Window Assembly Procedure, Vx Spectra

Testing and Process-Singapore Well Testing Centre-Vx Spectra Flow Meter

Introduction

This SWI consists of steps for the assembly of Monolithic Windows onto the venturi (Both sides).

This SWI is applicable for 2, 3, 4, 6, 8 inch Vx Spectra meters (All versions).

Steps

1 Tools needed

SL No	Description
1	Cleaning alcohol
2	Go-nogo gauge (center piece)
3	Spacer
4	Lint free paper
5	Chesterton 785
6	Foam swabs
7	Scissors
8	Nitril gloves
9	Nozzle plugged to air network
10	Tooling detector side
11	Tooling source side
12	Piston
13	Enerpac hydrolic pump
14	Torque wrench 10-100 Nm
15	Hex adaptor 6mm
16	Marker pen
17	Powerful torchlight
18	24 mm combination spannar
19	1/2" combination spannar
20	Ear muff
21	Studs and nuts for tooling
22	Jack Stand
23	Peek Window Centraliser
24	6mm Ball Head Socket
25	6mm Allen Key Socket

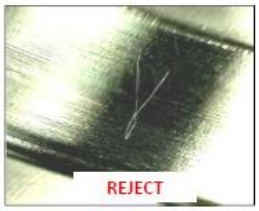
Steps

2 Check and verify the cleanbooth as per the guidelines below:

Kyodo Class 100K Cleanbooth Guidelines	
Before beginning assembly activites:	
☑	Clean the workstation surface using a lint-free wipe and alcohol to ensure it is dust-free
☑	Make sure floor is mopped, swept and free of dust or particles
☑	Station the assembly trolley in the cleanbooth
☑	Check the calibration sticker to ensure it has not expired
☑	Power on the cleanbooth, lights and filter, at least 15 minutes prior to performing assembly
Additional operating guidelines:	
☑	Cardboard boxes and other particle-producing materials are not permitted in the cleanbooth
☑	All paper used in the cleanbooth must be in a plastic cover or laminated
☑	Only lint-free wipes are permitted for use in the cleanbooth
☑	Remove venturi window covers just before assembly
☑	No entering or exiting the cleanbooth during assembly
☑	Maximum of 2 people in the cleanbooth during assembly
☑	Power down the cleanbooth at the end of the workday

Step 3

Steps			
	3a	Collect and visually inspect all the parts required for Windows assembly and verify the item's part number as per work order/As-built.	
	3b	Check PN of the Monolithic Window and Back Flange as below	
	3c	For Vx Spectra Size 2", 3", 4"and 6" - Monolithic Window: 101662219 (2"), 101662974 (3"), 101663845 (4"), 101666461 (6") Back Flange: 101346959, Back Flange Bolts: 101661362	
	3d	For Vx Spectra Size 8" - Monolithic Window: 102689842, Back Flange: 102702003, Back Flange Bolts: 102703128	
	Ensure serial number or heat number on the physical part matches with the barcode. Check completeness of the kit. And complete PLQS As-built.		
	Use scissors to open packaging during the entire assembly process		
	Two people are required for movement of trolley. Use ear muffs when using air gun.		
Step 4			

Steps			
	4a	Position trolley inside the clean tent, lock the trolley wheels and ensure safety knob is in "locked" position	 
	4b	With Venturi in vertical orientation, blow out any foreign particle using air gun on all the holes and sealing surfaces.	  
	4c	Inspect source and detector side sealing surfaces for any scratches and dirt.	 
	4d	Look for scratches across sealing surfaces and raise TFL if required.	
		See pictures for reference to acceptable and non acceptable scratches: if the scratch is intermittent, it means that it does not carve to the bottom of the circular lays, it is acceptable.	
		Take care of pinch points during placement of jackstand and when rotating the Venturi. Keep clear distance.	
Step 5			
	5a	Prior to rotating the Venturi, place a jack stand (Refer to picture in step above).	
	5b	Turn the safety knob to "unlocked" position (Refer to picture in step above).	
	5c	Rotate the flywheel until the Venturi reaches the horizontal orientation.	
	5d	Check whether the jackstand is supporting or adjust the height accordingly.	
	5e	Turn the safety knob to "locked" position	
		Jackstand is required to support the weight of Venturi at horizontal orientation.	

Steps

Step 6

6a	Spray alcohol on the sealing surfaces and clean with help of lint free paper and foam swabs.	
6b	Check the sealing surface using torch light.	
6c	If not acceptable, repeat this step.	

Check for scratches.

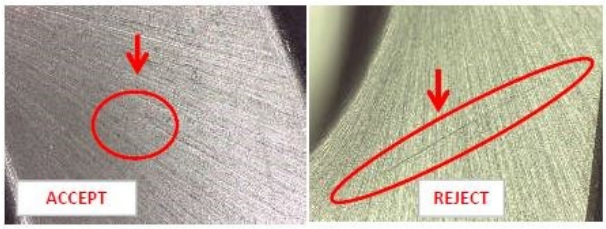
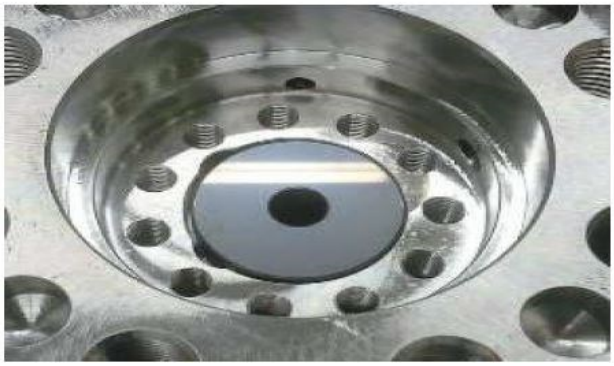
Step 7

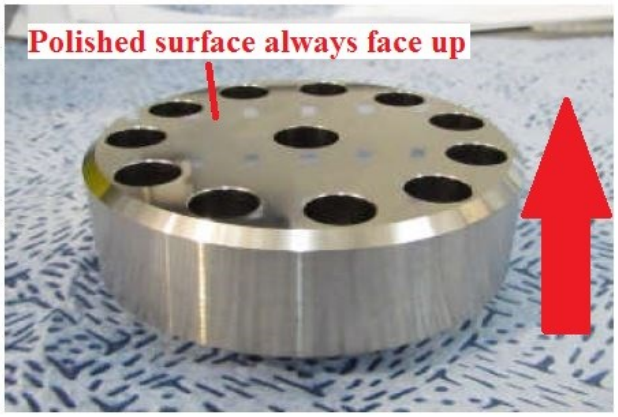
7a	Visually inspect the C-Ring for non-conformance such as scratches, dirt, etc.	
7b	If necessary clean with alcohol.	

Record C-Ring batch number or serial number into PLQS as-built. Once done, mount it onto the C-ring groove on Venturi. Handle c-ring with nitrile gloves.

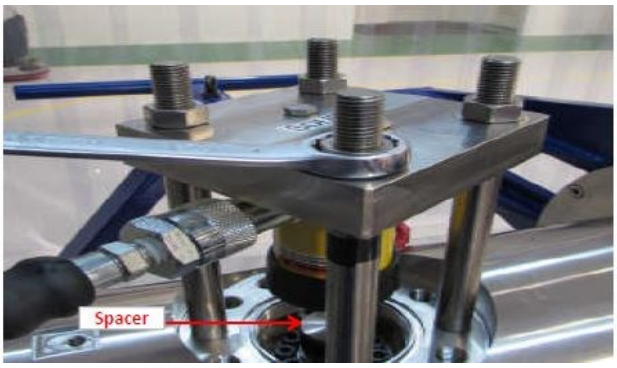
Be cautious when handling the monolithic window. Always make sure to place the monolithic window surface upward and handle using nitrile gloves. IMPORTANT! If the monolithic window drops on the floor, raise an TFL, the part will be scrapped.

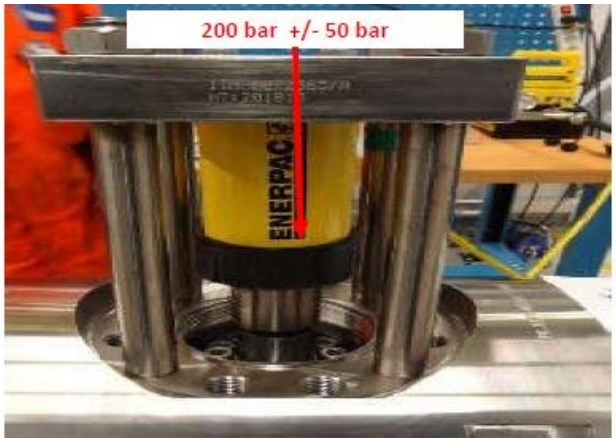
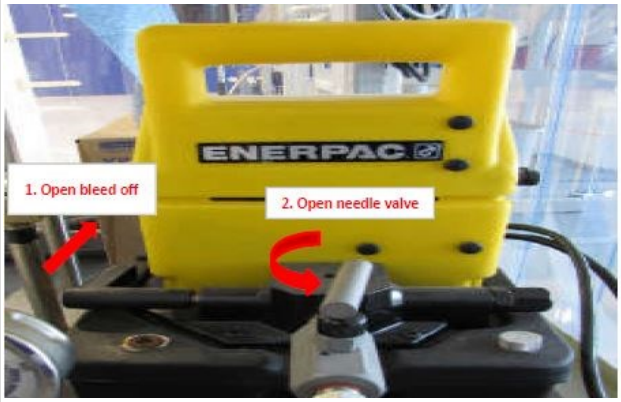
Step 8

Steps			
	8a	Inspect monolithic window (MW) for evident chip-offs or cracks or discolouration and blow with air gun.	
	8b	Use lint free paper or foam swabs to clean the monolithic window.	
9		Assemble window onto the Venturi using a clean and non-stress & non-scratch tooling to hold the monolithic window. E.g. the bottom of a marker or a reverse tweezer.	 
i		The notch on the window needs to be well aligned with the notch in the venturi. Note that there is a play in the alignment notch, make sure the window is placed in the center position. Ensure the window is centralized at its position i.e the window shall not have any direct contact with the Venturi surfaces	

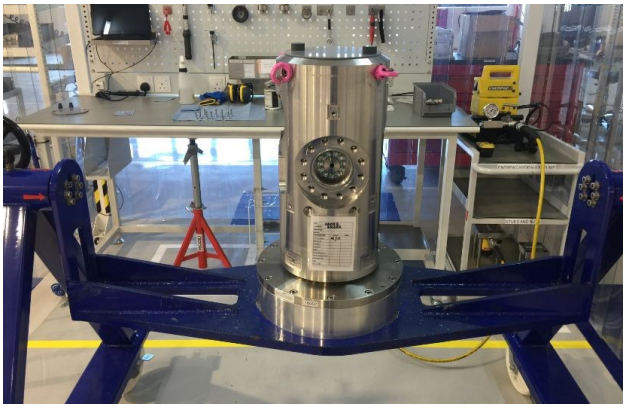
Steps			
i	Remove the tooling cautiously to ensure the window doesn't move out of its orientation or gets a shock. Keep both window plastic bags and indicate on which side they are used, source or detector side, and enter serial number in PLQS as-built.		
Step 10			
	10a	Inspect Back Flange PN: 101346959 (For 2", 3", 4", 6") or Back Flange PN: 102702003 (For 8") for any non conformance (scratches).	
	10b	Clean by blowing with air gun	
	10c	Clean using alcohol, lint free paper and foam swabs.	
i	Do not put the back flanges polished surface on the table, place it upward on a lint free paper instead. Use ear muffs when using air gun.		
Step 11			
	11a	Put the back flanges to the designated place and insert the center piece onto the middle of the back flange hole.	
	11b	The center piece must be able to move up or down freely without resistance, when completely inserted.	
	11c	The aim is to align the center of Monolithic Window to the back flange.	

Steps			
i	Avoid dropping the back flange with a shock on the monolithic window. Clean go-no go (center piece) before using it.		
12	At the detector side use the peak window centralizer as a guide when installing back flange.		
Step 13			
	13a	Apply Chesterton 785 to the end of the threads for 1cm and under the bolt head.	
	13b	Put all the screws onto the back flanges without torque it.	
Step 14			

Steps			
	14a	Apply the 4 hydraulic tooling studs and install it to the source or detector side.	
	14b	Put the spacer and the hydraulic tooling to the hydraulic studs	
	Clean the spacer before using it. To connect the piston to the tooling, use 1/2" spanner to open the screw		
15	Put the 4 nuts and tighten the nuts by using 24mm combination spanner.		
	Stay away from the pressurized hose while pumping. After pressure is stable you can proceed.		
Step 16			

Steps			
	16a	Switch on the pressure pump	
	16b	Turn 2 round to open the needle valve.	
	16c	Close bleed valve (black handle)	
	16d	Apply 200 +/- 50 bar and close Needle valve	
17	Torque the screws of the backflanges : 17 N.m (2", 3", 4", 6", 8") (For both sockets used)		
i	Torque in star manner before going 1 round. First use the 6mm Ball Head Socket for the torqueing Then remove and use 6mm Allen Key Socket for final torque		
i	Ensure that the ball head is fully engaged/inserted into the screw head. If ball head is not inserted properly it will lead to rounding of the screw head and screws cannot be dismantled if requried		
Step 18			
	18a	To release pressure: Open bleed off valve first.	
	18b	Open Needle valve slowly to avoid pressure shock.	

Steps			
19	Unscrew the 4 bolts using 24 mm combination spanner and remove the tooling and the spacer		
i	Apply torque one more round to ensure the bolt is torqued and mark with marker the final position of the nut. Verify that the position is not different/changed and all the bolts are marked.		
Step 20			
	20a	Inspect inside the venturi to check the alignment of the window.	
	20b	The window should be flush with the curvature of the inner borehole	
i	Using powerful torchlight or borescope to check and inspect the alignment of the window.		

Steps		
21	Follow steps 5 to 20 to install window on the opposite side.	
Step 22		
	22a	Once both windows are installed, "Unlock" the safety knob.
	22b	Rotate the flywheel until the Venturi is vertical.
	22c	"Lock" the safety knob immediately.
i	Apply good SIPP technique when turning the spindle of the flywheel.	
23	Remove the jack stand and move to its home position	
i	Ensure all tools are returned to their home position and workarea is clean for the next assembly	
	Result: Assembly of Monolithic Windows onto the Venturi is completed.	

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.