

Sensors in the S1-G Cryomodules (Updated 20090601)

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List of temperature sensors (Module-C)

28	#3 Cavity (FNAL-Cavity)	TKC300	Helium Vessel	T (Carbon Resistor)	1.4K~100K
29		TKC301	HOM coupler in the input coupler side-top	T (Carbon Resistor)	1.4K~100K
30		TKC302	HOM coupler in the input coupler side-bottom	T (Carbon Resistor)	1.4K~100K
31		TKC303	HOM coupler in the non-input coupler side-top	T (Carbon Resistor)	1.4K~100K
32		TKC304	HOM coupler in the non-input coupler side-bottom	T (Carbon Resistor)	1.4K~100K
33		TKC305	Piezo	T (Carbon Resistor)	1.4K~100K
34		TCC310	Connection area of input coupler with beam pipe	T (Cernox)	1.4K~100K
35		TCC311	5K thermal intercept of input coupler (beam pipe side)	T (Cernox)	1.4K~100K
36		TCC312	5K thermal intercept of input coupler (body)	T (Cernox)	1.4K~100K
37		TCC313	5K thermal intercept of input coupler (warm coupler side)	T (Cernox)	1.4K~100K
38		TCC314	5K thermal intercept of input coupler (cooling pipe side)	T (Cernox)	1.4K~100K
39		TPC320	Helium Vessel	T (PtCo)	2K~310K
40		TTC330	80K thermal intercept of input coupler (beam pipe side)	T (Cu-Constantan)	70K~310K
41		TTC331	80K thermal intercept of input coupler (body)	T (Cu-Constantan)	70K~310K
42		TTC332	80K thermal intercept of input coupler (vacuum vessel side)	T (Cu-Constantan)	70K~310K
43		TTC333	80K thermal intercept brade of input coupler (coupler side)	T (Cu-Constantan)	70K~310K
44		TTC334	80K thermal intercept brade of input coupler (cooling pipe side)	T (Cu-Constantan)	70K~310K
45	TTC335	Input coupler (room temperature and in the vacuum vessel)	T (Cu-Constantan)	70K~310K	
46	#4 Cavity (FNAL-Cavity)	TKC400	Helium Vessel	T (Carbon Resistor)	1.4K~100K
47		TKC401	HOM coupler in the input coupler side-top	T (Carbon Resistor)	1.4K~100K
48		TKC402	HOM coupler in the input coupler side-bottom	T (Carbon Resistor)	1.4K~100K
49		TKC403	HOM coupler in the non-input coupler side-top	T (Carbon Resistor)	1.4K~100K
50		TKC404	HOM coupler in the non-input coupler side-bottom	T (Carbon Resistor)	1.4K~100K
51		TKC405	Piezo	T (Carbon Resistor)	1.4K~100K
52		TCC410	Connection area of input coupler with beam pipe	T (Cernox)	1.4K~100K
53		TCC411	5K thermal anchor of input coupler	T (Cernox)	1.4K~100K
54		TPC420	Helium Vessel	T (PtCo)	2K~310K
46		TTC430	80K thermal intercept of input coupler (body)	T (Cu-Constantan)	70K~310K

Cernox: one cavity
(1.4K~ 100K)

Input coupler : 5 or 2

Carbon: one cavity
(1.4K~ 100K)

Helium Vessel : 1
HOM coupler : 4
Piezo : 1

The sensors for HOM couplers, the helium vessel and the Piezo are changed from the Cernoxs to the calibrated carbon resistors

List of temperature sensors (Module-C)

91	GRP	TPC711	Upstream-top (Module-C connection side)	T (PtCo)	2K~310K
92		TPC712	Upstream-bottom	T (PtCo)	2K~310K
93		TPC713	Center-top	T (PtCo)	2K~310K
94		TPC714	Center-bottom	T (PtCo)	2K~310K
95		TPC715	Downstream-top (end flange side)	T (PtCo)	2K~310K
96		TPC716	Downstream-bottom	T (PtCo)	2K~310K
97		TPC717	Connection area to the fixed support post	T (PtCo)	2K~310K
98		TPC718	Connection area to the movable support post	T (PtCo)	2K~310K
99		STC720	Upstream-top	S (Strain Gauge)	
100		STC721	Upstream-right side	S (Strain Gauge)	
101		STC722	Upstream-left side	S (Strain Gauge)	
102		STC723	Upstream-bottom	S (Strain Gauge)	
103		STC724	Center-top	S (Strain Gauge)	
104		STC725	Center-right side	S (Strain Gauge)	
105		STC726	Center-left side	S (Strain Gauge)	
106		STC727	Center-bottom	S (Strain Gauge)	
107		STC728	Downstream-top	S (Strain Gauge)	
108		STC729	Downstream-right side	S (Strain Gauge)	
109	STC730	Downstream-left side	S (Strain Gauge)		
110	STC731	Downstream-bottom	S (Strain Gauge)		

PtCo:
(4K~300K)

GRP : 6

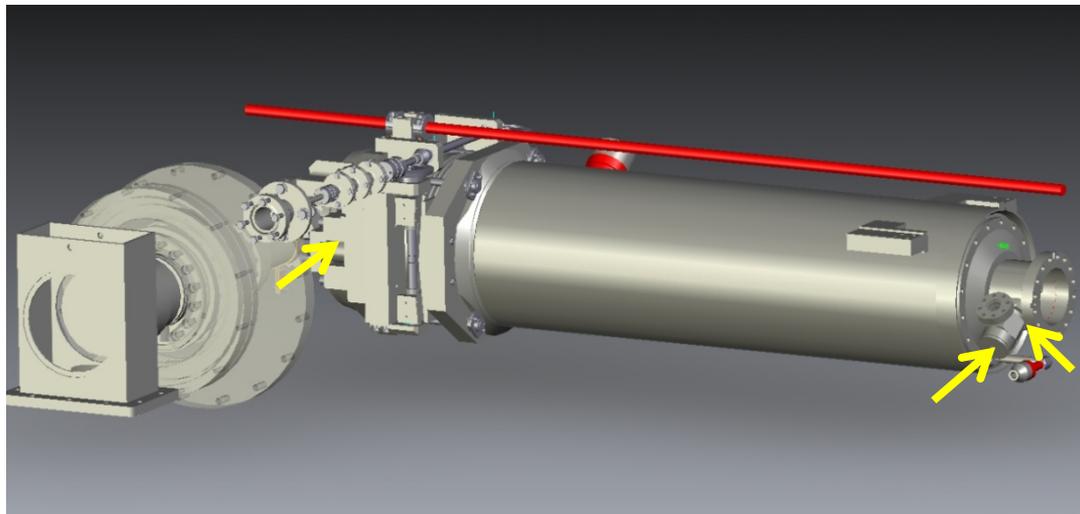
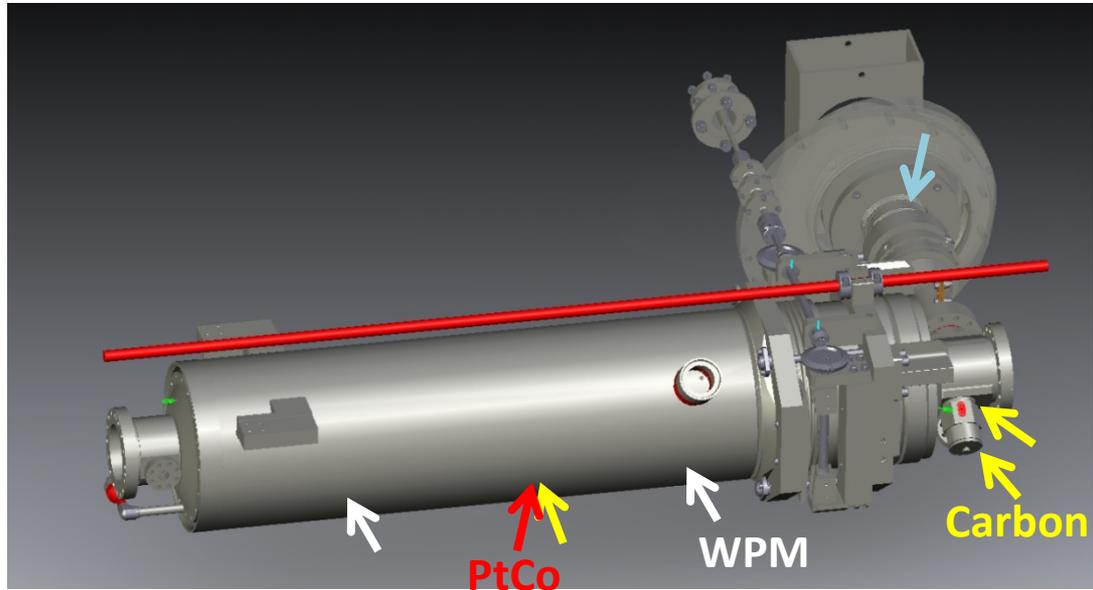
Strain Gauge:

GRP : 12

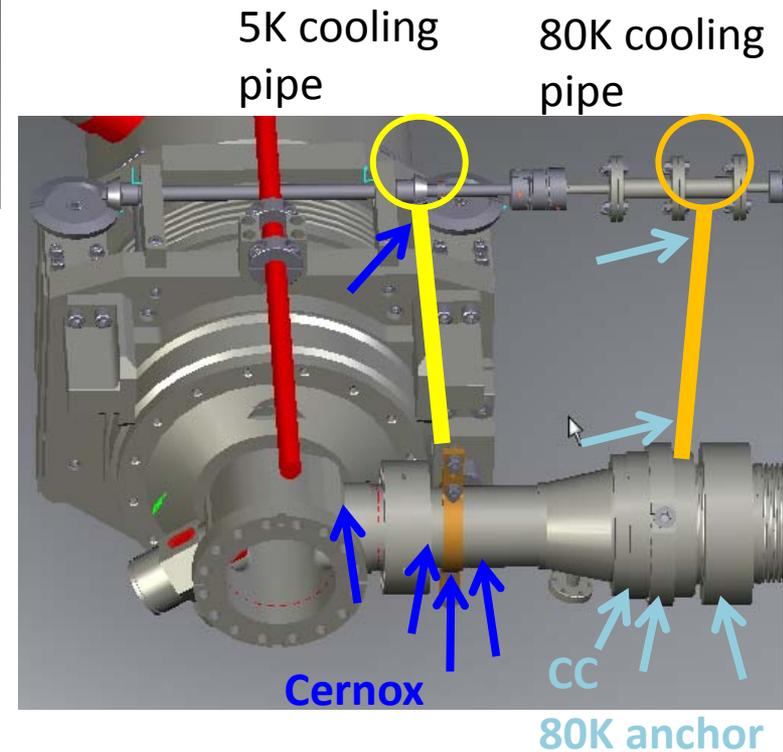
In the previous table, sensors for the GRP were the Cernox sensors and CC thermocouples. The sensors for the GRP are changed to PtCo sensors which can measure the temperature from 2K to 310K.

Strain gauges are added to the list.

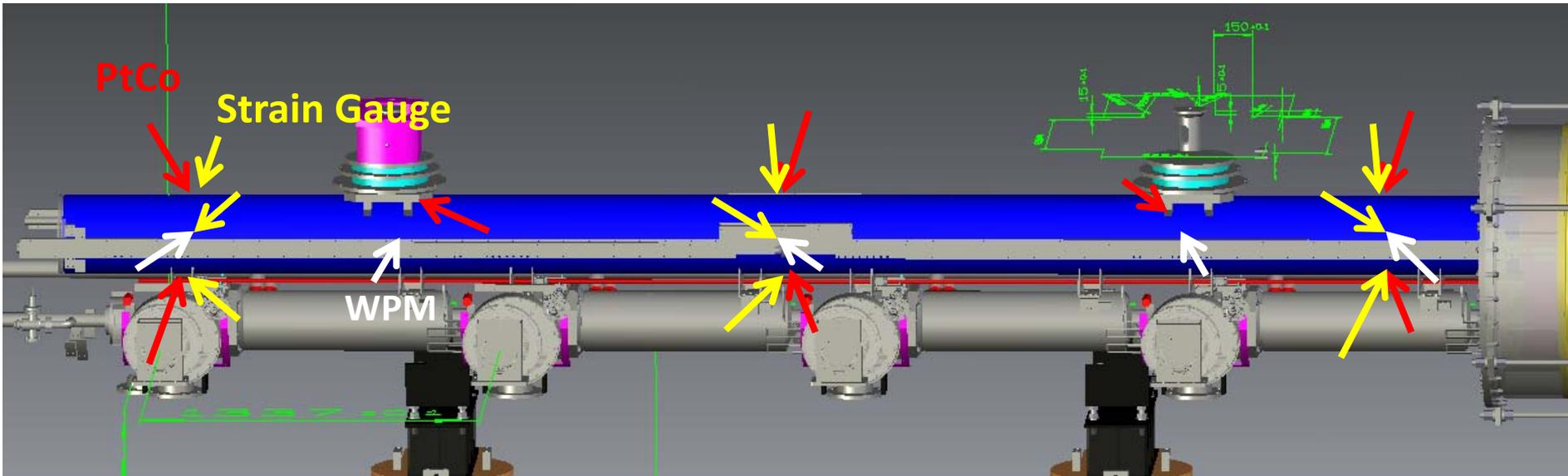
Cavity jacket and input coupler



Cernox : 5 or 2
Carbon : 6
PtCo : 1
CC : 6 or 1
WPM : 2 for KEK cavity



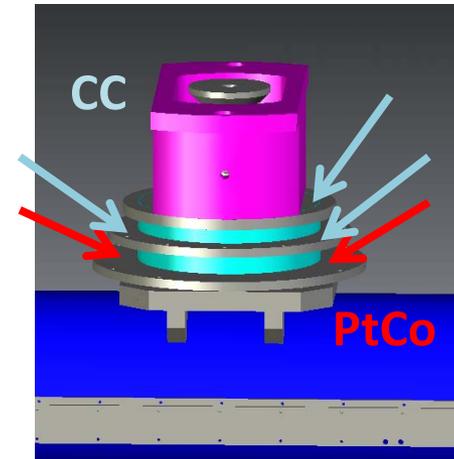
GRP



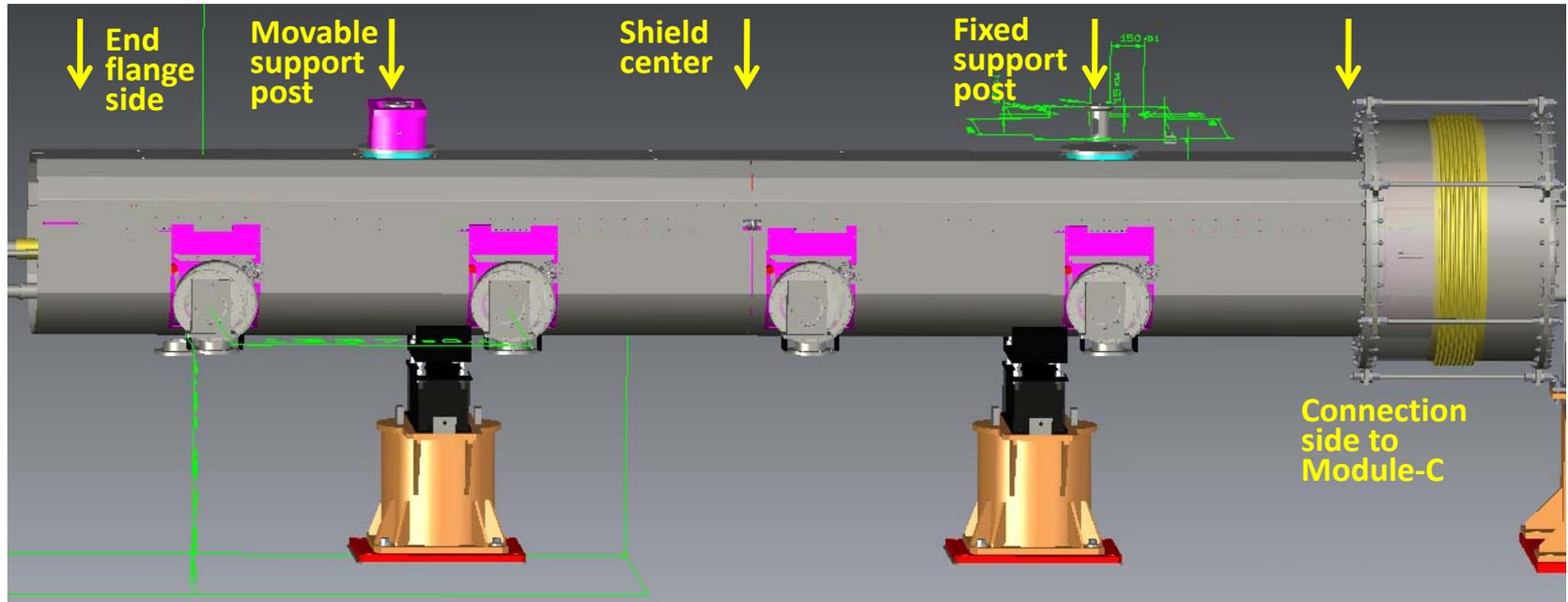
PtCo : 8
Strain gauge : 12
WPM : 5

Support Post

PtCo : 2×2
CC : 3 × 2



Thermal shields



5K shield (PtCo):18

Connection side to Module-C

0, 90, 180, 270 degree

Fixed support post

90, 180, 270 degree

Shield center

0, 90, 180, 270 degree

Movable support post

90, 180, 270 degree

End flange side

0, 90, 180, 270 degree

80K shield (CC):12

Connection side to Module-C

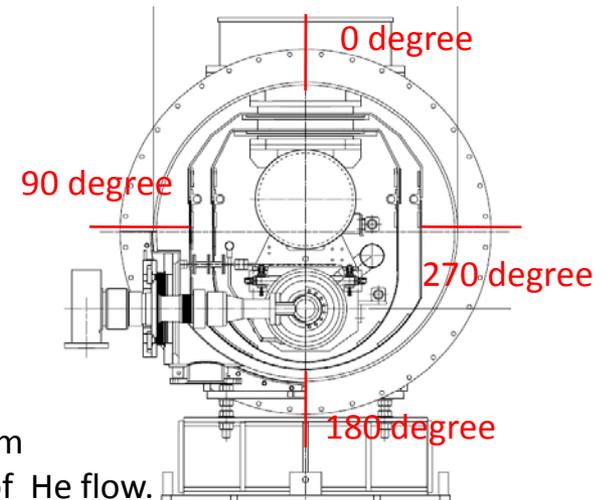
0, 90, 180, 270 degree

Shield center

0, 90, 180, 270 degree

End flange side

0, 90, 180, 270 degree



Viewed from upstream of He flow.

Sensors at Zanon

- GRP
 - PtCo: 8
 - Strain Gauge: 12
 - WPM: 5
- Support Post
 - PtCo: 4
 - CC thermocouple: 6
- Thermal Shield
 - PtCo: 3 for 5K shield
 - CC: 3 for 80K shield