

Target Module Connection and Disconnection Procedure		
Document-141576	Release No. 2	Release Date: 2018-02-21

## 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>	50
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>• <del>Wrenches (two 1/2")</del> NA ✓</li> <li>• Wipes ✓</li> <li>• 10" Cable Ties ✓</li> <li>• RAM ✓</li> </ul>		OK
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>	OK
1	Shutter	<ul style="list-style-type: none"> <li>• Cut cable tie ✓</li> <li>• Push down bellow (air cylinder) ✓</li> </ul>	OK
2	Compressed Air to Shutter and Valves (x2)	Shutter should be opened (pushed down) ✓	OK
3	Gas Line (5/8" & 11/16") NA	FEBIAD target only ✓ Two manual valves are opened ✓ <i>valve on module is closed</i>	NA
4	ITW/ITE Roughing out	Ask ISAC operator roughing 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) (PQ)Coil + NA ✓</li> <li>g) (RU)Coil - NA ✓</li> </ul>	f) FEBIAD target only g) FEBIAD target only	OK
6	Extraction Electrode (I) ✓		OK
7	Einzel Lens (Y) ✓	Einzel lens cable should be routed as far away from all 60 kV corona rings as possible	OK

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

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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>7. Coil 2 ✓</li> <li>8. Coil 1 (ITE only) NA ✓</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>f) PNG4 (TM4 only) NA ✓</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>	3 HV connectors	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	✓

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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. Coil 2(ITE only), ✓</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>	OK
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)	OK
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)	OK
20	Return Work Permit and E-log entry	Call RIB operators (ext. 7500) Call Main Control Room (ext. 7333)	✓

NOTES:

TARGET: Nb # 08  
 TARGET MODULE: TM1 TM2 TM3 TM4  
 STATION: ITW ITE  
 SIGNATURE 1: *[Signature]*  
 SIGNATURE 2: *[Signature]*

DATE: 2018-07-03

DOSE 1: 807 mSv 0.11 mSv  
 DOSE 2: 849 mSv 0.08 mSv