## Yale Titan Krios G2 Projection venting and evacuation

For services on the detectors, the projection chamber needs to be vented.

Prerequisite:

- 1. Column valves are closed, objective apertures are retracted.
- 2. Detectors (Falcon, Ceta, K2) are retracted. Double check the Blank shutter monitor and Camera ocx.

Warm up detectors:

- 1. K2: temperature set to 20C, wait.
- Ceta and Falcon: Microscope software Launcher -> tools -> camera and detector -> Ceta/Falcon service tool -> uncheck cooling controlled by Tem server, wait till temperature rises to 20C



🔆 Ceta Service Tool				
Basic Operations CSU Camera Settings Monitor Networ	k Version Information Sensor Defects Boot Info			
Insertion control	Temperature control			
Actual insertion state: Retracted	Status: Off			
Retract Insert	Sensor temperature: 28.7 °C			
	Current setpoint: -18 °C			
Open Close Home				
Board detection				
CSU Main board: Ok CSU DDR: Ok	C Cooling On Setpoint: -18 C			
CSU Power board: Ok CCU board: Ok				
CSU I/O board: Ok Sensor package:Ok				
Water valves	Warnings			
Actual valve state: Opened				
Detected valve type: Monostable	Boot information			
Valve override: Monostable	Boot server: OK			
Open Close	Number of devices connected: 1/1			
	Connection state. Connected			
callera, Ready, state: Operational				
Falcon Service Tool				
Falcon Service Tool Basic Operations CSU CMTS Camera Settings Monitor	Network Version Information Sensor Defects Sensor Radiation Boot Info			
Falcon Service Tool Basic Operations CSU   CMTS   Camera Settings   Monitor Insertion control	Network Version Information Sensor Defects Sensor Radiation Boot Info			
Falcon Service Tool Basic Operations     CSU   CMTS   Camera Settings   Monitor     Insertion control     Actual insertion state: Retracted	Network Version Information Sensor Defects Sensor Radiation Boot Info			
Falcon Service Tool Basic Operations     CSU   CMTS   Camera Settings   Monitor     Insertion control     Actual insertion state: Retracted     Betract   Insert	Network Version Information Sensor Defects Sensor Radiation Boot Info Temperature control Status: Off Sensor temperature: 27.4 °C			
Falcon Service Tool Basic Operations     CSU   CMTS   Camera Settings   Monitor Insertion control Actual insertion state: Retracted Retract Insert Inse	Network       Version       Information       Sensor Defects       Sensor Radiation       Boot       Info         Temperature control			
Falcon Service Tool Basic Operations CSU CMTS Camera Settings Monitor Insertion control Actual insertion state: Retract Open Close Home	Network Version Information Sensor Defects Sensor Radiation Boot Info Temperature control Status: Off Sensor temperature: 27.4 °C Current setpoint: -25 °C Control Control controlled by TEM sensor			
Falcon Service Tool Basic Operations     CSU CMTS Camera Settings Monitor      Insertion control      Actual insertion state: Retracted      Retract Insert      Open Close Home      Board detection	Network Version Information Sensor Defects Sensor Radiation Boot Info Temperature control Status: Off Sensor temperature: 27.4 °C Current setpoint: -25 °C  Off Cooling controlled by TEM server			
Falcon Service Tool Basic Operations     CSU CMTS Camera Settings Monitor     Insertion control     Actual insertion state: Retracted     Retract Insert     Open Close Home      Board detection     CSU Main board: Ok CSU DDR: Ok	Network       Version Information       Sensor Defects       Sensor Radiation       Boot Info         Temperature control         Status:       Off         Sensor temperature:       27.4 °C         Current setpoint:       -25 °C         Image: Online Cooling controlled by TEM server         Image: Cooling On       Setpoint:       -25 °C			
Falcon Service Tool Basic Operations     CSU   CMTS   Camera Settings   Monitor     Insertion control     Actual insertion state: Retracted     Retract Insert     Open Close Home      Board detection     CSU Main board: Ok CSU DDR: Ok     CSU Power board: Ok CCU board: Ok	Network Version Information Sensor Defects Sensor Radiation Boot Info Temperature control Status: Off Sensor temperature: 27.4 °C Current setpoint: -25 °C © Off Cooling controlled by TEM server © Cooling On Setpoint: -25 °C			
Falcon Service Tool         Basic Operations       CSU       CMTS       Camera Settings       Monitor         Insertion control       Actual insertion state:       Retracted       Retract       Insert         Open       Close       Home         Board detection       CSU DDR:       Ok         CSU Main board:       Ok       CSU DDR:       Ok         CSU Power board:       Ok       CCU board:       Ok         CSU I/O board:       Ok       Sensor package:Ok	Network       Version Information       Sensor Defects       Sensor Radiation       Boot Info         Temperature control         Status:       Off         Sensor temperature:       27.4 °C         Current setpoint:       -25 °C         Image: Off       Cooling controlled by TEM server         Image: Cooling On       Setpoint:       -25 °C			
Falcon Service Tool Basic Operations     CSU   CMTS   Camera Settings   Monitor Insertion control Actual insertion state: Retracted     Retract Insert     Open Close Home Board detection CSU Main board: Ok CSU DDR: Ok CSU Power board: Ok CCU board: Ok CSU I/O board: Ok Sensor package:Ok  Water valves	Network       Version Information       Sensor Defects       Sensor Radiation       Boot Info         Temperature control         Status:       Off         Sensor temperature:       27.4 °C         Current setpoint:       -25 °C         Image: Cooling controlled by TEM server         Cooling On       Setpoint:         -25 °C			
Falcon Service Tool Basic Operations     CSU   CMTS   Camera Settings   Monitor Insertion control Actual insertion state: Retracted     Retract Insert     Open Close Home Board detection CSU Main board: Ok CSU DDR: Ok CSU Power board: Ok CCU board: Ok CSU I/O board: Ok Sensor package:Ok Water valves Actual valve state: Opened	Network       Version Information       Sensor Defects       Sensor Radiation       Boot Info         Temperature control         Status:       Off         Sensor temperature:       27.4 °C         Current setpoint:       -25 °C         Image: Cooling controlled by TEM server         Image: Cooling On       Setpoint:         -25 °C         Image: Warnings			
Falcon Service Tool Basic Operations     CSU   CMTS   Camera Settings   Monitor Insertion control Actual insertion state: Retracted     Retract Insert     Open Close Home Board detection CSU Main board: Ok CSU DDR: Ok CSU Power board: Ok CCU board: Ok CSU I/O board: Ok Sensor package:Ok Water valves Actual valve state: Opened Detected valve type: Monostable	Network       Version Information       Sensor Defects       Sensor Radiation       Boot Info         Temperature control         Status:       Off         Sensor temperature:       27.4 °C         Current setpoint:       -25 °C         Image: Cooling controlled by TEM server         Image: Cooling On       Setpoint:       -25 °C         Image: Warnings         Boot information			
Falcon Service Tool Basic Operations CSU CMTS Camera Settings Monitor Insertion control Actual insertion state: Retracted      Retract Insert      Open Close Home      Board detection      CSU Main board: Ok CSU DDR: Ok      CSU Power board: Ok CCU board: Ok      CSU I/O board: Ok Sensor package:Ok      Water valves      Actual valve state: Opened Detected valve type: Monostable Valve overide: Monostable      Valve overide: Monostable	Network       Version Information       Sensor Defects       Sensor Radiation       Boot Info         Temperature control         Status:       Off         Sensor temperature:       27.4 °C         Current setpoint:       -25 °C         Image: Cooling controlled by TEM server         Image: Cooling On       Setpoint:         -25 °C         Image: Cooling On         Setpoint:       -25 °C         Image: Cooling On         Setpoint:       -25 °C         Image: Cooling On         Setpoint:       -25 °C         Image: Cooling On         Setpoint:       -25 °C         Image: Cooling On         Setpoint:       -25 °C         Image: Cooling On         Setpoint:       -25 °C			
Falcon Service Tool Basic Operations     CSU CMTS Camera Settings Monitor Insertion control Actual insertion state: Retracted     Retract     Open     Close     Home Board detection     CSU Main board: Ok     CSU DDR: Ok     CSU Power board: Ok     CSU DDR: Ok     CSU I/O board: Ok     Sensor package:Ok      Water valves Actual valve state: Opened Detected valve type: Monostable Valve ovemide: Monostable     Valve ovemide: Monostable	Network       Version Information       Sensor Defects       Sensor Radiation       Boot Info         Temperature control			
Falcon Service Tool         Basic Operations       CSU       CMTS       Camera Settings       Monitor         Insertion control       Actual insertion state:       Retract       Insert         Open       Close       Home         Board detection       CSU DDR:       Ok         CSU Main board:       Ok       CSU DDR:       Ok         CSU Power board:       Ok       CCU board:       Ok         CSU I/O board:       Ok       Sensor package:Ok         Water valves       Actual valve state:       Opened         Detected valve type:       Monostable       Valve override:         Open       Close       Image: Topened	Network       Version Information       Sensor Defects       Sensor Radiation       Boot Info         Temperature control			

- 3. Vacuum ocx -> flap-out Settings -> click Projection Vented, this button will turn yellow -> wait for Turbo pump TMPp to spin down.
- 4. It's ready for the service engineer to work on the detectors.

Recover the projection vacuum.

- Vacuum ocx -> flap-out Settings -> click the yellow Projection Vented -> Turbo pump starts, wait for the Projection vacuum to turn green. It takes half a day or so to go back to original level (26~27 log). If it stabilizes at a much higher level (poorer vacuum), call service.
- Cool down detectors
   Ceta and Falcon: check cooling controlled by Tem server

🗰 Ceta Service Tool		Falcon Service Tool		
Basic Operations CSU Camera Settings Monitor Netwo	k Version Information Sensor Defects Boot Info	Basic Operations CSU CMTS Camera Settings Monitor Network Version Inf	ormation   Sensor Defects   Sensor Radiation   Boot Info	
Insettion control           Actual insetion state. Retracted           Retract         Inset           Open         Close           Board detection         Forme	Temperature control Status: Cooling (stable) Sensor temperature: -17.9 ℃ Councer setpoint: -18 ℃ C Off IF Cooling Controlled by TEM server C Cooling Chn Setpoint: -18 ℃	Insettion control         Actual insettion state:         Retracted         Status:           Retract         Insett         Copen         Copen	Cooling (stable) -25.0 °C -25.°C g controlled by TEM server Setpont: -25.°C	
CSU Main board: Ok CSU DDH: OK CSU Power board: Ok CCU board: Ok CSU I/O board: Ok Sensor package:Ok		CSU Main board: UK CSU DDR: UK CSU Power board: OK CCU board: OK CSU I/O board: OK Sensor package:Ok		
Water valves Actual valve state: Opened	Warnings	Actual valves Actual valve state: Opened		
Detected valve type: Monostable Valve override: Monostable Open Close	Dox formation     Dox server:     OK     Number of devices connected:     1/1     Connected	Detected valve bpe: Monostable Boot information  Valve overnide: Monostable  Open Close  Correction state:	OK onnected: 5/5 Connected	
Camera: Ready, State: Operational		Camera: Ready, State: Operational		

K2: Set temperature to -20C

To get immediate technical assistance from Thermo customer service

- 1. Call from lab phone: dial 9 + 1 877 727 9112, follow the instructions, and provide the serial number (D3572) to the representative. For immediate technical support, provide the Rapid IP address (can be found in the Rapid UI on the support PC): 172.27.13.158 password: d3572
- 2. Start up RAPID if it is not on: Rapid (remote control program used by Thermofisher engineers) should be always on. If the Titan PC or Support PC is rebooted, then Rapid needs to be manually started.
  - On Support PC: Desktop -> Run 'RAPID connection wizard' as administrator -> Click Start RAPID connection.
  - On Titan PC: Start menu -> Run 'RAPID connection wizard' -> Click Test RAPID connection.