

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"> ✓ • Electronic dosimeter ✓ • Tank Suit ✓ • Respirator ✓ • Overshoes ✓ • Gloves(double) ✓ • Safety Glasses / Full Face Respirator 	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 ($\leq 500 \mu\text{Sv/h}$) ¹	
Prep	Check tools: <ul style="list-style-type: none"> ✓ • Hex Keys (9/16", 3/16" & 3/8") ✓ ✓ • Side Cutter ✓ ✓ • Wrenches (two 1/2") <i>big, small crescent</i> ✓ ✓ • Wipes ✓ ✓ • 10" Cable Ties ✓ ✓ • RAM ✓ 		OK
0	High Active Cooling Water	<ul style="list-style-type: none"> • Verify valve for supply water closed ✓ • Verify valve for return water closed ✓ 	OK
1	Shutter ✓	<ul style="list-style-type: none"> • Cut cable tie • Push down bellow (air cylinder) 	OK
2	Compressed Air to Shutter and Valves (x2) ✓	Shutter should be opened (pushed down)	OK
3	Gas Line (5/8" & 11/16")	FEBIAD target only 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"> a) (A)Target Oven + ✓ b) (B)Target Oven - ✓ c) (C)Tube heater - ✓ d) (D)Tube Heater + ✓ e) (T)60KV Bias ✓ f) (PQ)Coil + g) (RU)Coil - 	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

¹ Ref Dose Estimate Form Document-19905

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

14 check argon vent set up in E-room and ITE ✓

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14	<p>Water Signals Check</p> <p>a) Target Module:</p> <ol style="list-style-type: none"> 1. Target, ✓ 2. Tube, ✓ 3. MSP, ✓ 4. HS, ✓ 5. EE, ✓ 6. Coil (1), ✓ 7. Coil 2(ITE only), ✓ 8. Module Window, ✓ <p>b) Beamline 2A:</p> <ol style="list-style-type: none"> 1. Tank ✓ 2. Dump(Plug) ✓ 3. Dump Shielding ✓ 4. 2A Window ✓ 5. Collimator ✓ <p><i>closed ←</i></p>	<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><i>dump is closed & it will be opened when blocks transfer.</i></p>	OK
15	Double Check Module Connection ✓	General, visually check all connections Verify voltage gaps free of cables and waterlines	OIC
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	Good
		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: *TM4-UCx26#*

TARGET MODULE: TM1 TM2 TM3 *TM4*

STATION: ITW *ITE*

SIGNATURE 1: *David W.*

SIGNATURE 2: *FRANKS.*

DATE: *2018-12-04*

827 DOSE 1: *0.090* mSv

853 DOSE 2: *0.04* mSv