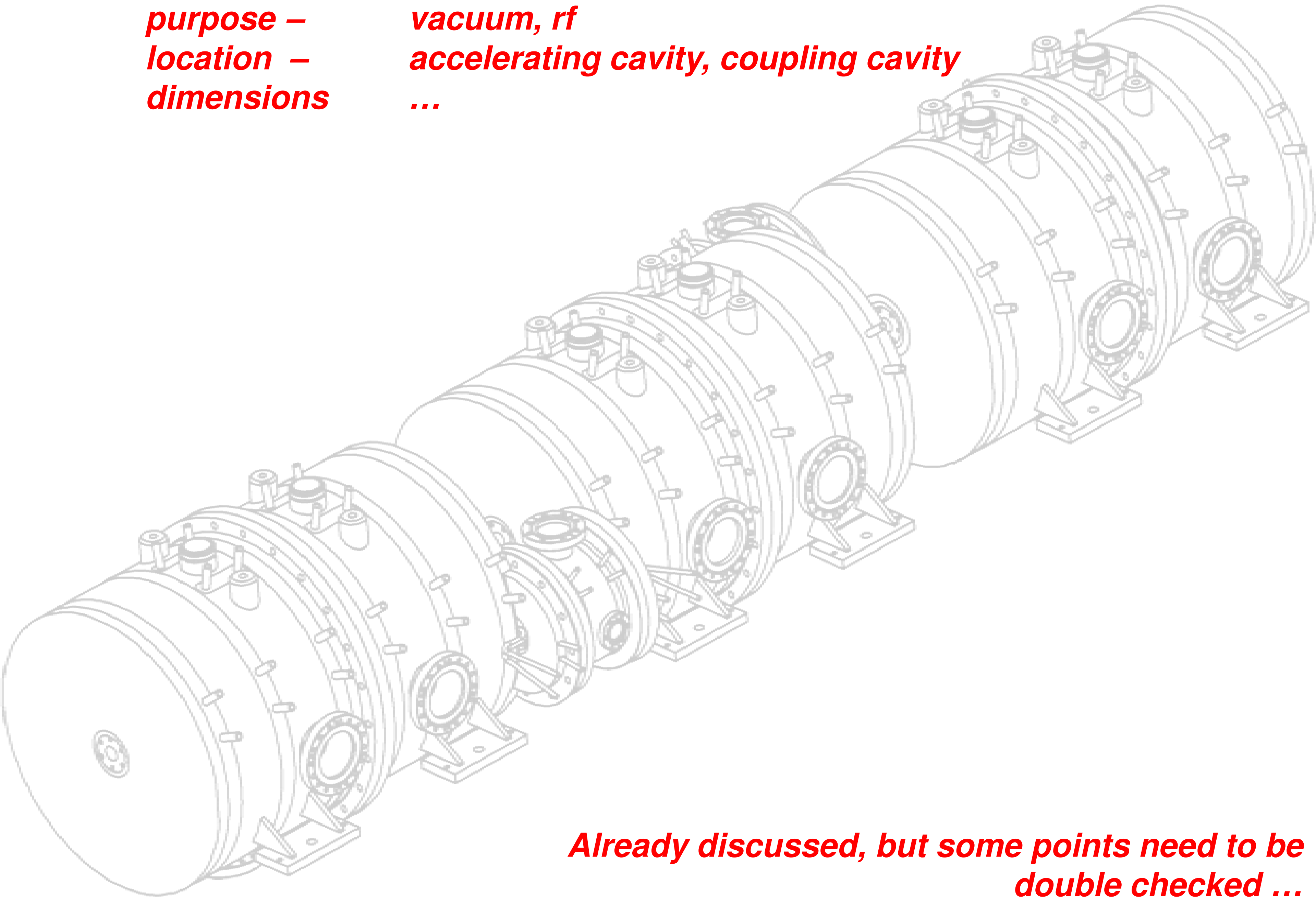
Ports:

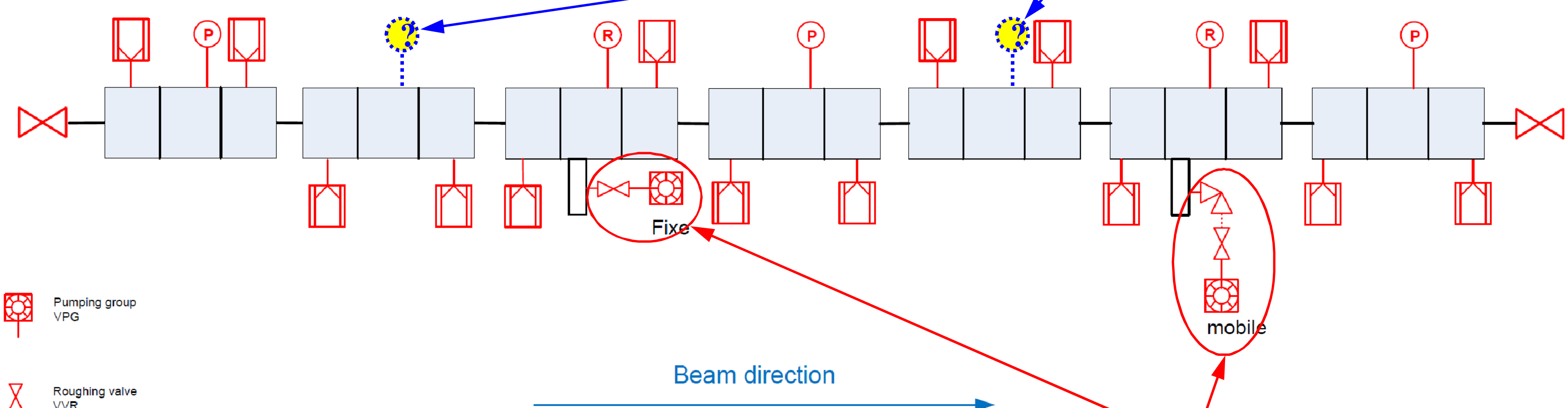
purpose –	*vacuum, rf*
location –	*accelerating cavity, coupling cavity*
dimensions	*…*

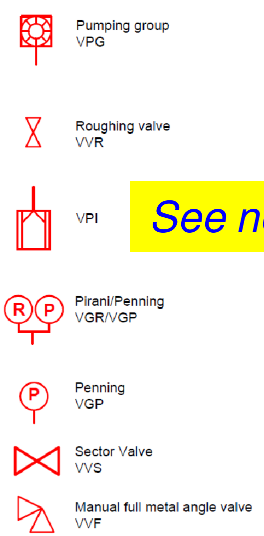


Already discussed, but some points need to be double checked …

Ports / Vacuum

- VPIs = VAC ION PLUS 300 : 2 per module (1 on Cavity #1 and 1 on Cavity #3) ***DN100CF (identical to the STDVFUHV0052)***.
- Roughing pumps (pumping groups - VPG): 1 fix VPG (stays in the tunnel) on wave guide box of module #3 and 1 mobile VPG (not in the tunnel during operation) on wave guide box of module #6.
- Gauges: 5 gauges (either Pirani (R) or Penning (P)) placed on DN40CF ***(identical to the RF pick-up flange STDVFUHV0093)*** of 4th ***half-***cavity of modules #1,3,4,6. ***and 7 ?***
- ***Should not we add similar ports (spare) on 4th half-cavity of modules #2 and 5 to make all middle tanks identical (from this point of view)***





See next slide for a VPI flange note

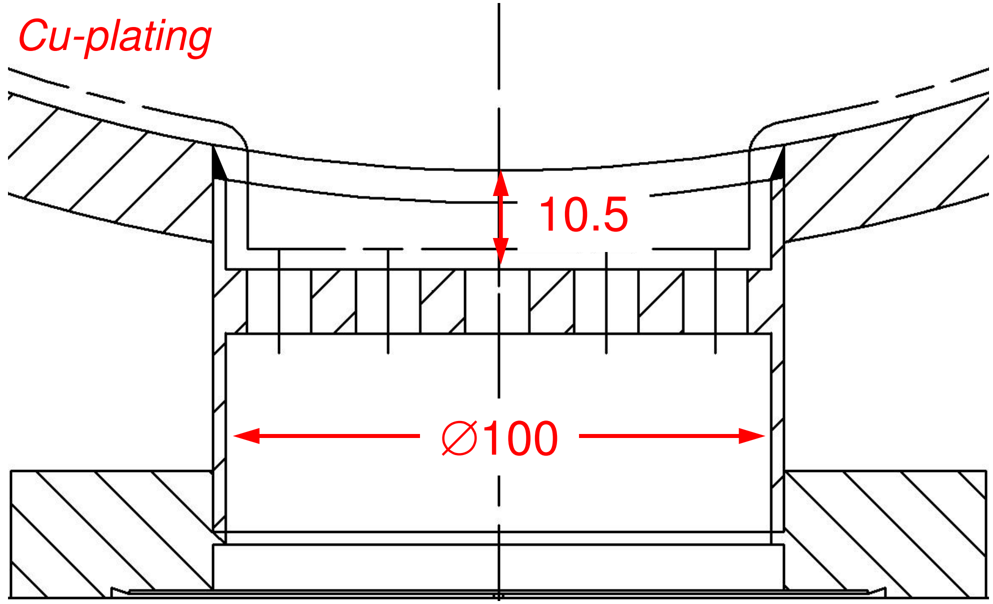
What are the dimensions of roughing pumping groups?

LINAC-4-LAYOUT-CCDTL		DESSINE :	E. PAGE	19/03/2009
		CONTROLE		
		SOURCE	TE-VSC	
REFERENCE :	TE-VSC	FICHIER :	LINAC-4-LAYOUT-CCDTL_B.vsd	
MACHINE:	LINAC4			
CERN / TE-VSC		ECHELLE : --	FORMAT : A4	INDICE : B

Ports / Vacuum

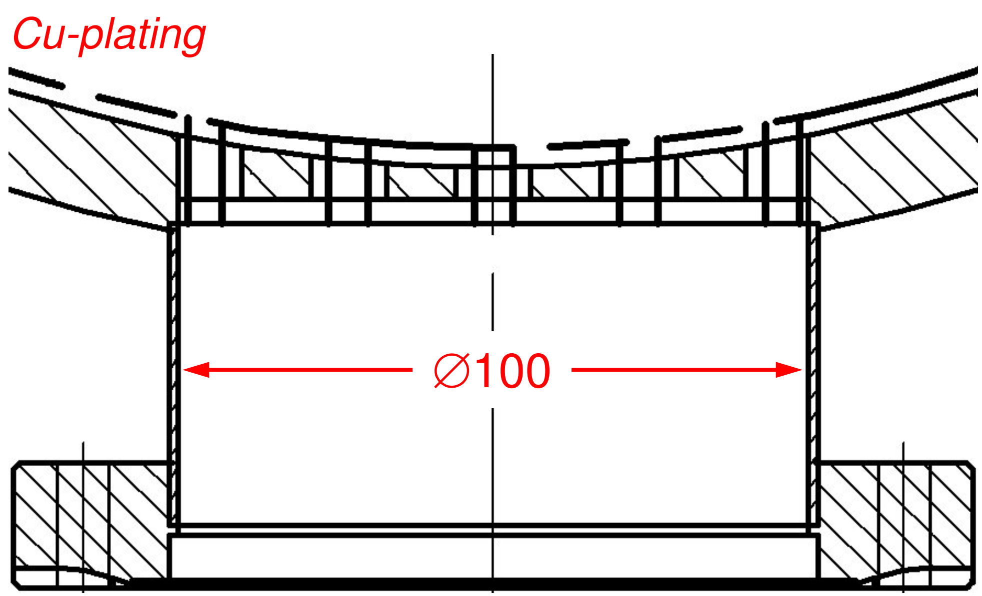
Gridded port for an ion pump

ISTC prototype



DN100CF (STDVFUHV0052)

CERN hot model

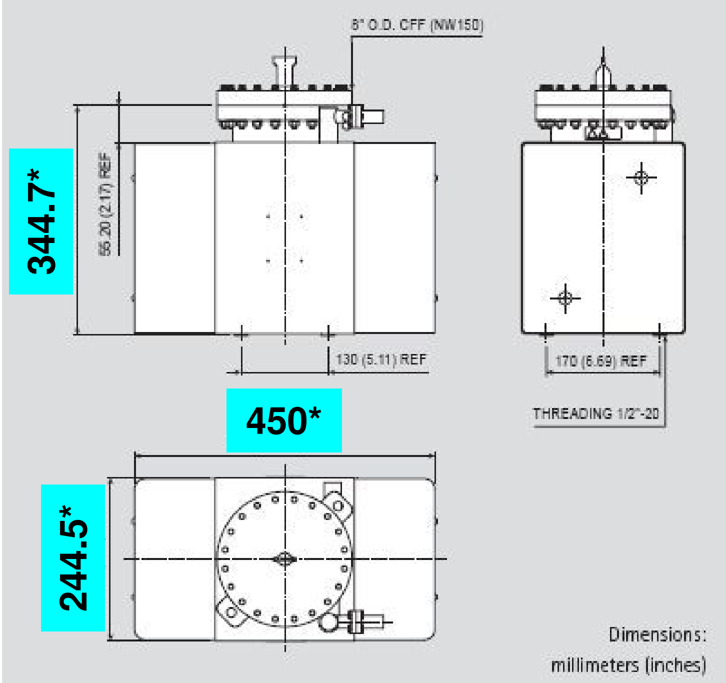


DN100CF

Ports / Vacuum

Vaclon *Plus* 300

Outline Drawing



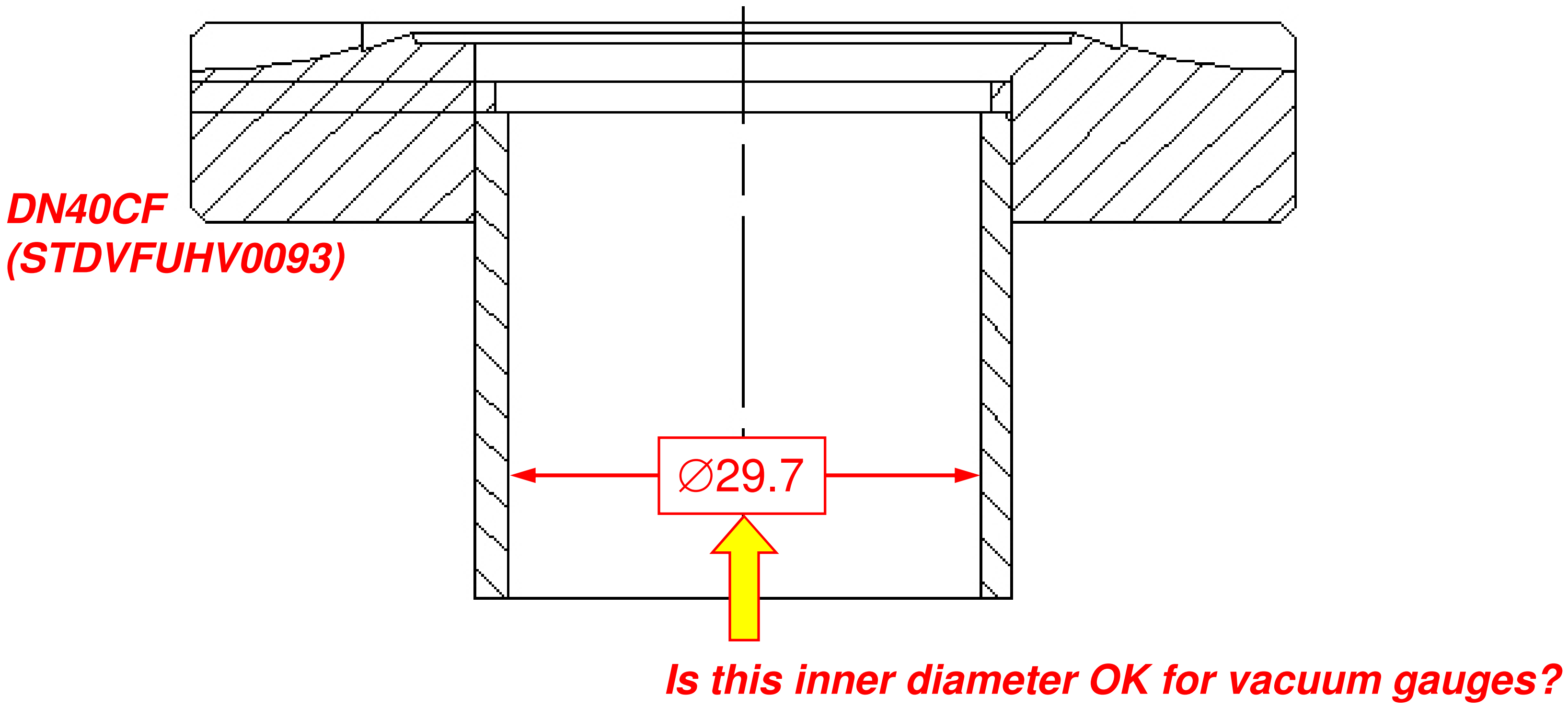
Technical Specifications

	StarCell®	Noble Diode	Diode
Nominal pumping speed for Nitrogen (*) (l/s)	240	260	300
Operating life at $1x10^{-6}$ mbar (hours)	80,000	50,000	50,000
Maximum starting pressure (mbar)	≤ $1x10^{-2}$	≤ $1x10^{-3}$	
Ultimate pressure	Below 10^{-11}		
Inlet flange	8" CFF (NW 150) AISI 304 ESR		
Maximum baking temperature (°C)	350		
Weight, kg (lbs)	69 (149)		

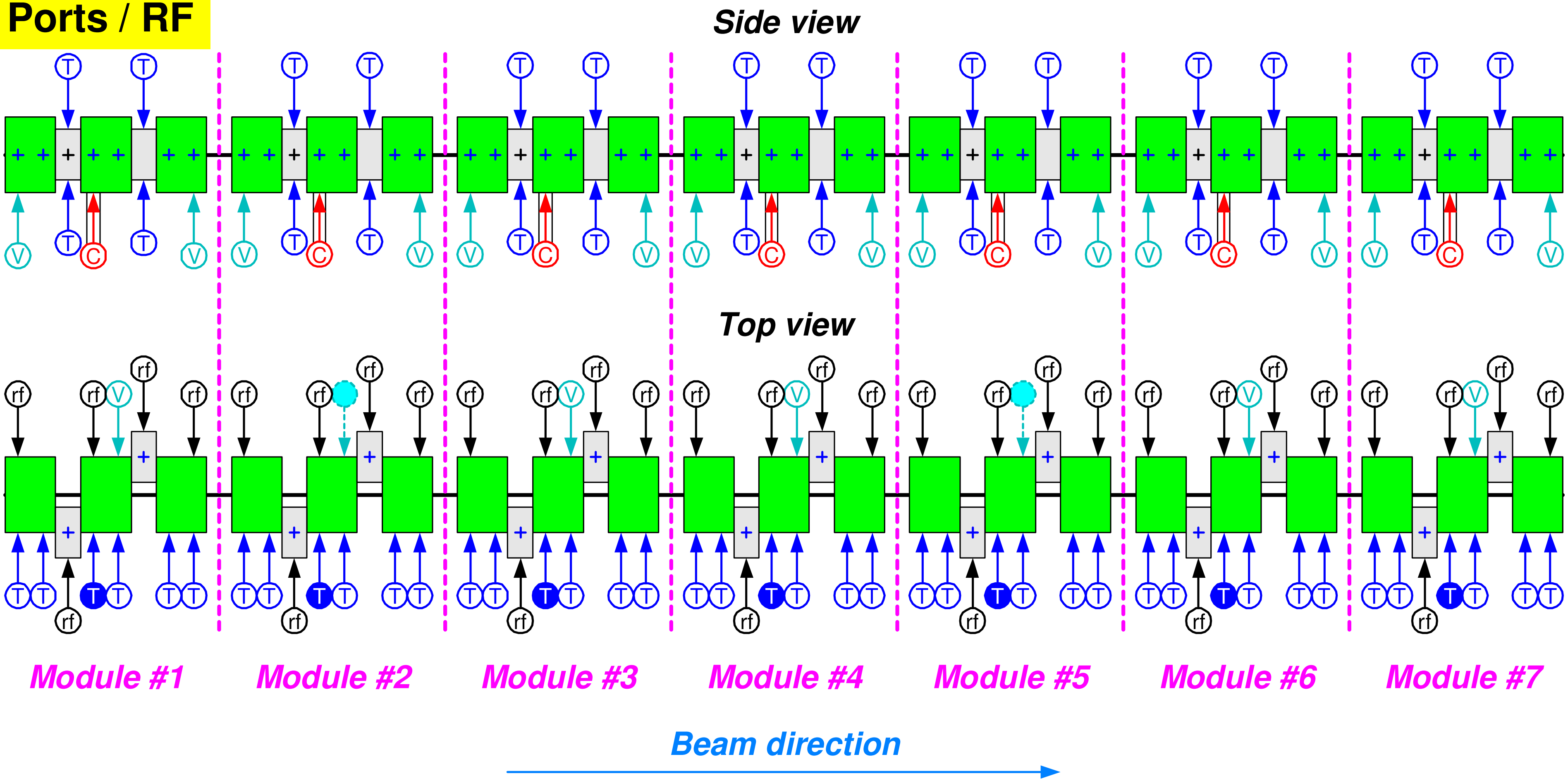
(*) Tested according to ISO/DIS 3556-1-1992

Ports / Vacuum / Vacuum gauges (= rf pick-ups)

- Gauges: 5 gauges (either Pirani (R) or Penning (P)) placed on DN40CF



Ports / RF



Tuner fixed

Tuner movable

Rf pick-up

Waveguide input coupler

Vacuum equipment

Spare ports (for the sake of uniformity) ?

Accelerating cavity (tank)

Coupling cavity (cell)

Port flanges:

Accelerating cavity tuner = DN100CF

Coupling cavity tuner = DN63CF

Rf pick-up = DN40CF

Waveguide input coupler = Helicoflex

Vacuum gauges = DN40CF

Vacuum ion pump = DN100CF

Beam pipe = Helicoflex

Ports / RF Input coupler

ISTC prototype

Very difficult access to the nuts

M6 thread, studs

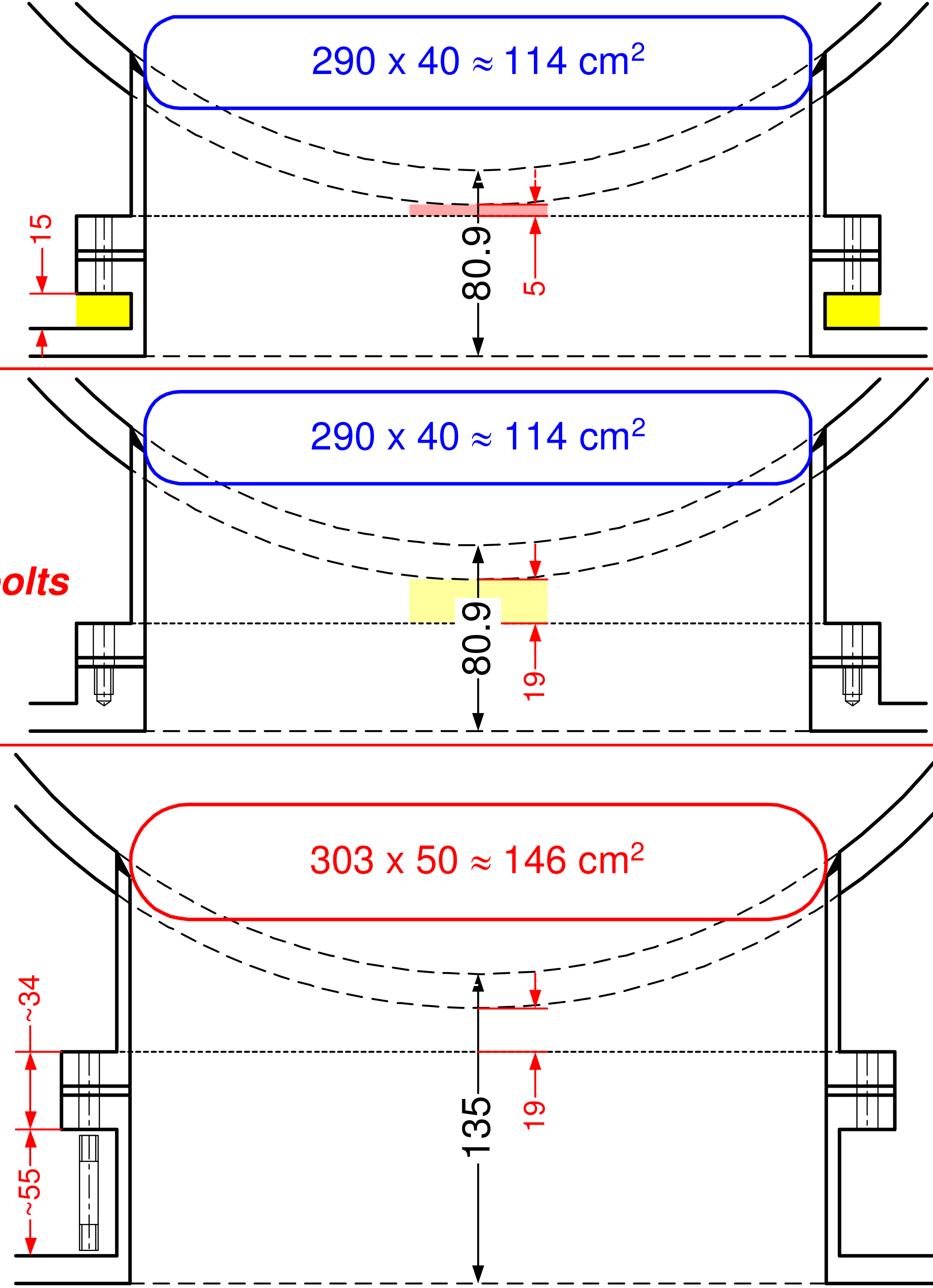
Easier access to the nuts

M8 thread, tapped holes, studs or bolts

Easy access to the nuts

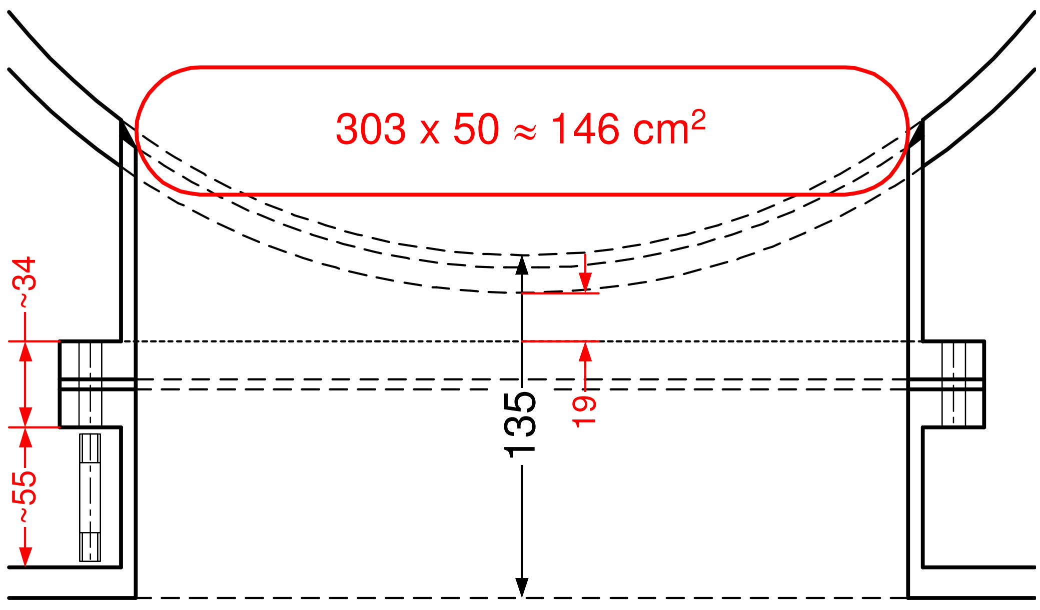
M8 thread, studs or bolts

Same HELICOFLEX dimensions as for DTL and PIMS structures



Ports / RF Input coupler

Coupling



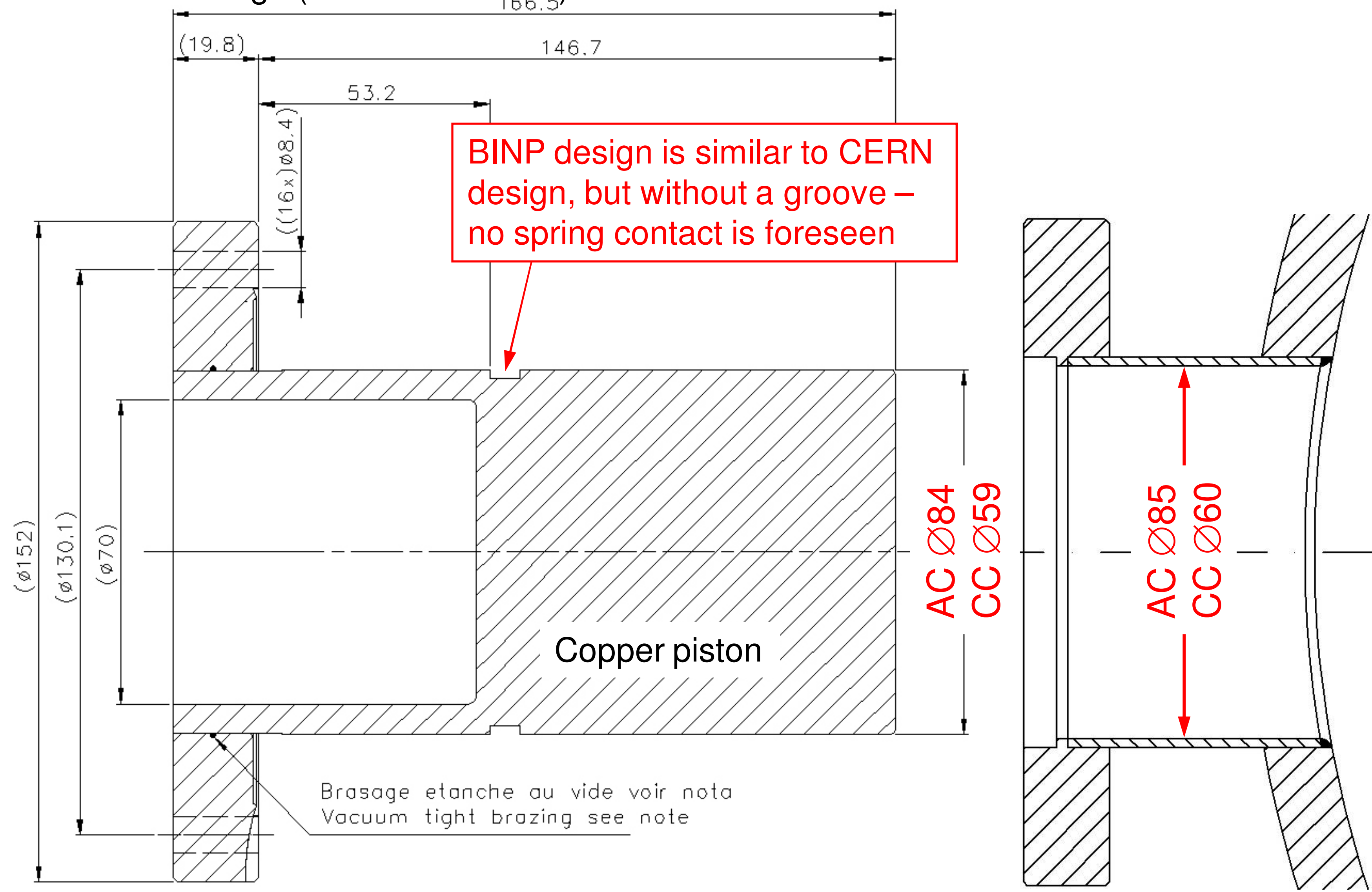
Easy access to the nuts

M8 thread, studs or bolts

Same HELICOFLEX dimensions as for DTL and PIMS structures

Ports / Tuner

Fixed tuner – CERN design (SPLACTUF0012)



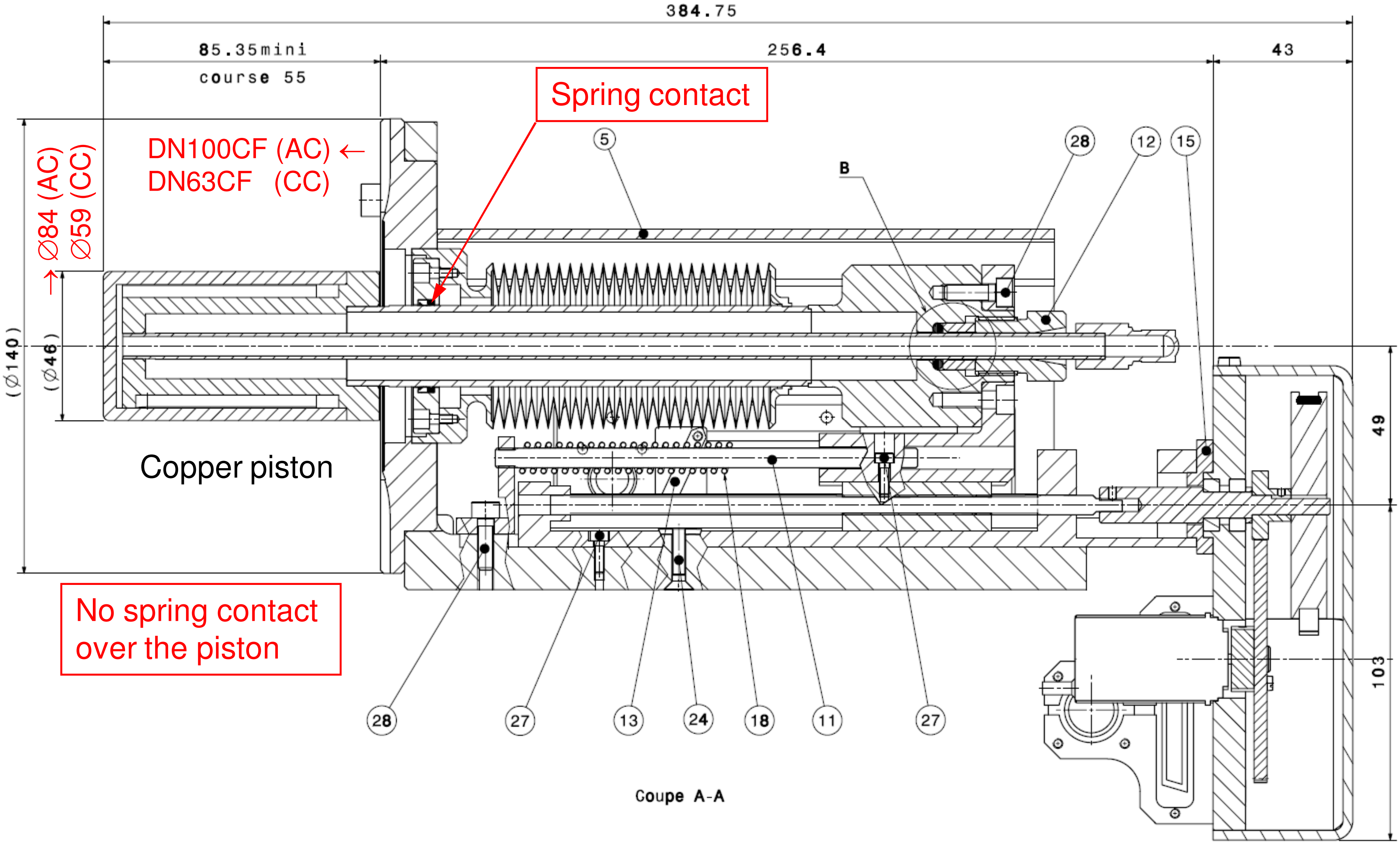
Accelerating cavity – DN100CF (STDVFUHV0094)

Coupling cavity – DN63CF (STDVFUHV0028)

BINP will make fixed tuners

Ports / Tuner

Movable tuner – CERN design (SPLACTUA0001)



CERN will provide movable tuners

Ports / Tuner

How important is a spring contact ?

Measurements (ISTC prototype tank 2, 2 tuners)

$$\left.\frac{\Delta Q}{Q_0}\right|_{x_1+x_2=80\,\mathrm{mm}} = 3.8\%$$

Calculations (Linac4 tank 1, single tuner, without spring contact)

$$2\times\left.\frac{\Delta Q}{Q_0}\right|_{x_1=40\,\mathrm{mm}} = 3\%$$

Calculations (Linac4 tank 1, single tuner, with spring contact)

$$2\times\left.\frac{\Delta Q}{Q_0}\right|_{x_1=40\,\mathrm{mm}} = 1.5\%$$

Ports / Tuner

Why do we want so many tuners per module?

Coupling cell manufacturing precision corresponds to ±800 kHz → 2 tuners per cell are necessary

Half-tank manufacturing finite precision will be compensated by DTs re-machining.

DT manufacturing precision corresponds to ±190(160) kHz → either 1 tuner or 2 tuners per tank might be used. If 1 tuner is used, it will be inserted deeper into the cavity.

Measurements
(ISTC prototype tank 2, 2 tuners)

$$\left.\frac{\Delta Q}{Q_0}\right|_{x_1+x_2=80\,\mathrm{mm}} = 3.8\%$$

Calculations
(Linac4 tank 1, single tuner)

$$2\times\left.\frac{\Delta Q}{Q_0}\right|_{x_1=40\,\mathrm{mm}} = 3\%$$

Ports / Tuner

BINP will make all fixed tuners + 7.
So the modules could be tested without movable tuners.