

## 6 Module Connection Checklist

SEQ	ITEM	NOTE	CHECK
Safety	Acknowledge and Activate Work Permit	Call RIB operators (ext. 7500) Call Main Control Room if disconnecting or closing water supply/return in SEQ 0 (ext. 7333)	✓ ✓ ✓ ok
Safety	<ul style="list-style-type: none"> <li>• Electronic dosimeter ✓</li> <li>• Tank Suit ✓</li> <li>• Respirator ✓</li> <li>• Overshoes ✓</li> <li>• Gloves(double) ✓</li> <li>• Safety Glasses / Full Face Respirator ✓</li> </ul>	Remove and replace overshoes when exiting the pit to reduce risk of spreading contamination.	ok
Safety	Check the General Field of ITW/ ITE	RAM or pole monitor ( $\leq 500 \mu\text{Sv/h}$ ) <sup>1</sup>	✓
Prep	Check tools: <ul style="list-style-type: none"> <li>• Hex Keys (9/16", 3/16" &amp; 3/8")</li> <li>• Side Cutter</li> <li>• Wrenches (two 1/2")</li> <li>• Wipes</li> <li>• 10" Cable Ties</li> <li>• RAM</li> </ul>		✓
0	High Active Cooling Water	<ul style="list-style-type: none"> <li>• Verify valve for supply water closed</li> <li>• Verify valve for return water closed</li> </ul>	✓
1	Shutter	<ul style="list-style-type: none"> <li>• Cut cable tie</li> <li>• Push down bellow (air cylinder)</li> </ul>	✓
2	Compressed Air to Shutter and Valves (x2)	Shutter should be opened (pushed down)	✓
3	Gas Line (5/8" & 11/16")	<b>FEBIAD target only</b> Two manual valves are opened	NA
4	ITW/ITE Roughing out	Ask ISAC operator rouging out ITW/ITE	✓
5	High Current Cables: <ul style="list-style-type: none"> <li>a) (A)Target Oven + ✓</li> <li>b) (B)Target Oven - ✓</li> <li>c) (C)Tube heater - ✓</li> <li>d) (D)Tube Heater + ✓</li> <li>e) (T)60KV Bias ✓</li> <li>f) <del>(PQ)Coil +</del></li> <li>g) <del>(RU)Coil -</del></li> </ul>	f) FEBIAD target only g) FEBIAD target only	ok ✓
6	Extraction Electrode (I)		✓
7	Einzel Lens (Y)	Einzel lens cable should be routed as far away from all 60 kV corona rings as possible	✓

<sup>1</sup> Ref Dose Estimate Form Document-19905

8	52 Pin Connector (H)	Ground to bias stand	
9	<p>a) Water Lines</p> <ol style="list-style-type: none"> <li>1. Target Oven ✓</li> <li>2. Tube Heater ✓</li> <li>3. MSP ✓</li> <li>4. EE ✓</li> <li>5. HS ✓</li> <li>6. Window ✓</li> <li><del>7. Coil 2</del></li> <li>8. Coil 1 (ITE only) ✓</li> </ol> <p>b) Open water (after step a)</p> <p>c) No Drip Leaks on Quick Connector (QC)</p> <p>d) No contact between SST Elbows and QC</p>	<p>a) Water Lines</p> <ol style="list-style-type: none"> <li>1. With bypass loop between Ta+ and Ta- on module</li> <li>2. With bypass loop between Tu+ and Tu- on module</li> <li>3. Bypassed (looped) on station. Cable tie to station.</li> <li>4. Connected to module always</li> </ol> <p>b) Open supply and return valves</p> <ol style="list-style-type: none"> <li>1. Hand check, wipe away water if necessary</li> <li>2. <b>SST elbows and quick connectors must be clear of each other, otherwise an electrical short will be produced.</b></li> </ol>	OK ✓
10	<p>Vacuum System</p> <ol style="list-style-type: none"> <li>a) TP1 Controller ✓</li> <li>b) TP2 Controller ✓</li> <li>c) TP1 BV1 ✓</li> <li>d) TP2 BV2 ✓</li> <li>e) IG1 ✓</li> <li><del>f) PNG4 (TM4 only)</del></li> <li>g) TP1 TP2 Fans ✓</li> </ol>	<ol style="list-style-type: none"> <li>a) Connector on pump body</li> <li>b) Connector on pump body</li> <li>c) KF 25 and O-ring , Connector for BV 24 V DC</li> <li>d) KF 25 and O-ring , Connector for BV 24 V DC</li> <li>e) Align the gauge pins</li> <li>f) Beside the shutter, use PNG1 cable</li> <li>g) Attach and switch on all fans (2 of 110 V Plugs for ITW, switch on Extension bar for ITE)</li> </ol>	OK ✓
11	<p>Steers</p> <p>ITE:</p> <ul style="list-style-type: none"> <li>• Left, top ✓</li> <li>• Bottom (Right) ✓</li> </ul> <p>ITW:</p> <ul style="list-style-type: none"> <li>• X</li> <li>• Y</li> <li>• Common</li> </ul>	<p>3 HV connectors</p> <p>X - top</p> <p>Y - Left</p> <p>Bottom (Right) - Common</p>	OK ✓
12	ISAC Control Page set up (plug, connector)	<del>Surface with EINZEL LENS, IGLIS, and FEBIAD</del>	✓
13	TP1 TP2 Controllers Reset	Electrical room, TP1 and TP2 controllers	✓




14	<p>Water Signals Check</p> <p>a) Target Module:</p> <ol style="list-style-type: none"> <li>1. Target, ✓</li> <li>2. Tube, ✓</li> <li>3. MSP ✓</li> <li>4. HS ✓</li> <li>5. EE ✓</li> <li>6. Coil (1) ✓</li> <li>7. <del>Coil 2(ITE only)</del></li> <li>8. Module Window ✓</li> </ol> <p>b) Beamline 2A:</p> <ol style="list-style-type: none"> <li>1. Tank ✓</li> <li>2. Dump(Plug) ✓</li> <li>3. Dump Shielding ✓</li> <li>4. 2A Window ✓</li> <li>5. Collimator ✓</li> </ol>	<p>In Electrical room, water signal panels:</p> <p>Yellow lights should flick at certain frequency and green lights should be constantly on</p> <p>*If signal is not right, go back to pit and visually check wheel spin in flow sensor for trouble shooting</p> <p>TM2 and TM4 GE line are not in use (leak), No signal</p>	<p>OK ✓</p>
15	Double Check Module Connection	General, visually check all connections Verify voltage gaps free of cables and waterlines	OK ✓
16	HV Fence and HV Cover on TM Service Cap	Limit switches and cables Retract HV Keys	OK ✓
17	Restore HV Keys to Electrical Room	Limit switches signals check in electrical room	OK ✓
18	Start TP1 TP2	ITW/ITE: CG4/CG4S below 200 mTorr (ask ISAC OP)	✓
19	All Turbo Pumps(six) Current Draw Check at Normal Status	Check current draw for each pump on TP controller, current draw at full speed (38kRPM) ≤ 2.0 A  Visually confirm TPBVs in pit are opened (red button sticks out)	✓
20	Return Work Permit and E-log entry	Call RIB operators (ext. 7500) Call Main Control Room (ext. 7333)	✓


NOTES:

TARGET: Ta 58#

TARGET MODULE: TM1 TM2 TM3 TM4

STATION: ITW ITE

SIGNATURE 1: 

SIGNATURE 2: 

DATE: 2019-06-04

DOSE 1: mSv

DOSE 2: mSv