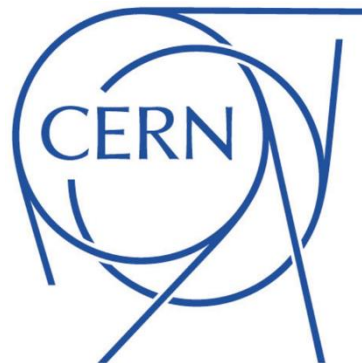


Task 4.6:

Measurements on cryogenic beam vacuum system prototype



Task 4.6:

Measurements on cryogenic beam vacuum system prototype

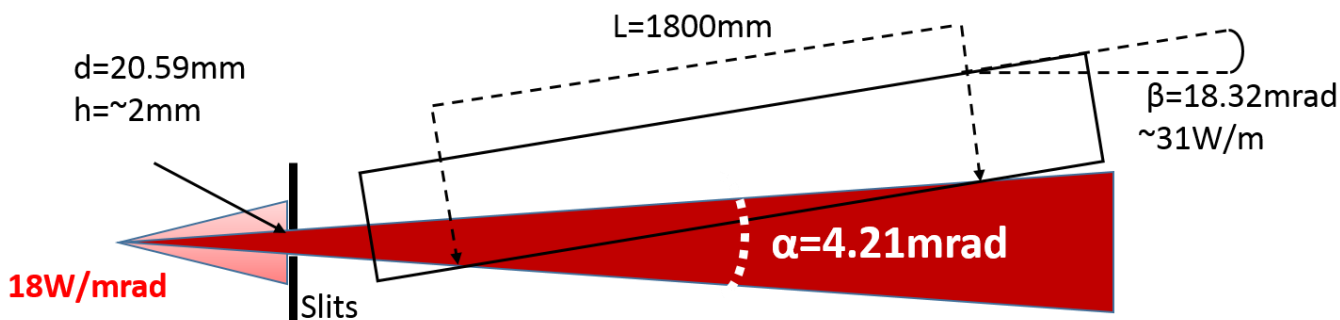
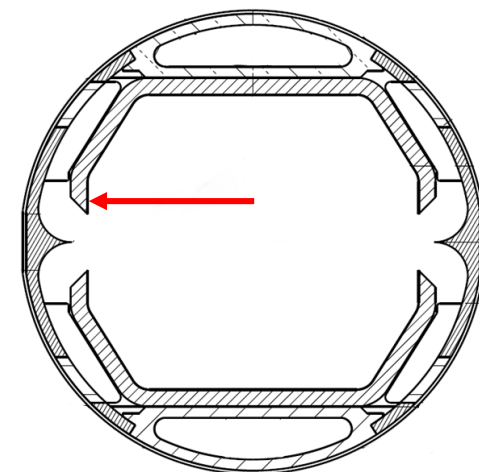
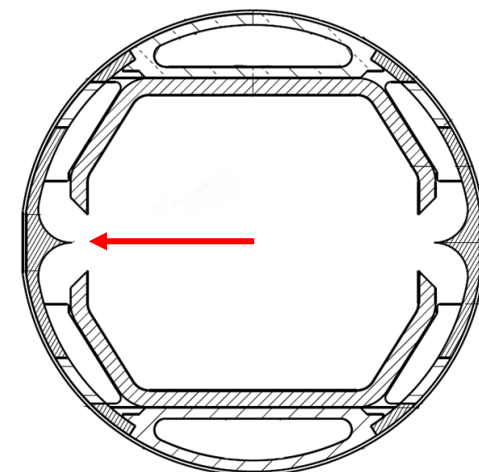
Overview:

- Planned Activity at ANKA
- Advances in Alignment procedure
- Control system
- Purchasing status
- Schedule

Task 4.6: Planned activity at ANKA

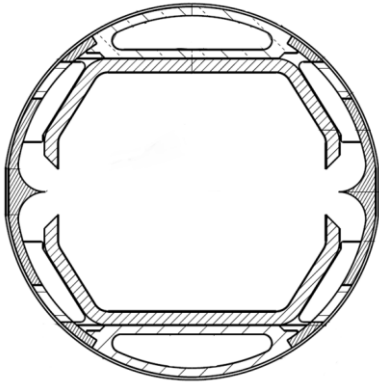
Series of measurements related to beam instabilities on the prototype of the FCC-hh beamscreen @ RT

Gracing angle of 18.32mrad..... **7mrad**
Ec = 6.2KeV..... **4.3KeV**
Photon flux=6E19 ph/s*mrad – 1.4E20ph/s*m..... **1.34E17ph/s*m**
Power deposited=18 W/mrad - ~31W/m..... **26W/m**

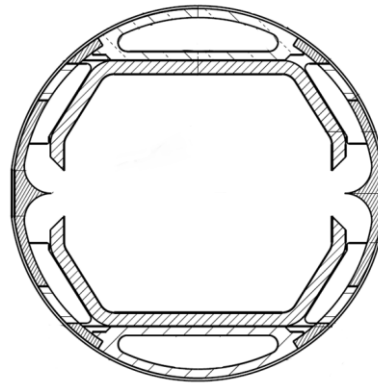


Task 4.6: Planned activity at ANKA

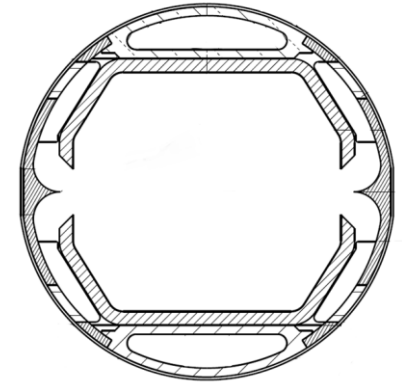
Three different Prototypes will be measured



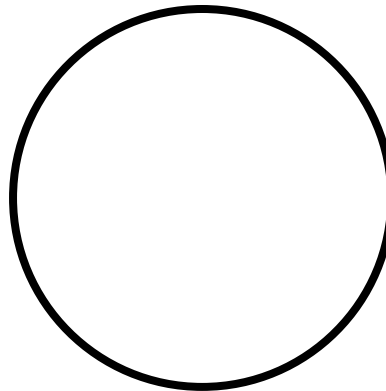
BS prototype
Copper coating
Photodesorption
Reflectivity
Thermal behavior



BS prototype
Insulated Cu Stripe
Photoelectron measurements



BS prototype
Anti e-Cloud laser treatment
Photodesorption studies
Reflectivity
Thermal behavior

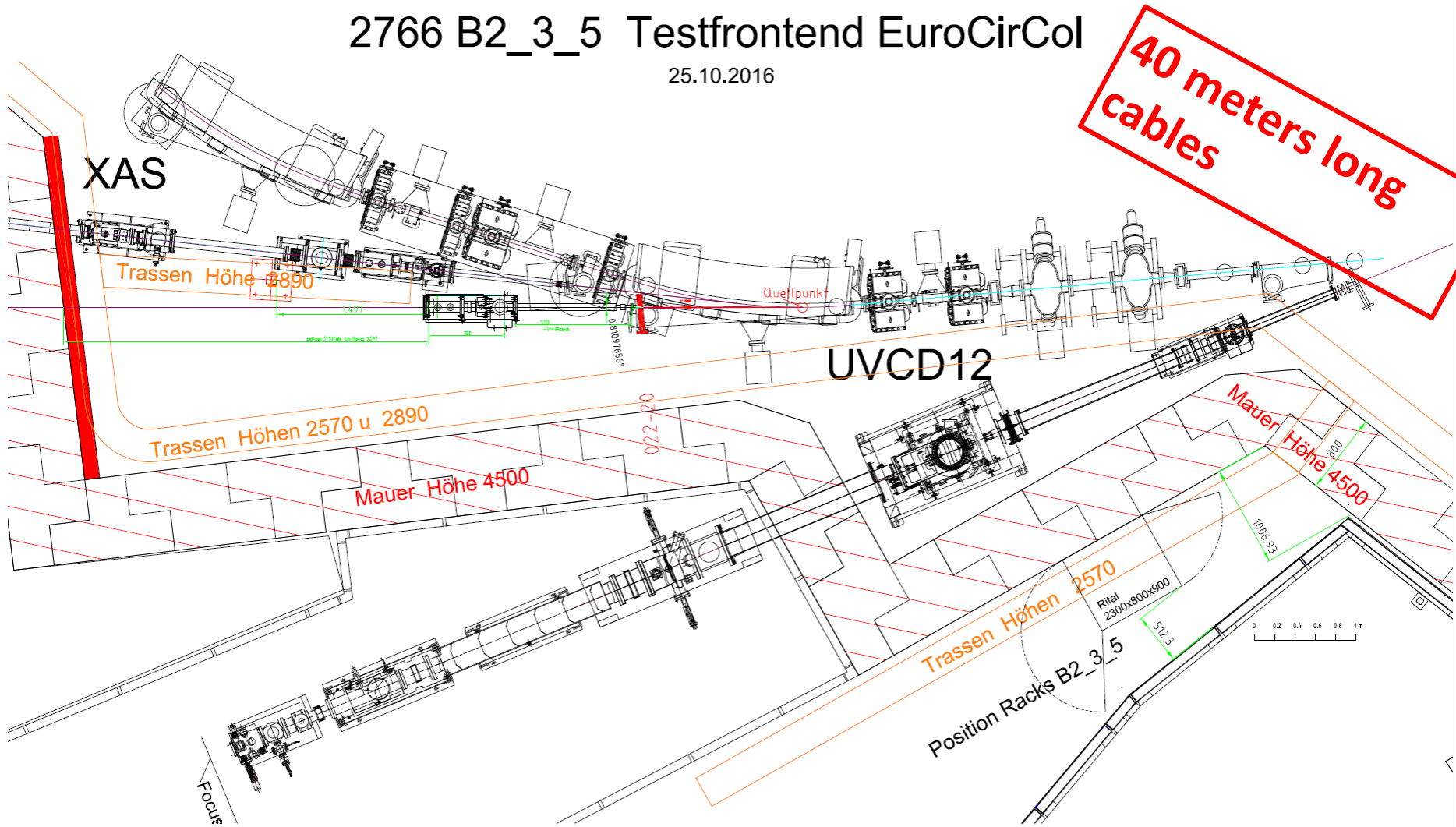


Stainless Steel
Commisioning

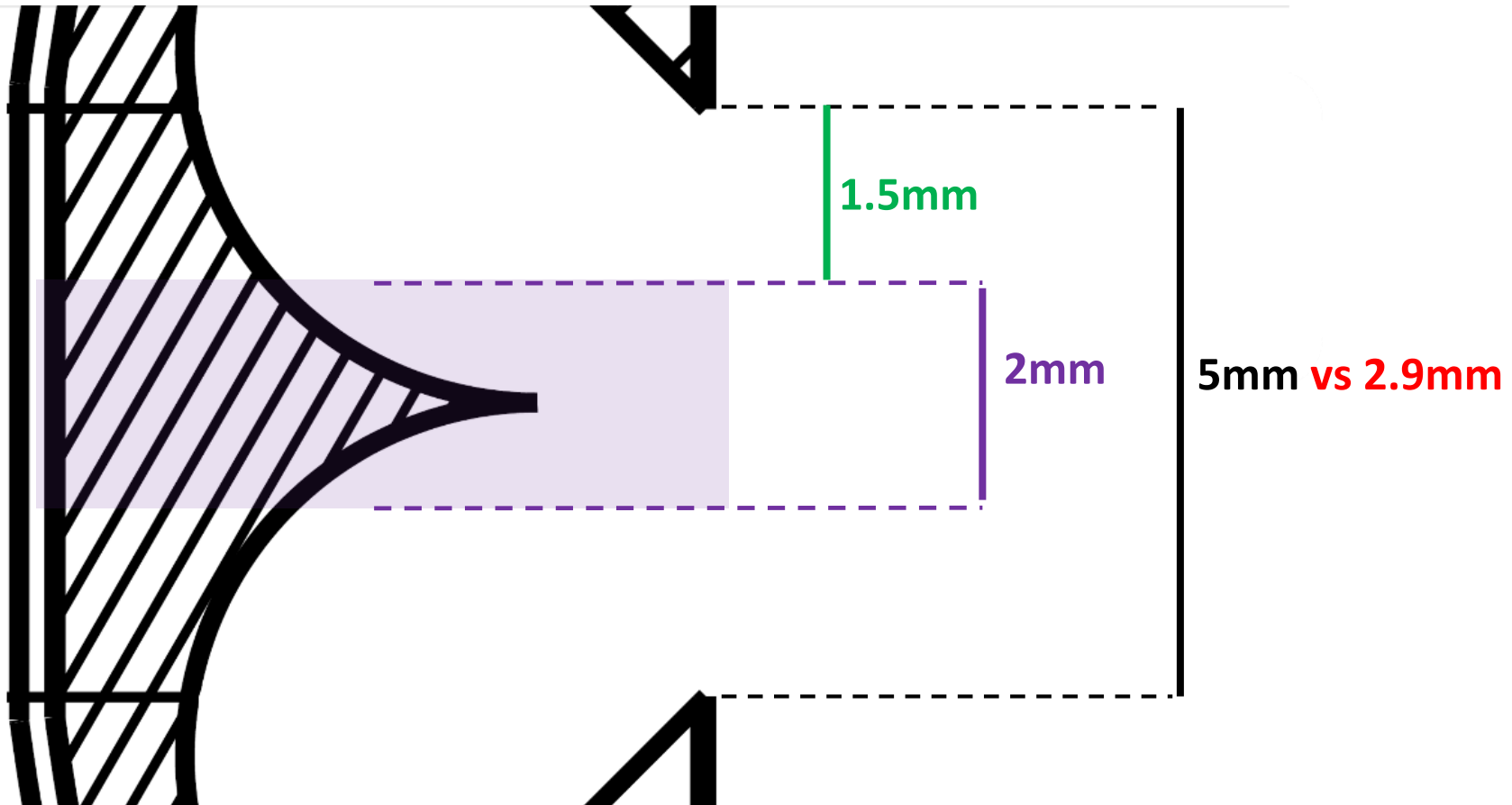
Task 4.6: Planned activity at ANKA

2766 B2_3_5 Testfrontend EuroCirCol

25.10.2016

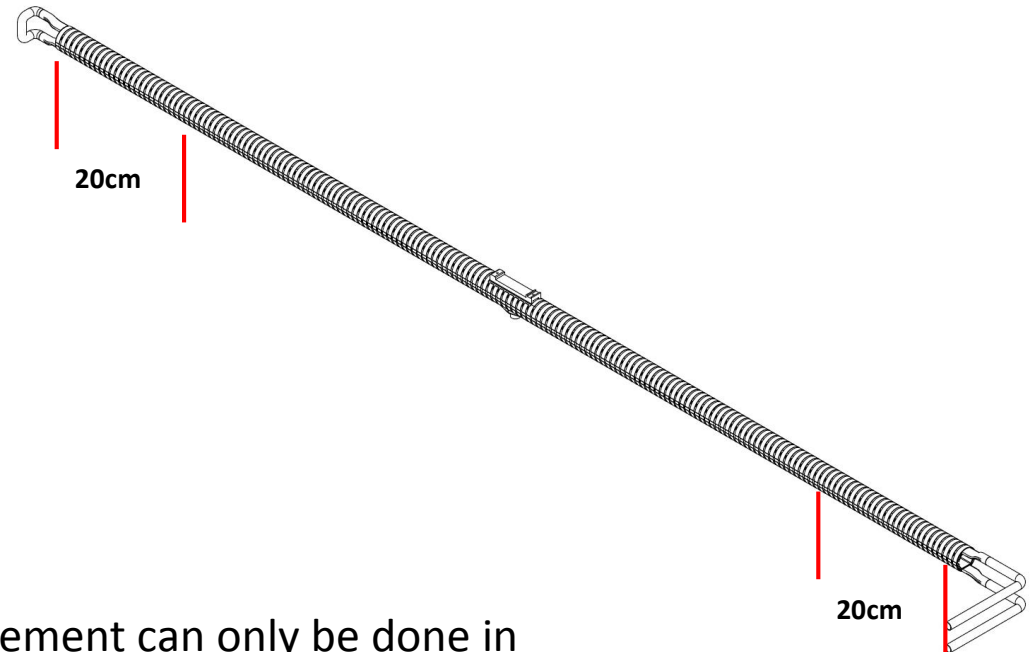
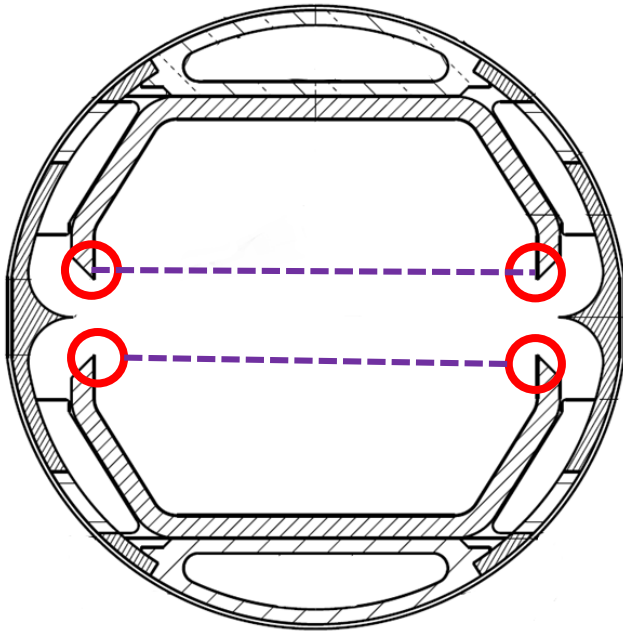


Task 4.6: Alignment procedure update



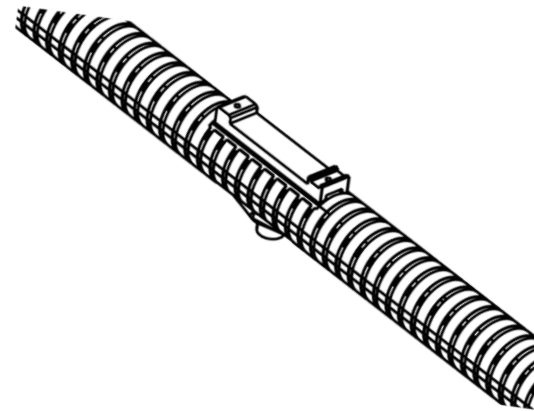
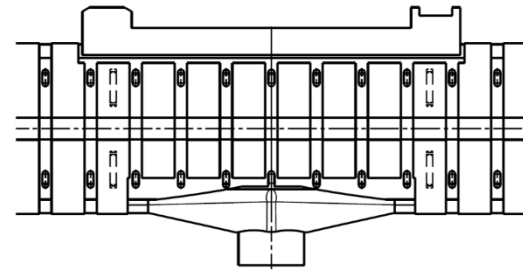
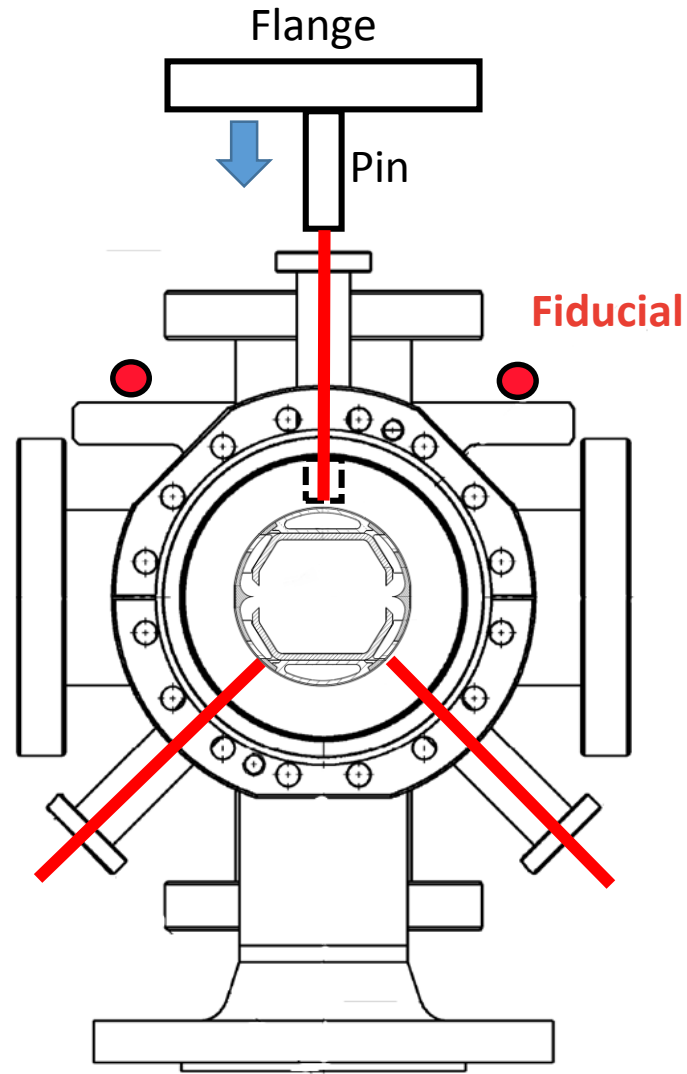
Task 4.6: Alignment procedure Metrology work

Determination of Straightnes
expected $\pm 0.250\text{mm}$
Accuracy of measurement **0.005 mm**



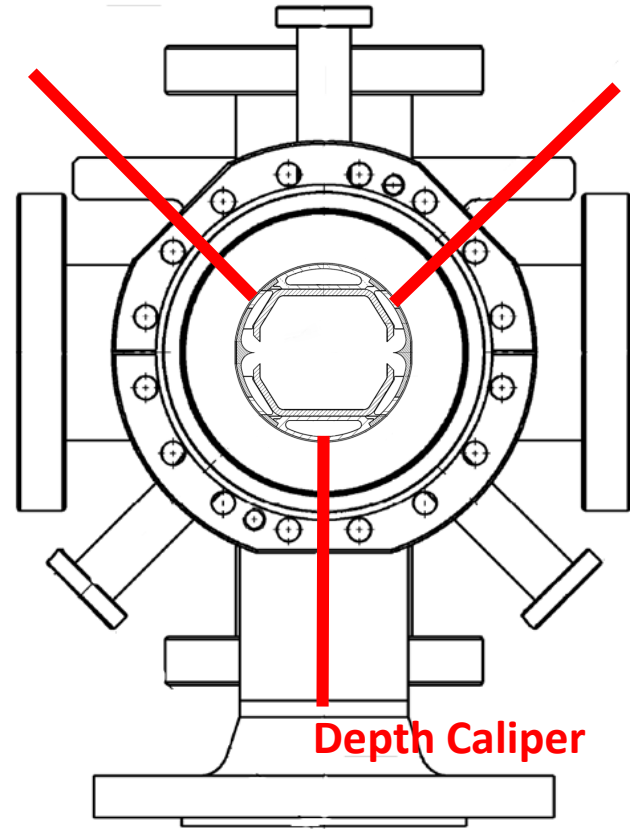
Measurement can only be done in
the first 20cm from each extreme

Task 4.6: Alignment procedure Metrology work

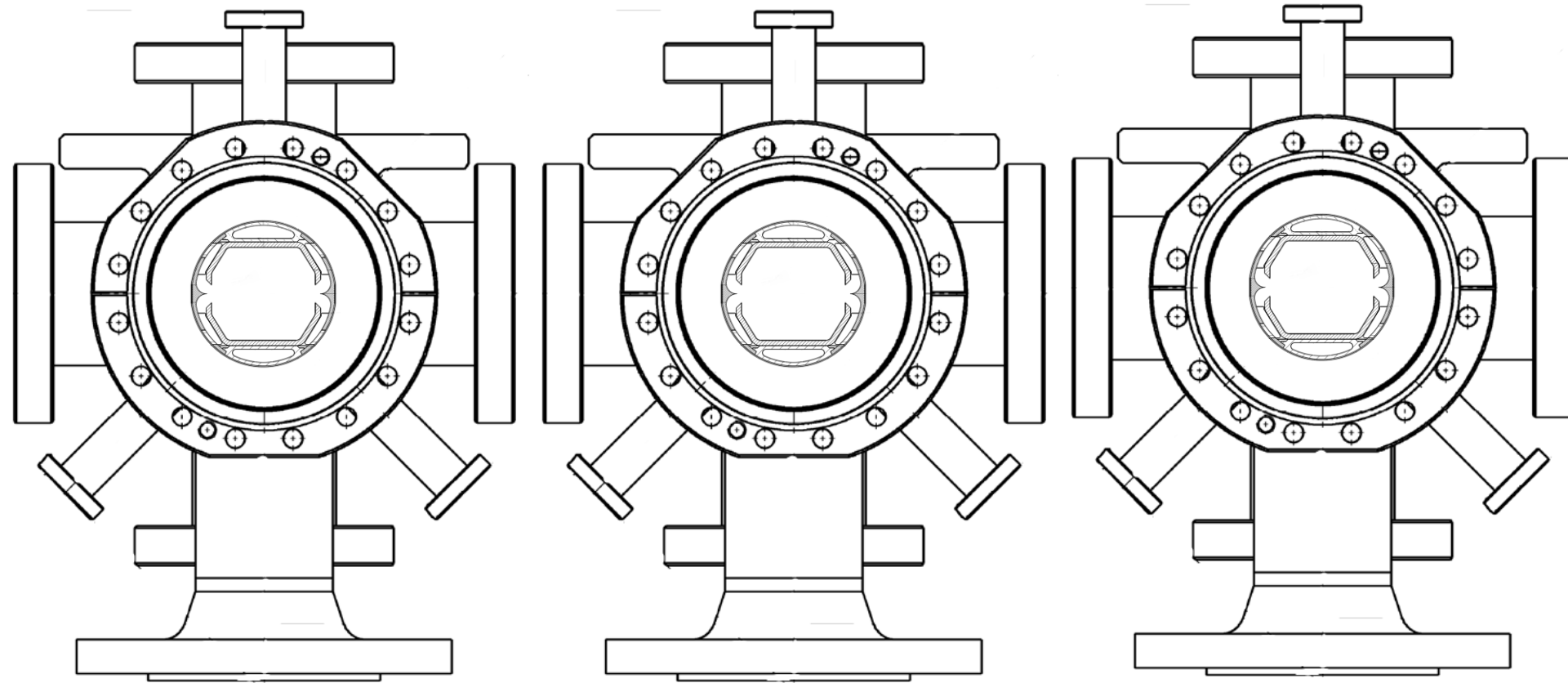


Task 4.6: Alignment procedure Metrology work

Depth Caliper Depth Caliper

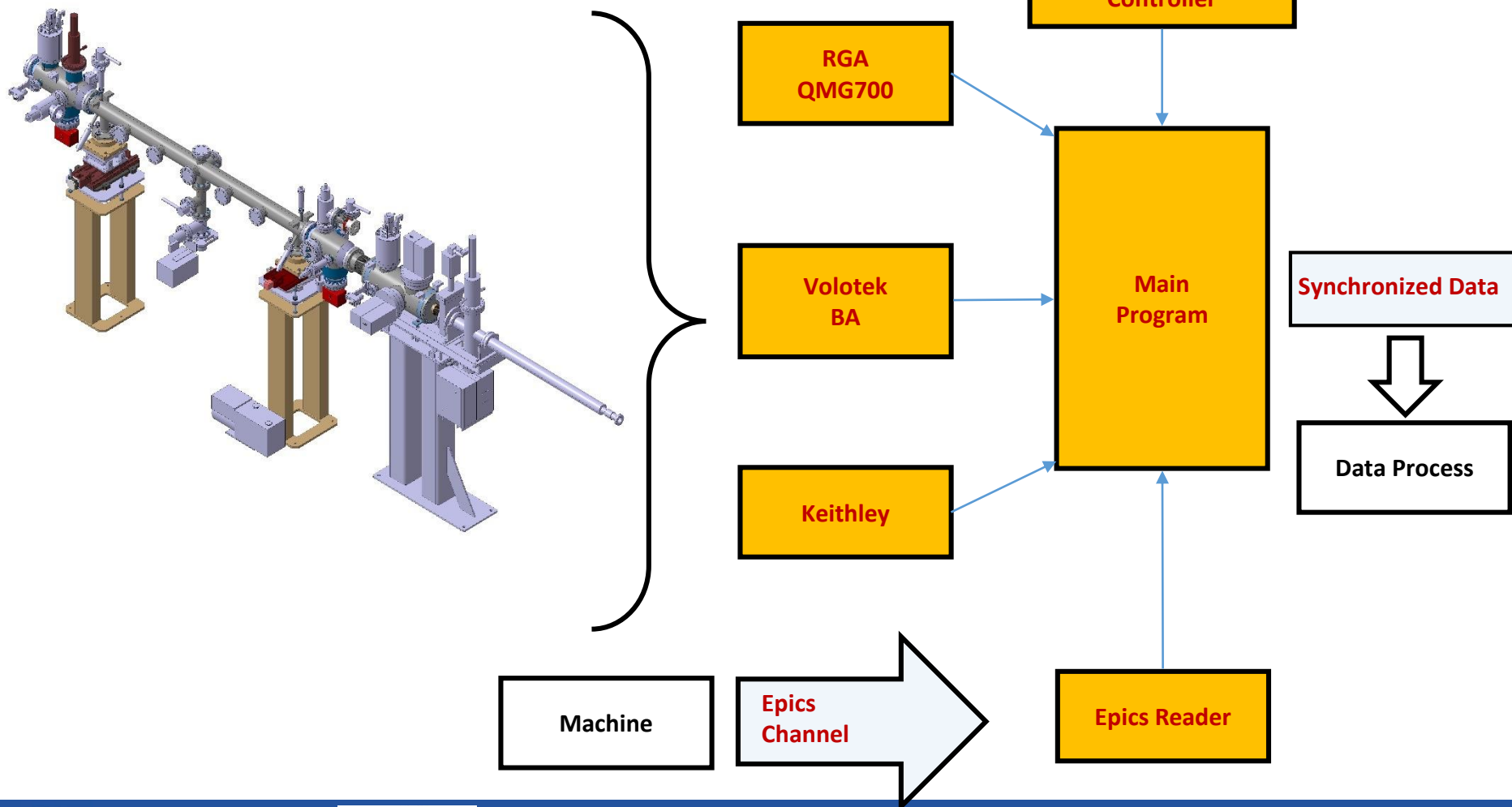


Task 4.6: Alignment procedure

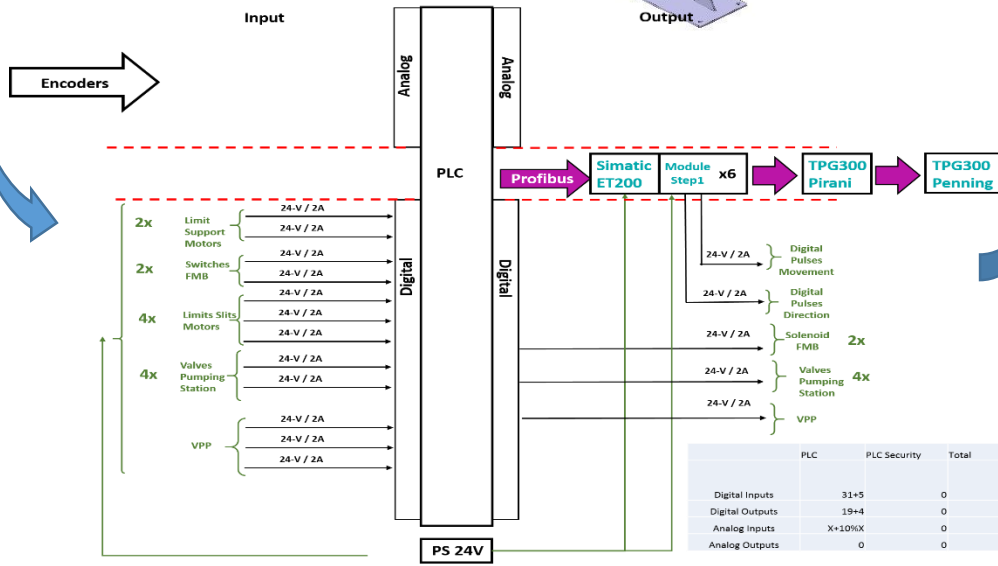
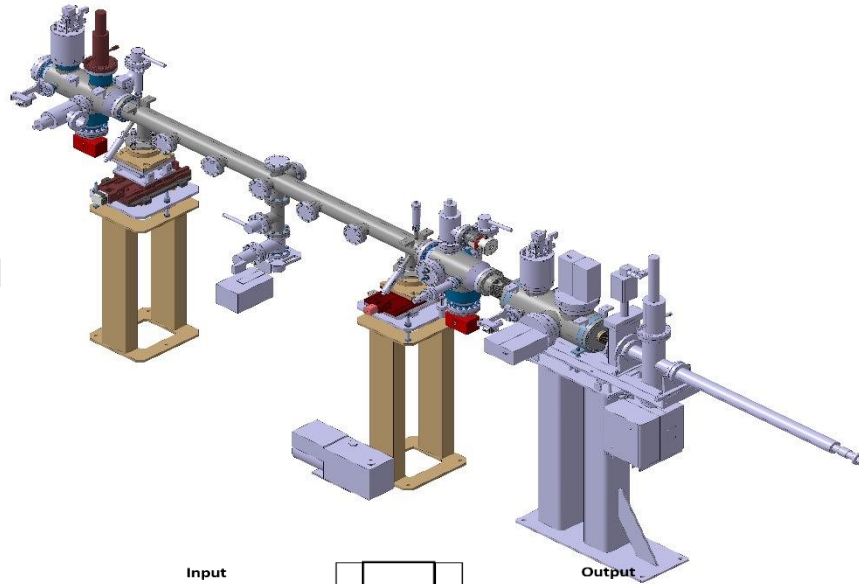


Task 4.6: Control system: Data acquisition

- Data will be acquired by using LabView Software.
- We have the VI's that control every of our equipment



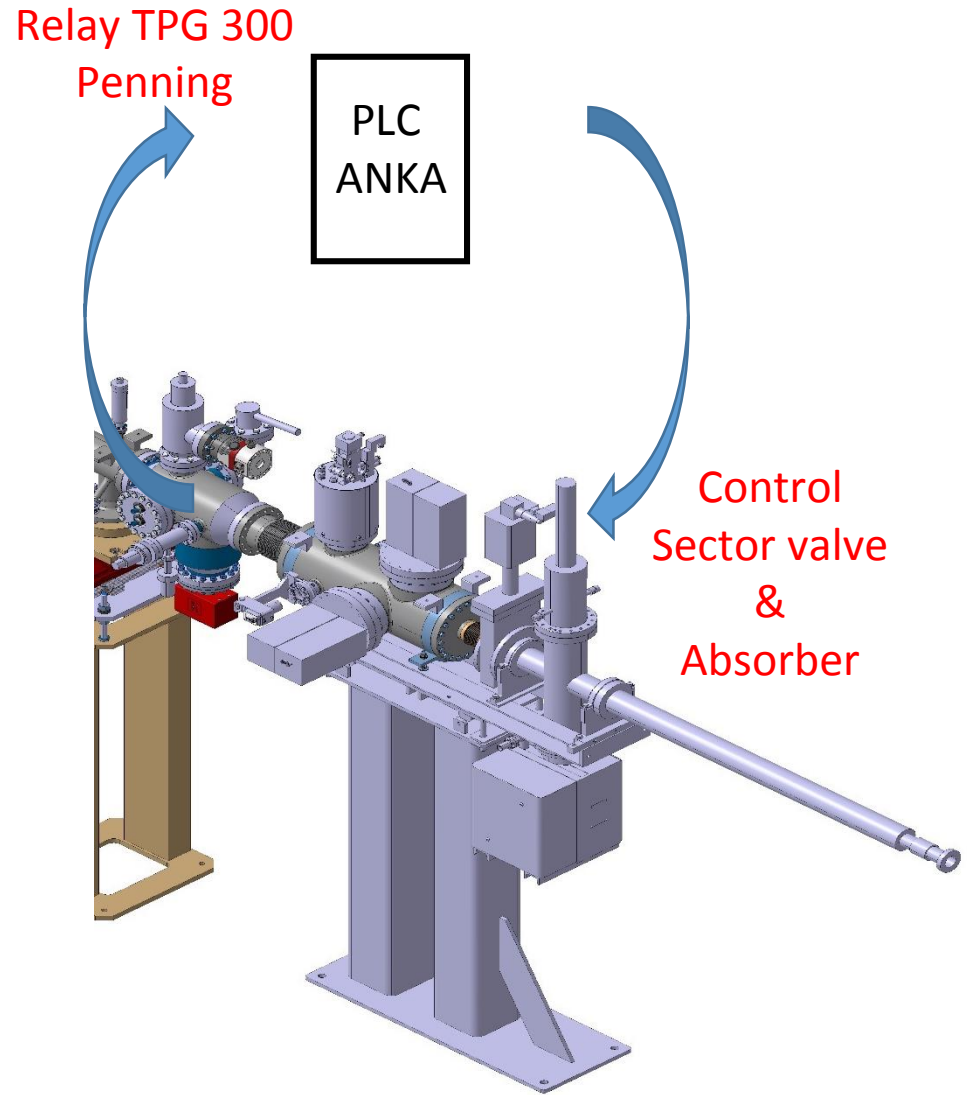
Task 4.6: Control system: Actuators control



- PLC's + PVSS software
- UNICOS framework
 - Support from CERN at ANKA
- Electrical drawing design process is ongoing
- Software design is ongoing
- Cable manufacturing is ongoing
- License PLC available at ANKA sporadically
- License PVSS awaiting for confirmation at CERN
- Safety interlocks will be in charge of ANKA
 - Signal from penning
- Pumping station will be manual with interlocks

Task 4.6: Control system: safety

- A relay from tpg300, setting a penning pressure threshold will be connected to the security PLC at ANKA
- The logics of the security will be taken care of by ANKA
- Security over pressure while venting: Rupture disk- WitzemannC305 254 – used in cryobeam vacuum sections in LHC- Breaks at pressures 1.3 bar



Task 4.6: Purchasing Status

Controllers

Pumping station

Scroll-VPP
Turbo-PCP350
NexTorr-Niops6
TPG300
Pirani/Penning cards-TPG300
Profibus Cards – TPG 300

Valves

Fluorescent Screen Solenoid
Fluorescent Screen Switches
Photon Collector Solenoid
Photon Collector Switches
Valves Solenoids
Valves switches

V. Gauges

Bayard Alpert- Volotek
Bayard Alpert Amplifier
RGA-controller

Temp

Thermocouple controller

Motors

Middex Motor Cards
Siemens PLC Step7
Siemens-Step1 Modules
Encoder Counters
PC

Electrometer

Keithley

Cables:

40 m Long

Etherenet-Camera

Thermocouples



Task 4.6: Purchasing Status

Number	Type	Short Description	Creator	Created	Budget Codes	Assigned to	Total
6571061	MAG	(BAAN6571061) Pirani Penning Controller	Luis Antonio GONZALEZ GOMEZ	02.11.2016			3,881.00
6564341	MAG	(BAAN6564341) Rough vacuum flanges	Luis Antonio GONZALEZ GOMEZ	27.10.2016			68.00
6564335	DAI	Rough pump flanges	Luis Antonio GONZALEZ GOMEZ	27.10.2016	10827		99.00
6563387	SHIP2	Shipping TestBench to ANKA	Luis Antonio GONZALEZ GOMEZ	26.10.2016			N/A
6558775	MAG	Pieces for ANKA setup	Luis Antonio GONZALEZ GOMEZ	23.10.2016		Michael Markus BENEDIKT (tel. 73380), 26.10.2016	6,069.68
6531421	SHIP2	Flanges for UHV Chamber Manufacturing	Luis Antonio GONZALEZ GOMEZ	30.09.2016			N/A
6529576	DAI	UHV Chambers ANKA	Luis Antonio GONZALEZ GOMEZ	28.09.2016	10827		27,960.00
6522402	MAG	(QUAL6522402) Connectors Motors Slits	Luis Antonio GONZALEZ GOMEZ	22.09.2016			149.52
6521733	DAI	Angle Valves	Luis Antonio GONZALEZ GOMEZ	21.09.2016	10827		7,602.00
6520709	MAG	(QUAL6520709) Goupilles	Luis Antonio GONZALEZ GOMEZ	21.09.2016			121.28
6520235	MAG	(BAAN6520235) Disc for special Flange	Luis Antonio GONZALEZ GOMEZ	20.09.2016			395.40
6519324	DAI	KF Parts	Luis Antonio GONZALEZ GOMEZ	20.09.2016	10827		657.00
6517378	DAI	Linear Motion Feedthroughs	Luis Antonio GONZALEZ GOMEZ	19.09.2016	10827		6,152.00
6517203	DAI	Scroll Pump	Luis Antonio GONZALEZ GOMEZ	19.09.2016	10827		3,342.00
6516457	TRN	Siemens - STEP7 : level 1	Luis Antonio GONZALEZ GOMEZ	16.09.2016			1,837.44
6516448	TRN	UNICOS-CPC Basic Course	Luis Antonio GONZALEZ GOMEZ	16.09.2016			249.92
6516440	TRN	JCOP Framework and WinCC-OA	Luis Antonio GONZALEZ GOMEZ	16.09.2016			100.10
6503806	MAG	(BAAN6503806) Flanges for ANKA Setup	Luis Antonio GONZALEZ GOMEZ	05.09.2016			8,277.00
6500854	DAI	Beam diagnosis equipment	Luis Antonio GONZALEZ GOMEZ	01.09.2016	10827		60,914.00
6567071	DAI	FCC Test-Line sup. syst. from Ap.motion	Miguel GIL COSTA	31.10.2016	10827	Purchase Officer Pool (tel.), 02.11.2016	1,429.00
6564222	DAI	FCC Test-Line sup. syst. from Montalpina	Miguel GIL COSTA	27.10.2016	10827		402.00
6563458	DAI	FCC Test-Line sup. system - 123roulement	Miguel GIL COSTA	26.10.2016	10827		144.00
6563184	DAI	ANKA Test-Line sup. system from MISUMI	Miguel GIL COSTA	26.10.2016	10827		3,606.00
6521626	DAI	HiPace80 CF TCP350 1BX2-Special [LAGG]	Willemjan Wim MAAN		21.09.2016	10827	4,682.00
6516061	DAI	NEXTorr D2000 (LA)	Anthony HARRISON	16.09.2016	10827		32,965.00

+

Internal transfers Volotek controlers, Cable manufacturing...

15000

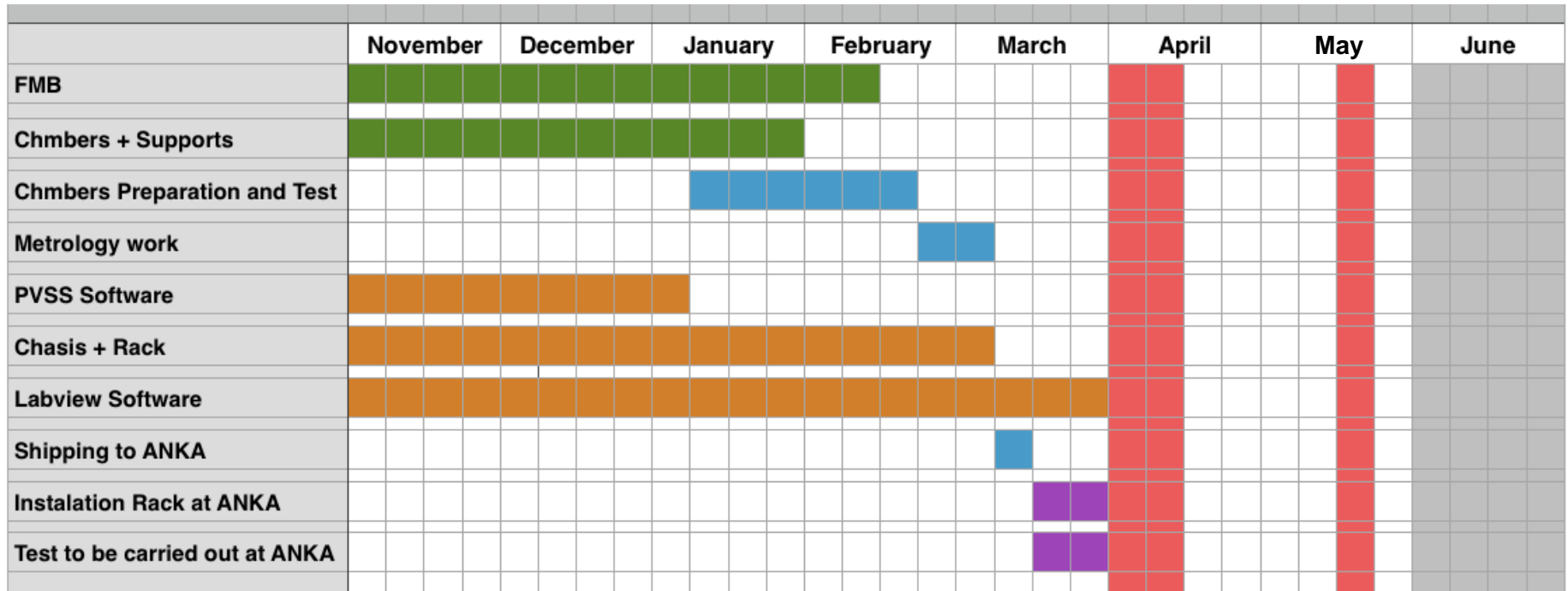
~ 190.000 CHF



Task 4.6: Schedule

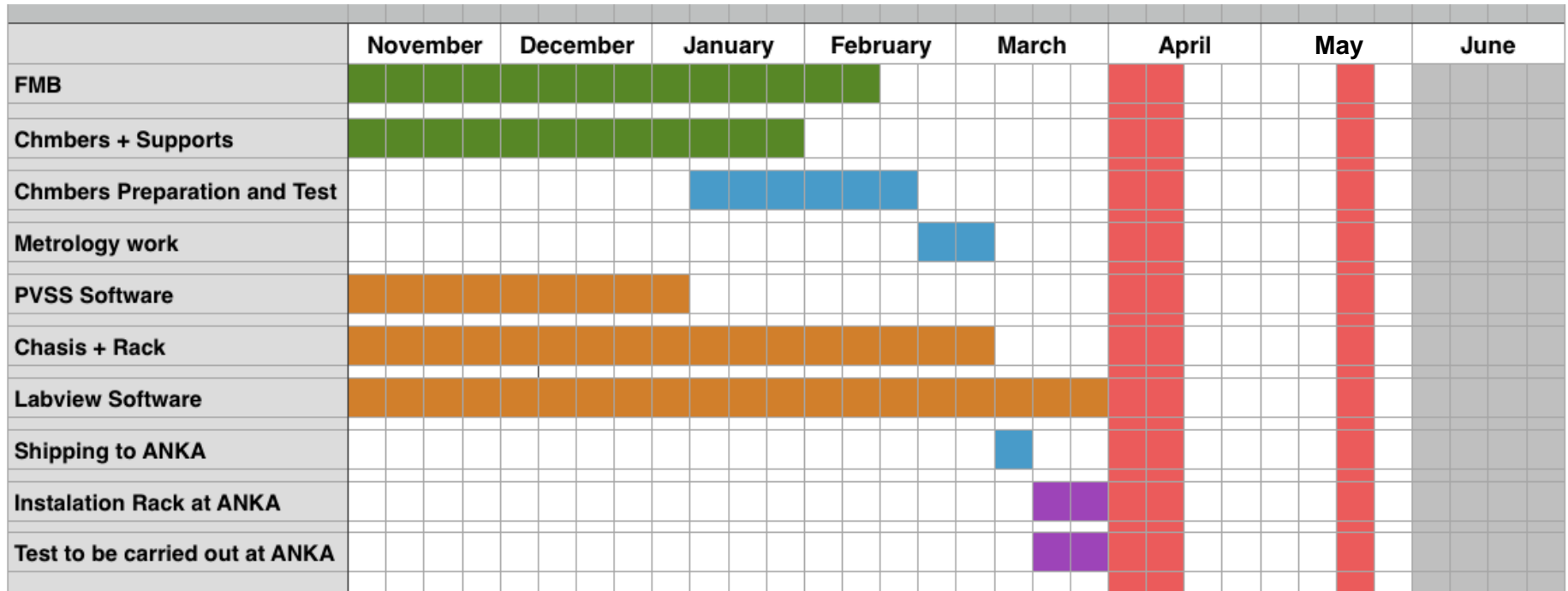
ANKA BEAM TIME CALENDAR JANUARY - JUNE 2017																													
Jan-17					Feb-17					Mar-17					Apr-17					May-17					Jun-17				
Weekd	Day	Week	Shift 9-18	Shift 19-8	Day	Week	Shift 9-18	Shift 19-8	Day	Week	Shift 9-18	Shift 19-8	Day	Week	Shift 9-18	Shift 19-8	Day	Week	Shift 9-18	Shift 19-8	Day	Week	Shift 9-18	Shift 19-8					
Mo						5											1	18 Tag der Arbeit				22							
Tu																	2												
We					1		UO	UO	1		UO	UO					3												
Th					2		UO	UO	2		UO	UO					4							UO	UO				
Fr					3		UO	UO	3		UO	UO					5							UO	UO				
Sa					4				4				1				6												
Su	1	Neujahr			5				5				2				7												
Mo	2	1		NO	NO	6	6	NO	St	6	10	NO	St	3	14	NO	NO	8	19	NO	St	5	23	Pfingstsonntag					
Tu	3			NO	NO	7		UO	UO	7		UO	UO	4		NO	NO	9		UO	UO	6		NO	St				
We	4			NO	NO	8		UO	UO	8		UO	UO	5		NO	NO	10		UO	UO	7		MP	MP				
Th	5			NO	NO	9		UO	UO	9		UO	UO	6		NO	NO	11		UO	UO	8		MP	MP				
Fr	6	Heilige 3 Könige			10		UO	UO	10		UO	UO	7		NO	NO	12		UO	UO	9		MP	MP					
Sa	7				11				11				8				13					10							
Su	8				12				12				9				14					11							
Mo	9	2		NO	St	13	7	NO	St	13	11	NO	St	10	15	NO	NO	15	20	UO	UO	12	24	NO	St				
Tu	10			St	St	14		MP	MP	14		MP	MP	11		NO	NO	16		UO	UO	13		MP	MP				
We	11			St	St	15		MP	MP	15		MP	MP	12		NO	NO	17		UO	UO	14		MP	MP				
Th	12			St	St	16		SUO	SUO	16		SUO	SUO	13		NO	NO	18		UO	UO	15		NO	NO				
Fr	13			St	St	17		SUO	SUO	17		SUO	SUO	14	Karfreitag			19		UO	UO	16		NO	NO				
Sa	14					18				18				15				20				17							
Su	15					19				19				16	Ostersonntag			21				18							
Mo	16	3		NO	St	20	8	NO	St	20	12	NO	St	17	16	Ostermontag		22	21	NO	NO	19	25	NO	St				
Tu	17			MP	MP	21		UO	UO	21		UO	UO	18		NO	St	23		NO	NO	20		UO	UO				
We	18			MP	MP	22		UO	UO	22		UO	UO	19		St	St	24		NO	NO	21		UO	UO				
Th	19			SUO	SUO	23		UO	UO	23		UO	UO	20		St	St	25	Christi Himmelfahrt	NO	NO	22		UO	UO				
Fr	20			SUO	SUO	24		UO	UO	24		UO	UO	21		St	St	26		NO	NO	23		UO	UO				
Sa	21					25				25				22				27				24							
Su	22					26				26				23				28				25							
Mo	23	4		NO	St	27	9	NO	St	27	13	NO	St	17	17	NO	MP	22	22	NO	St	26	26	NO	St				
Tu	24			UO	UO	28		UO	UO	28		MP	MP	25		MP	MP	30		UO	UO	27		UO	UO				
We	25			UO	UO			UO	UO	29		TÜV	TÜV	26		MP	MP	31		UO	UO	28		UO	UO				
Th	26			UO	UO			UO	UO	30		TÜV	TÜV	27		MP	MP					29		UO	UO				
Fr	27			UO	UO			UO	UO	31		TÜV	TÜV	28		MP	MP					30		UO	UO				
Sa	28												29																
Su	29												30																
Mo	30			NO	St																								
Tu	31			UO	UO																								

Task 4.6: Schedule



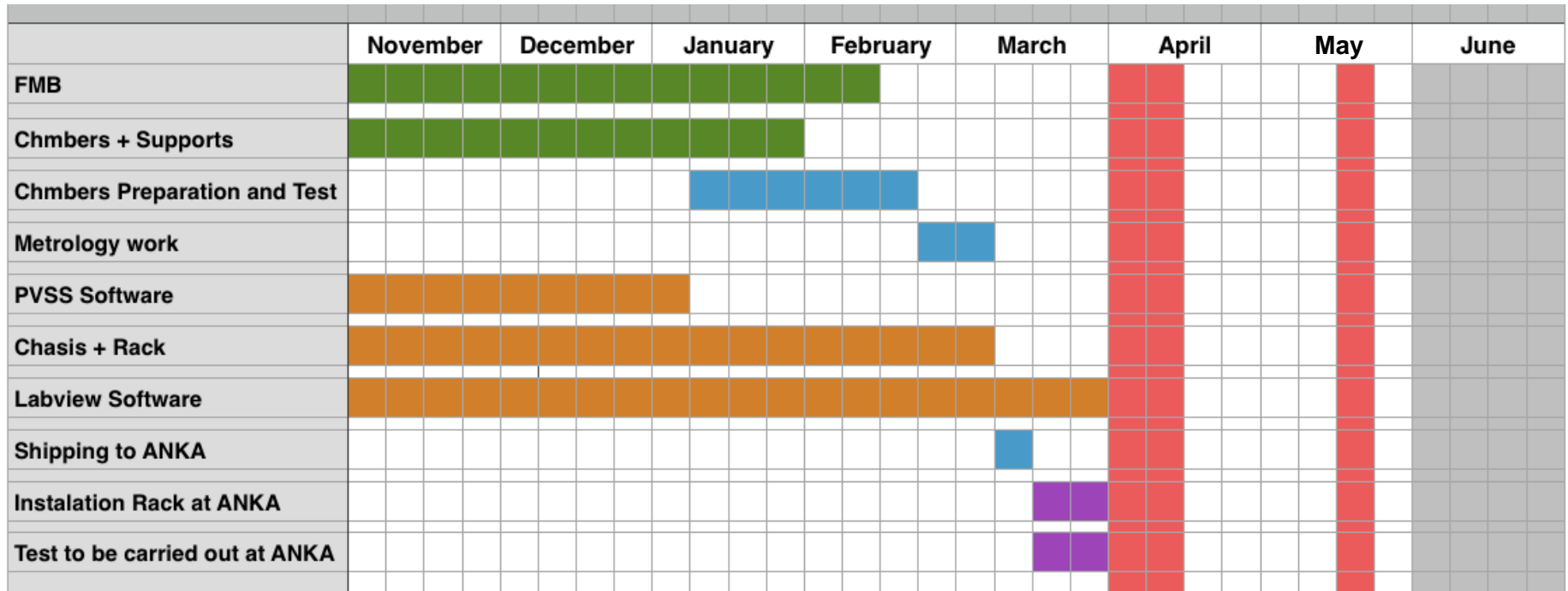
- UHV Chambers are purchased and in manufacturing process
- Beam Diagnosis Equipment is purchased and in manufacturing process
- Parts to be purchased in the supports are purchased

Task 4.6: Schedule



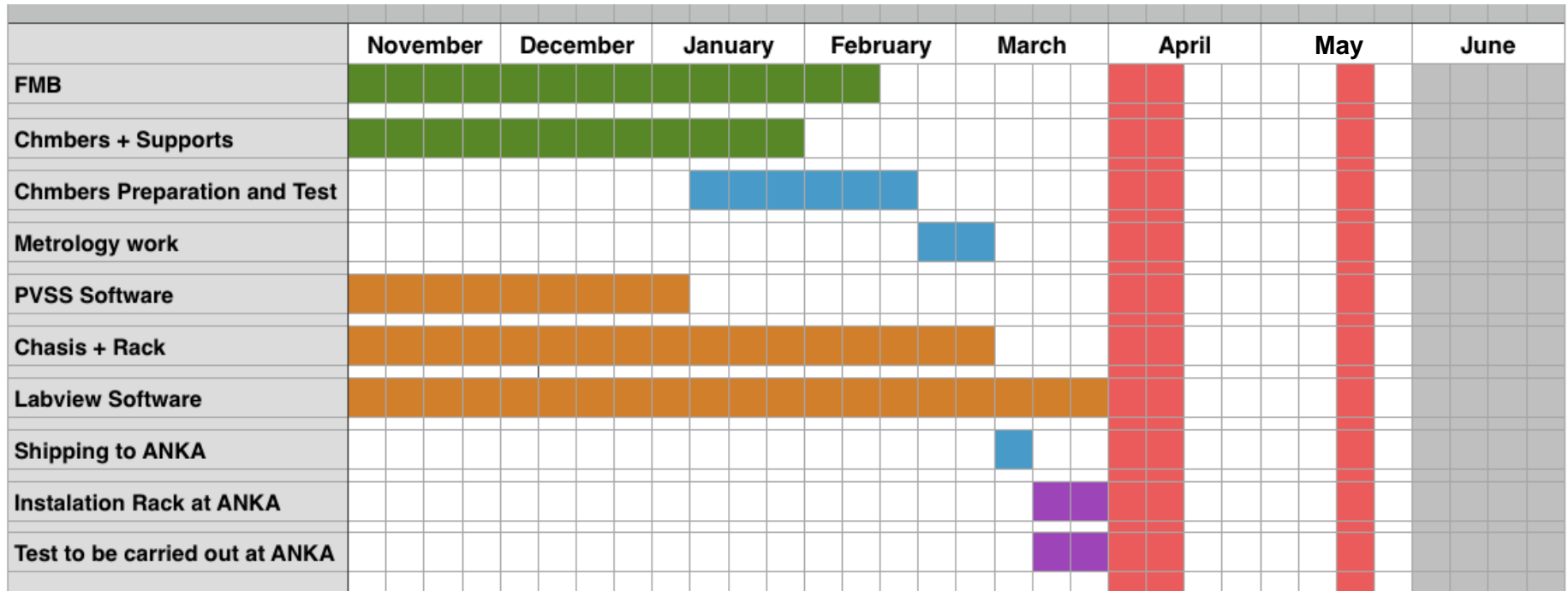
- Before Arrival of Chambers
 - Testing functioning of Supports
 - Testing motors and PVSS motor software
- After arrival of Chambers
 - Cleaning
 - Firing
 - Leak tightness

Task 4.6: Schedule



- Shipping to ANKA
 - After Chambers are ready
 - After Rack is ready
- Before Shutdown
 - Installation Rack
 - Testing Chambers

Task 4.6: Schedule



- Scenarios

-Delay on Chambers delivery and/or Rack ● → Shifting of installation to 3rd week of May

-Delay on FMB Delivery ● → Shifting of installation to 3rd week of May

● → Two step fiducilization

Task 4.6: Summary and Conclusions

- Installation of SetUp in ANKA during April shut down is possible – There is a very small margin of error
- Chambers cleaning procedure and transportation must be well coordinated – there is still time to do that
- Most critical tasks depends on Trinos and Electrical installation– in case of delay our only choice is to use second shutdown.
- In case of delay from FMB – setup sent to ANKA without it - Fiducilization should be done in two steps
- Data will be acquired by using LabView VI's
- hardware will be controlled by using PLC's + PVSS/UNICOS
- Improvement of Alignment procedure, more versatile
- Three BS prototypes will be measured + Commissioning tube
- Need of a chamber per BS prototype