



Bruker BioSpin

# NMR CASE ●

System Requirements Manual

Version 012

think forward

NMR Spectroscopy

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# System Requirements

# 1

## Warnings

1.1



### WARNING!

The NMR CASE has to be installed on top of a NMR magnet cryostat.



### DANGER!

This magnet creates a very STRONG MAGNETIC FIELD.

Objects and tools can be attracted to the magnet with great force and may cause damage.

Use only NON-MAGNETIC tools and equipment.

A non-magnetic TOOL SET is supplied with the NMR CASE.

Read and follow carefully this installation manual. Product description, usage, scope of manual, etc.

## Non-magnetic Ladder

1.2

To install the NMR case on top of the magnet cryostat, a non-magnetic ladder made from wood or aluminum must be available. Bruker does not supply non-magnetic ladders.

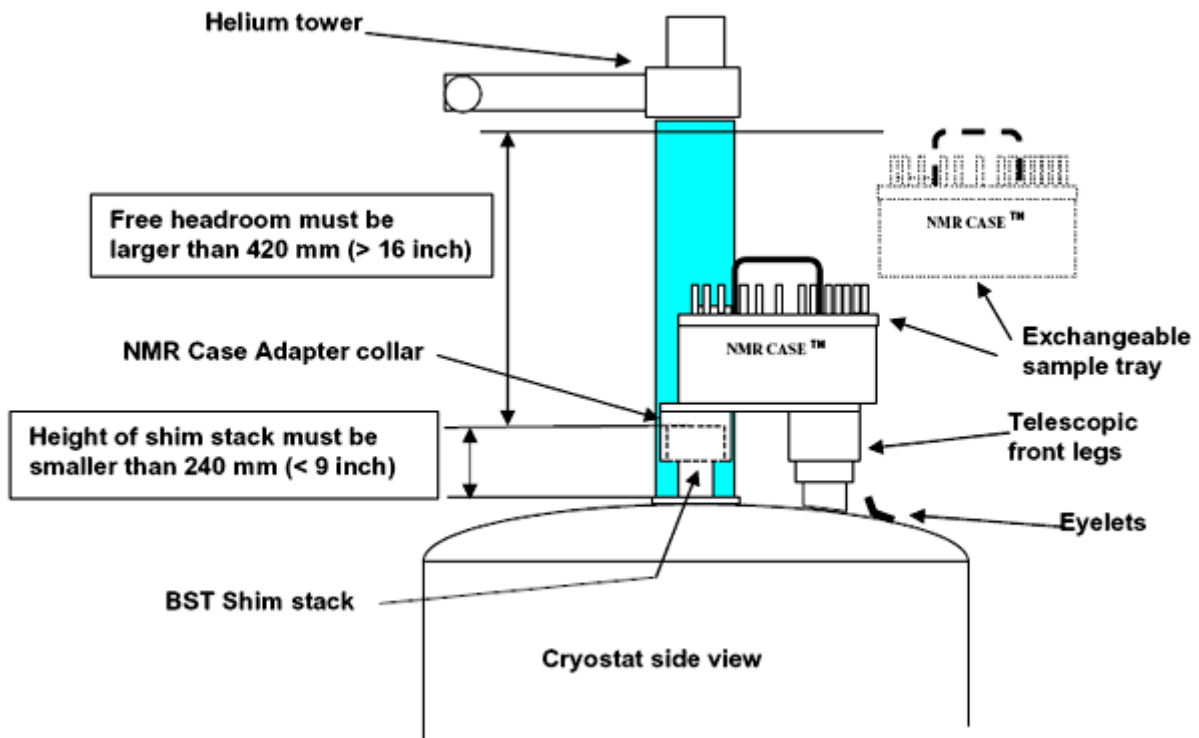
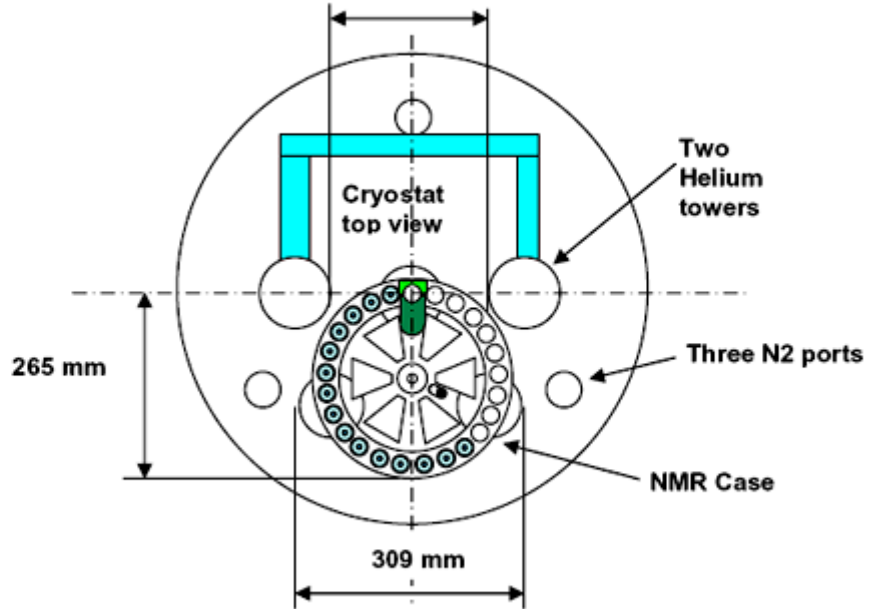


### WARNING!

To avoid damage to the magnet cryostat, use only NON - MAGNETIC equipment.

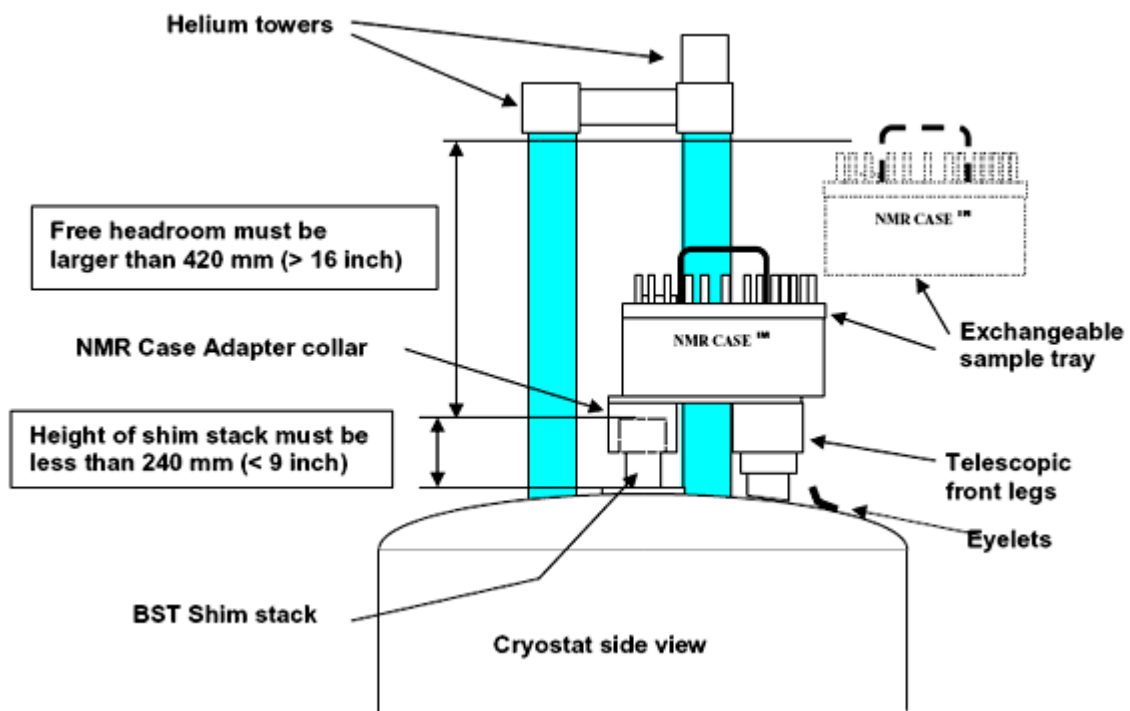
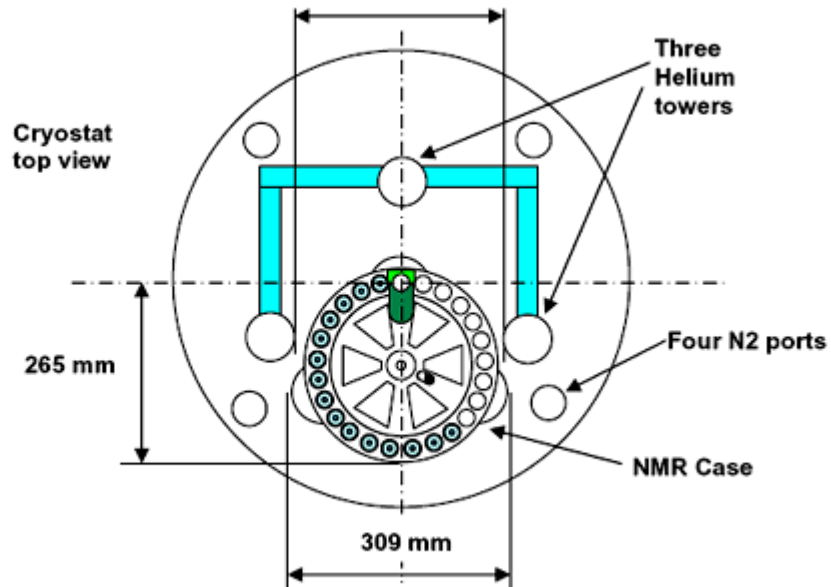
Necessary space on top of the magnet cryostat with TWO helium towers 1.3

Clearance between the two helium towers must be larger than 225 mm (> 9 inch)



Necessary space on top of the magnet cryostat with THREE helium towers 1.4

Clearance between the two helium towers (front) must be larger than 292 mm (> 11.5 inch)



### Orientation of the Shim Stack

1.5

The shim stack orientation must be as shown. The two air inlets must point to the front of the cryostat. The spin rate cable connector must point to the rear. The shim cable at the bottom of the cryostat must point to the rear.

#### Precision of the orientation

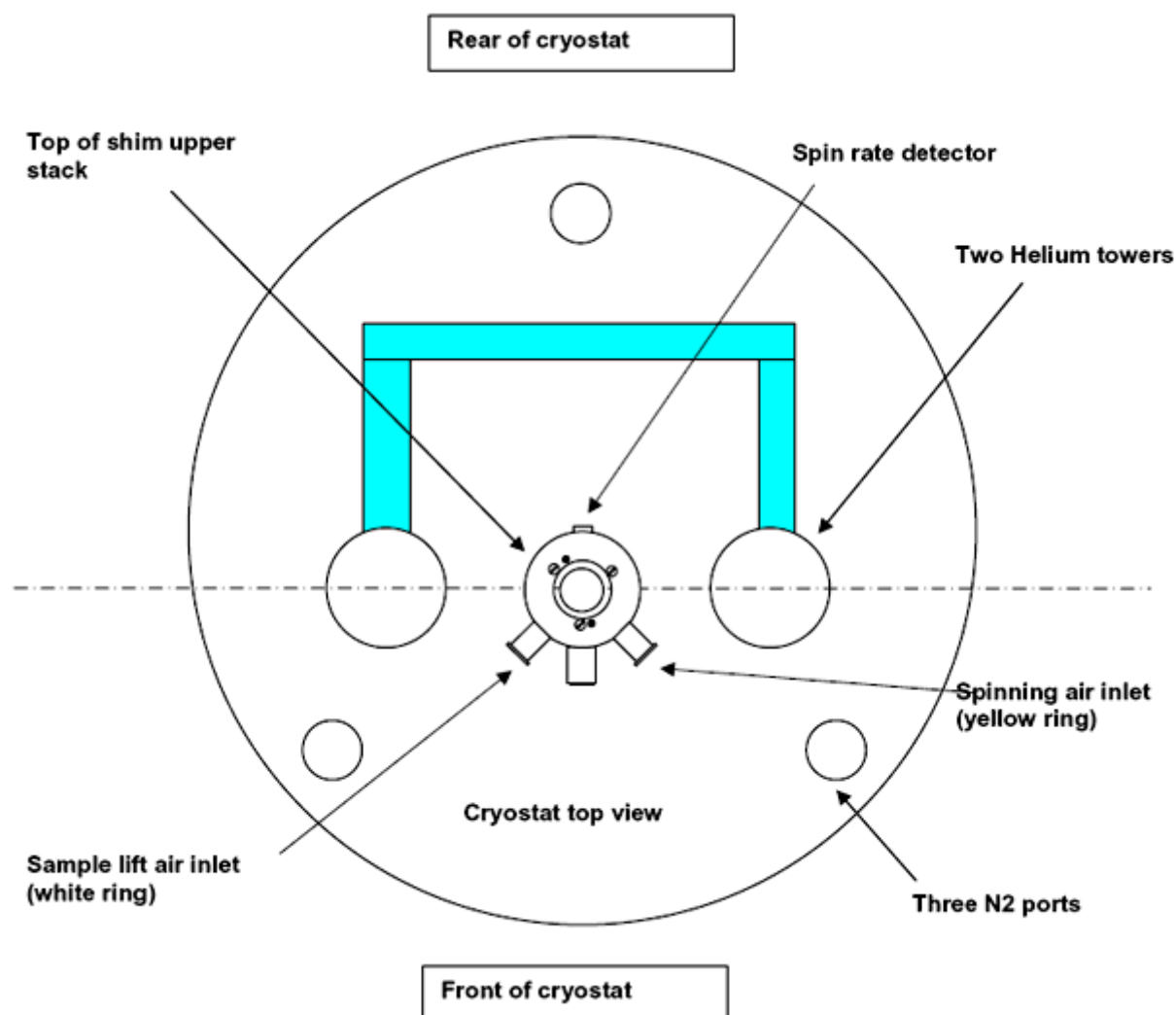
1.5.1

The collar for the NMR Case can be rotated by  $\pm 30$  degrees; therefore the orientation of the shim stack does not need to be very precise.

#### Shimming

1.5.2

If the shim stack needs to be rotated, complete new shim settings are necessary. Please consult a BRUKER engineer before rotating the shim stack.



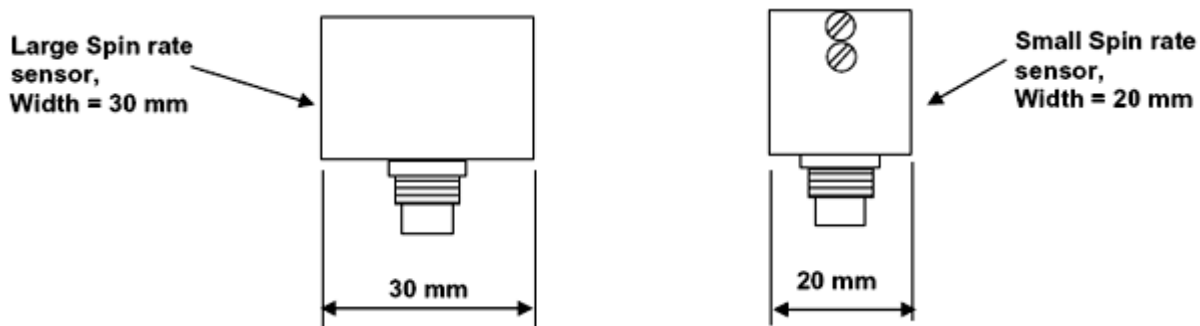


Shim Upper Stack Adapter Collars

1.6

The following adapter collars are necessary and must be specified when ordering an NMR Case:

Shim Upper Stack, Shim Upper Part Adapter, Shim Upper Part						NMR Case Adapter Collar
Type	Part Number	Serial Number	Color	Top Diameter	Spin rate Sensor (width)	Part Number
BST	Z9523 Z9524 Z9525 Z9526 Z42416 Z9527 Z46308 Z48798		Red	Ø 75 mm	Built in	B2383 Is included with every NMR CASE
Standard Bore old type-01	Z5178 Z001103 Z00627 Z5266		Red	Ø 50 mm	Small (20 mm)	B0635
WB > SB adapter insert	Z7680 Z3972 Z5297 Z6964	Below 0019 Below 0030 Below 0123 Below 0014	Gray	Ø 50 mm	Large (30 mm)	B0636
WB > SB adapter insert	Z7680 Z3972 Z5297 Z6964	Above 0019 Above 0030 Above 0123 Above 0014	Gray	Ø 50 mm	Small (20 mm)	B0635
BST WB/99 > SB	Z46401. A - L		Red	Ø 100 mm	Built in	B3944



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### ***The telescopic legs hit a metal eyelet on the cryostat*** **1.7**

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Eyelet covers can be ordered from Bruker USA, the part number is B3156. The telescopic legs will rest on top of the eyelet covers.

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### ***The telescopic legs are too long*** **1.8**

---

Short legs can be ordered. The part numbers are B3743 and B3744, two each are necessary.

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### ***Electrical outlet requirement*** **1.9**

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110 Volt AC 60 Hz or 220 Volt AC 50 Hz, 50 Watt.

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### ***Compressed gas requirement*** **1.10**

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#### ***NMR Case motion controller unit*** **1.10.1**

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The NMR Case motion controller unit must be connected to compressed, oil-free, dry and dust-free air. Oil content < 0.005 ppm (0.005 mg/m<sup>3</sup>), filter size 1 micron, dew point < 4 degrees C.

To ensure the long term operation of the NMR Case, the air filters need to be flushed out and cleaned on a regularly basis. Any dust or dirt will eventually block the valves and air flow reducers of the NMR Case.

Any oil mist in the air will eventually weaken the air cylinders inside the NMR Case.

A better solution is to use dry nitrogen gas with a minimum purity of 99%.

The gas pressure should be between 60 to 90 pounds per square inch (4 bar to 6 bar). The necessary flow rate is 0.5 cubic foot per minute (14 liters per minute).

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#### ***NMR Console*** **1.10.2**

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The NMR console has to deliver the sample lift air. Usually, the sample lift airflow needs to be increased above the amount necessary for manual operation.

The sample lift airflow is dependent on the weight of the sample spinners and the length and type of shim stack. For the blue 5 mm spinners and a short BST shim stack, an sample lift air flow of 3.5 cfm (100 l/m) is necessary. Heavy spinners and a long shim stack of an older version than BST need 4.5 cfm (140 l/m). Of course this high air flow is necessary only during the duration of the sample eject/insert cycle (ca 30 seconds).

Consult the site installation manual and make sure there is enough supply airflow and pressure available to allow for a sample lift airflow set fully to the maximum.

Consult the BSMS manual on how to increase the sample lift airflow.

### Lifting up the helium tower connecting tubes

1.11

In some installations the shim stack tube is long and causes the NMR Case sample changer to sit high above the magnet dewar. In this case, there is not enough free space above the NMR Case, because the horizontal helium tower connection tube (T) of the magnet dewar is in the way.

Solution: the tower connection tube (T) can be raised by 90 mm with commercial available vacuum components.

Example: components from

Nor-Cal Products, Inc.  
1967 South Oregon Street, P.O. box 518,  
Yreka, California 96097,  
phone (916) 842-4457 or (800) 824-4166,  
fax (916) 842-9130,  
web page <http://www.n-c.com/Page.asp?NavID=35>.

Clicking on "NW Flanges and Fitting Catalog" leads to an Adobe Acrobat file, which shows drawings and prices for the parts as follow:

Parts (H): 4 pieces of NW 90° radius elbows part number 2E-NW-25B for \$43.00 each (2004).

Parts (R): 4 pieces of NW clamps, part number NW-25-CP for \$ 7.00 each (2004)

4 pieces of NW aluminum centering rings with Viton o-ring, part number NW-25-CR-AV for \$ 3.50 each (2004).

Of course, these parts can also be ordered through BRUKER.

### Mounting

1.11.1

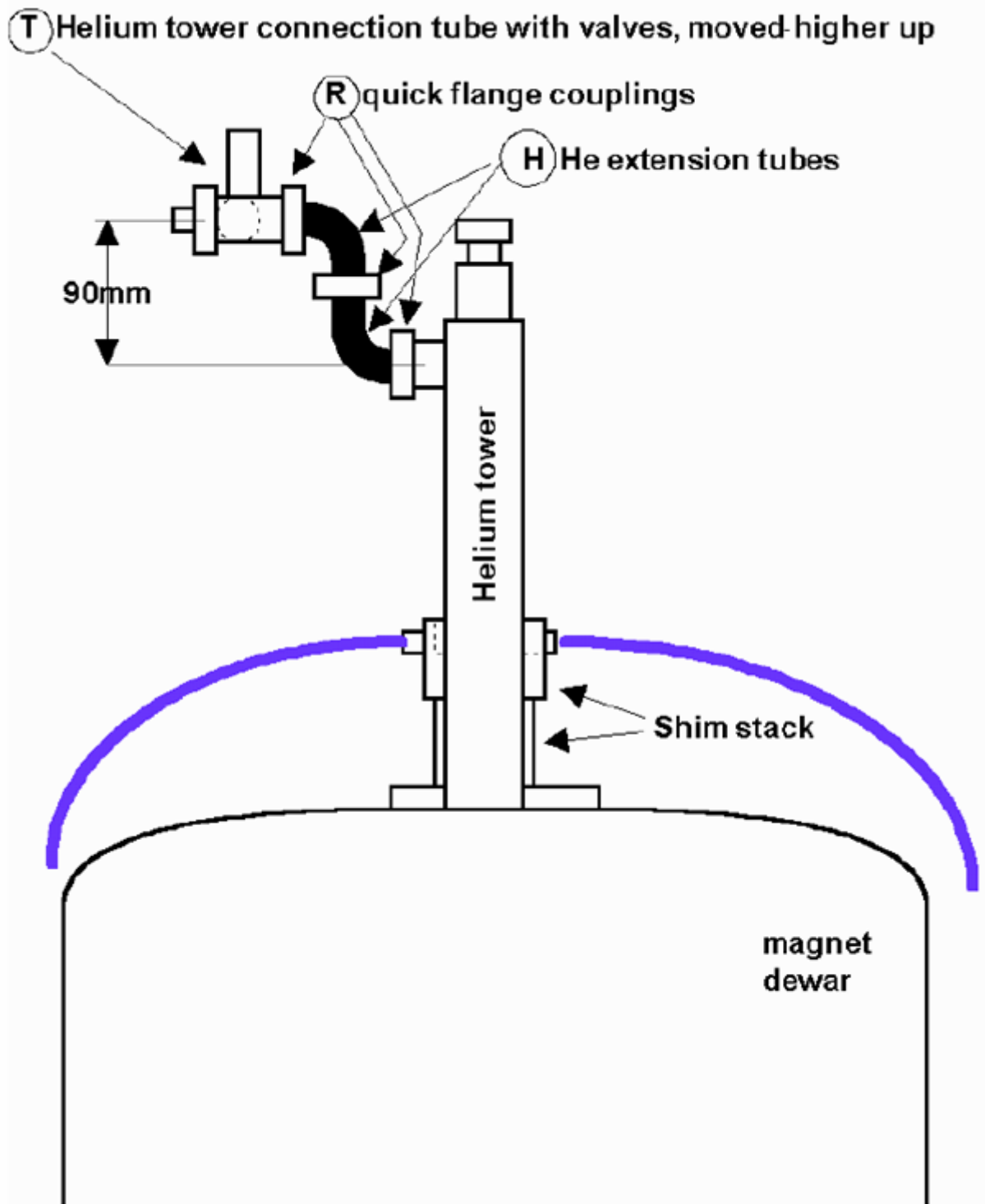
Open the clamps of the two originals quick flange couplings (R) and remove the he tower connection tube from the he towers.



**Important:** to avoid moisture entering the helium towers, immediately block the two openings into the helium towers with Kleenex tissues.

Connect the two extension tubes to both sides of the horizontal connection tube. Use two clamps and o-rings.

Remove the Kleenex tissues and quickly reconnect the tube assembly to the two helium towers.





**End of Document**

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