



Crab Cavities - current status

Marco Spitoni

HL-LHC / Work Package 9 / Heat Load Working Group

CERN, 05/May/2020

Process Flow Diagram

EDMS 2013776 v.3.1

Thermal shield (60-80 K)

Instrumentation plate
Cold to Warm Transitions thermalization

Beam screen (4.5-20 K)

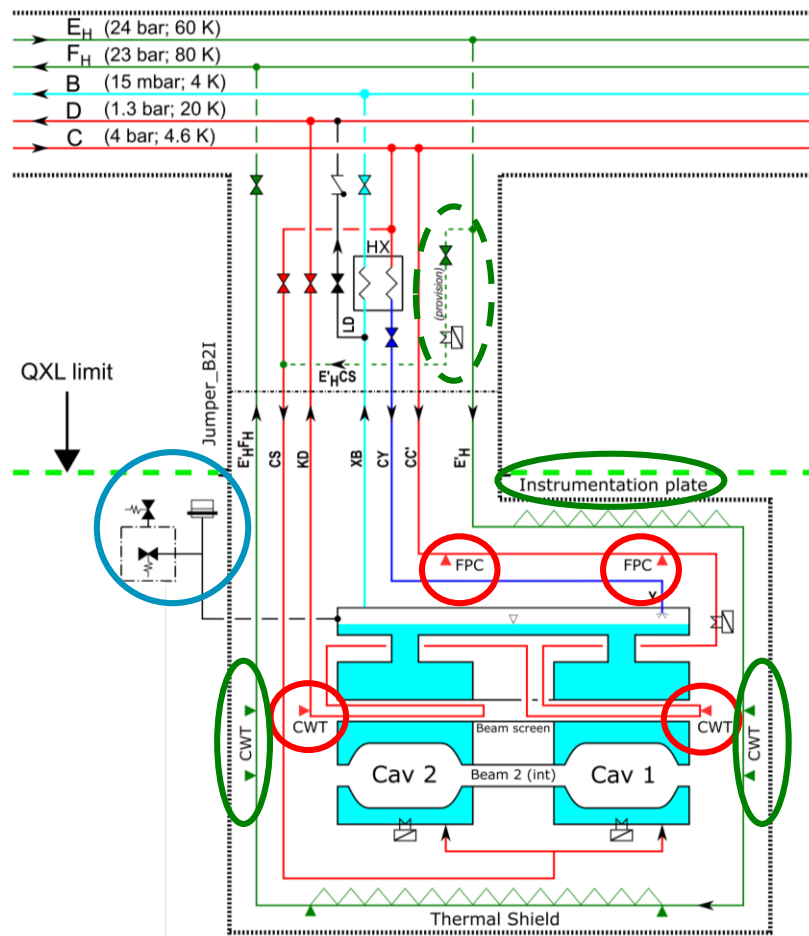
Fundamental Power Coupler thermalisation
Cold to Warm Transition thermalization
Dedicated circuit for each cavity

Warm-up line (60 K)

1 g/s for warm-up to 60 K in 1-2 h
First proposal for valve size $\rightarrow K_v = 0.05$

Protection system

CV to header D \rightarrow recommended $K_v = 1.5$
SV to air \rightarrow recommended ID 10 mm
BD to air \rightarrow 100 mm for ~ 1 kg/s

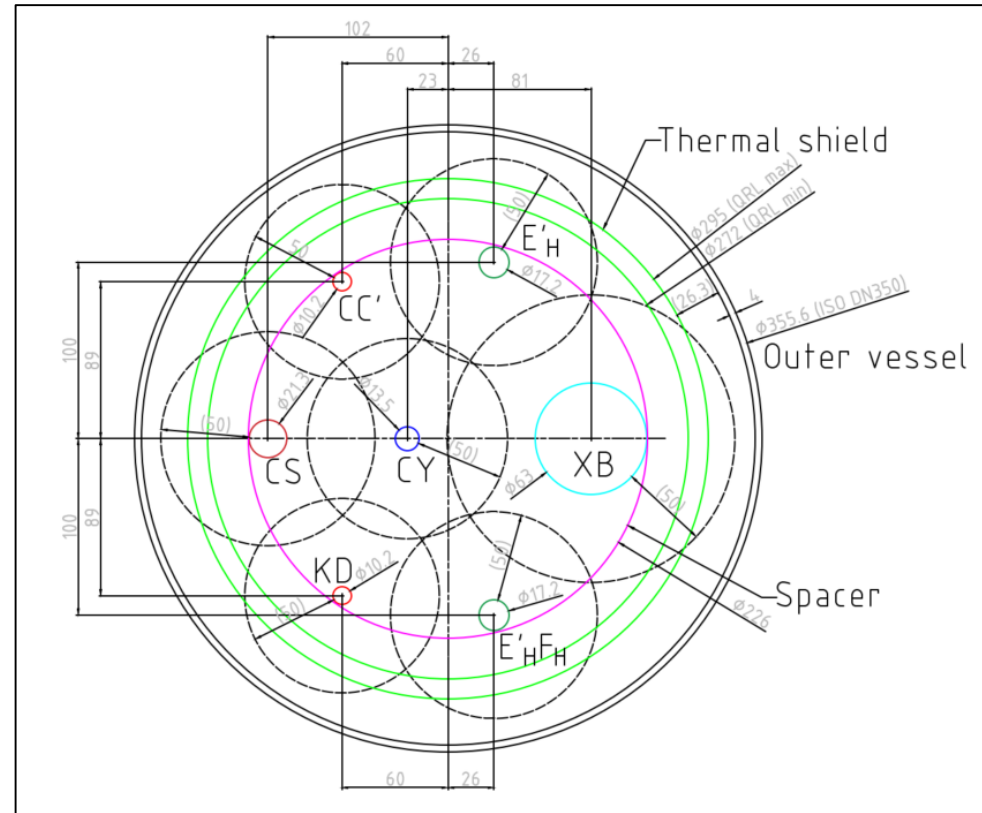


He II bath at 2 K ; 30 mbar

Jumper cross-section

Latest cross-section and pipes ID

Pipe name	Chosen ID (OD) [mm]	Remarks
E _H E' _H	14 (17.2)	T.S. circuit
E' _H F _H	14 (17.2)	T.S. circuit
CC'	8.2 (10.2)	B.S. circuit
KD	8.2 (10.2)	B.S. circuit
CS	18.1 (21.3)	Cool down/warm-up
CY	10.3 (13.5)	Driven by HEX size
XB	60 (63)	Pumping line



Hydraulic calculations showed no issues with proposed diameters