



MAINTENANCE TRACKING TOOL
PETTRACE800

Date:2023-09-28

Country: Germany	Site: MUN
Intervention:	Programmed maintenance: UBM/CBM <input checked="" type="checkbox"/>
Subsystems:	

PRE-MAINTENANCE

Registration Date: 2023-09-2000
Gas flow(sccm): 1.0

TPG Settings Verifications

	Low limit (x10-)	High limit (x10-)
Piranni 1 (TPG300 A1):	1.0	2.0
Piranni 2 (TPG300 A2):	3.0	4.0
Penning:	5.0	6.0

Notes

notas

Gauge number	Pressure (x10-) without gas	Pressure (x10-) with gas
A1:	A1	A2
A2 Under Range:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A2:		
B1:	B1	B2






System software

Subsystem	Version
Master:	Master
ACS:	1
Service System:	2
Manager:	3
Informix (only applicable to SUN-Master Station):	4

Comments

comentario

Paper Burn Before PM

Pictures	
Image	Comments
	photo1
	photo2
	photo1
	photo2
	photo1

Pictures

Image

Comments



photo2

VACUUM

TPG settings verifications

Date: 2023-09-20

Production gas flow: 5.0

Piranni 1 (TPG300 A1)

Pressure with gas	Low limit (x10-)	High limit
12.0	488.0	44578.0

Piranni 2 (TPG300 A2)

Under range	Pressure with gas	Low limit	High limit
<input checked="" type="checkbox"/>		123.0	3543.0

Penning

Pressure with gas	Low limit	High limit
12.0	45.0	12.0

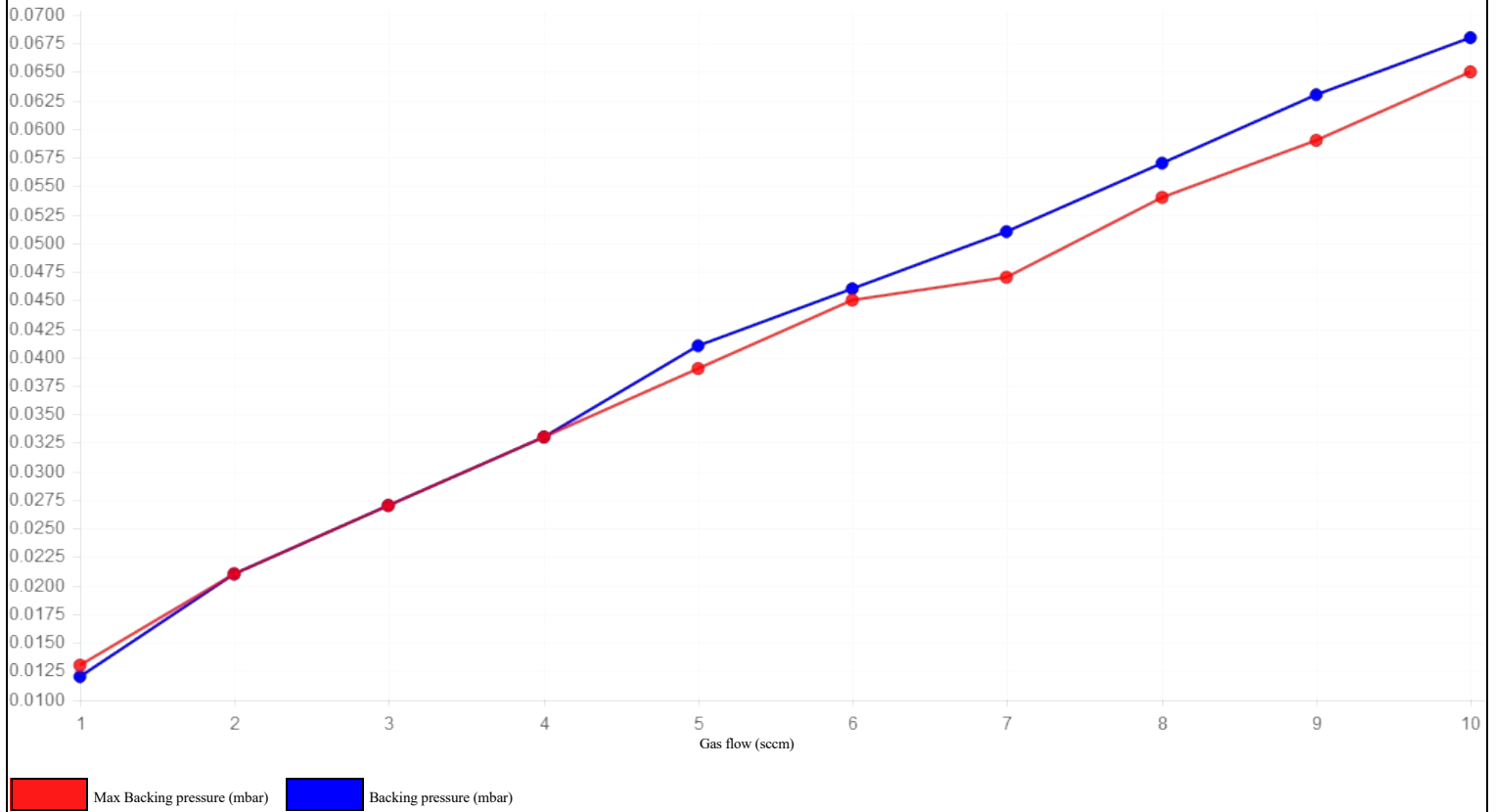
Notes

notas

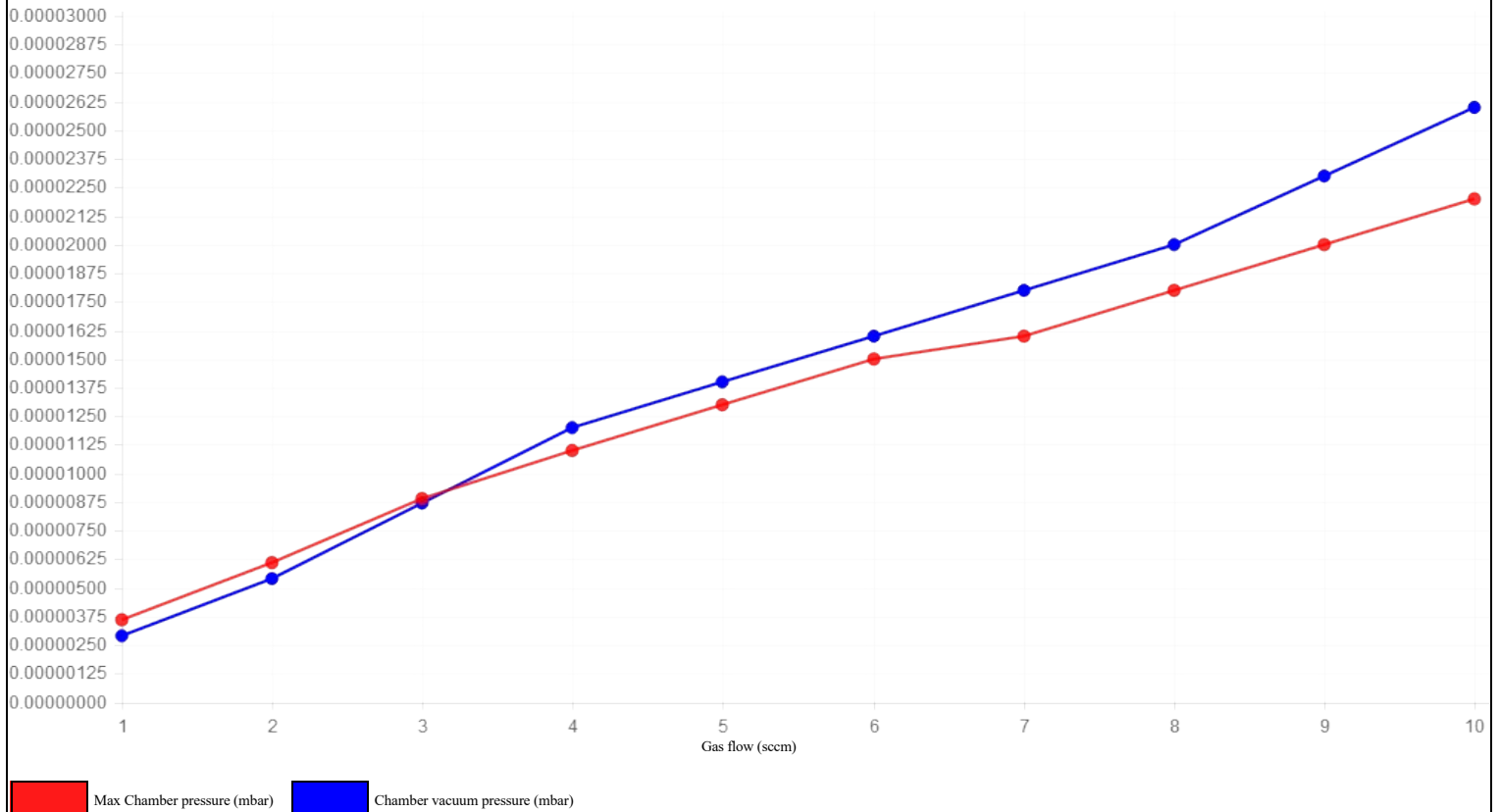
Vacuum MFC curve test

SCCM	Chamber pressure	Backing pressure
1	2.9E-6	0.012
2	5.4E-6	0.021
3	8.7E-6	0.027
4	1.2E-5	0.033
5	1.4E-5	0.041
6	1.6E-5	0.046
7	1.8E-5	0.051
8	2.0E-5	0.057
9	2.3E-5	0.063
10	2.6E-5	0.068

Backing Pressure

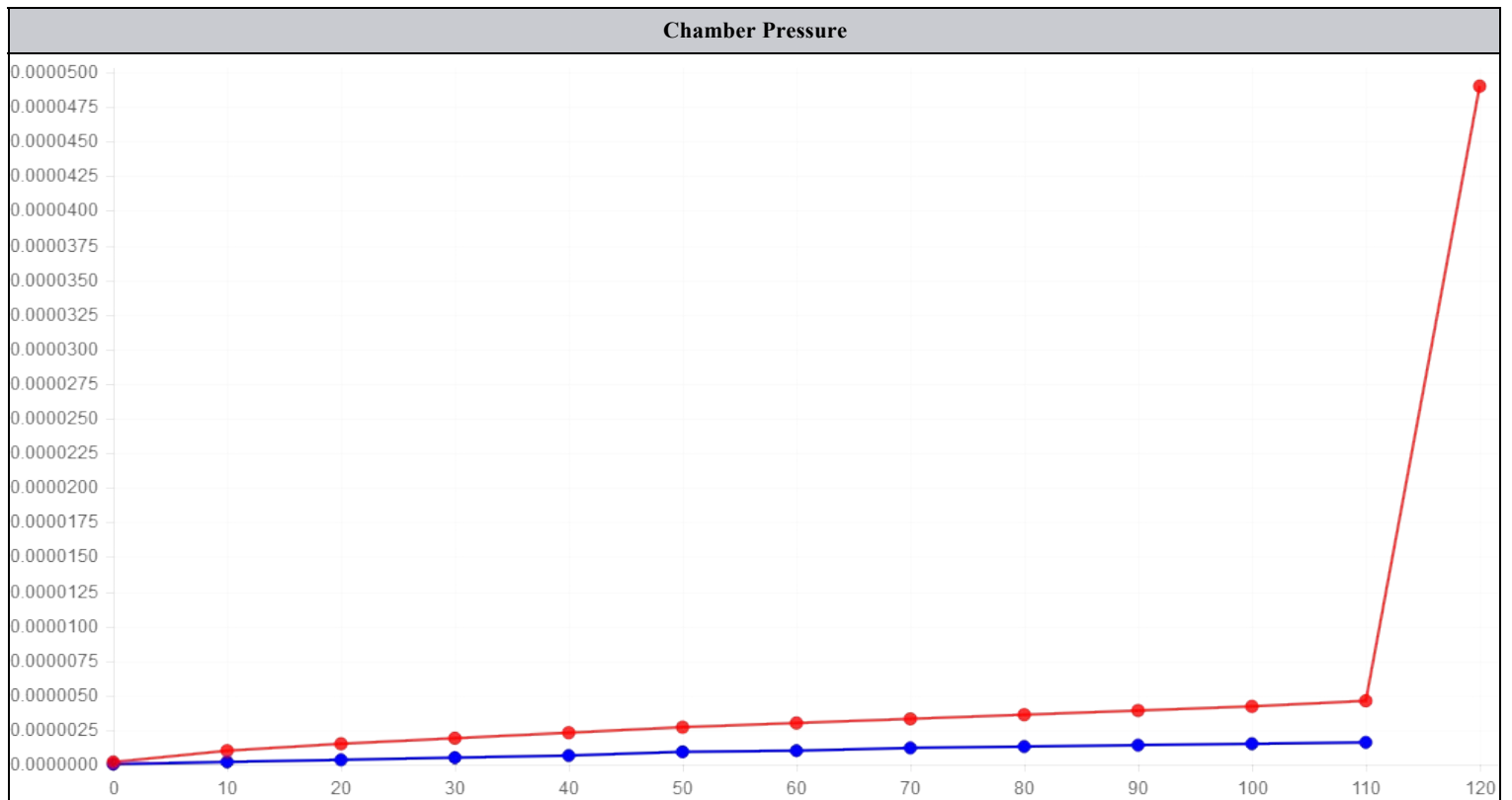


Chamber Pressure



Vacuum leak test

Seconds since push standby	Chamber pressure	Max. Chamber pressure
0	3.0E-8	1.80E-07
10	1.9E-7	1.00E-06
20	3.4E-7	1.50E-06
30	5.0E-7	1.90E-06
40	6.5E-7	2.30E-06
50	9.2E-7	2.70E-06
60	1.0E-6	3.00E-06
70	1.2E-6	3.30E-06
80	1.3E-6	3.60E-06
90	1.4E-6	3.90E-06
100	1.5E-6	4.20E-06
110	1.6E-6	4.60E-06



Diffusion pump & HVV timing

TimeInto	HeatingTime	PumpingTimeBeforeOpenHVV	TimeToOpenHVV
Pump		15.0	

RP & DP pump oil condition

Date last rotary oil change: 2023-08-31

Roughing pump oil mist filter cleaned	Roughing pump oil is in good color and condition
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Last DP maintenance: 2023-08-31

DP oil is in good color and condition	<input checked="" type="checkbox"/>

RP Photos



DP Photos



DP Photos



RP Photos



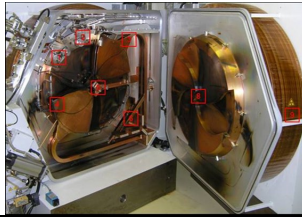
Notes

notas

OtherTest

Name the test	test
Test explanation	aqui se envia una foto o un video

Photos or Videos

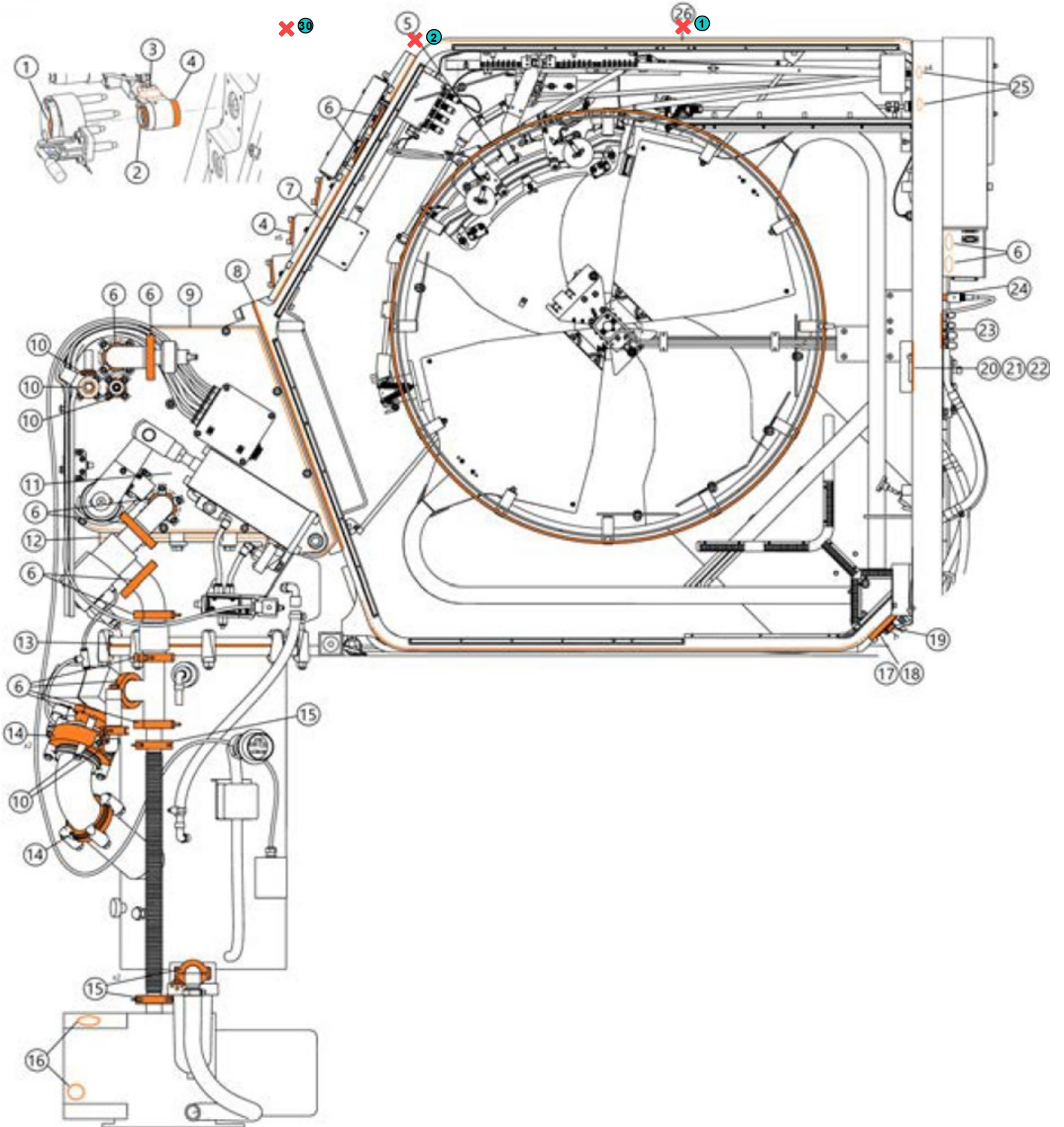


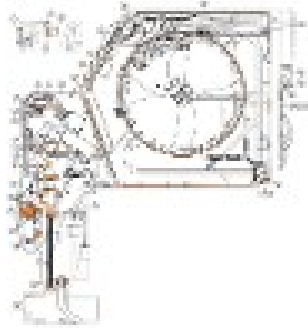
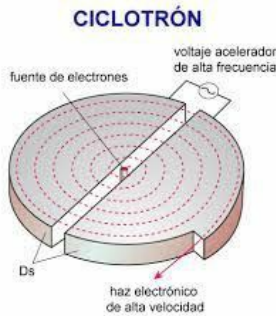
Photos or Videos




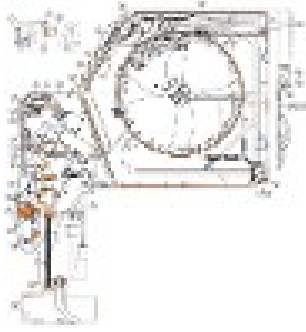
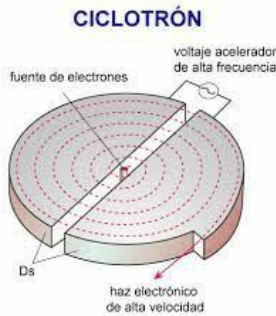
PETtrace800 O-Rings analysis

Pins



Pin 1			
Name the O-Ring	Name and Info of the O-Ring		Name the O-Ring
	Name of O- Ring	Parameter	
(1) Target port o-ring T4	O-Ring 3	7,8,9	t
Explain The Intervention			
Photos			
Photo		Name	
			
<p style="text-align: center;">CICLOTRÓN</p>  <p style="text-align: center;">fuente de electrones voltaje acelerador de alta frecuencia</p> <p style="text-align: center;">Ds haz electrónico de alta velocidad</p>		fff	

Pin 2			
Name the O-Ring	Name and Info of the O-Ring		Name the O-Ring
	Name of O- Ring	Parameter	
(1)Target port o-ring T2	O-Ring 3	7,8,9	gggg
Explain The Intervention			
Photos			
Photo			Name
			

Pin 30			
Name the O-Ring	Name and Info of the O-Ring		Name the O-Ring
	Name of O- Ring	Parameter	
(1) Target port o-ring T4	O-Ring 3	7,8,9	t
Explain The Intervention			
Photos			
Photo			Name
			
<p style="text-align: center;">CICLOTRÓN</p>  <p style="text-align: center;">fuente de electrones voltaje acelerador de alta frecuencia</p> <p style="text-align: center;">Ds haz electrónico de alta velocidad</p>			fff

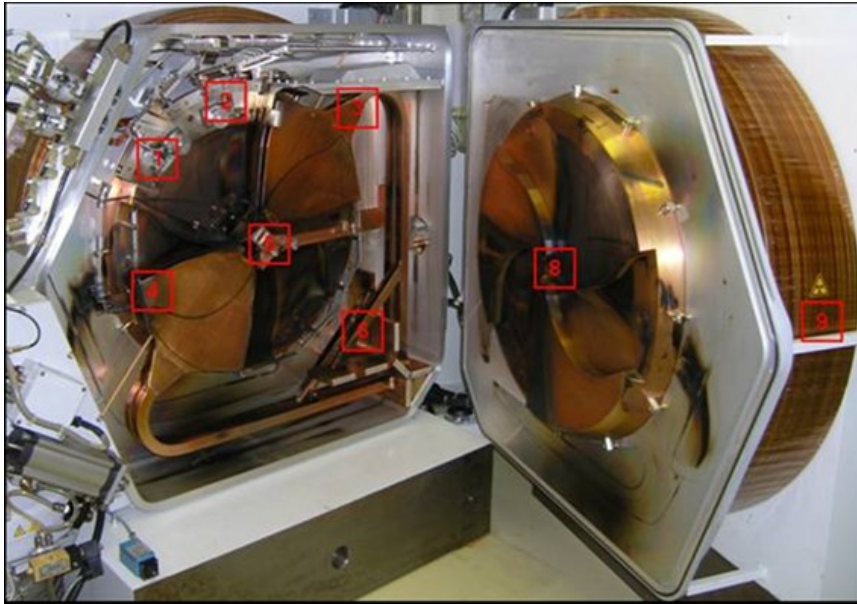
CHAMBER

Chamber Opening

Close target cooling water lines	✓
Visual inspection of door bolts and motor	✓

Measure yoke play, adjust if needed: 1.0

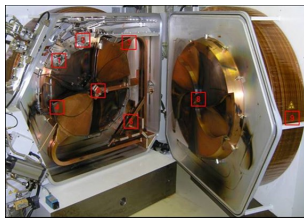
Dose rate mapping (positions 1-9, [$\mu\text{Sv/h}$])



Position1At36CmFromExtractionTrolley	12
Position2At36CmFromCarousel2	23
Position3At36CmFromDee2stemJunction	34
Position5At36CmFromCentralRegion	56

Photo documentation & visual inspection

Magnet pole



Beam exit valve tests

Visual inspection of opening/closing	<input checked="" type="checkbox"/>
Visual inspection of tubing	<input checked="" type="checkbox"/>
Tubing replacement if needed	<input checked="" type="checkbox"/>

Flaps

Flap 2

Calibrate flaps, record minimum and maximum motor current:

Minimum current [mA]	123
MaximumCurrentMA	123

Record flap to dee distances for 0%, 50%, 100%

0% value [mm]	1.0
50% value [mm]	2.0
100% value [mm]	2.0

Central Region

Visual inspection of flip-in probe



Measure flip-in probe position (a,b,c,d,e)

A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
1.0	2.0	3.0	4.0	5.0

Dismount ion source and mount dummy ion source



Measure central region distances (A, B, C, D) [mm]

A [mm]	B [mm]	C [mm]	D [mm]
6.0	7.0	8.0	9.0

Visual inspection and photo of H-puller



If needed: H-puller replacement



If needed: Adjustment of central region and record A, B, C, D again

If needed: Adjustment of central region and record A, B, C, D again



A [mm]	B [mm]	C [mm]	D [mm]
1.0	2.0	3.0	4.0

If needed: Ion source maintenance or replacement



Install back ion source





Restore and record flip-in probe position

Restore and record flip-in probe position



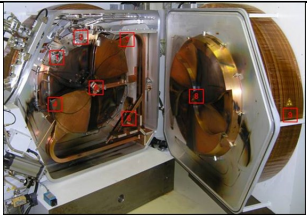
A [mm]	B [mm]	C [mm]	D [mm]
3.0	4.0	5.0	6.0

Pictures	
Image	Comments
	qqw
	qwe

Dees

Visual inspection of dees, internal and external baffles	✓
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	Measure dee thickness	Measure dee height
A	1.0	9.0
B	2.0	10.0
C	3.0	11.0
D	4.0	1.0
E	5.0	2.0
F	6.0	1.0
G	7.0	3.0
H	8.0	14.0

Pictures	
Image	Comments
	123

Verify tightness of dee- and stem screws	✓
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Extraction

Test each microswitch of extraction system	<input checked="" type="checkbox"/>
Replace extraction foils of carousels	<input checked="" type="checkbox"/>
Visual inspection of extraction cables	<input checked="" type="checkbox"/>

Calibrate balance, record minimum and maximum motor current [mA]

	Calibrate balance, record minimum and maximum motor current	Calibrate extraction 1, record minimum and maximum motor current [mA]	Calibrate extraction 2, record minimum and maximum motor current [mA]
Minimum current [mA]	1.0	3.0	5.0
Maximum current [mA]	2.0	4.0	6.0

Diagnostic system checks

Visual inspection of collimators and collimator cables	<input checked="" type="checkbox"/>
Check collimator screws tightness	<input checked="" type="checkbox"/>

Check collimator vertical opening for each collimator pair	1.0
Check collimator vertical opening for each collimator pair	2.0
Measure flip-in probe resistance	3.0

	Resistance Measurement	Insulation Measurement
Extraction 1	4.0	5.0
Extraction 2	6.0	7.0

Targets	8.0
Comments	9

Chamber Clean-up

Carousel repositioning

Reset foil counter	<input checked="" type="checkbox"/>
Install back carousels	<input checked="" type="checkbox"/>
Foil change test on each carousel	<input checked="" type="checkbox"/>

Full picture of vacuum chamber



Chamber clean-up

Regrease door o-ring	<input checked="" type="checkbox"/>
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Cabinets

Swedewater

Inspect cooling water system for leaks	PSMC / RFPG water manifold, Swedewater cabinet
If needed inspection of cooling water filters	Inspect and clean Z1 filter

Record of water cooling system performance

Record expansion vessel pressure BP1 [bar]	1.0
Record water level [mm]. Adjust if needed	2.0
Record main pump pressure BP2 [bar]	3.0
Record system temperature BT1 [°C]	4.0
Record temperature alarm setting [°C]	5.0
Record cooling water out temperature T2 [°C]	6.0
Record cooling water in temperature BT3 [°C]	7.0
Record deionizer flow BF10 [l/min]	8.0
Record conductivity BQ1[μS/cm]	9.0
Replace deionizer vessel if needed	<input checked="" type="checkbox"/>

Pictures	
Image	Comments
	23

Cabinets RFPG

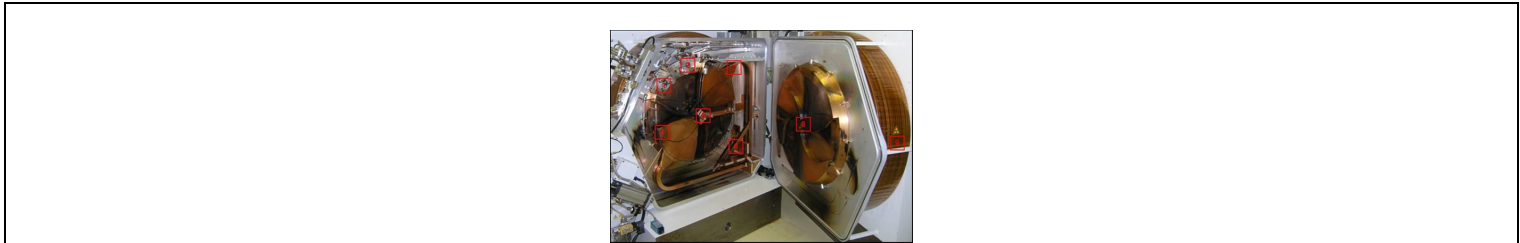
RFPG general tasks

Switch off power to RFPG, log out & tag out	Replace the RFPG air inlet filters, clean the front grid cover, inspect the grid of the back of the cabinet, clean if required
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

TAU inspection

TAU inspection	Verify that no burn marks, loose cables, or water leaks are present
Repair and/or replace as required	repair

Take photos (upper and lower compartment)



GSPU inspection

Verify that no burn marks or loose cables are present	<input checked="" type="checkbox"/>
Clean	<input checked="" type="checkbox"/>

Repair and/or replace as required
replace

Take photos

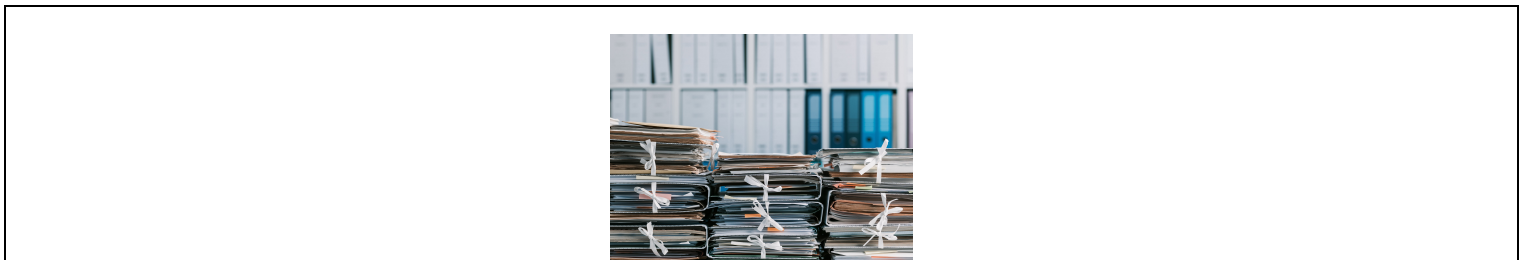


DPA inspection

Verify that no burn marks, loose cables, or water leaks are present	<input checked="" type="checkbox"/>
Clean	<input checked="" type="checkbox"/>

Repair and/or replace as required
replace

Take photos



TPSU back side inspection

Record the resistance of the earth stick	5.0
TPSU back side inspection	Verify that no burn marks, loose cables, or water leaks are present

Repair and/or replace as required
replace

Take photos



Remove earth stick	<input checked="" type="checkbox"/>
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TPSU front side inspection

TPSU front side inspection	Clean
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Repair and/or replace as required
repair

Take photos



RFPG live tests

Record RFPG water cooling pressure	Switch on RFPG main power	Record DPSU voltage [V]	Record DPSU ripple [mV rms]
1.0	<input checked="" type="checkbox"/>	2.0	3.0

Record voltages on phase load detector board (SCU)

3V [V]	TP1 +15V [V]	TP2 -15V [V]	TP3 +5V [V]	TP4 +24V [V]
4.0	5.0	6.0	7.0	8.0

Record ripple on phase load detector board (SCU)

3V [V rms]	TP1 +15V [V rms]	TP2 -15V [V rms]	TP3 +5V [V rms]	TP4 +24V [V rms]
9.0	10.0	11.0	12.0	13.0

Turn on Magnet to set value



Record RF parameters in off mode

RFrom SCU Webpage:

DEE voltage ref [V]	999.0
DEE voltage read 1 [V]	14.0
DEE voltage read 2 [V]	15.0
RF fwd voltage [Vrms]	16.0
RF reflected voltage [Vrms]	17.0
DPA RF FWD voltage [Vrms]	18.0
FWD power [kW]	19.0
Reflected power [kW]	20.0
Anode voltage [kV]	21.0
Anode current [A]	72.0
Grid voltage [V]	23.0
Grid current [A]	24.0
Screen voltage [V]	25.0
Screen current [mA]	26.0
Heater voltage [V rms]	27.0

From PSS:

DEE voltage set [kV]	28.0
DEE voltage read [kV]	29.0
Delta DEE voltage set [kV]	30.0
Delta DEE voltage read [kV]	31.0
FWD power [kV]	32.0
Reflected power [kV]	33.0
Flap I start [%]	34.0
Flap I position [%]	35.0
Flap II start [%]	36.0
Flap II position [%]	37.0

Record RF parameters in standby mode

From SCU Webpage:

DEE voltage ref [V]	38.0
DEE voltage read 1 [V]	39.0
DEE voltage read 2 [V]	40.0
DRF fwd voltage [Vrms]	41.0
RF reflected voltage [Vrms]	42.0
DPA RF FWD voltage [Vrms]	43.0
FWD power [kW]	44.0
Reflected power [kW]	45.0
Anode voltage [kV]	46.0
Anode current [A]	47.0
Grid voltage [V]	48.0
Grid current [A]	49.0
Screen voltage [V]	50.0
Screen current [mA]	51.0
Heater voltage [V rms]	52.0

From PSS:

DEE voltage set [kV]	53.0
DEE voltage read [kV]	54.0
Delta DEE voltage set [kv]	55.0
Delta DEE voltage read [kV]	56.0
FWD power [kV]	57.0
Reflected power [kV]	58.0
Flap I start [%]	59.0
Flap I position [%]	60.0
Flap II start [%]	61.0
Flap II position [%]	62.0
Soft-start RFPG. Start from 25kV / 0kV, ramp up with 1kV / 10s to config value	<input checked="" type="checkbox"/>

Record RF parameters in on mode

From SCU Webpage:

DEE voltage ref [V]	63.0
DEE voltage read 1 [V]	64.0
DEE voltage read 2 [V]	65.0
RF fwd voltage [Vrms]	66.0
RF reflected voltage [Vrms]	67.0
DPA RF FWD voltage [Vrms]	68.0
FWD power [kW]	69.0
Reflected power [kW]	70.0
Anode voltage [kV]	71.0
Anode current [A]	72.0
Grid voltage [V]	73.0
Grid current [A]	74.0
Screen voltage [V]	75.0
Screen current [mA]	76.0
Heater voltage [V rms]	77.0

From PSS:

DEE voltage set [kV]	78.0
DEE voltage read [kV]	79.0
Delta DEE voltage set [kv]	80.0
Delta DEE voltage read [kV]	81.0
FWD power [kV]	82.0
Reflected power [kV]	83.0
Flap I start [%]	84.0
Flap I position [%]	85.0
Flap II start [%]	86.0
Flap II position [%]	87.0
Let the system run for approximately 1-2 hours, monitor parameters, record fastlog, five second log and statistic log, download the SCU logs.	88
Upload files	https://api.moreapp.com/api/v1.0/client/registrations/files/68496b7d-edab-48c1-adeb-5048498d13d1

Record RF parameters in on mode again

From SCU Webpage:

DEE voltage ref [V]	89.0
DEE voltage read 1 [V]	90.0
DEE voltage read 2 [V]	91.0
RF fwd voltage [Vrms]	92.0
RF reflected voltage [Vrms]	93.0
DPA RF FWD voltage [Vrms]	94.0
FWD power [kW]	95.0
Reflected power [kW]	96.0
Anode voltage [kV]	97.0
Anode current [A]	98.0
Grid voltage [V]	99.0
Grid current [A]	100.0
Screen voltage [V]	101.0
Screen current [mA]	102.0
Heater voltage [V rms]	103.0

From PSS:

DEE voltage set [kV]	104.0
DEE voltage read [kV]	105.0
Delta DEE voltage set [kv]	106.0
Delta DEE voltage read [kV]	107.0
FWD power [kV]	108.0
Reflected power [kV]	109.0
Flap I start [%]	110.0
Flap I position [%]	111.0
Flap II start [%]	112.0
Flap II position [%]	113.0
Turn RFG off	<input checked="" type="checkbox"/>

Cabinets PSMC

PSMC
Inspect for water leaks, burn marks and broken parts

Verify the resistance values with the installation tester

Resistance between negative and positive [Ω]	Resistance between negative and ground [$M\Omega$]	Resistance between positive and ground [$M\Omega$]
1.0	2.0	3.0

Lookup
Install back all covers,Verify fan functionality,Verify interlock functionality

Record on sequence ramping speed	Record on sequence ramping up time to maximum	Record on sequence ramping up time to configuration value
4.0	5.0	6.0

Verify PSMC performance for H-config value

Set current	7.0
Output current [A]	8.0
Voltage read PSS [V]	9.0
Coil voltage [V]	10.0
Firing sequence [number of peaks in 20ms]	11.0
Ripple [mV rms]	12.0

Verify PSMC performance for 499A

Set current	13.0
Output current [A]	14.0
Voltage read PSS [V]	15.0
Coil voltage [V]	16.0
Firing sequence [number of peaks in 20ms]	17.0
Ripple [mV rms]	18.0

Verify PSMC performance for 250A

Set current	19.0
Output current [A]	20.0
Voltage read PSS [V]	21.0
Coil voltage [V]	212.0
Firing sequence [number of peaks in 20ms]	23.0
Ripple [mV rms]	24.0

Verify PSMC performance for 50A

Set current	25.0
Output current [A]	26.0
Voltage read PSS [V]	278.0
Coil voltage [V]	28.0
Firing sequence [number of peaks in 20ms]	29.0
Ripple [mV rms]	30.0


Turn off PSMC and measure off sequence ramping down time	<input checked="" type="checkbox"/>
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Cabinets ACU

Record ACU voltages GND_IO / 24	Record ACU voltages GND_IO / +15V	Record ACU voltages GND_IO / -15V	Record ACU voltages GND / +5V	Record ACU voltages Chassis / GND_IO
9.0	8.0	7.0	6.0	5.0

Cabinets PDU

Visual inspection	<input checked="" type="checkbox"/>
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Pictures	
Image	Comments
	comentario de foto

Check and tighten all terminal screws	<input checked="" type="checkbox"/>
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Ion Source

Record H2 gas pressure

Set point [bar]	Reading at MFC [bar]
1.0	2.0

Turn on Magnet, set probe in, turn on RF, turn on gas.

Magnet current [A]	DEE1 voltage [kV]	DEE2 voltage [kV]	Gas flow [sccm]	If ion source was maintained, perform ion source conditioning (ramp up from 30 mA to 100 mA in 30 minutes and from 100mA to 200mA in 10 minutes)
3.0	4.0	5.0	6.0	<input checked="" type="checkbox"/>

Record Ion Source Performance

IS current [mA]	IS voltage [V]	Flip in probe current [μ A]
9.0	5.0	1.0

Paper Burn Test

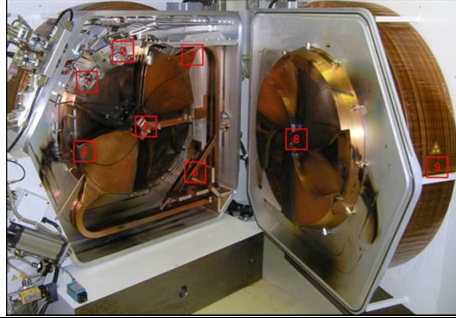
Install paper burn target



Perform paper burn test in SB and DB



Install paper burn target



If needed, adjust collimators and repeat


asd

LTF

LTF	If needed, replace LTF peek lines and connectors
Inspect the movement of all LTF compressed air actuators	V3

Starting pressure [psi]	Pressure drop [psi / h]
7.0	5.0

If needed: Perform target fill tests and adjustment for each target	3.0
If needed, adjust and repeat test, record adjustment value	0.0

Pictures	
Image	Comments
	asd

Autoshield

Check compressor oil level and operational hours	12.0
Autoshield	Manually drain the the air tank and the air manifold to evacuate condensated water,Verify the air tank relief valve operation, repair/replace as required
Verify tank water level and float switches functionality, top up water level/repair and/or replace switches as required	✓
Verify functionality of micro switches for: Door closed	✓
Read and record door lift timing for left door	12.0
Read and record door lift timing for right door	4.0
Verify functionality of skirt microswitches and that the skirts seats properly on the micro switches	✓
Verify tightening of the upper and the lower socket heads screws	✓

Autoshield Upper



Read and record upper manometer lifting pressures

K1	K2	K3	K4	K5	K6
9.0	8.0	7.0	6.0	5.0	4.0


Autoshield Lower

Read and record lower manometer lifting pressures

K1	K2	K3	K4	K5	K6
0.0	1.0	2.0	3.0	4.0	5.0

Pictures	
Image	Comments
	q
	23

Beam Conditioning

Photo name	Add Photo	Add Comment
nombre1		12

PMDebriefing

Record additional tasks performed not recorded elsewhere	Record open tasks and issues	Record spare parts / consumables to be ordered	Record worker dosimetry
123	123	3	1.0