Helium Leak Test Procedure, Vx Spectra

Well Testing and Process-Singapore Well Testing Center-Vx Spectra Flow Meters

Introduction

This SWI will have additional instructions related to Vx Spectra, 63 Bar. Take care while using the procedure.

This SWI consists of steps for performing the Helium Leak Test on Vx Spectra.

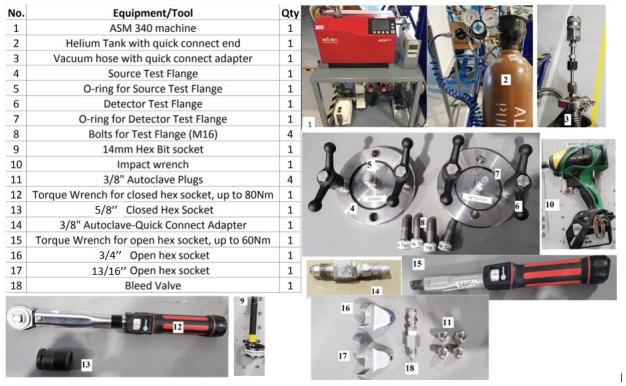
Steps

Take note of additional tooling required for Vx Spectra, 63 Bar only.

Tooling list

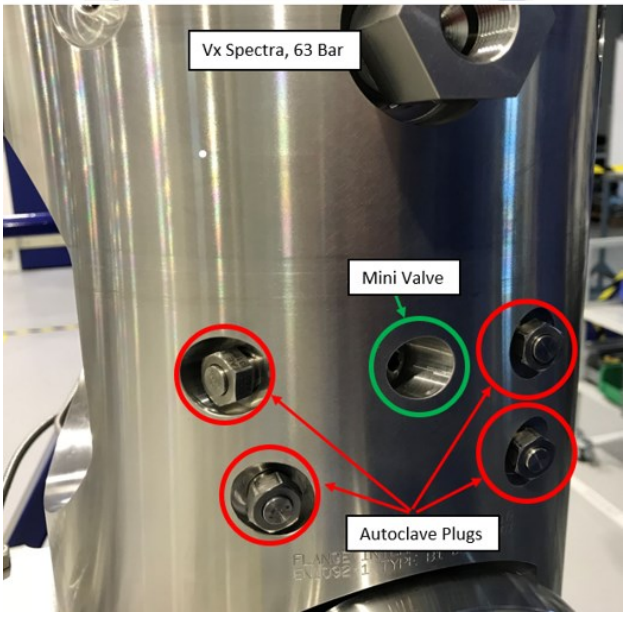
1a	Check that all the equipment required are present as listed.
1b	For Vx Spectra, 63 Bar: Use 10mm Hex Bit socket instead of 14mm Hex Bit socket.
1c	For Vx Spectra, 63 Bar: Additional tooling required are M6 allen key and T30 Torx socket.

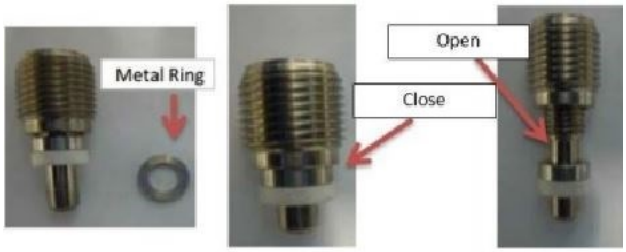
No.	Equipment/Tool	Qty
1	ASM 340 machine	1
2	Helium Tank with quick connect end	1
3	Vacuum hose with quick connect adapter	1
4	Source Test Flange	1
5	O-ring for Source Test Flange	1
6	Detector Test Flange	1
7	O-ring for Detector Test Flange	1
8	Bolts for Test Flange (M16)	4
9	14mm Hex Bit socket	1
10	Impact wrench	1
11	3/8" Autoclave Plugs	4
12	Torque Wrench for closed hex socket, up to 80Nm	1
13	5/8" Closed Hex Socket	1
14	3/8" Autoclave-Quick Connect Adapter	1
15	Torque Wrench for open hex socket, up to 60Nm	1
16	3/4" Open hex socket	1
17	13/16" Open hex socket	1
18	Bleed Valve	1

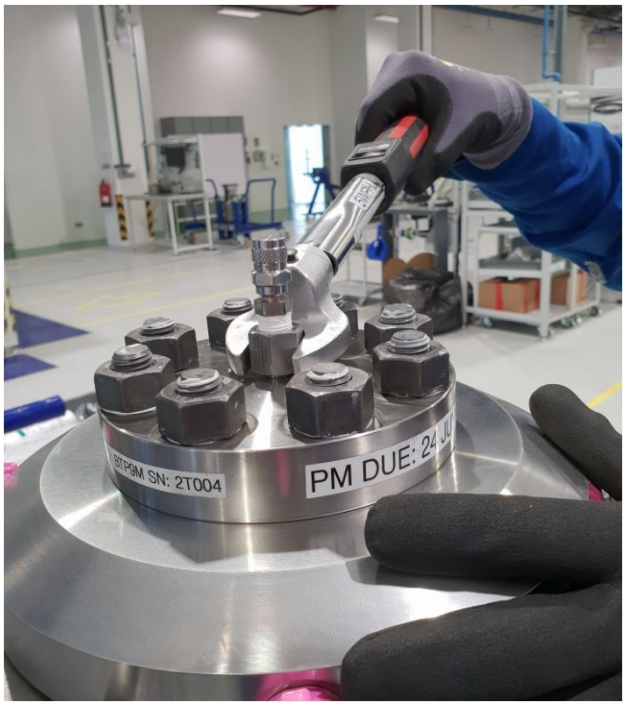


Place the caution sign as shown in the picture in step 2

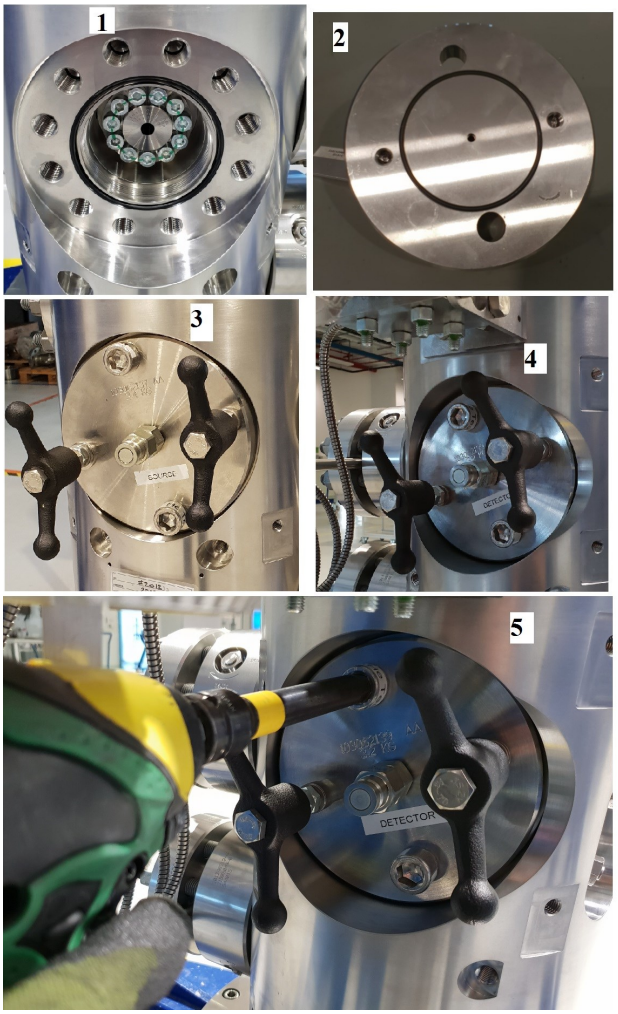
Steps		
2	Switch on the main switch of the ASM 340 Machine and wait until the screen shows standby as shown in the picture.	
⚠	**Double check the WO and follow respective steps.**	
Autoclave Assy		

Steps			
	3a	Install the 3/8" autoclave plugs on the 4 locations as shown in the picture for Standard and Vx Spectra, 63 Bar Venturi respectively.	
	3b	Torque the plugs using a 5/8" closed hex socket to 40.6 Nm.	
	3c	For Vx Spectra, 63 Bar meter only, inspect the mini valve port on the Venturi as per picture.	
⚠	**Applicable for Vx Spectra, 63 Bar meter only. All other versions will only use Mini Valve in Source Housing Assembly.**		
Vx Spectra, 63 Bar meter Only: Mini Valve Assy			

Steps			
	4a	Inspect the mini valve and ensure all parts are available as per picture.	
	4b	Half-Open the mini valve by hand as shown in the picture.	
	4c	Install the valve onto the Venturi using a M6 allen key.	Picture for reference only. Taken from Source HSG Assy 
	4d	Torque the gland nut using a torque wrench with M6 socket to 20 Nm.	
	4e	Tighten the valve stem slightly using a T30 Torx socket using socket wrench.	

Steps		
5	Install the bleed valve on the top flange as shown in the picture, and torque to 40Nm with a 13/16'' open hex socket.	
	In step 6, be careful not to cut the O-rings when handling them. Also take precaution not to scratch any sealing surface while installing the test flanges. This steps has special instruction for Vx Spectra, 63 Bar Meter.	
Step 6 (Install test flanges on source & detector side)		

Steps

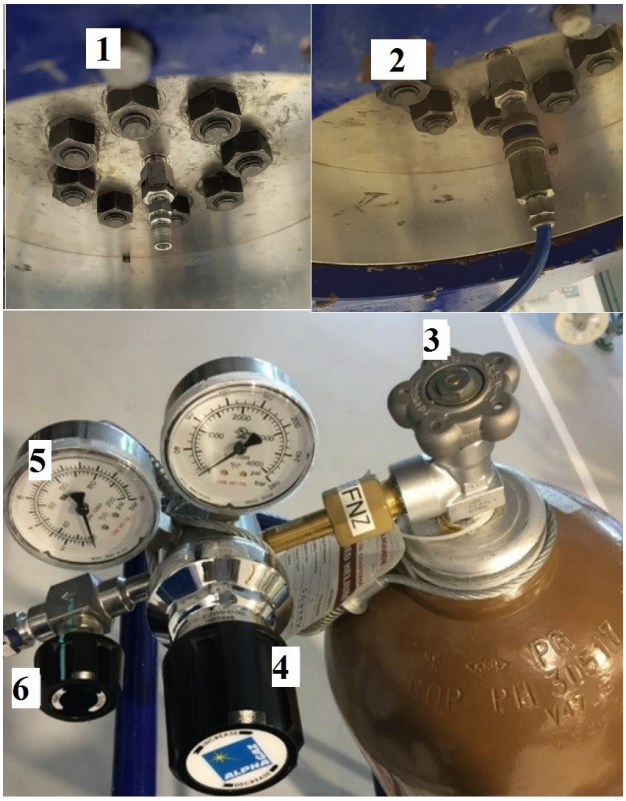
	6a	Place the O-ring into the groove on the source side of venturi as shown in picture 1.	

Steps			
	6b	Place the O-ring into the groove on detector test flange as shown in picture 2.	
	6c	For Standard Vx Spectra versions, mount the source and detector test flanges onto the venturi with 2 x M16 bolts (for each flange) as shown in picture 3 and 4.	
	6d	For Vx Spectra, 63 Bar meter only, mount the source test flanges onto the venturi with 2 x M12 (PN 100425421) bolts, mount the detector test flanges onto the venturi with 2 x M16 bolts.	
	6e	Hand tighten the bolts to ensure starting thread enter the threaded hole to prevent cross thread.	
	6f	For Standard Vx Spectra, using impact wrench and 14mm hex bit socket (picture 5), complete torqueing of the designated bolts.	
	6g	For Vx Spectra, 63 Bar meter only, using impact wrench and 10mm hex bit socket for the source side, using impact wrench and 14mm hex bit socket for the detector side, complete torqueing of the designated bolts.	

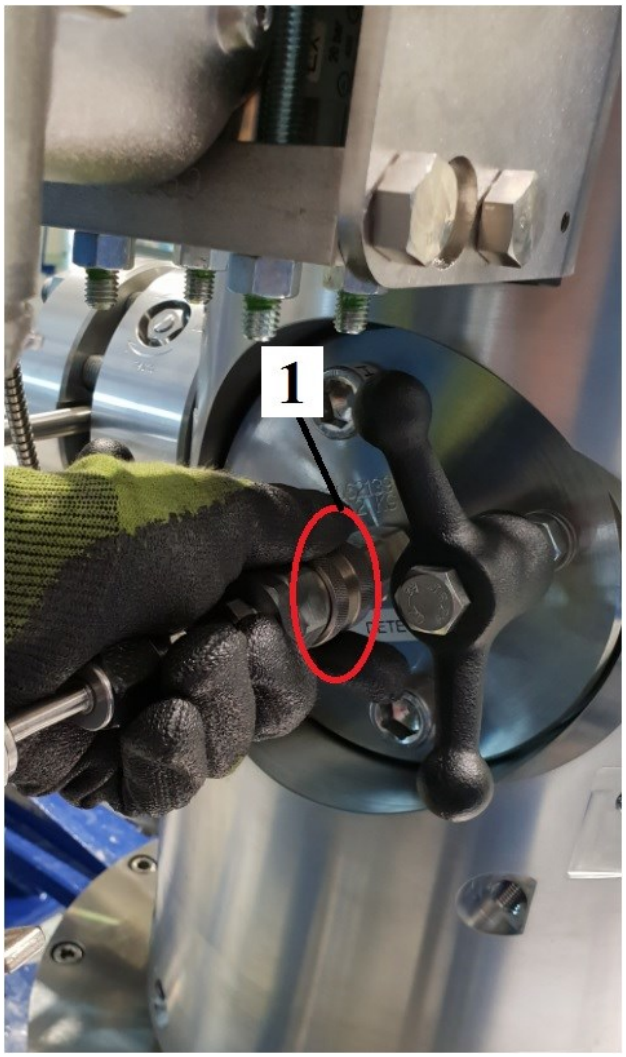
Steps	
	Hold the test flanges by the handles. Do not hold the flange by the quick connection.
7	Connect the vacuum hose quick connect to the port on the detector test flange. 
	Upon proper connection of the quick connect, there should be a click sound.
Step 8 (Pull vacuum on detector side)	

Steps			
	8a	Power up the Vacuum gauge (Pfeiffer Dual Gauge) switch at the back of it.	
	8b	Open the valves V1, V2 and V3 by turning them anti-clockwise.	
	8c	Turn on the vaccum pump switch at the back of the pump as shown in picture 4.	
	8d	Wait for the reading on the Vacuum gauge to be stable at 2.0E-2 mbar (approx. 5mins). If the reading does not stabilize at value of 2.0E-2 mbar or below after 5 minutes, refer to document #103119197.	
	8e	Record the vacuum pressure from the Vacuum gauge (picture 1) in the document #101437624 under the detector section.	
9	Close the valve V2 by turning the knob clockwise to bypass the vacuum pump. Press the start (standby) button on the ASM Machine. This will switch the ASM detector to Measuring mode (green screen).		
	In step 10, adjust the bigger black knob[4] slowly to ensure the filling pressure is gradually increased to 2 bar.		

Step 10 (Fill venturi with helium)

Steps			
	10a	Connect the 3/8" autoclave to quick connect adapter to the bottom of the venturi trolley. Torque to 40Nm using the 3/4'' open hex socket. (picture 1)	
	10b	Connect the hose from the helium tank to the adapter mounted in step 10a (picture 2)	
	10c	Open the helium tank valve by turning the silver knob[3] anti clockwise.	
	10d	Open the bigger black knob [4] by turning it clockwise until the pressure dial gauge [5] reads exactly 2 bar.	
	10e	Open the smaller black knob [6] by fully turning it anti-clockwise to allow the helium to flow through.	
Step 11 (Take reading for detector side)			

Steps			
	11a	Wait for the leak rate reading on the ASM machine to stabilize (approx. 2 mins).	
	11b	Record the leak rate reading from the screen of the ASM machine in document #101437624 under the detector section.	
	11c	If there is a leak, there will be a rejected sign on the screen of the ASM Machine.	
12	Open the valve V2 by turning the knob anti-clockwise to connect back the vacuum pump. Press the start (standby) button on the ASM Machine. This will switch the ASM detector back into standby mode (grey screen).		

Steps		
13	Disconnect the vacuum hose quick connect from the detector flange.	
	Pull the collar [1] before disconnecting the connection.	

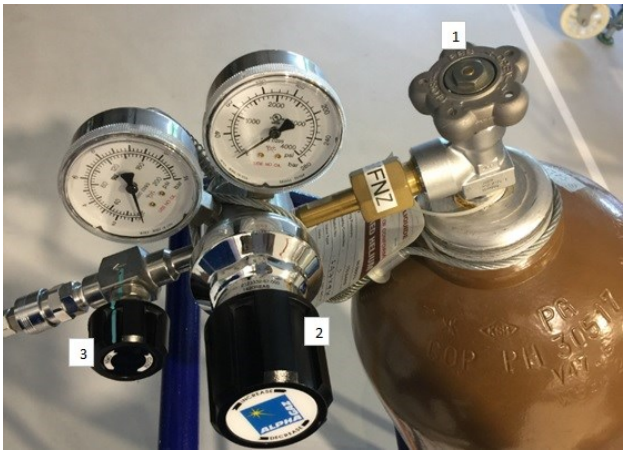
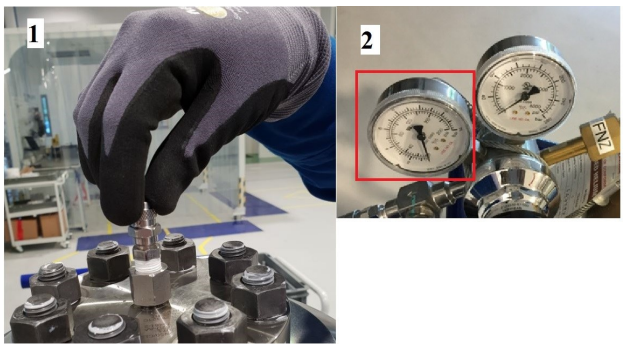
Steps		
14	Connect the vacuum hose quick connect to the port on the source flange.	
	Upon proper connection of the quick connect, there should be a click sound.	

Step 15 (Pull vacuum on source side)

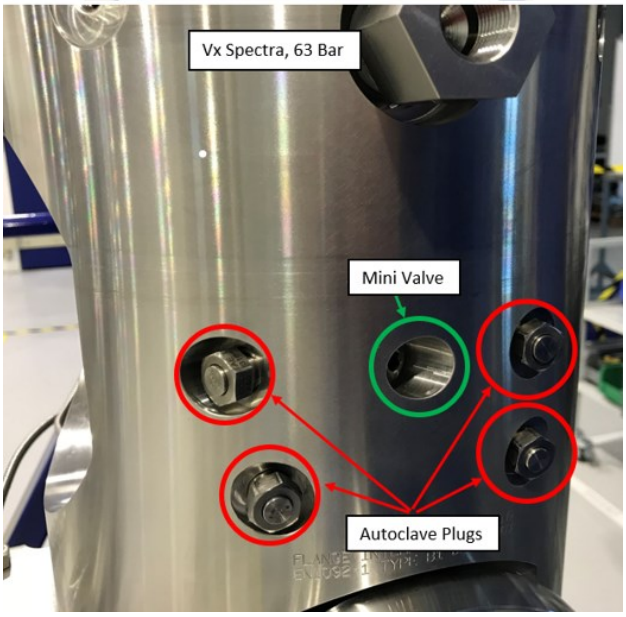
Steps			
	15a	Wait for the reading on the Vacuum gauge to be stable at 2.0E-2 mbar (approx. 5mins). If the reading does not stabilize at value of 2.0E-2 mbar or below after 5 minutes, refer to document #103119197.	
	15b	Record the vacuum pressure from the Vacuum gauge in the document #101437624 under the source section.	
16	Close the valve V2 by turning the knob clockwise to bypass the vacuum pump. Press the start (standby) button on the ASM Machine. This will switch the ASM detector to Measuring mode (green screen).		
Step 17 (Take reading for source side)			

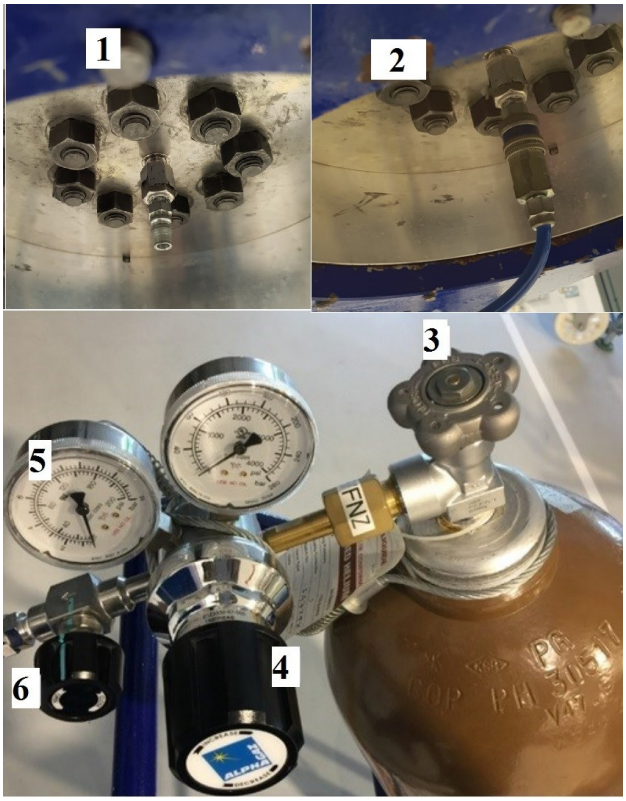
Steps			
	17a	Wait for the leak rate reading on the ASM machine to stabilize (approx. 2 mins).	
	17b	Record the leak rate reading from the screen of the ASM machine in document ##101437624 under the source section.	
	17c	If there is a leak, there will be a rejected sign on the screen of the ASM Machine.	
18		Open the valve V2 by turning the knob anti-clockwise to connect back the vacuum pump. Press the start (standby) button on the ASM Machine. This will switch the ASM detector back into standby mode (grey screen).	

Steps		
19	Disconnect the vacuum hose quick connect from the source flange.	
	Pull the collar [1] before disconnecting the connection.	
Step 20 (Power off system)		

Steps			
	20a	Switch off the Vacuum gauge (Pfeiffer Dual Gauge) switch at the back of it.	
	20b	Close the valves V1, V2 and V3 by turning the knobs clockwise.	
	20c	Switch off the vaccum pump switch at the back of the pump as shown in picture 4.	
	20d	Power off the ASM machine.	
21	Close the helium tank valve by turning the silver knob[1] clockwise.		
	Make sure the helium supply is cut off by following step 21 before bleeding off pressure inside the venturi.		
22	Bleed off the pressure from the venturi by loosening the bleed valve as shown in picture 1. Confirm that the pressure has been bled off completely by ensuring the pressure gauge in picture 2 shows zero reading.		

Steps	
	Make sure the pressure is bled off by following step 22 before removing the bleed valve on top of the venturi.
23	Remove the bleed valve from the top of the venturi. 
	Additional task required for Vx Spectra, 63 Bar Meter only,
Removal of parts	

Steps			
	24a	Remove the 4 autoclave plugs from the locations highlighted in the picture.	
	24b	For Vx Spectra, 63 Bar only, remove the autoclaves and the mini valve.	
Step 25 (Disconnect helium tank from system)			

Steps			
	25a	Close the bigger black knob [4] by fully turning it anti-clockwise.	
	25b	Close the smaller black knob [6] by fully turning it clockwise.	
	25c	Disconnect the helium tank hose from the adapter at the bottom of the venturi troley (picture 2)	
	25d	Remove the 3/8" autoclave to quick connect adapter from the bottom of the venturi trolley (picture 1)	
	25e	Put the helium tank back to its designated location.	
26	Remove the test flanges and O-rings from the venturi.		
27	Remove the warning sign from the venturi.		
⚠	**Mandatory to archive in DCP step in PLQS.**		
28	Complete the Helium Leak Test Report 101437624 and upload to PLQS DCP Step for traceability.		
	Result: This concludes the completion of Helium Leak Test for Vx Spectra.		

END OF STANDARD WORK INSTRUCTION

This symbol means that the equipment cannot be discarded in a rubbish-bin. At its end of life, the equipment and/or its components must be treated, following Schlumberger Environmental procedures, in compliance with Schlumberger QHSE Policy and applicable laws and regulations on waste management.