What to test	Observe	Criteria	Results	
Vacuum cleanliness	IG1 (before heating)	< 5 E-7 Torr	6.9E-7 Torr 2015-04-30	
			<mark>4.8E-7 Torr</mark> 2015-05-04 (w/o left coil line)	
			2.8E-7 Torr 2015-06-01 (after heating)	
Water lines, brazing,	IG1	No increase in vacuum when	Pass	
soldering, c-seals		water is switched on		
	RGA (if operational)	No increase in mass 18 when	Pass	
		water is switched on		
	Flow meters	HS + MSP > 4 lpm	<mark>4.5 lpm</mark>	
		TGHT > 5.5 lpm	<mark>5.9 lpm</mark>	
		TBHT > 5.5 lpm	<mark>6.2 lpm</mark>	
		COIL > 5 lpm	5.2 lpm	
High voltage BIAS	BIAS I @ 55 kV	< 60 μΑ	<mark>43 uA @ 55 kV</mark>	
	# sparks @ 55 kV	< 1/ 10 min	<mark>No sparks for 30 min</mark> – first test	
			< 4 sparks hour – final test	
High voltage EINZEL	EZL I @ 30 kV	< 125 μA	110 uA @ 30 kV	
	# sparks @ 30 kV	< 1/60 min	No sparks for 60 min	
Voltage Extraction Electrode	EE I @ 2 kV	< 700 μA	<mark>691 uA @ 2kV (cold)</mark>	
Voltage Anode/Cathode	ANODE I @ 300 V (cold source)	= 0 A	0.000 mA @ 300 V	
High current	TGHT U @ 580 A	<7.2 V	7.1 V	
			7.5 V	
	TBHT U @ 320 A	< 2.4 V	2.5 V at 300 A	
			<mark>2.6 V</mark> at 300 A	
	COIL U @ 50 A	< 0.5 V	0.34 V	
Beam transport	Steerers	Confirm steering horizontal	Steering confirmed	
		Confirm steering vertical		
	Einzel lens	Confirm focusing	Focusing confimred	
Ion Source (FEBIAD)	Extracted beam	Confirm Ne beam on FC6	1.4E-9 A at 580 A, 300 A, 200 V, 50 A	
		> 1E-9 A		
Mass spectrum	Record mass spectrum from	Compare with previous data	ОК	
	source			
Emittance	Emittance	Compare with previous data	ОК	

TM2 Source Tray Test in ISAC Test Stand April/May 2015

e-log entries

Final test: https://elog.triumf.ca/TIS/Test-Stand/447

Test aborted due to EE line touching coil line – electrical short: <u>https://elog.triumf.ca/TIS/Test-Stand/444</u>

Test with redesigned coil conductor blocks – repeated leak at coil conductor block: <u>https://elog.triumf.ca/TIS/Test-Stand/441</u> Leak developed at coil conductor block while target hot

First test: <u>https://elog.triumf.ca/TIS/Test-Stand/438</u> Leak developed at coil conductor block while target hot

Notes

- 1. EZL was tuned to 15.7 kV at 30 kV BIAS. Required EZL voltage at 60 kV BIAS is expected to be 31.4 kV (5% more than the rated voltage for the cable used)
- 2. VCB1 steering required was 700 V (500 V CBC). A steering voltage of 1400 V could be required at 60 kV
- 3. TBHT and TGHT voltage was somewhat higher than expected. This could be explained by the thermal cycling of the target and the trips due to vacuum leaks.
- 4. Window cooling lines were installed but not connected to the water block nor the windows
- 5. The read back from the FEBIAD coil power supply stopped working during the test.

X		/usr1/isact/edl/isact	_febiadsrc.edl			×
	ISAC T	EST STAND FEBIAD	ION SOURCE			
					Global Reset	
<mark>P</mark>	TSGEZL	15700 40000 15687	V 61 uA		00 A TSG:COL1	
—	TSG:CB1	500 1000	500 V 500) V 0 500	5000 TSG:CBC	
00	TSGVCB1	700 1000	700 V 500) V 🖂 💷	5000 TSG:CBC	
		-1500	-1497 V	Set Limit Volts	-10002 V	
/		-	512.821 u/	4		
	0	0.25	0.0.V	Sat Limit Volta	6.00 V	
		100.00	200 0.00 A	Set Limit Amps	200.00 A	
	,					
	TSH:ANODE	200	1000 200 V	Set Limit Volts	500 V	
	, ,	150.000	124.542 mA	Set Limit Amps	5000.000 mA	
	,0	2.600	10 2.562 V	Set Limit Volts	10.000 V	
2.007 T		300.0	600 298.9 A	Set Limit Amps	600.0 A	
TSGIG1	0	7.500	10 7.448.\/	Set Limit Volts	10.000 V	
7.70e-07 T	TSHITGHT	580.0		Set Limit Amps	600.0 A	
	, , , , , , , , , , , , , , , , , , ,					
	TSG:BIAS	30000 60000 29978 \	/ 37 uA			
	Gases					
	Auto "P/S	on" "P/S off"		"TPS/TSG Anti-s	park ISACT	
				Set Limit Volts		
				Set Limit Amps		
	Sources Save/Restore				arget Heat/Cool Ramp	
N TSGCGIA 0.007 TSGCGIA 7.70e-07 T . •	TSG:CBI Image: Control of the second sec	500 1000 international international intern	500 V 500 700 V 500 700 V 500 512.821 u/ 0.00 V 124.542 mA 0.00 V 124.542 mA 0	V O	500 ISGGCDC 500 ISGCDC -10002 V - 6.00 V 200.00 A 5000.000 mA - 10.000 V - 600.0 A - 10.000 V - 600.0 A - 10.000 V - 10.000 V - 10.000 V - 600.0 A - 10.000 V -	

Figure 1: EZL voltage higher than for the Test Stand Source Tray, steering applied.



Figure 2: Final HV conditioning



Figure 3: Test Stand coil configuration



Figure 5: Original coil connector blocks



Figure 4: TM2 coil configuration



Figure 6: New coil connector blocks