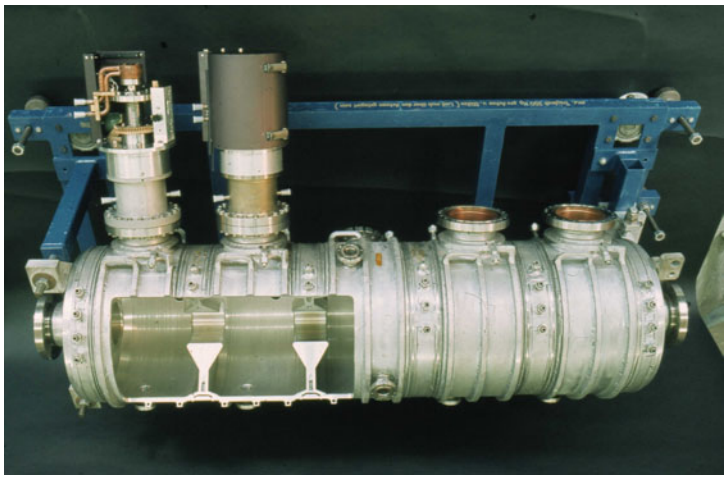
DATA SHEET
500 MHz, 5-Cell Cavity

DESY-MHFe, Vers. 2.1 October 2007

Type: PETRA
Manufacturer: **DESY / Balzers Hochvakuum GmbH**



Technical Data:

	Unit	Min.	Nom.	Max.	Remarks
π-mode frequency @ 35°C	MHz		499.67		Plungers flat
Tuning range	MHz			501	Plungers s = +40 mm
Tuning range	MHz	499			Plungers s = -20 mm
Unloaded quality factor	-	29,000		36,000	
R/(Q*l)	Ω/m		370		± 5%
Shunt impedance	MΩ		15		
Coupling factor	-			3.0	
Bandwidth	kHz			74	Coupling factor 3.0
Beam tube cut-off frequency	GHz		1.46		H_{11}
Field flatness	%	± 25			@ maximum power & cooling flow not adjusted to dissipated power
Coupling between cells	%		0.67		$k = \frac{1}{2}\frac{\omega_0^2 - \omega_\pi^2}{2\omega_\pi^2 - \omega_0^2 \cdot (1 - \cos\left(\frac{\pi}{N}\right))}$
Detuning due to temperature	kHz/°C		8,5		
Detuning due to plunger pos.	kHz/mm	10	20	40	Both plungers moved
Accelerating voltage	MV		1.34	1,94	
Accelerating gradient	MV/m		0.89	1.29	
Dissipated cavity power	kW		60	125	
Water flow rate of single cooling circuits	l/h	1600		2000	@ pressure drop 3 bar
Water flow rate (total)	m³/h		8		Cooling circuits parallel. No orifice plates. Pressure drop 1.2 bar
Pressure drop	bar			4	Cooling circuits parallel and flow rates adjusted by orifice plates
Test pressure	bar			8	15 minutes
Total length	mm		1800		(Flange to flange)
Cell length	mm		5*300		
Outside diameter	mm		445		Without water installation
Beam tube aperture	mm		120		
Weight	kg		500		Accessories and blind flanges excluded

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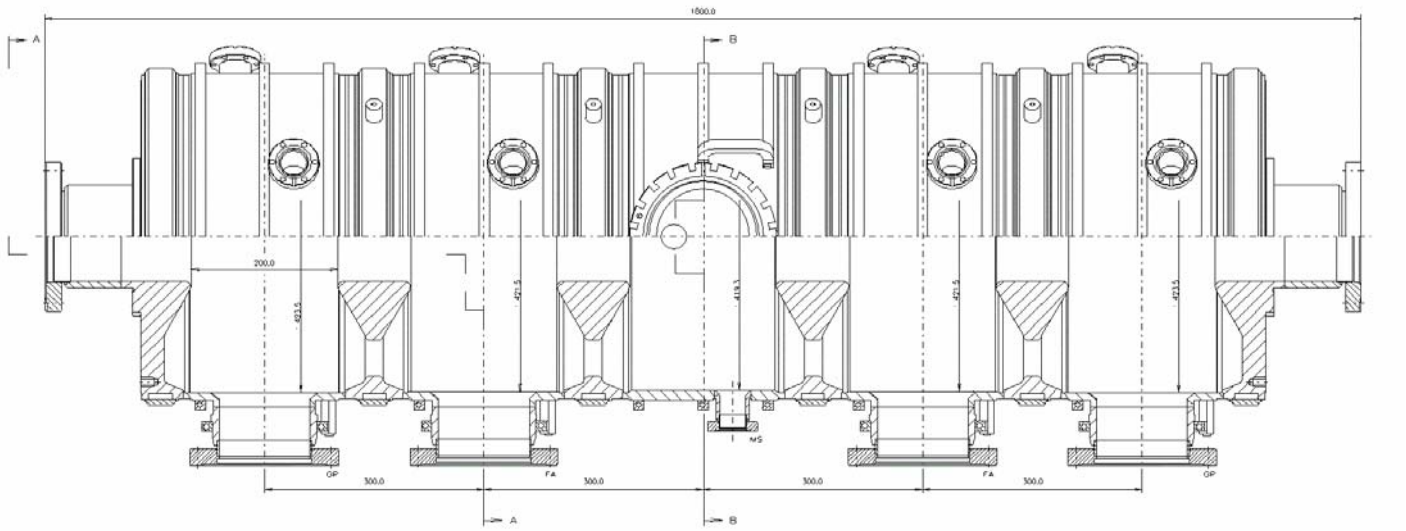
Cooling water flow for maximum field flatness

Cooling circuit	Q [l/h]
end discs 1 & 6	250
cells 1 - 5	740
discs 2 - 5	980
Sum	**8000**

Mode frequencies

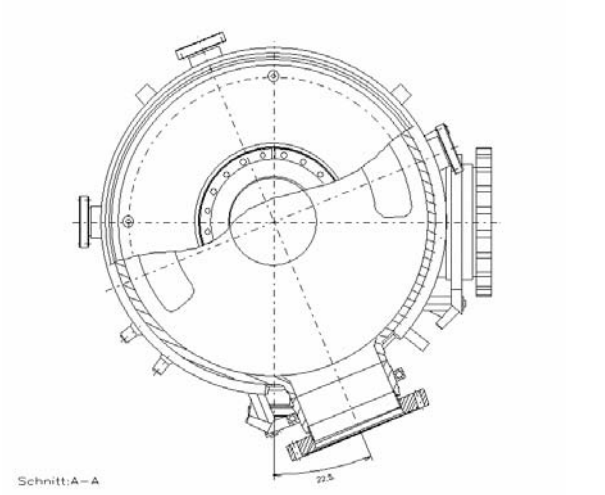
Mode	Frequency [MHz]
π	499,0
$3/4\ \pi$	500,3
$\pi/2$	501,9
$\pi/4$	503,4
0	504,8

Disc #: 1 2 3 4 5 6
Cell #: 1 2 3 4 5

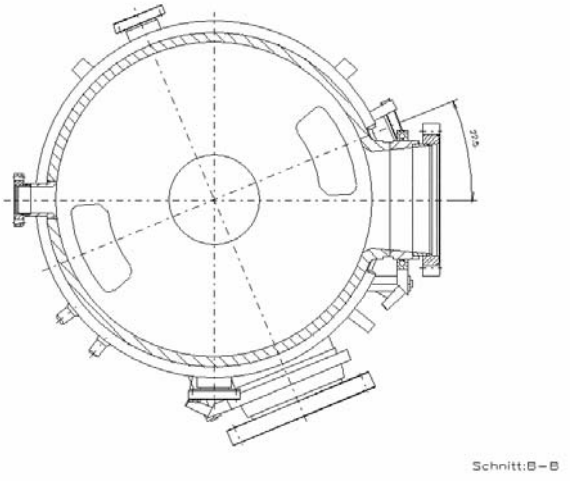


Flange neck diameters:	2x DN35, 1x DN125	2x DN35, 1x DN125	2x DN35, 1x DN144	2x DN35, 1x DN125	2x DN35, 1x DN125
Flange types:	2x DN35 CF 1x DN150 CA	2x DN35 CF 1x DN150 CA	2x DN35 CF 1x DN150 SF	2x DN35 CF 1x DN150 CA	2x DN35 CF 1x DN150 CA

Sectional drawing A-A
Disk 1 to Cell 2 (Plunger cell)



Sectional drawing B-B
Cell 3 (Input coupler cell)



Beam tube flanges:
Flange neck diameters: DN120

Flange types: DN150 SF