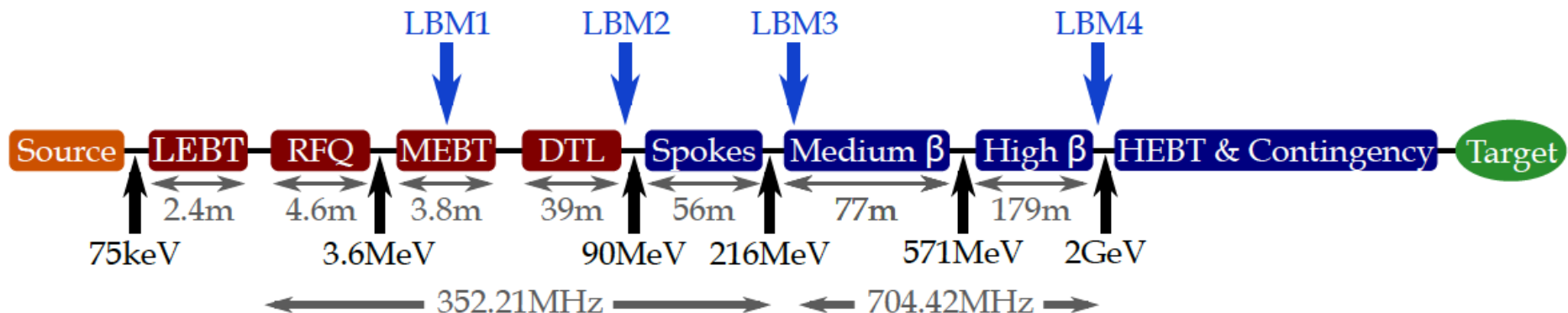


BSM

*S. Grishin (installation manager),
I. Dolenc Kittelmann (BSM system lead)*

- Longitudinal Bunch Shape Monitoring (LBM)
 - Originally foreseen 4 LBM devices along the ESS linac
 - LBM1: MEBT
 - LBM2: End of DTL (LEDP)
 - LBM3 & LBM4: After Frequency jump (MB), at the end of HB - now both cancelled
- MEBT & DTL LBM: Bunch Shape Monitor (BSM) – “Feschenko device”
 - 2 year contract with INR, Moscow (S. Feschenko, S. Gavrilov)
 - Design and production of 2 BSMs
 - Modernize RF deflector design
 - Resolution improved from 1° to 0.7°



■ April 2018:

- 2 BSM devices arrive to ESS: MEBT & DTL BSM
- On schedule

"On Monday, 23. April, 2018, two Bunch Shape Monitor (BSM) devices arrived to ESS, following a 2 year long design and fabrication period without any delay. The BSMs were designed and fabricated by a team of experts from INR, Moscow, Russia, lead by S. Gavrilov and A. Feschenko. The two devices, which were prior to shipment disassembled and packed in 11 boxes, are currently stored in the RATS space in Lund. They will be installed in the MEBT and LEDP sections of the ESS linac and will provide valuable information about the average time structure of the proton bunch as measured during the commissioning and start-up periods of the ESS linac."

■ May 2018:

- Working meeting with S. Feschenko and S. Gavrilov
- Discussing installation plans, commissioning, DAQ



List of additional equipment

According to the contract with INR


- Certain items provided by ESS
- Procurement close to final (Clement)
 - Orders: all in place
 - Received: all items apart from one (rack mountable PC)



Pages: 1 / 1 BSM Ventoux

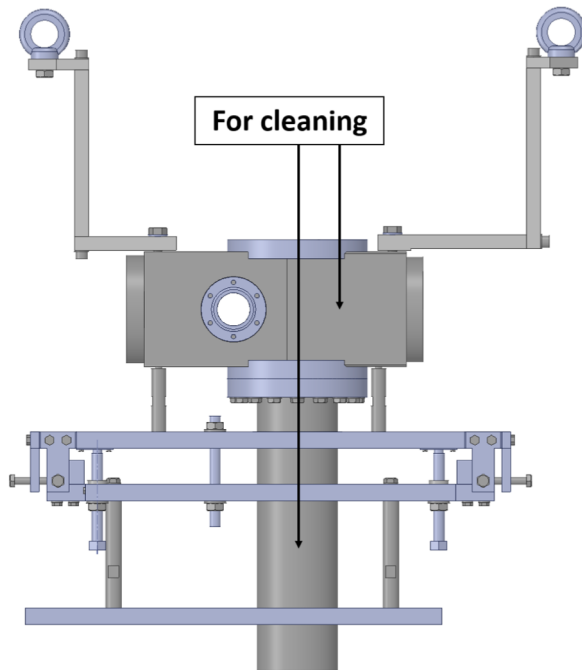
BSM items to be ordered by ESS

Created by Inera Odian Kildemoen, last modified by Clement Daniel on Nov 12, 2018

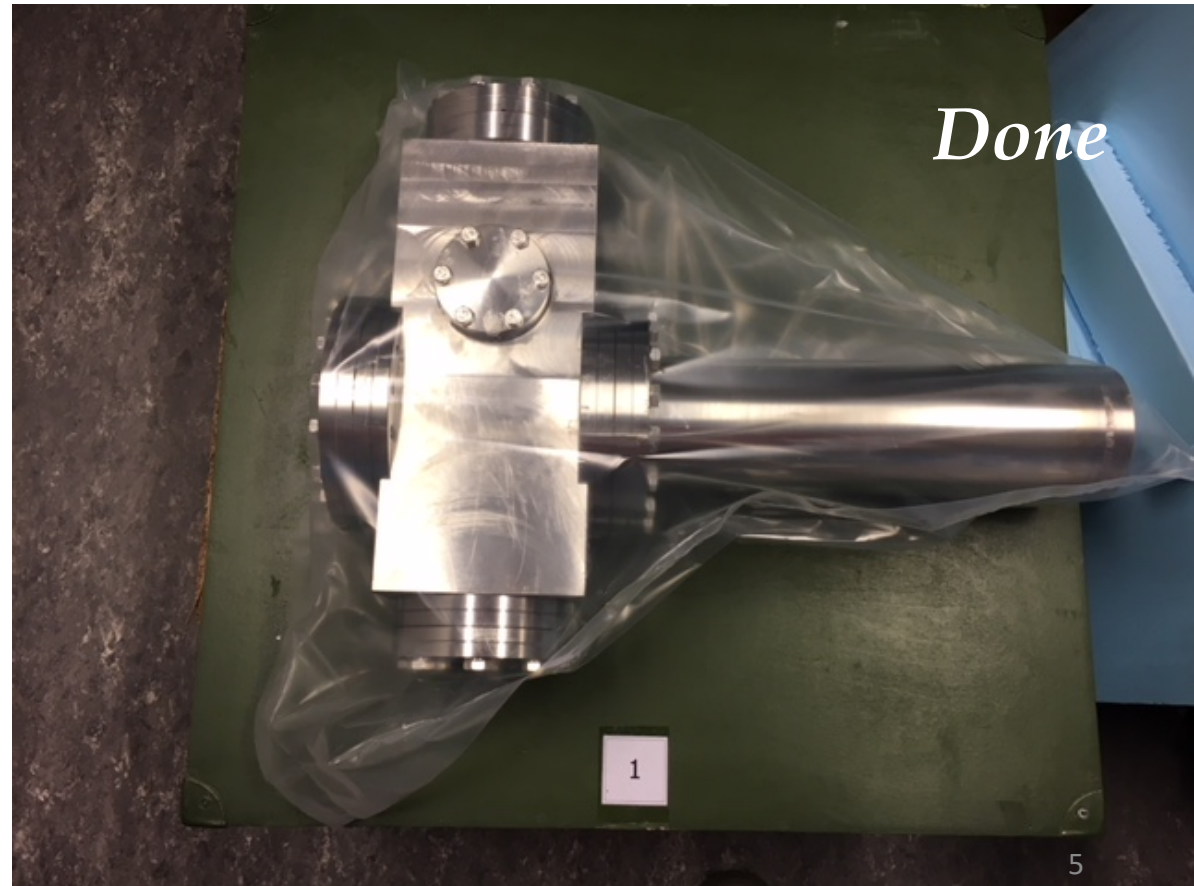
Item ID	Item description	Part number(s)	Final location (BSM1, BSM2 or INR)	quote and order confirmation	Order date	Reception date (at ESS)	status	value (SEK)	comment
1	Manual drive for RF tuning	LBC16-25-H	INR	Offert_3981.pdf	~June 2017 (TBC)	Beginning of November 2017	DONE	4982	Shipped to INR in November 2017. Stays at INR according to the contract.
2	Motorized drive for the wire		INR			delivered	DONE		
3	What do we have in the box in the lab?? We have a box with this part: LSM38-50-SS-EN-LIP	LSM38-50-SS-EN-LIP	BSM1, BSM2	4 items ordered/confirmed		delivered	DONE		
4	All motorized stages needed for 2 BSM to be installed (this is related to the line above) Each BSM needs: • LSM38-50-SS-EN-LIP • MSMAC-ENC-LM16 - not 100% sure, since it's been a while, but I think we need this too. Will to crosscheck with Serge. • MSMAC1-H-L1-US-240V Plus this item: • manual drive for RF tuning • LBC16-25-H								2 sets of items needed. For BSM number 2, we have to check with vacuum for the particle free elements → Each BSM should be checked with separately.
5	1U or 2U Rackmount PC: Intel Core-i5 CPU, 8 GB DDR4 RAM, 120 GB SSD Windows 7 Pro 64bit installed	General Technics GT242 → Beckhoff CS2 10-0500	BSM1, BSM2	ESS Clement quote.pdf 76887 18-10-02 16.05.37.pdf	October 2018		Ordered	26 963	
6	1U Keyboard, 17in LCD, Touchpad with DVI, USB	General Technics RK715, Aten CL series	BSM1, BSM2			delivered November 2018	Done	8000	
7	MJ Series 15 102T Regulated HV DC Modules, input 240V RMS, negative polarity, 0-5 kV 0-10 kV with cable PG 8U	Glassman: MJ5A3000 MJ10N1500	BSM1, BSM2	Quotation to- European Spallation Source EPSC MAJ01807271140 18-07-27.pdf	August 2018	delivered October 2018	Done	81 480	2 and 4 items needed
8	High power RF amplifier	Mincircuits: ZHL-20W-135W-	BSM1, BSM2	12472 ESS Lund 180718.pdf	August 2018	delivered September 2018	Done	35 500	2 items needed Distributor: inResonance AB
9	Electron Multiplier	Hamamatsu R996	BSM1, BSM2	N08873_Quote_ESS.pdf	August 2018	delivered November 2018	Done	27 200	
10	19" McLaren crate	SIMRACK1	BSM1, BSM2	ESSB 111185 QW.pdf	August 2018	delivered October 2018	Done	7 540	2 items needed
11	silver plated bolts: • M8*25 - 20 • M8*35 - 80 • M8*55 - 60 • M8*75 - 60 • M8*14 - 40 • M8*16 - 20 + set of washers and nuts non vented	VACOM_Quotation_10107738.pdf	BSM1, BSM2	VACOM_Quotation_10107738.pdf	August 2018	delivered October 2018	Done	14 532	

BSM cleaning (MEBT)

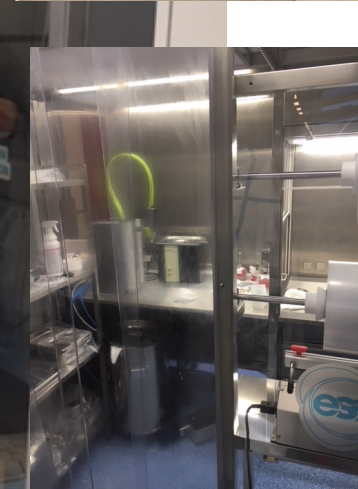
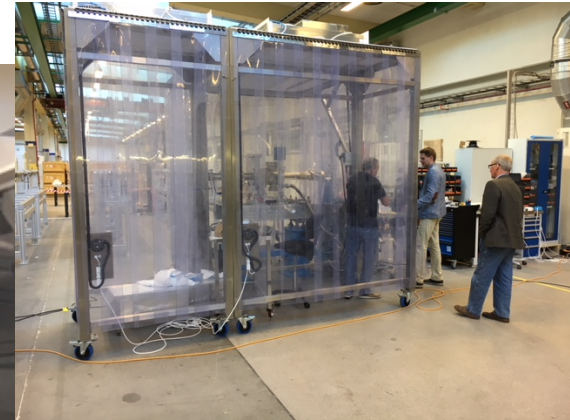
BSM cleaning: necessary minimum to cross-check BSM-MEBT mechanical integration at Bilbao



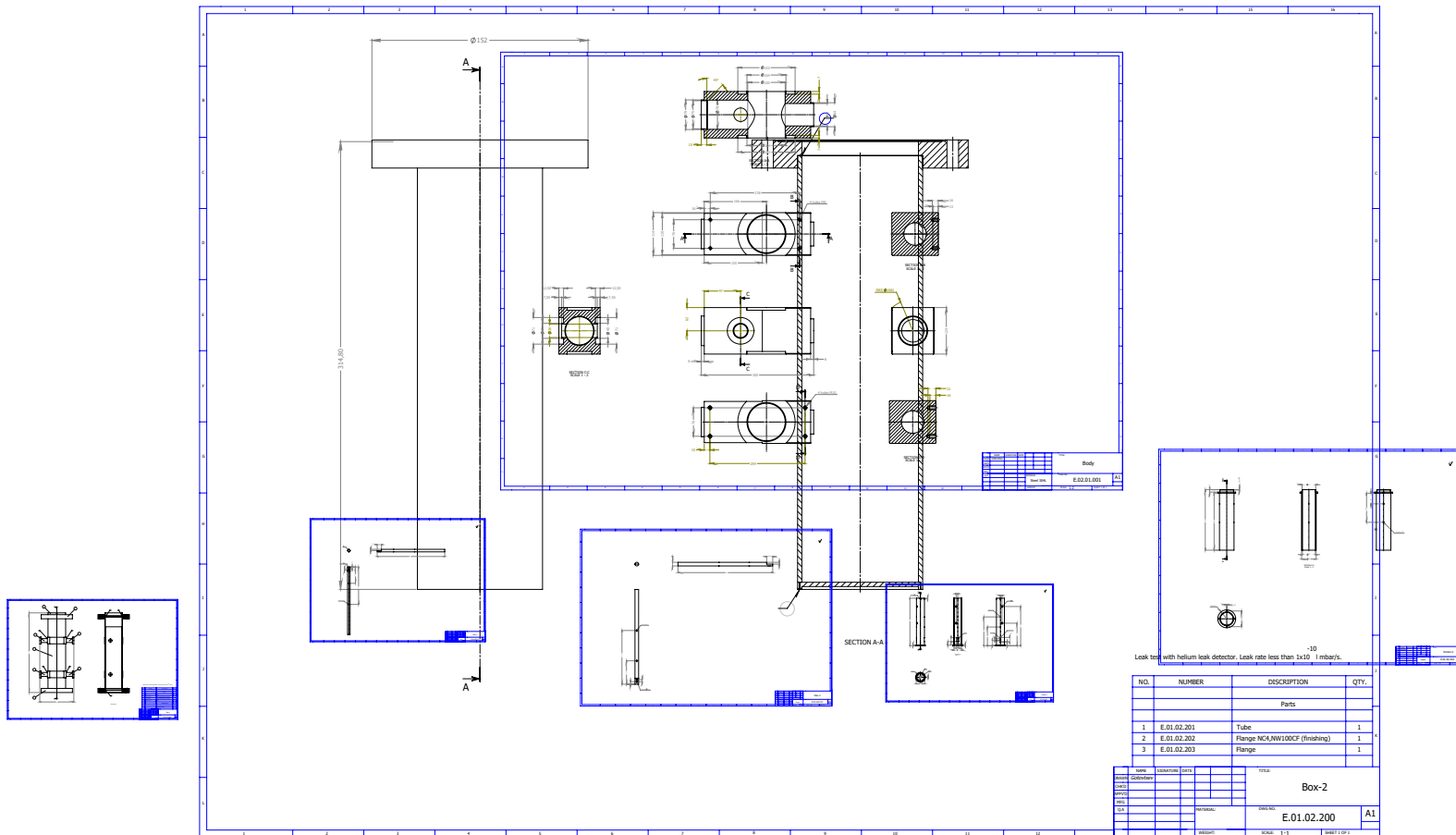
INR: "ESS can open Box#1 (number one) to clean vacuum parts. You will need to disassemble them, because it was packed as one part ready for installation".



BSM cleaning at ESS vacuum facility

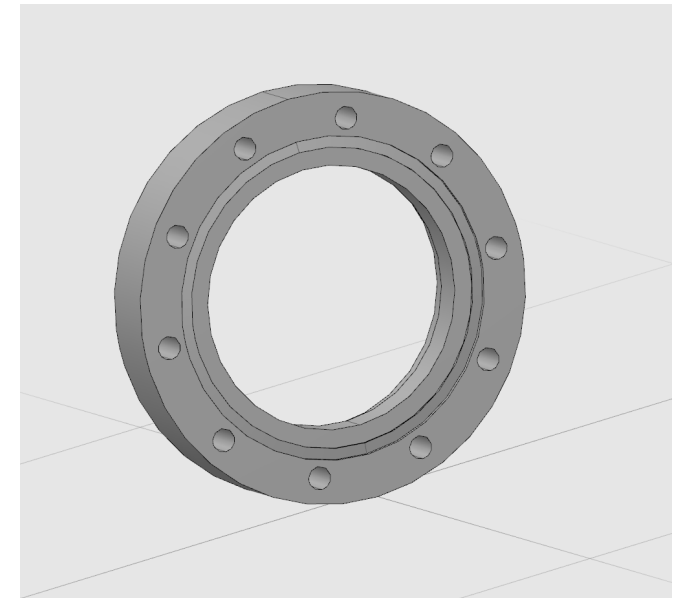
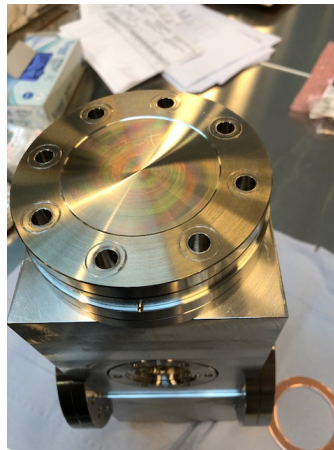
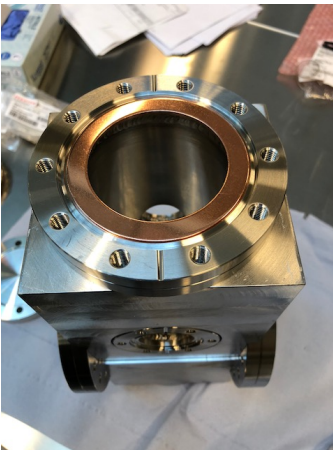


"big" BSM parts for UHV-cleaning



BSM cleaning : small lesson

- After UHV cleaning, the next step was a leak check.
- Assembling the BSM-MEBT with UHV blank flanges on one DN 63 CF flange – it doesn't fit



It is a standard DN75CF (4.625" OD) flange (and gasket)

Leak test



Document Type: Technical report
 Document Number: Chess Controlled Core Word
 Date: March 08, 2016
 Revision: 0 (1)
 State: Released
 Confidentiality Level: Internal
 Page: 1 (2)

Document Type: Document Template
 Document Number: Chess Controlled Core Word
 Date: Sep 22, 2015
 Revision: 0 (1)
 State: Released
 Confidentiality Level: Internal

Gas analysis

HELIUM LEAK TEST REPORT + GAS ANALYSIS

ESS Part Identifier: BCM MEBT

Calibrated leak : 1123

Pumping group : ESS mobile turbo pumping cart

$q_{CL} : 1.9 \cdot 10^{-8}$ (mbar.l/s)

Leak detector : Leybold UL 300

Calibration leak signal

$S_{CL} : 2.2 \cdot 10^{-8}$

LEAK TEST RESULT

Leak tightness requirement: $2 \cdot 10^{-10}$ mbar.l/s

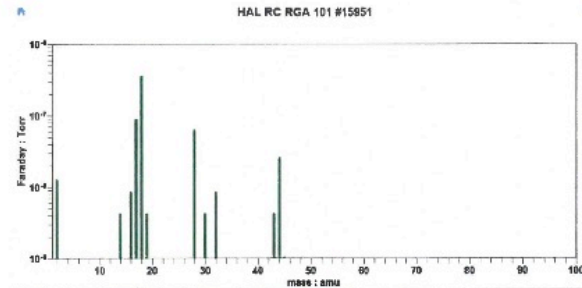
Name equipment	Residual signal R_S	Signal Leak after 10 min S_L	Leak evaluation mbar.l/s q_G	Conformance <i>YES/NO</i>
BCM	$9,7 \cdot 10^{-14}$ mbar.l/s	$5,3 \cdot 10^{-11}$		YES

Remarks:

Vacuum pressure during leak test is $1,9 \cdot 10^{-7}$ mbar.



BCM enclosed in plastic bag filled up in Helium



Vacuum operator: Christophe Jarrige

Approved by: Christophe Jarrige

Date: 2018/10/02

Date: 2018/10/03

Visa: 

Visa: 