The horizontal connection bar and the vertical poles can be mounted in several different ways. Make sure the horizontal connection bar is as far as possible from the centre of the magnet in order to have then later a god support for the axis.

Figure 3.7: The pre assembled N2 mounting hardware

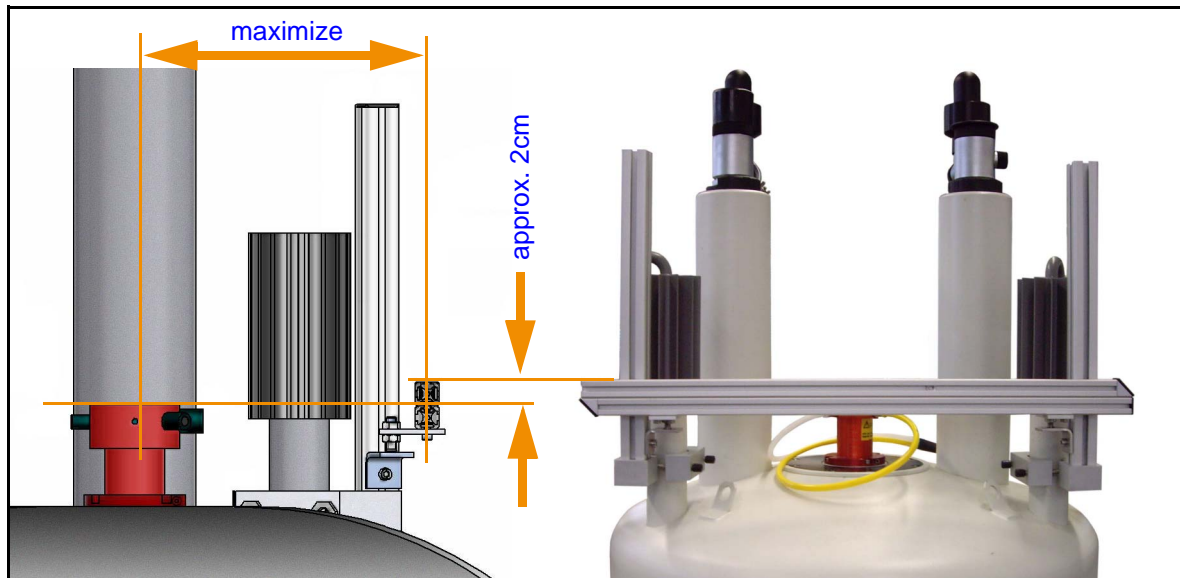


Figure 3.8: Offset of the horizontal bar

- [5] Level and adjust the horizontal bar to be approx. 2cm higher than the top of the BST. The bar will then later be adjusted (levelled) exactly together with the axis. For this make sure that the adjustment nut on the poles have some space in both directions and are not already in the most upper or lower position.

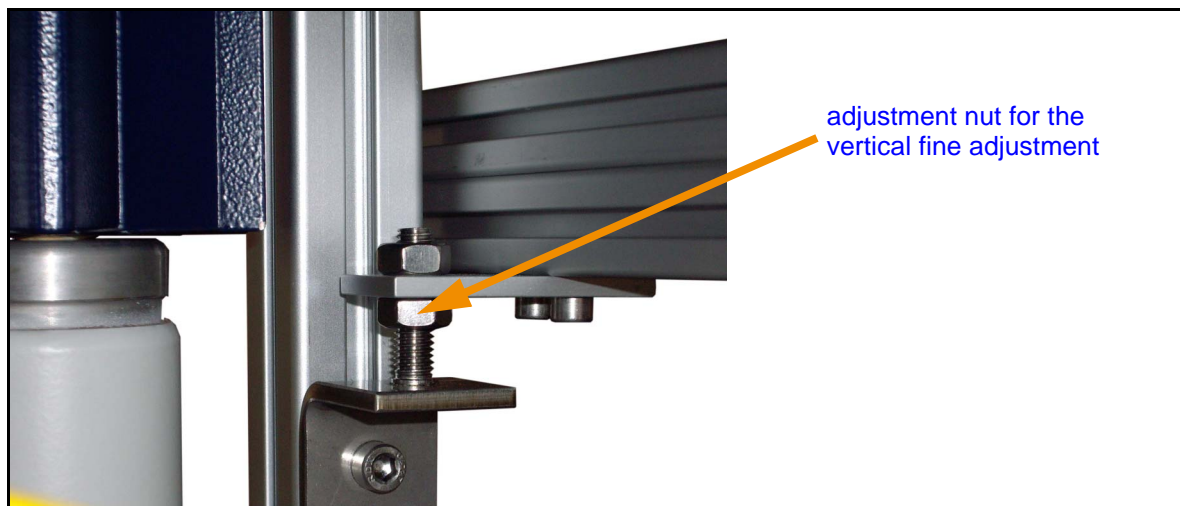


Figure 3.9: Horizontal bar fine adjustment

- [6] Remove the black, vertical end plates on the upper bar and feed one slot nut (check orientation) into the nut on both sides.

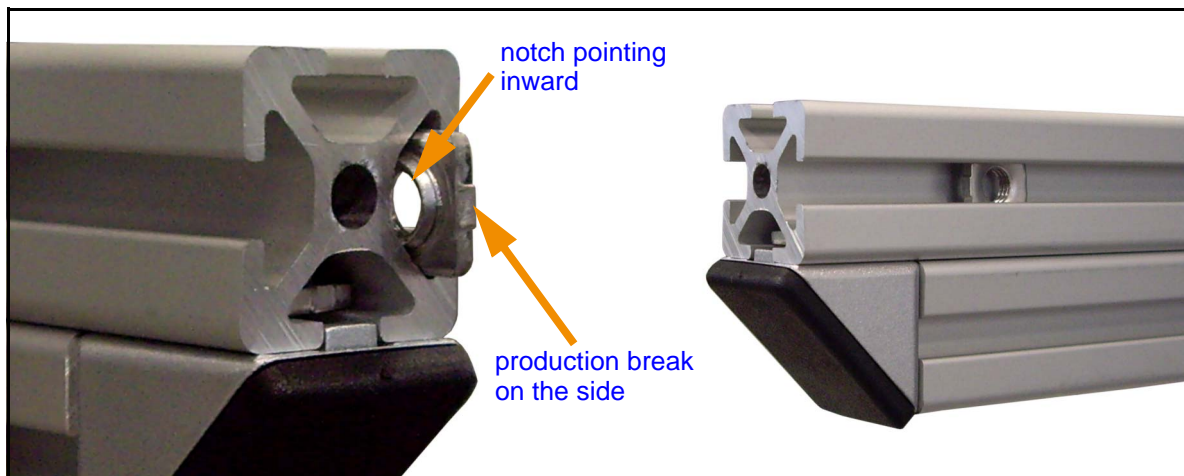
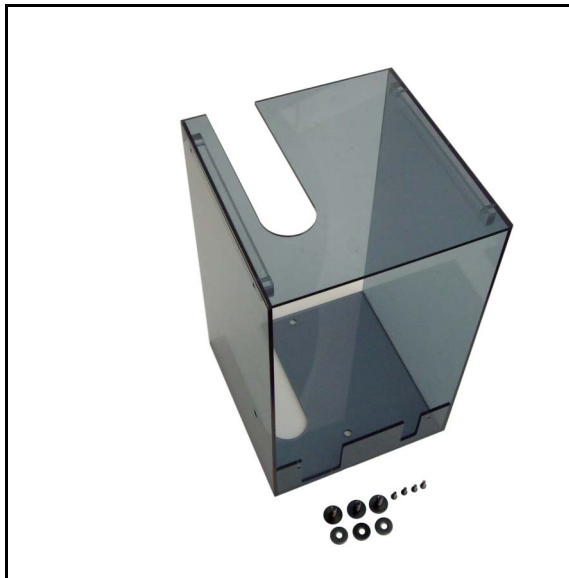


Figure 3.10: How to insert a slot nut

3.5.2 Axis Installation



[7] Before mounting the axis remove the cover (if mounted).

Figure 3.11: The Pyrex cover on the user side with its screws

NOTICE

Work carefully on the BST

Screws need to be placed and removed on top of the BST for this installation and may fall into the magnet.

- ▶ Close the hole to the magnet if possible.
- ▶ Work on the screws one after another.

[8] Remove the two special screws on the top of the BST and remember the position of those two threads and the position of the lid switch.

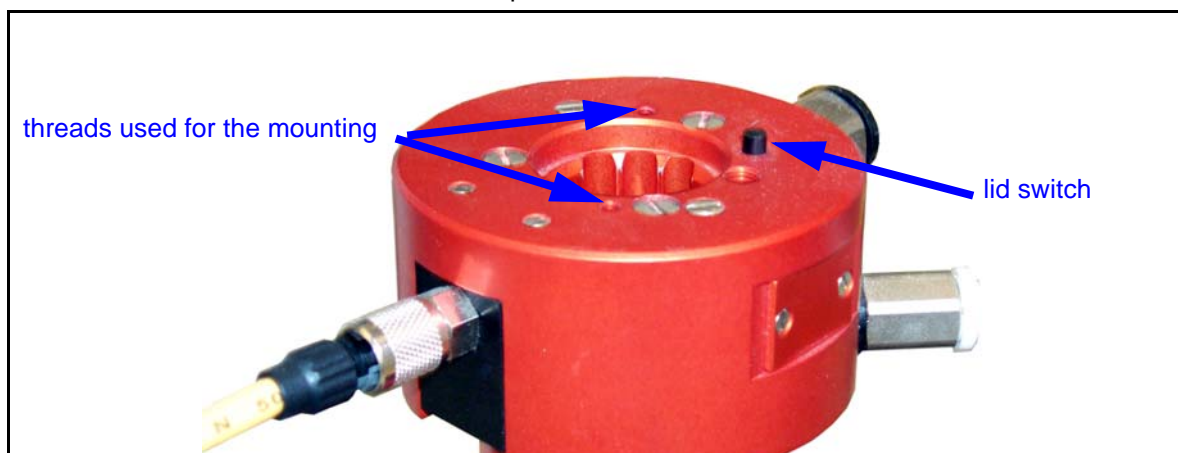
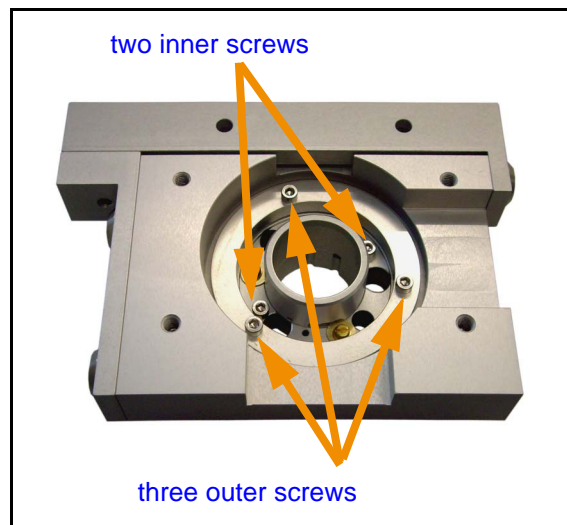
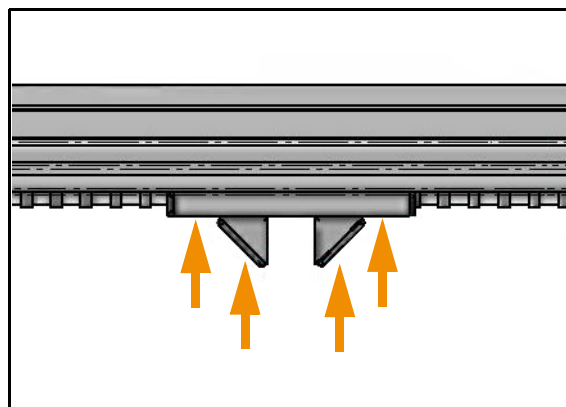


Figure 3.12: Prepare the BST top



[9] Untighten the three outer screws on the BST mounting hardware so that the inner part can be rotated.

Figure 3.13: Prepare the BST mounting hardware



[10] Untighten the screws on the spacer and on the two connectors.

Figure 3.14: Prepare the axis

NOTICE

Do not force half-mounted axis

The axis has a leverage effect to the mounting points when mounted only on one side.

- ▶ Only screw the axis when the horizontal mounting bar is roughly adjusted.
- ▶ Begin with screwing the axis on the BST while it is supported by the horizontal bar.
- ▶ Do first put in screws loose on both mounting points before tighten the screws.

- [11] Put the axis on the magnet and secure it from falling down by screwing the axis to the BST. For this the inner part of the mounting hardware needs to be rotated until the two inner screws reaches the threads and the lid switch is in its hole. Do not tighten the three outer screws so that the axis can be rotated around the mounting point. Support the spacer on the axis on the horizontal bar.



Figure 3.15: The linear axis on the magnet



- [12] Rotate the axis in its final position and screw the connection with the horizontal bar from both sides.

Figure 3.16: Screwing the connection

- [13] Level the axis and the horizontal bar.
[14] Tighten all the screws if everything is levelled.

3.5.3 Carousel Unit

[15] Remove the cover from the carousel unit for the installation.

[16] Set the mounting clamp to the lower or higher position to have the carousel at the chosen height.

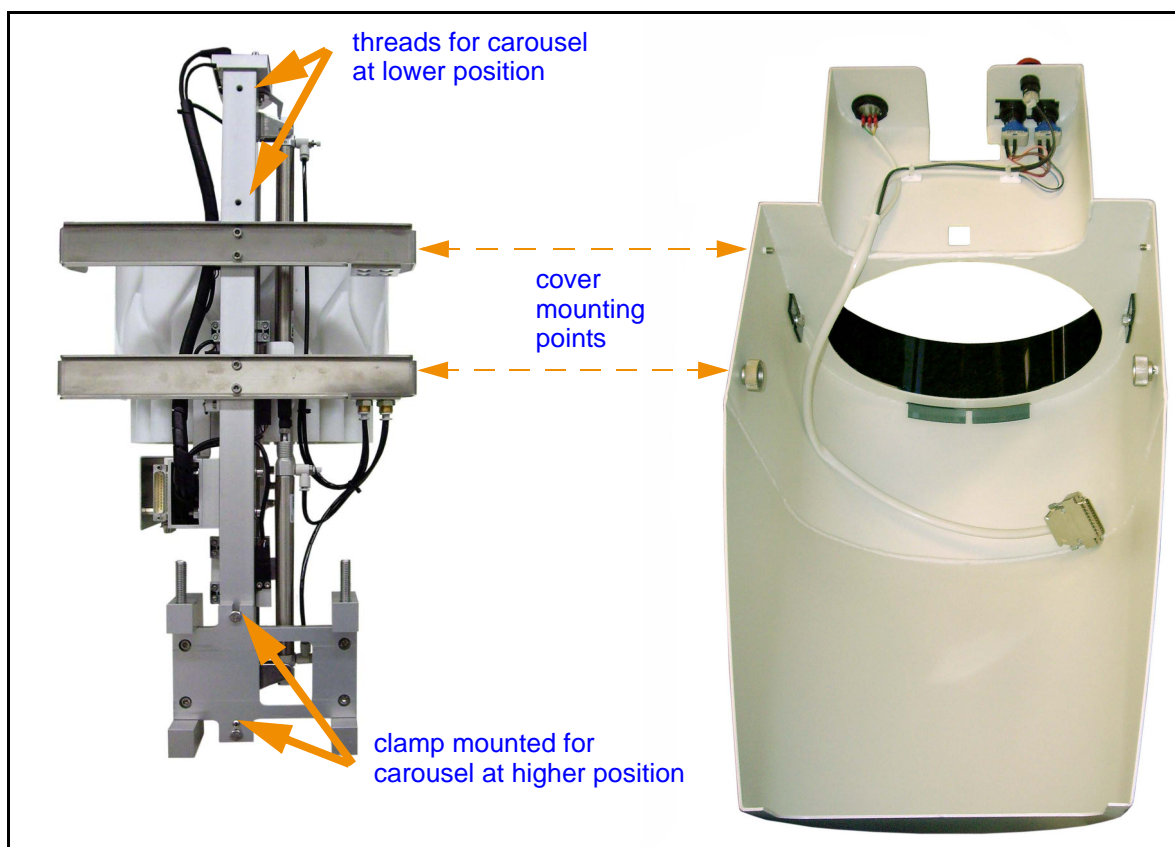
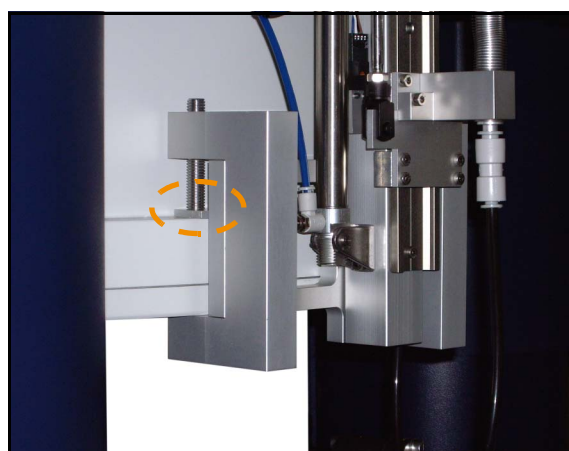


Figure 3.17: The carousel and its cover



[17] Clamp the carousel to the magnet flange. Use the protection plates on both top sides to protect the surface of the magnet dewar.

Figure 3.18: Clamping the carousel on the magnet



Figure 3.19: Set the carousel to its position

[18] Roughly adjust the carousel to have its port located underneath the port of the axis.
The fine adjustment needs to be done later.

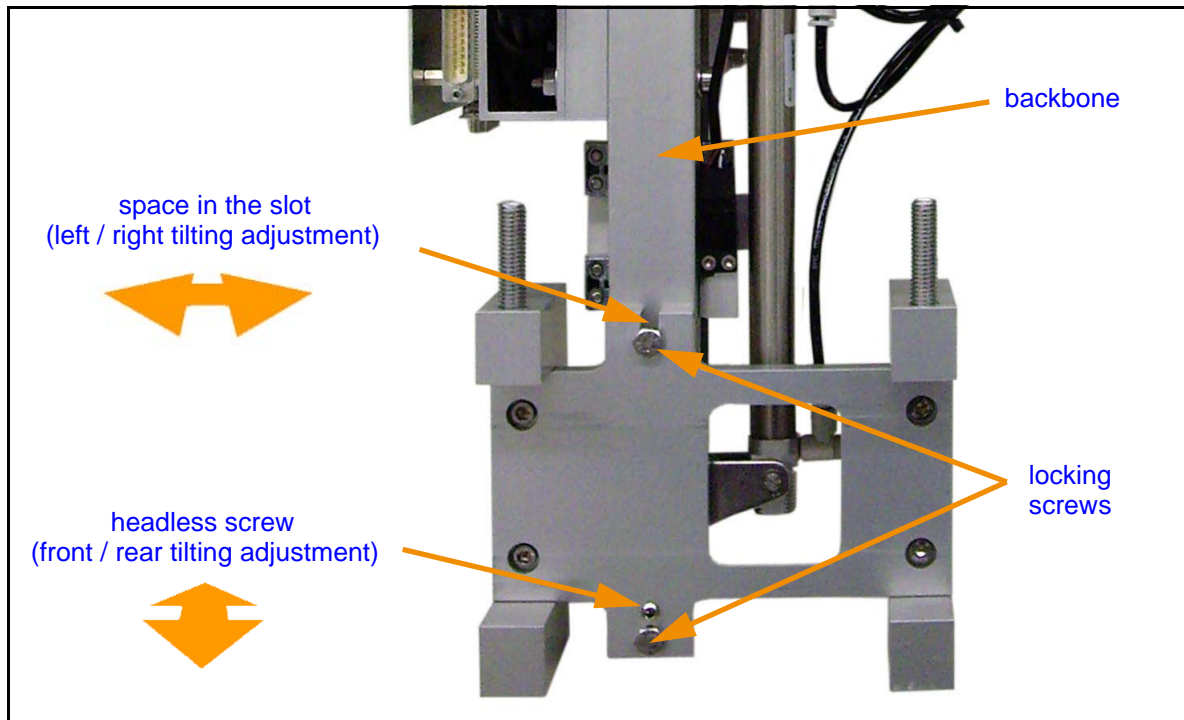


Figure 3.20: Carousel tilting adjustment

[19] Check the tilting of the carousel with the level and correct it in both directions. Use the headless screw to adjust tilting to front or rear and the space in the slot for left or right correction. Check the tilting with a level on the backbone.

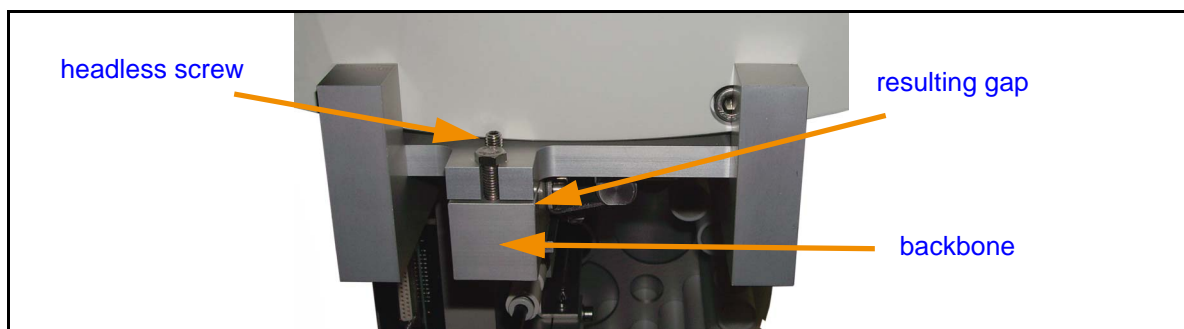


Figure 3.21: Bottom up view of the carousel adjusted with headless screw

3.5.4 Transport Tube

The next step is to cut the transport tube to the proper length and prepare the two ends.

NOTICE

Carefully cut the transport tube

The vertical transport tube needs to be cut to the proper length very accurate. If once the tube is too short, the installation cannot be completed. In addition it is difficult to cut away a short piece if the tube is too long.

- ▶ Make sure the previously installed hardware is aligned before cutting the tube
- ▶ In a first approach cut the tube some centimetres longer and measure then the offset for the final cut.
- ▶ Properly mark the distance for the final cut.
- ▶ Cut carefully by always rotating the tube and not the cutting tool.

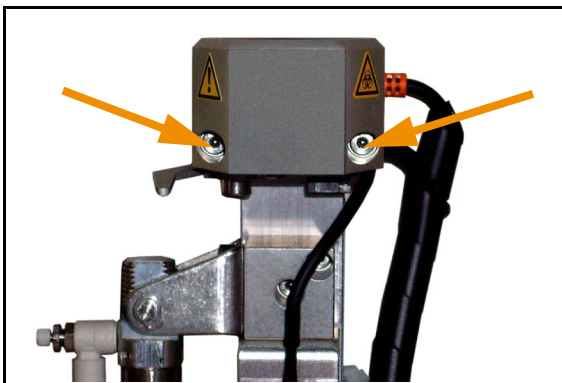


Figure 3.22: Remove the port

[20] Unscrew the port for the tube with the two screws as shown and pull the port to the front.



Figure 3.23: How to cut the tube with the tool

[21] To cut the tube use the cutter and the inlet that comes with the delivery. The inlet needs to be inside the tube to stabilize the soft tube when applying force with the cutter.

Do not rotate the cutting tool because this will produce no straight cut. To get a straight cut hold the tool in place and rotate the tube while slowly increasing cutting depth.

On the first approach cut the tube some centimetres longer than actually needed.

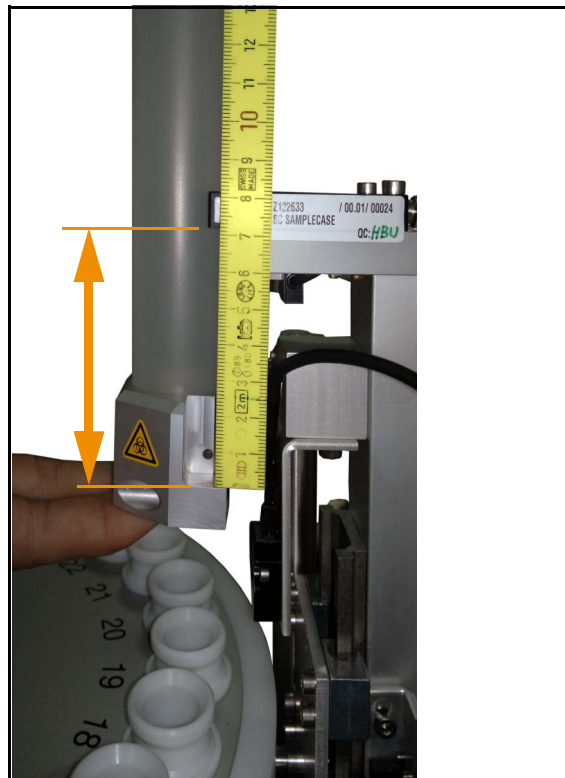


Figure 3.24: Measure the offset to cut

[22] Once the tube is close to its final length the remaining offset can be measured as shown.

[23] Mark the offset on the tube and do the final cut. **The tolerance of the tube length is -1/ -3 mm.**

[24] After cutting the tube both sides needs to be prepared with the scalpel blade that comes with the delivery. Cutting the tube will lead to end pieces pointing inwards.

You have to cut away this inner edge in a steep angle as shown on the drawing and check the result with a spinner.

The end pieces are prepared when the spinner cannot hang on the inner edge.

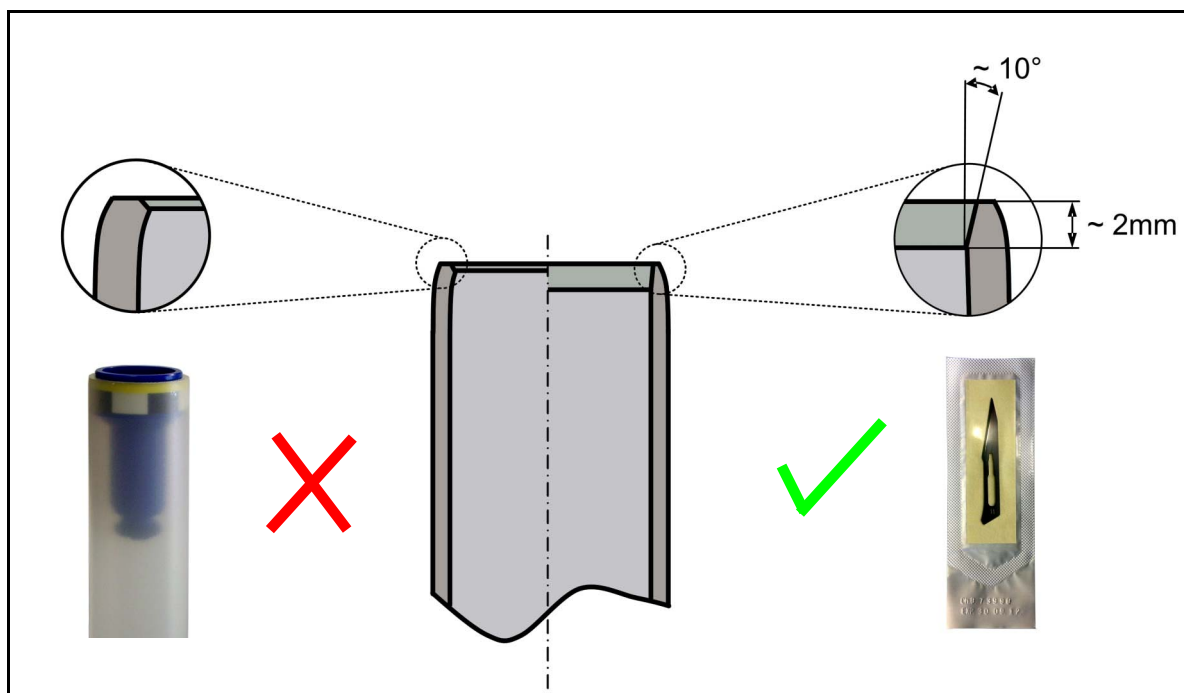
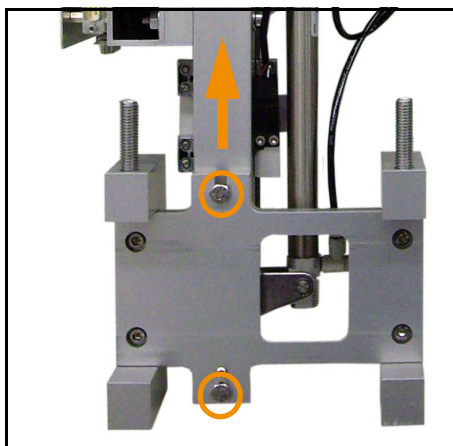


Figure 3.25: How to prepare the end of the transport tube



[25] Insert the tube and screw in the port. If the tube can be shifted slightly (1mm) up and down, the tube has the proper length.

If the tube is too long it will be squeezed and therefore needs to be shortened.

If the tube is too short you can lift the carousel unit a little as shown. Open the two locking screws and carefully (do not hit the carousel and tube against the horizontal axis) lift the backbone. Take care to preserve the tilting adjustment of the carousel unit.

Figure 3.26: Lift the carousel if the tube is too short

[26] Adjust the carousel so that the transport tube is straight. Use the level for this but keep in mind that the transport tube is never 100% straight. Rotate the transport tube to see its bending.



Figure 3.27: Adjust the carousel to its final position

3.5.5 Cabling and Tubing

- [27] Connect the gray input/outputs cable from the control unit to the carousel.
- [28] Connect the lift hose from the control unit to the carousel. Wait with cutting the hose to the proper length.
- [29] Connect the four hoses for the cylinders from the control unit to the carousel. The connectors on the control unit and the carousel are color coded. Wait with cutting the hose to the proper length.

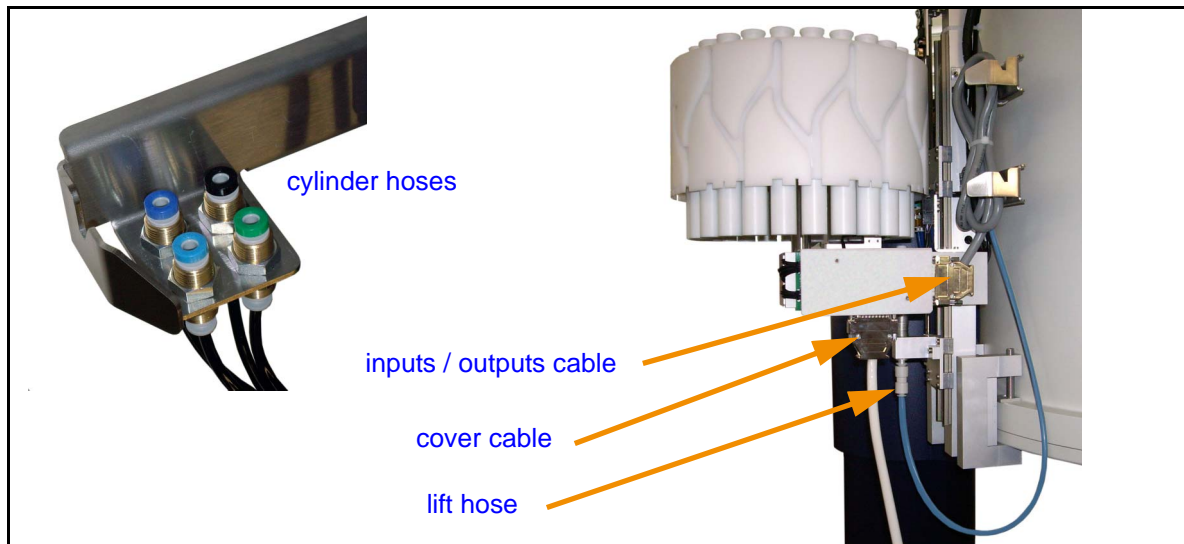


Figure 3.28: The connectors on the carousel

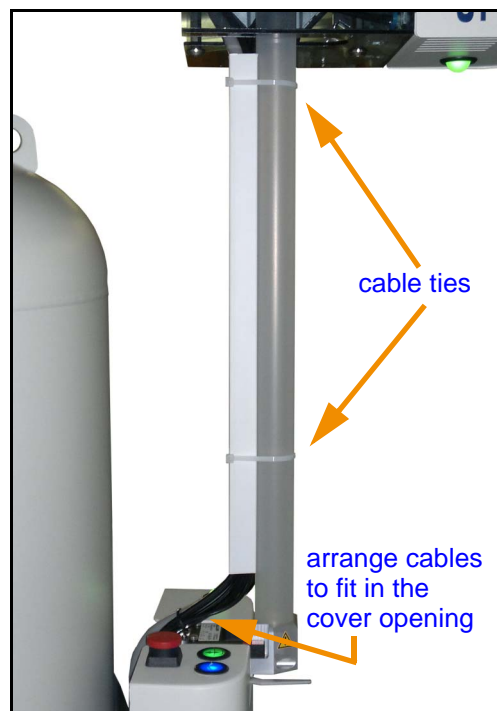


Figure 3.29: The cable duct

[30] Cover the cable and tubes in the white cable duct and attach it with cable ties to the transfer tube. Do not pull to much on the cable ties because this will squeeze the transfer tube.

[31] When all the cables are arranged in a way that the cover can be mounted, cut the hoses on the carousel to the proper length.

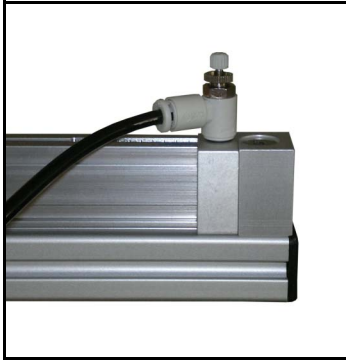


Figure 3.30: The axis gas supply

[32] Connect the hoses on each end of the linear axis. Those hoses intentionally have been unplugged from production to avoid under pressure inside and resulting problems with the axis sealing. See "Precautions" on page 14.

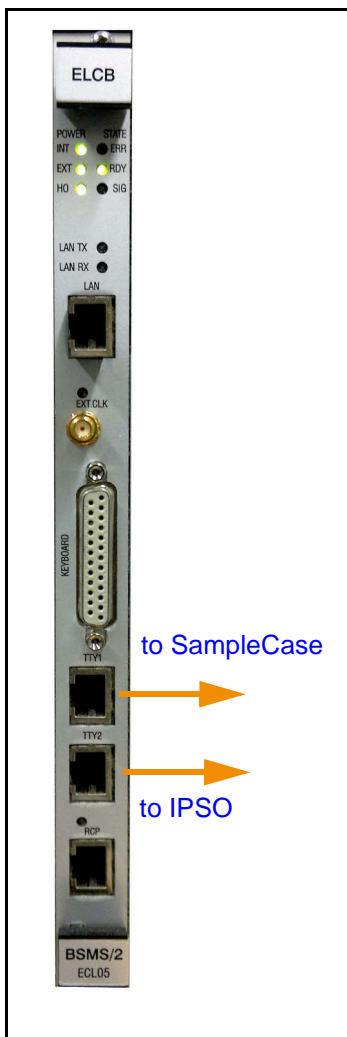


Figure 3.31: Connections on the ELCB

[33] Connect the data cable from the end of the axis to the ELCB TTY1. The additional short data cable can be used, if the connection can be fed through a connector on the back of the console.

[34] Connect the TTY2 on the ELCB to any free TTY port (except TTY0) on the IPSO.

[35] Connect the earth wire to the earth screw on the HPPR or the console.

- [36] Connect the gas supply (transparent 6mm hose) to the gas switch. The switch should be placed in a height that it is easy reachable. Take care about the proper orientation (gas flow) of the switch.

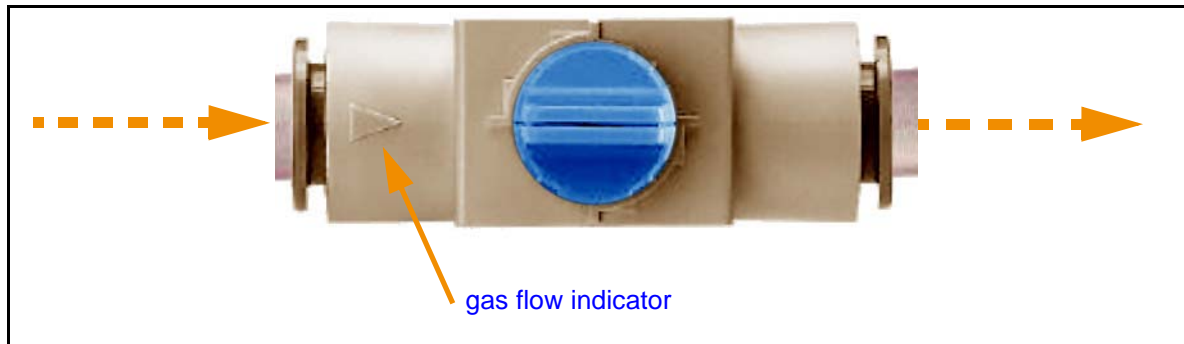


Figure 3.32: The gas switch

- [37] Connect the power cable to the power supply and the power supply to the console.



Figure 3.33: The power supply

[38] Connect the lift gas coming from the console to the SampleCase and the gas returning from the SampleCase to the BST.

The drawing below shows the lift hoses and the two paths for the gas flow switched by a valve inside the SampleCase control unit. The valve is either switching the lift gas to the shim stack or to the external transport tube.

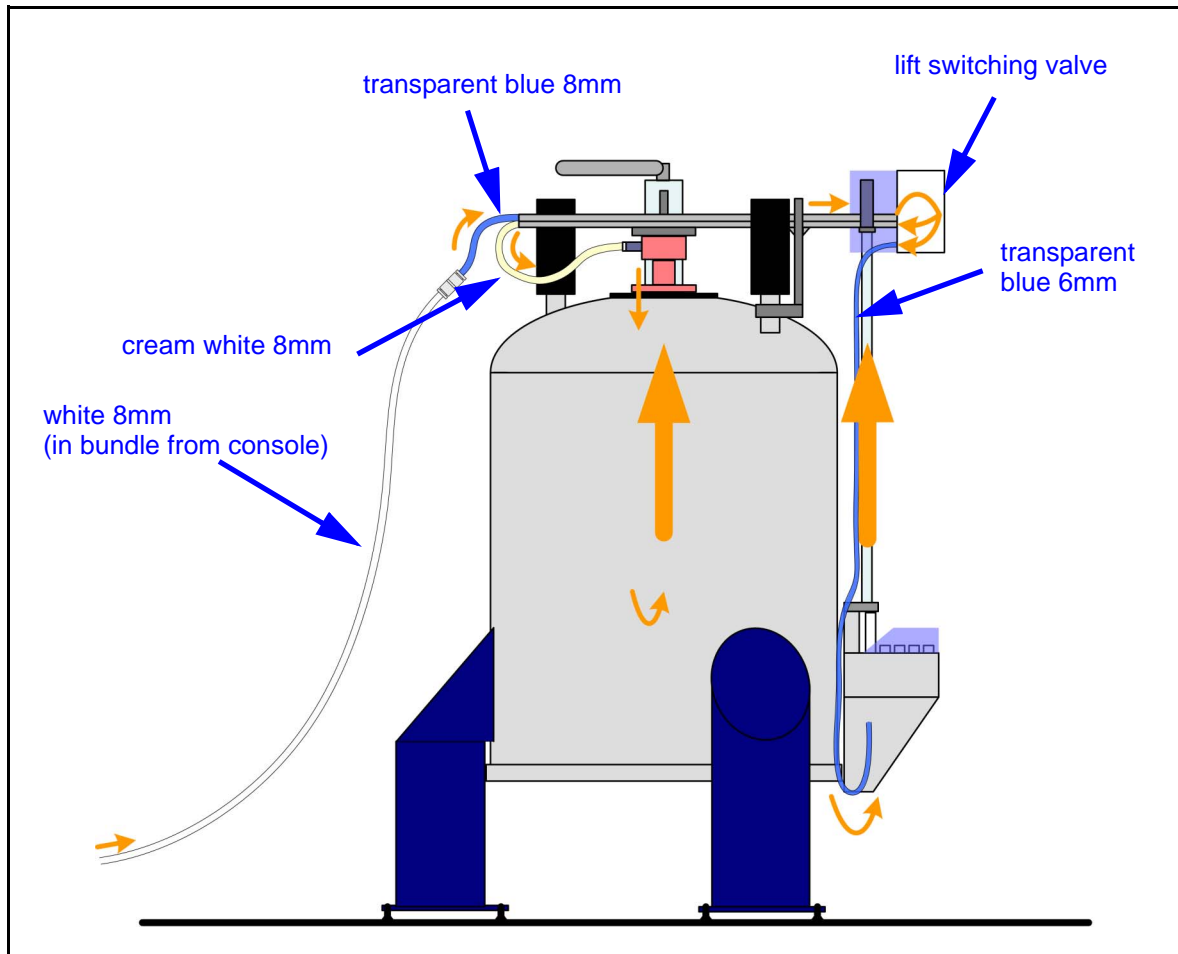


Figure 3.34: The two paths of the lift gas

3.5.6 Covers



[39] Plug in the cover cable see [figure 3.28 on page 31](#).

[40] Hang in the cover on the carousels 4 hanging points. Take care that the cable of the cover is not jammed between the cover and the mounting point or the cover and the carousel. Then tighten the two knurled screws from the side if they are accessible.

Figure 3.35: The carousel cover

[41] Mount the Pyrex cover on the control unit. Put a washer inside the cover for all the three mounting screws.

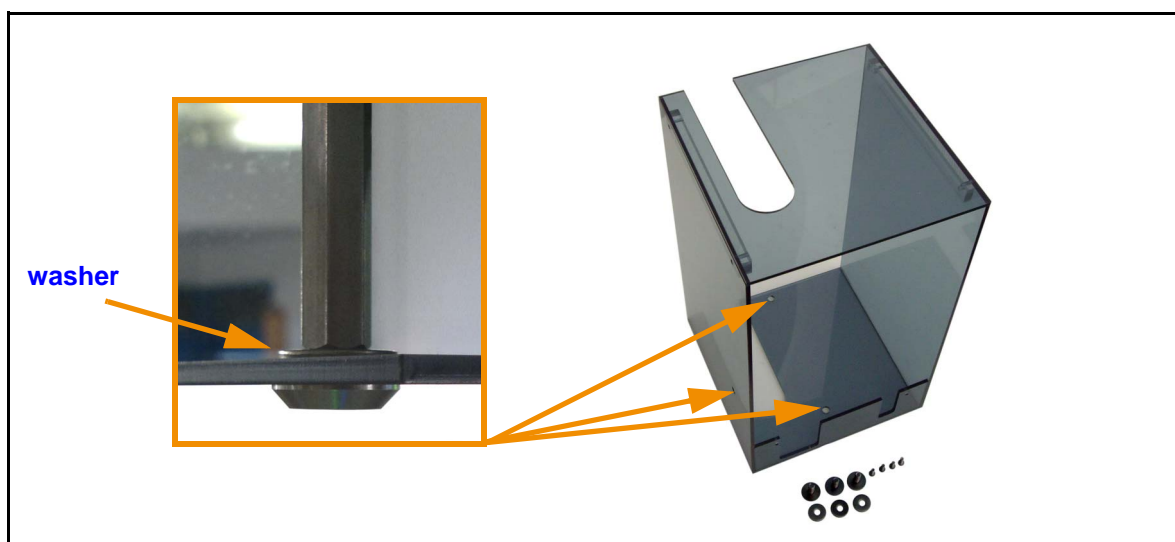


Figure 3.36: The Pyrex cover

4 Presettings

4.1 About the Presettings

The hardware, sensors and actuators on the linear axis are set from factory site according to the order depending on the magnet. Those settings can also be changed in the field if the intended magnet for the system has changed.

i Even if the settings had not to be changed they should be checked after the installation.

The factory presettings includes the following issues:

- Presetting of the axis track length
- Hardware adjustment
- Sensor and actuators adjustment

NOTICE

Bad adjustments causes failures

If the hardware is not properly adjusted this can decrease the lifetime of the hardware and lead to unreliable system stability even if the system is currently working fine.

- ▶ Carefully check the adjustments after the installation.
- ▶ Spend the time to adjust the hardware to get a failure-free system.

4.2 Track Length

The track length is the distance the transfer slider tube will run on the axis. This distance is not given by the axis but set with end stoppers on both sides. To run the system all sensors and actuators on the linear axis need to be adjusted relative to the end stop on either side.

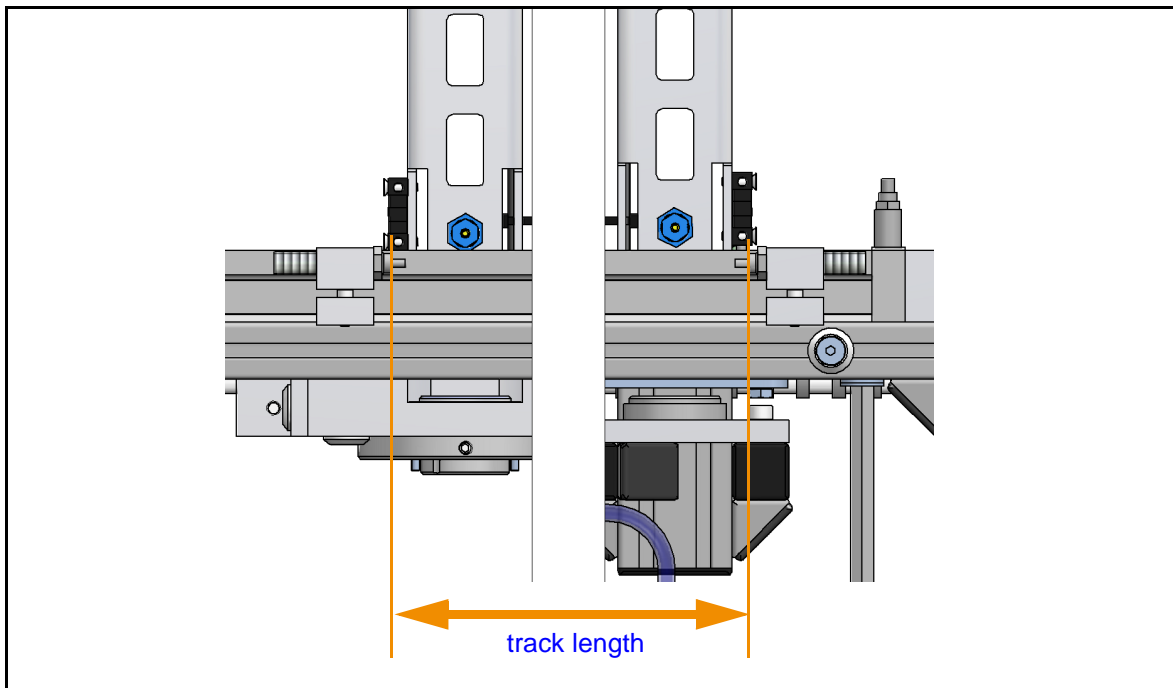


Figure 4.1: Definition of the track length

If the track length needs to be adjusted to a magnet it can either be looked up in the following table or calculated from the magnet dimensions if the magnet is not listed in the table.

The track length is 155mm longer than the radius of the magnet flange.

$$\text{length}_{\text{track}} = \text{radius}_{\text{magnetflange}} + 155\text{mm}$$

Equation 4.1: Calculate the track length

Magnet dewar	Magnet flange radius [mm]	Track length [mm]
D205	360	515
D207	360	515
D221	400	555
D222 ^a	400	555
D232	360	515
D241	360	515
D262 ^a	310	575
D315	397.5	552.5
D325	362.5	517.5
D335	425	580
D345	425	580
RS346 ^b	425	580
RS348 ^b	425	580
D350	475	630
D355	475	630
D365	550	705
D370	682	837
D372	682	837
D375	682	837

Table 4.1: Track length for Swiss magnets

- a. Round bottom magnet
- b. Nitrogen free magnet

Magnet type	Magnet flange radius [mm]	Track length [mm]
M1007500	640	795
M1008000	640	795
M1008020	844	999
M1008040	640	795
M1008520	844	999
M1008540	640	795
M1009000	844	999
M1009020	844	999
M1009520	844	999

Table 4.2: Track length for German magnets

4.3 Hardware Adjustment

4.3.1 How to Check Adjustments

When doing adjustments it is important to know, that the transfer slider tube has a big backlash to the axis. For adjusting the hardware, sensors and actuators on the linear axis the transfer slider tube needs to be in a defined position. Two criteria must be fulfilled to have similar conditions as if the system would be running:

- The transfer slider tube needs to be pressed completely against the end stop.
- There are no other forces allowed on the transfer slider tube than the force in the direction to the end stop and at the height of the end stop. The best thing to do is to let the axis itself press the transfer slider tube to the end stop.

i The transfer slider tube needs to be in its defined end position to do adjustments.



Figure 4.2: The adjustment ring

Check the adjustment visually and with the adjustment ring on the both sides. If the adjustment is perfect the ring will fall down itself when lifted and between the two tubes will be a very small and even gap. **The gap tolerance is 0.1mm to 0.3mm (1 to 3 sheets of paper).**

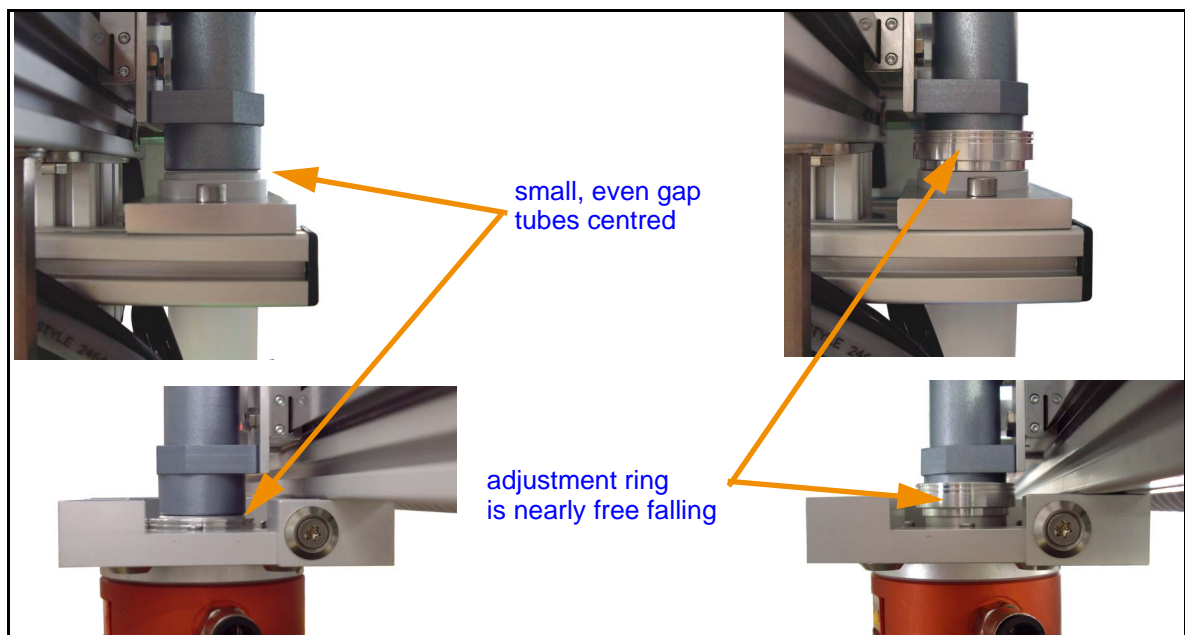


Figure 4.3: Check alignment on both sides.

4.3.2 Hardware Adjustment Sequence

It is important that the adjustments are done in the proper sequence. Otherwise some adjustment steps needs to be redone. If the track length does not need to be adjusted, then the position on the axis of the hardware and the oil damper does not need to be changed.

Step	Action	Remark
(1)	Positioning the oil damper	Only when changing track length.
(2)	Coarse alignment in direction of the axis	Only when changing track length.
3	Vertical and angular alignment	
4	Horizontal alignment	

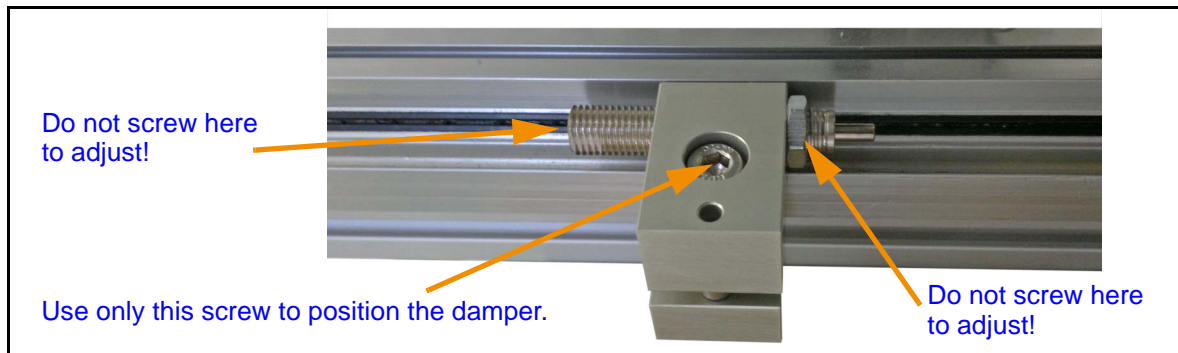


Figure 4.4: How to position the oil damper

4.3.3 Hardware Adjustment Magnet Side

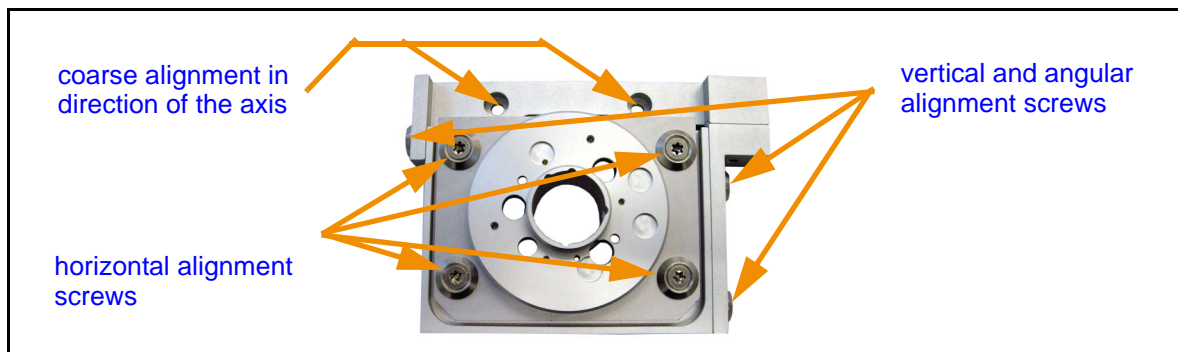


Figure 4.5: Alignment at the magnet side

Use the screws underneath and on the side of the shim system mounting hardware to adjust. If the adjustment is good tighten the screws firmly to retain the adjustment.

4.3.4 Hardware Adjustment User Side

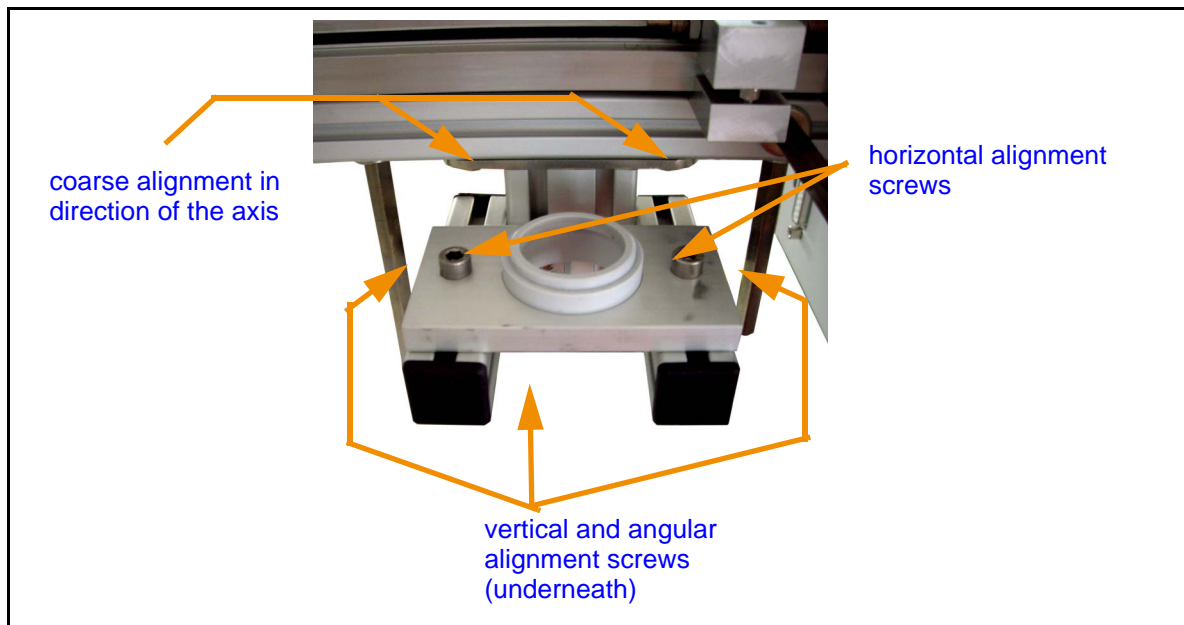


Figure 4.6: Alignment at the user side

Remove the end caps on the profile rail for the vertical alignment. The transport tube needs to be removed to reach all off the screws. Tighten the screws firmly to retain the adjustment.

4.4 Sensors and Actuators Adjustment

Both ends of the track are equipped with the same sensors and actuators. It is important that they are all adjusted correctly in the right sequence. The adjustment can be done without any measuring device since the sensors all have digital output and a indication LED. To adjust the sensors just change their position.

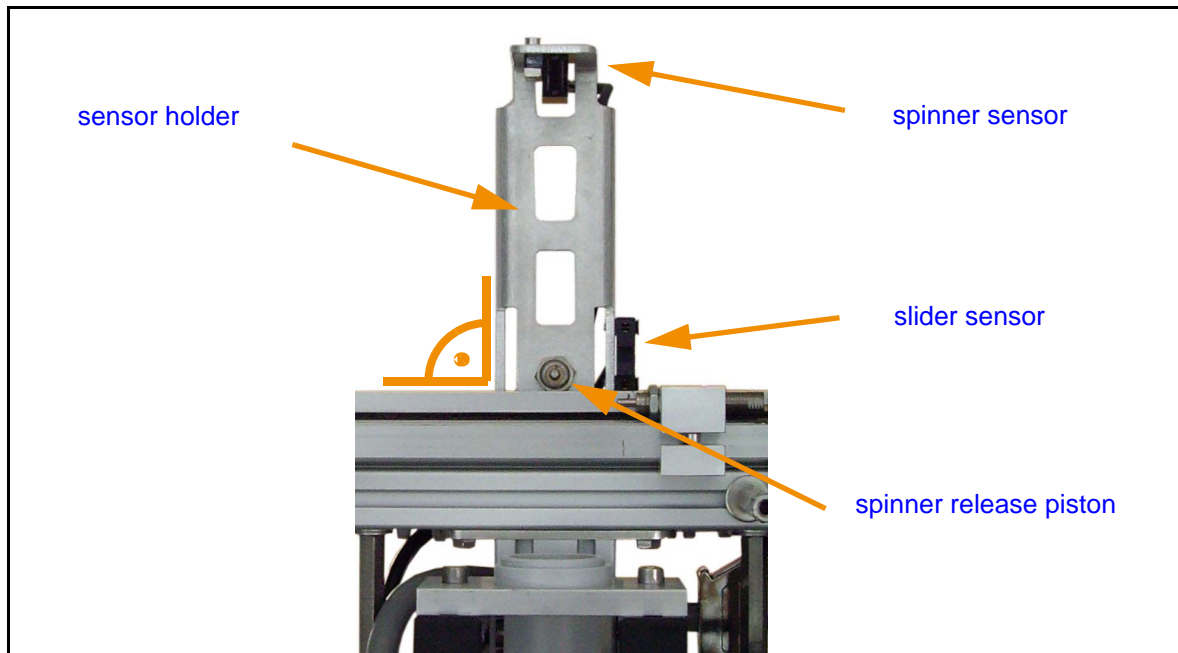


Figure 4.7: Sensors and actuator on the track end position

- [1] Start with adjusting the sensor holder. Shift the holder sideways until the slider sensor is just switching when the transfer slider tube is in its end position. Make sure that the sensor holder is rectangular to the axis.
- [2] Check if the spinner release piston is pointing to the release lever on the transfer slider tube. This should be the case when the sensor holder is adjusted.
- [3] Finally adjust the distance of the spinner sensor to transfer slider tube. For this a spinner with tube is needed. Check all the 2 states in the following table

Hardware Situation	Spinner Sensor sees	Spinner Sensor LED
Spinner sitting in the transfer slider tube and tube slightly tilted towards and away from the sensor	Yellow reflector ring on the spinner	on
Spinner lifted to the top of the transfer slider tube and tube slightly tilted towards and away from the sensor	Lower part of the spinner	off

Table 4.3: How to check the adjustment of the spinner sensor

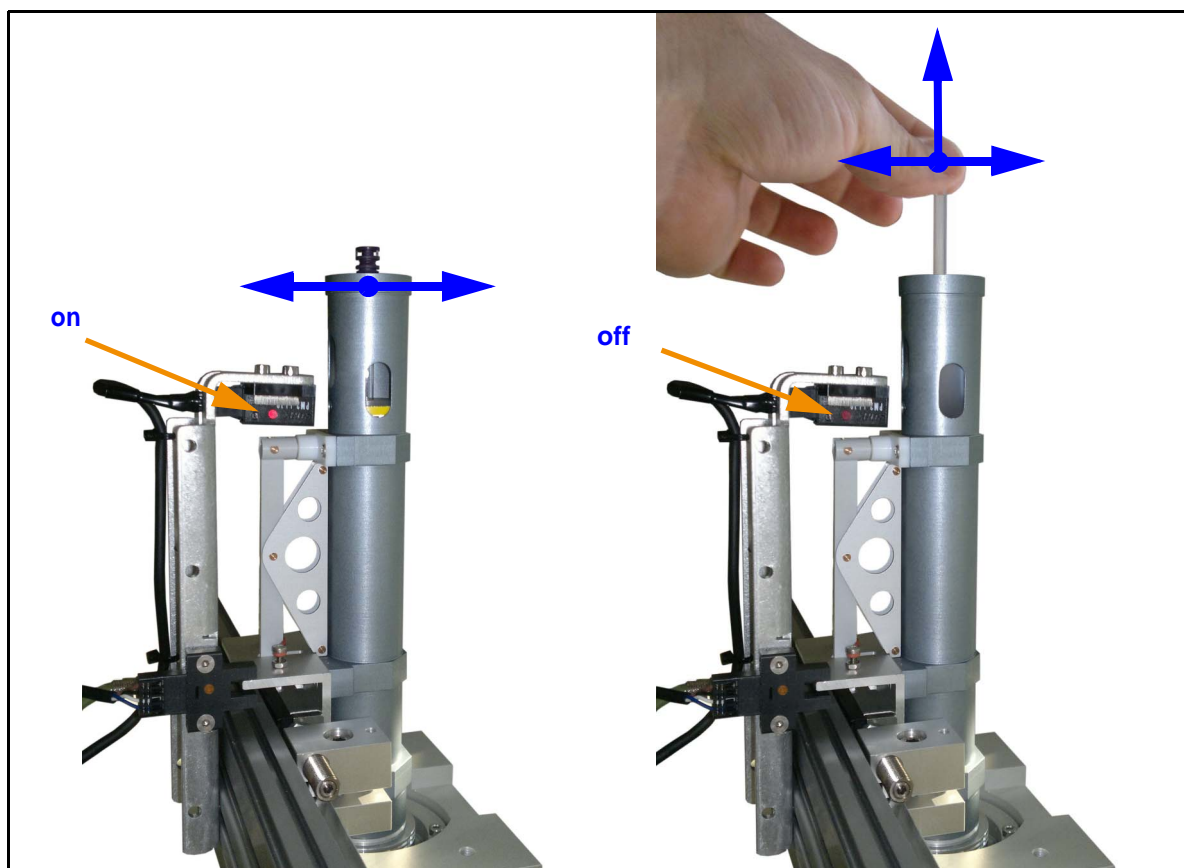


Figure 4.8: Check the spinner sensor adjustment

5 Troubleshooting

5.1 Sensor and Actuators Overview

The current state of all the inputs and outputs can be checked on the BSMS service web page "SPS I/O".

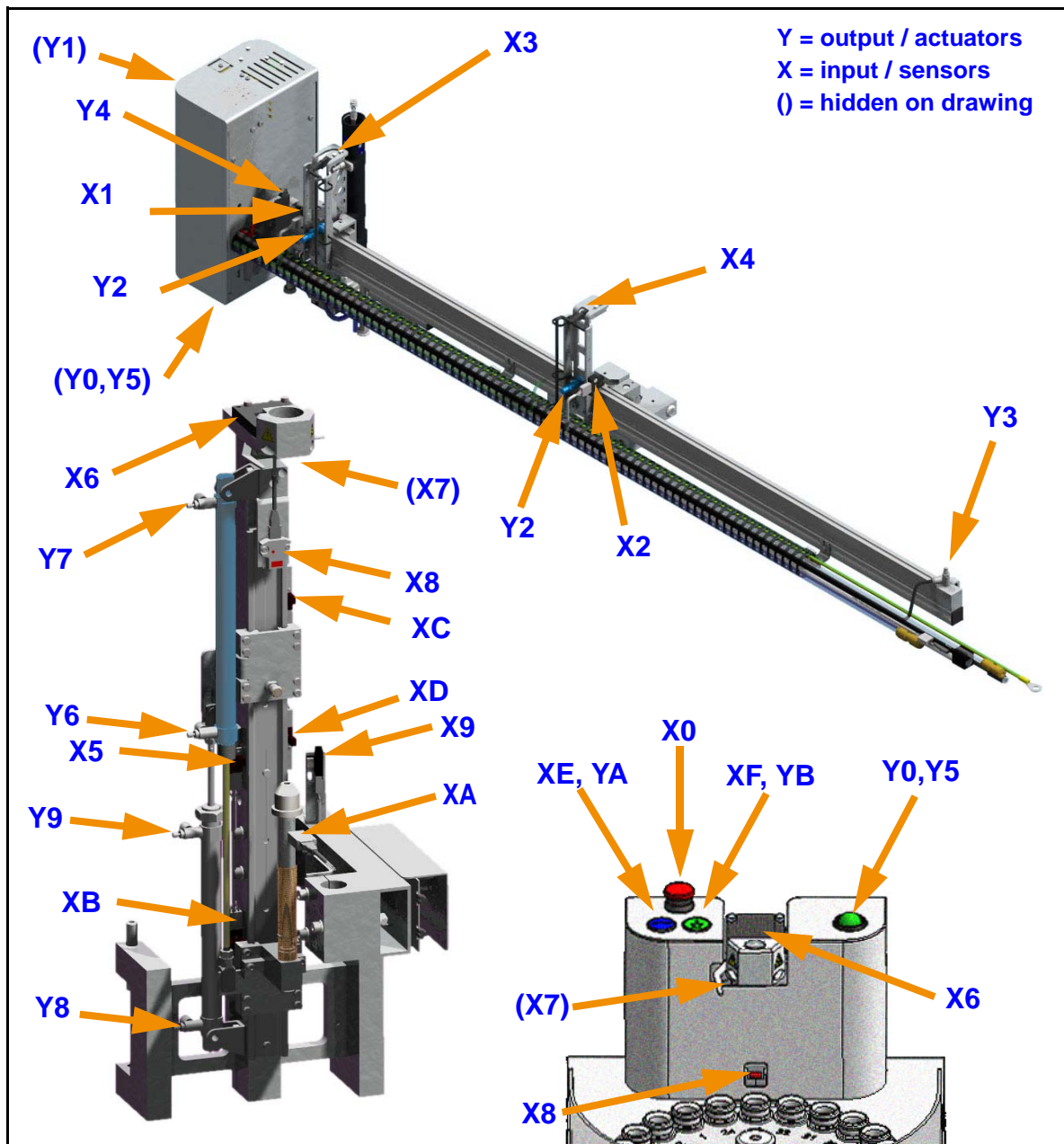


Figure 5.1: Actuators and sensors overview

SampleCase SPS input signals		
Name	Description	State
X0: IEM	emergency button released	1
X1: GL1	carriage at external tube	0
X2: GL2	carriage at BST	1
X3: RL1	shuttle on top of external tube	0
X4: RL2	shuttle on top of BST	0
X5:	jack is up	1
X6: DL3	shuttle at slider	0
X7:	sample too high	0
X8:	shuttle at jack position	1
X9:	position notch set	1
XA:	ready to rotate	0
XB:	jack is down	0
XC:	odd step finished	1
XD:	even step finished	0
XE:	do rotate	0
XF:	insert sample	0

SampleCase SPS output signals		
Name	Description	State
Y0:	LED red	1
Y1:	lift air to external tube	0
Y2:	release shuttle	0
Y3:	move carriage to external tube	0
Y4:	move carriage to BST	0
Y5:	LED green	1
Y6:	move jack up	0
Y7:	move jack down	0
Y8:	move odd step	0
Y9:	move even step	0
YA:	LED rotate button	0
YB:	LED inject/eject button	0

Figure 5.2: Example of SPS I/O page: Tube in magnet

6 Technical Data

6.1 Site Considerations

The SampleCase should be setup in a standard laboratory environment. For more information refer to the Avance spectrometer manual on site planning (see [appendix E "References"](#)) available from Bruker.

6.2 Electrical Specifications

Data	Value	Unit
Mains supply	90-240	VAC
Mains frequency	50-60	Hz
Power consumption	20	W
Device voltage	24V	VDC

Table 6.1: Electrical specifications

6.3 Pneumatic Specifications

Data	Value	Unit
Medium (dry, oil-free)	nitrogen, air	-
Pressure	6-8	Bar
Minimum gas flow	100	NI/min ^{a b}

Table 6.2: Pneumatic specifications

a. Standard conditions for gas: 20°C, 101.3kPa, 65%rH (ANR norm litres after ISO R558 2.3 and ISO R554 2.2)

b. Work pressure = supply pressure -1bar (Gas flow at work pressure after ISO 1217)

6.4 Temperature Limitations

Data	Value	Unit
Ambient temperature.	See Avance spectrometer manuals on site planning ^a .	-
Max. temperature for standard spinners.	Read the limitations in the probe head manual ^b .	-
Max. temperature of sample tubes.	Limitations given by the spinners.	-

Table 6.3: Temperature limitations

a. See Appendix: A.5 References

b. See Appendix: A.5 References

6.5 Shipping Dimensions

Data	Value	Unit
Number of packages	2	-
Length (Package 1 / Package 2)	1.89 / 0.75	m
Width (Package 1 / Package 2)	0.52 / 0.43	m
Height (Package 1 / Package 2)	0.27 / 0.49	m
Weight (Package 1 / Package 2)	15 / 15	kg

Table 6.4: Shipping dimensions

6.6 Hardware Requirements

Name		Version
ELCB		ECL 05.01 or more recent (ECL 05.00 and below on request, ECL 02.00 and below are not compatible)
Either or	SLCB	With PNK variant 3, 3s or 5
	BSVT	SPB or SPB-E

Table 6.5: Hardware requirements

6.7 Software Requirements

Name		Version
Topspin		2.0 or more recent
ELCB firmware		101206 or more recent
SampleCase firmware		v6
Either or	SLCB firmware	090206 or more recent
	BSVT firmware	all

Table 6.6: Software requirements

7 Safety Symbols

There are two warning signs on the device. If the warnings should be missing please contact Bruker and ask for replacement

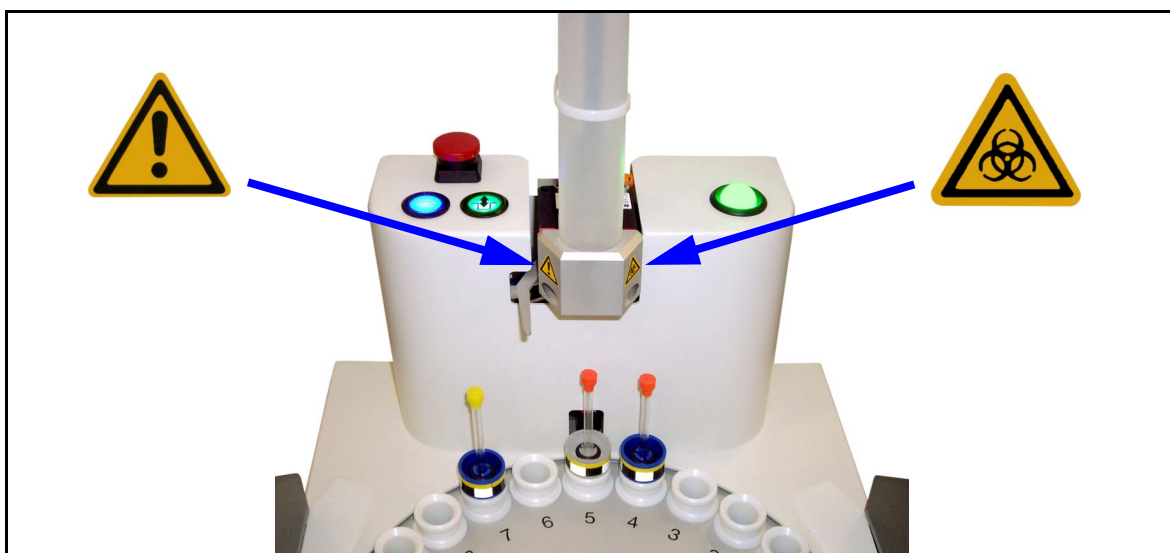


Figure 7.1: The locations of the warning signs


Symbol	Explanation
	<p>Warning of biological hazards:</p> <p>The SampleCase itself generates no direct biological hazard.</p> <p>Real danger can arise, however from substances whose hazardous biological content could endanger the operating personnel or other living beings through damage to its protective enclosure (for example, the breakage of a sealed sample glass). As is the case for the manual handling of biologically dangerous substances, no 100% guarantee against damage to the protective enclosure of these substances can be provided for their automatic handling.</p> <p>The operator himself must ensure that all the necessary safety precautions are taken for every NMR experiment in which biologically hazardous substances are used. In the case of the unit becoming contaminated with biologically hazardous substances, the operator must deal with this individually. Depending on the circumstances, this could lead to consequential damage to persons and machine components.</p> <p>It is not possible for BRUKER to draw up decontamination rules for all hazardous substances - and their combinations – that the operator could use in NMR experiments In case of contamination of the device the customer is responsible for the decontamination before Bruker employees get access to the system according to chapter "Safety and Repair Declaration" on page 56.</p>

Table 7.1: Explanation of the safety symbols on the device


Symbol	Explanation
	<p>Warning of chemical hazards:</p> <p>The SampleCase itself generates no direct chemical hazard.</p> <p>The operator himself must ensure that all the necessary safety precautions are taken for every NMR experiment in which substances are used that could represent a chemical and radioactive hazard or that are easily flammable.</p> <p>In the case of the unit becoming contaminated with hazardous substances, the operator must deal with this individually. Depending on the circumstances, this could lead to consequential damage to persons and machine components.</p> <p>It is not possible for BRUKER to draw up decontamination rules for all hazardous substances - and their combinations – that the operator could use in NMR experiments</p> <p>In case of contamination of the device the customer is responsible for the decontamination before Bruker employees get access to the system according to chapter "Safety and Repair Declaration" on page 56.</p>
	<p>Warning of moving parts</p> <p>There are uncovered moving parts on the SampleCase.</p> <p>Operators and bystanders must be aware of moving parts on the device. Specially hands, arms and eyes are in danger when they are close to those parts.</p>

Table 7.1: Explanation of the safety symbols on the device

8 Equipment Clearance

8.1 Information Regarding Service

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

- Service (planned 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 56 for work at the customer site. For any hardware leaving the customer this form must be used.

WARNING



Hardware exposed to hazardous substances

The product could be contaminated by hazardous substances by customers.

- ▶ The customers safety representative needs to declare that product is absolutely free of any hazardous substances with the "[Safety and Repair Declaration](#)" on page 56.
- ▶ If the product needs to be shipped, attach this declaration to the delivery note on the package exterior.

8.2 Safety and Repair Declaration¹

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: DATE:
NAME:	
MAILING ADDRESS:	
CITY / POSTAL CODE:	
COUNTRY:	
EMAIL:	

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

9 Contact

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

9.1 Manufacturer

Bruker BioSpin
Industriestrasse 26
CH-8117 Fällanden
Schweiz
Phone: +41-44-825-91-11
Fax: +41-44-825-96-96
<http://www.bruker.com>

9.2 Technical Hotline

Phone: +41-44-825-98-90
samplecase-servcie@bruker.ch

Please refer to the Model No., Serial No. and Internal Order No. in all correspondence regarding the MR system or components thereof.

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D Glossary

BSMS

Bruker Smart Magnet control System

BST

Bruker Sample Transport

ELCB

Extended Lock Control Board

HPPR

High Power Preamplifier

IconNMR

Bruker software module for automation

IPSO

Intelligent Pulse Sequence Organizer

SPS

programmable logic controller

Topspin

Bruker software for acquisition, processing and analysis

TTY

Serial Interface

E References

- [1] BRUKER SampleCase Users Manual (Z31972)
Reto Schmid, December 2010
Bruker BioSpin AG, Fällanden, Switzerland
- [2] BRUKER Site Planning AVANCE Systems 300-700MHz (Z31276)
Stanley J. Niles / Daniel B. Baumann, February 24, 2008
Bruker Biospin GmbH, Rheinstetten, Germany
- [3] BRUKER Site Planning AVANCE Systems 750-950 MHz (Z31686)
Razvan Teodorescu, August 28, 2006
Bruker Biospin GmbH, Rheinstetten, Germany
- [4] BRUKER Probes (Z31339)
D. Marek, R. Triebe, M. Waden, D. Wilhelm July 2, 2009
Bruker BioSpin AG, Fällanden, Switzerland

F Certifications

IEC		IECEE CB SCHEME		CB TEST CERTIFICATE		Ref. Certificate No. CH-6162
IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME						
Issued by:	Electrosuisse					
Product:	Probe transporter					
Applicant:	Bruker BioSpin AG	Industriestrasse 26 CH-8117 Fällanden	Switzerland			
Manufacturer:	Bruker BioSpin AG	Industriestrasse 26 CH-8117 Fällanden	Switzerland			
Factory:	Bruker BioSpin AG	Industriestrasse 26 CH-8117 Fällanden	Switzerland			
Rating and principal characteristics:	24VDC, 0.7A, IP20					
Trade mark (if any):	BRUKER					
Model/Type reference:	SAMPLEMAIL PLUS					
Additional information:	—					
Sample of product tested to be in conformity with IEC:	61010-1(ed.2) 61010-2-081(ed.1);am1				National differences: EU Group Differences; EU Special National Conditions; EU A-Deviations; CA; US	
Test Report Ref. No.:	11-EL-0015.01 + .02					
This CB Test Certificate is issued by the National Certification Body:						
Electrosuisse Luppenstrasse 1, CH-8320 Fehraltorf			electrosuisse >>			
Signed by:	Martin Plüss			page 1 of 1		
	2011-04-28					

Figure F.1: The CE test certificate

G Revision History

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001	22.11.2011	SRE	First release / Product launch

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