



## MAGNET INSTRUMENTATION

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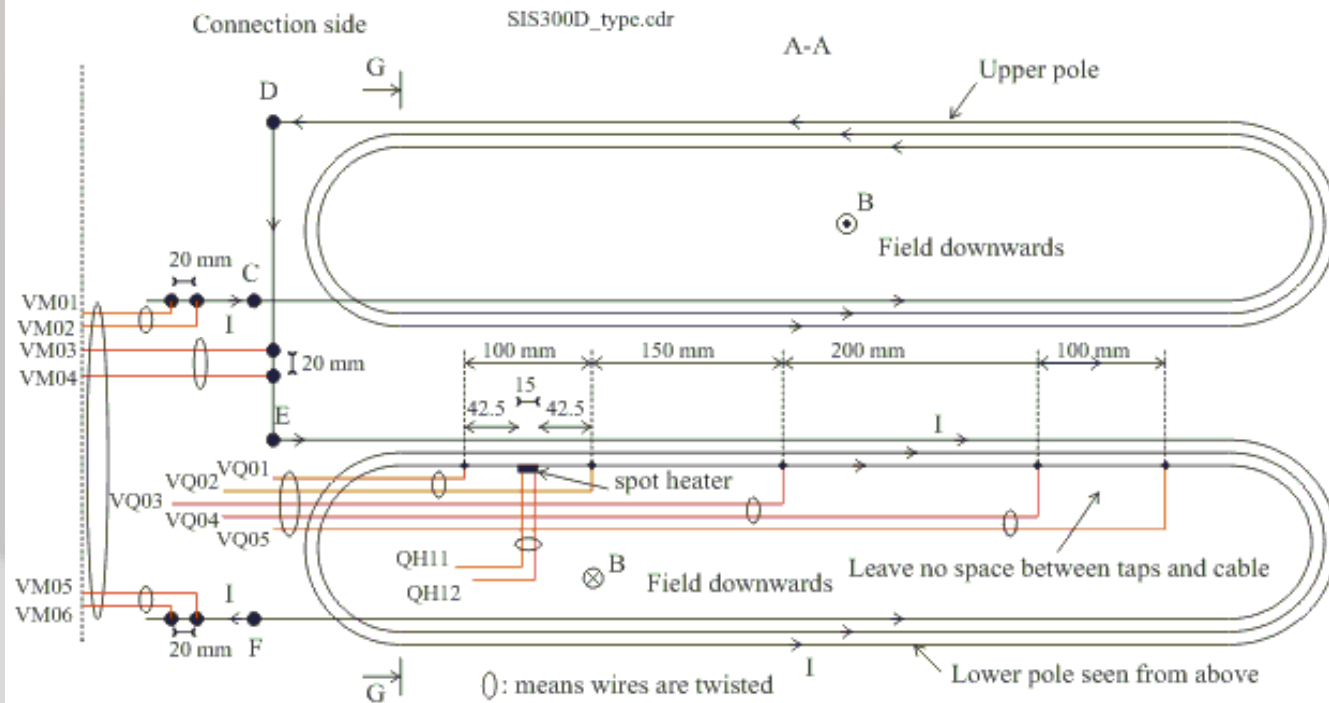
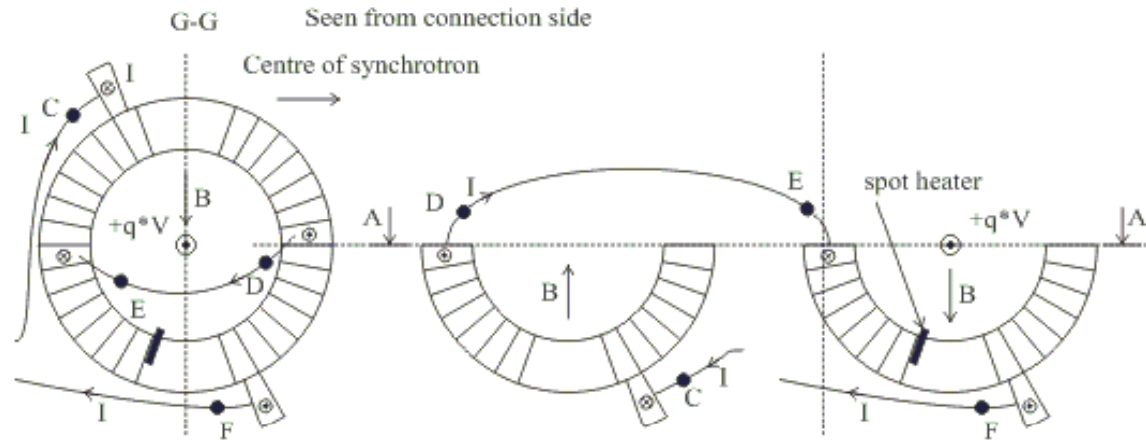
Voltage taps

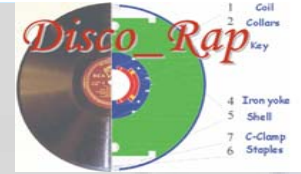
Quench heaters

Thermometers

Capacitive stress sensors

Strain gages

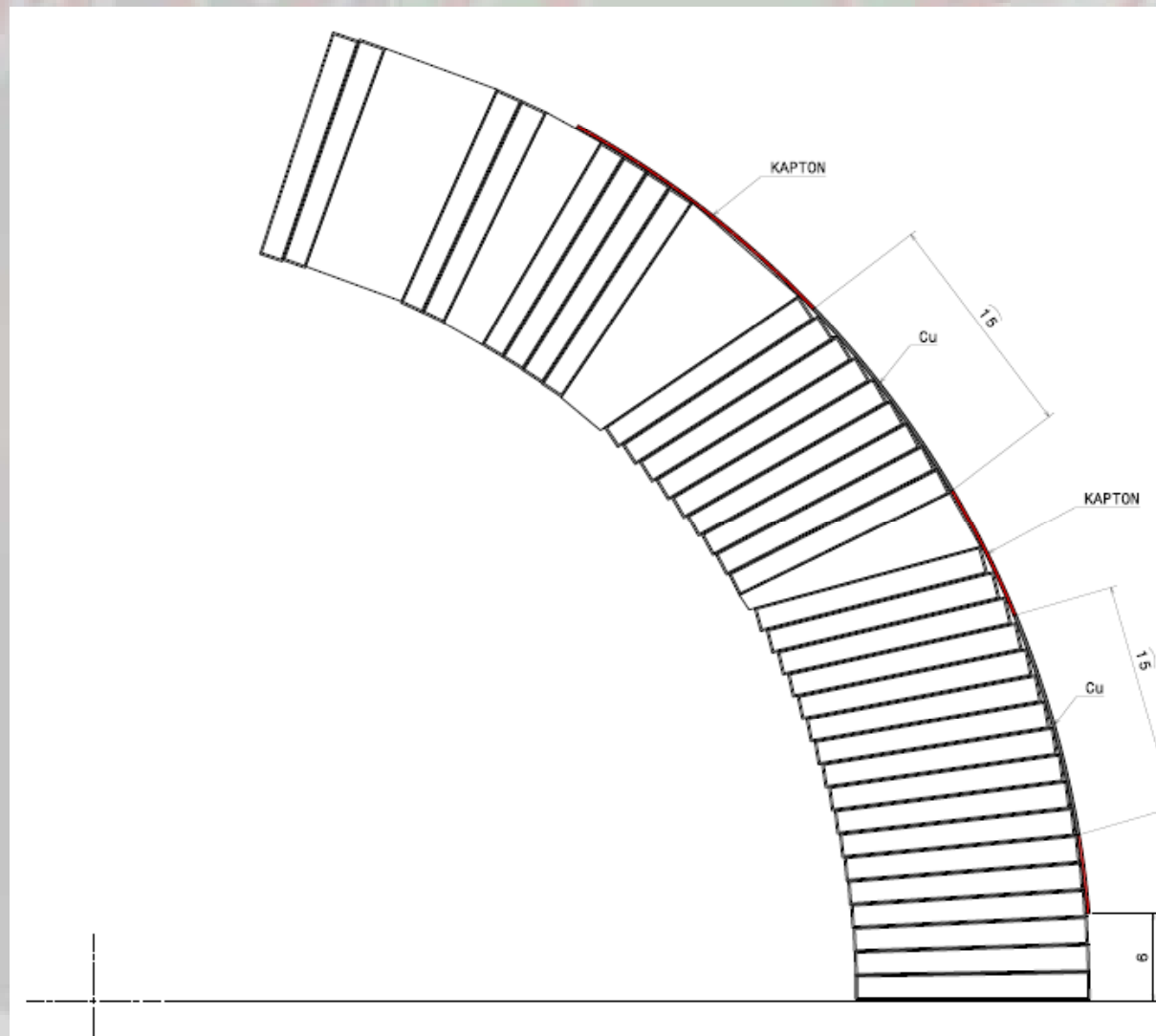


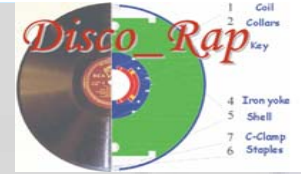


We have not yet tested the application through soft soldering of the voltage taps (thin Cu sheaths) on the first turn could be checked on one of the existing model poles



## Use of LHC quench heater



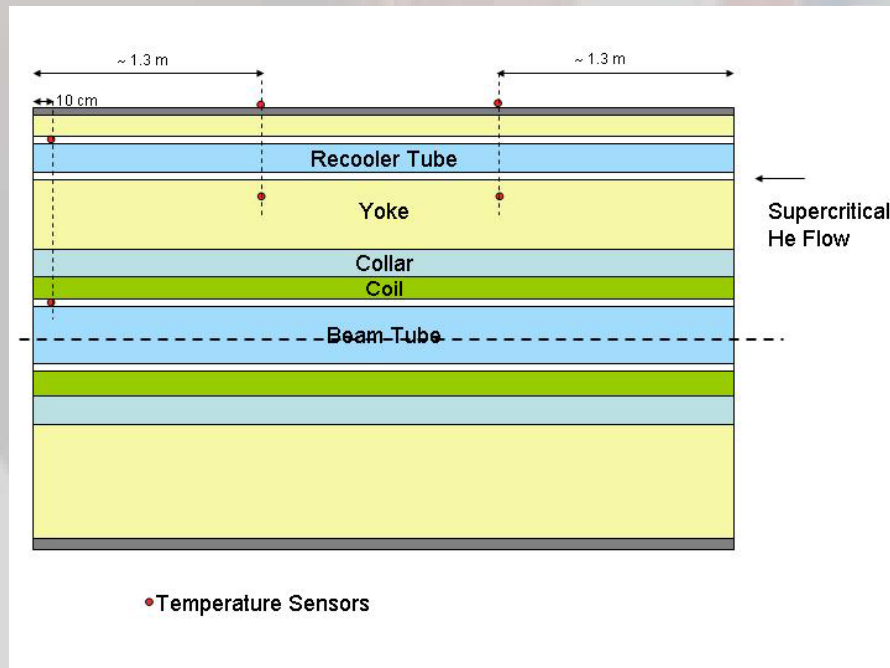


## Thermometers: GSI proposal is OK

3. Temperature Sensors: two temperature sensors in the iron yoke, at 1/3 and 2/3 of the length and two temperature sensors at same longitudinal positions on the outer shell of the cold mass should be installed (The outside sensors could be installed on the series magnets to check the temperature of the string. The temperature sensors inside the cold mass are to establish a correlation with the outside sensor)

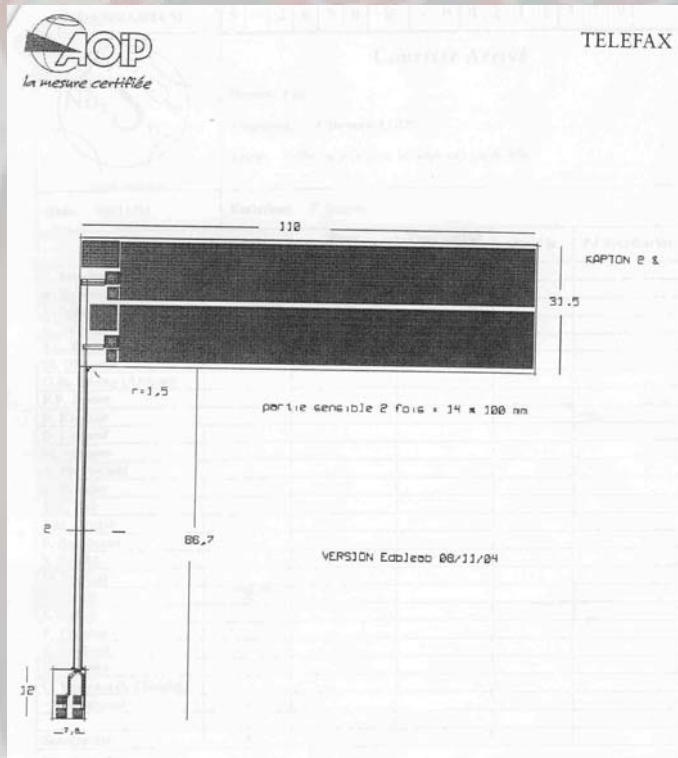
Also temperature sensors in the circular channel and the recooling channel at the supercritical He outlet (at about 10 cm from the end of cold mass) should be installed.

Idea for these last two sensors: Fix wires at the end plates that are put into the He channels and have the sensors on its tip. In Fig.1 a sketch of the position of these sensors is shown.



10  
calibrated  
CERNOX  
acquired

## Capacitive sensors and Bullet gauges



8 Capacitive sensors for azimuthal force +

Conditioning electronics  
+ wires (20k€)

8 Bullet gauges (each equipped with 2 strain gauges) for axial prestress.

30 strain gauges acquired