CDC Design Parameters

GlueX-doc-xxx

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Abstract

A brief abstract of the note that will be placed on the search sites to allow searching the document

1 List of Design Parameters

Table 1: Geometry

Active volume inner radius:	15.2 cm
Active volume outer radius:	58.9 cm
Chamber assembly outer radius:	60.5 cm
Axial layers (1-4):	15.2 to 22.2 cm
Stereo layers (5-8):	22.2 to 31.2 cm
Axial layers (9,13):	32.1 to 40.0 cm
Stereo layers (14-17):	40.6 to 48.3 cm
Axial layers (18,23):	48.3 to 58.9 cm
Thickness per layer (g/cm2):	0.977
Thickness per layer (rad. lengths):	0.018
Thickness per 23 layers (rad. lengths):	0.414
Number of sense wires (20 micron gold-plated W):	3350

Table 2: Material

Gas (at 1 at.):	$Ar/CO_2/CH_4$ 80/10/10 (possibly)
Number of cables : (34-conductor shielded ribbon cables)	3350/16
Positioning accuracy of sense wires (x,y):	10 μm
Positioning accuracy of package (z):	0.5 mm
Thickness of inner shell (g/cm2):	0.162
Thickness of inner shell (rad. lengths):	0.0067
Thickness of outer shell (g/cm2):	0.6 cm of fiberglass
Thickness of outer shell (rad. lengths):	

Table 3: Location active area

Upstream gas plenum:	$-3\,cm$
Upstream active volume:	$17\,cm$
Downstream active volume:	$192\,cm$
Downstream gas plenum:	$202\,cm$

Table 4: dE/dX capability

Sense wires:	YES
Momentum Range:	$p \leq 450 MeV/c$

Table 5: Operation:

Nominal operating voltage (sense):	$+1900\,V$
Nominal gas gain:	5×10^4
Gas flow:	$5/day$

Table 6: Preamplifier and Readout

Nominal gain:	
Noise level:	
Rise time:	
Tail compensation:	YES
Cable length to post-amp:	$30\,m$
Discriminator output:	NO
Sense wires:	$100\,MHz$ FADCs

Table 7: Calibration and Resolution

Sense wires (selected charge):	electronic pulser
Perpendicular to wire (σ):	$150\,\mu m$
z-position from stereo (σ): $2\,mm$	
z-position from charge division:	$8\,cm$