

Functional specifications for PXIE MEBT

Version of October 20, 2011

Parameter	Unit	Value	Tolerance	Comment
Ion type		H-		
Output energy	MeV	2.1	1%	Same as input energy
Max frequency of bunches	MHz	162.5		
Operational input beam current	mA	1 - 10		
Nominal input beam current	mA	5		
Average output current	mA	1	≤ 1	
Particles per bunch	E8	1.8	0.4 – 4	30 pC/bunch, nominal
Bunch selection: Pass-through or remove ^{&}		Bunch by bunch		Programmable cyclical buffer 16,250,000 bunches or less. Buffer should be reloaded on the fly in 0.5 ms or less.
Residual charge of removed bunches *	Relative	$< 10^{-4}$		Relative to pass-through bunches
Beam loss of pass-through bunches *	Relative	$< 5\%$		
Nominal transverse emittance* [#] (n, rms)	mm-mrad	0.27	0.1- 0.27	$\leq 10\%$ increase comparing with the input
Nominal longitudinal emittance* [#] (rms)	keV·nsec	0.8	≤ 1	$\leq 10\%$ increase comparing with the input
Beam displacement	mm	0	< 0.5	At the flange of HW cryomodule
Beam angle	mrad	0	< 0.5	
Scraping to transverse emittance [#] (n, rms)	mm-mrad	< 0.05		Pulse mode, 10 W average beam power

* - defined at the nominal parameters

- does not include a factor of π

& - if necessary, following limitation can be applied:

- maximum length of a gap in the bunch train provided by MEBT chopper is 100 ns. If a longer gap is needed, it is made with the LEPT chopper.

Orientation of coordinates

X	Horizontal, left from the direction of the beam propagation
Y	Up
Z	In direction of the beam propagation