

NORTH INPUT Tower:

location and coding of electrically connected Devices

CODING CONVENTION: The code is divided in 3 fields. The field separator is a dot. The 3th field is used only when more than one device of the same type is hosted on the same suspension stage.

DeviceType . SuspensionStage . DevicePosition (or Function)

<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>M</td><td>Motor</td></tr> <tr><td>MV</td><td>Vertical Motor</td></tr> <tr><td>MH</td><td>Horizontal Motor</td></tr> <tr><td>MA</td><td>Angular Motor</td></tr> <tr><td>TM</td><td>TiltMeter</td></tr> <tr><td>C</td><td>Coil</td></tr> <tr><td>CV</td><td>Vertical Coil</td></tr> <tr><td>CH</td><td>Horizontal Coil</td></tr> <tr><td>T</td><td>Temperature probe</td></tr> <tr><td>AV</td><td>Vert. Accelerometer</td></tr> <tr><td>AH</td><td>Hor. Accelerometer</td></tr> <tr><td>LV</td><td>Vertical LVDT</td></tr> <tr><td>LH</td><td>Horizontal LVDT</td></tr> </table>	M	Motor	MV	Vertical Motor	MH	Horizontal Motor	MA	Angular Motor	TM	TiltMeter	C	Coil	CV	Vertical Coil	CH	Horizontal Coil	T	Temperature probe	AV	Vert. Accelerometer	AH	Hor. Accelerometer	LV	Vertical LVDT	LH	Horizontal LVDT	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>F0</td><td>Filter #0 or top-stage</td></tr> <tr><td>F1</td><td>Filter #1</td></tr> <tr><td>F2</td><td>Filter #2</td></tr> <tr><td>F3</td><td>Filter #3</td></tr> <tr><td>F4</td><td>Filter #4</td></tr> <tr><td>F7</td><td>Filter #7</td></tr> <tr><td>MA</td><td>Marionette</td></tr> <tr><td>RM</td><td>Reference Mass</td></tr> <tr><td>TCS</td><td>TCS frame</td></tr> </table>	F0	Filter #0 or top-stage	F1	Filter #1	F2	Filter #2	F3	Filter #3	F4	Filter #4	F7	Filter #7	MA	Marionette	RM	Reference Mass	TCS	TCS frame	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>1, 2, 3, ...</td><td></td></tr> <tr><td>L</td><td>Left</td></tr> <tr><td>R</td><td>Right</td></tr> <tr><td>U</td><td>Up</td></tr> <tr><td>D</td><td>Down</td></tr> <tr><td>F</td><td>Front</td></tr> <tr><td>B</td><td>Back</td></tr> <tr><td>UL</td><td>Up Left</td></tr> <tr><td>UR</td><td>Up Right</td></tr> <tr><td>DL</td><td>Down Left</td></tr> <tr><td>DR</td><td>Down Right</td></tr> <tr><td>LL</td><td>Lateral Left</td></tr> <tr><td>LR</td><td>Lateral Righth</td></tr> <tr><td>TX</td><td>ϑ_x degree of freedom</td></tr> <tr><td>TZ</td><td>ϑ_z degree of freedom</td></tr> <tr><td>AH1</td><td>Hor. Accelerom. #1</td></tr> <tr><td>AH2</td><td>Hor. Accelerom. #2</td></tr> <tr><td>AH3</td><td>Hor. Accelerom. #3</td></tr> <tr><td>AV1</td><td>Vert. Accelerom. #1</td></tr> <tr><td>AV2</td><td>Vert. Accelerom. #2</td></tr> </table>	1, 2, 3, ...		L	Left	R	Right	U	Up	D	Down	F	Front	B	Back	UL	Up Left	UR	Up Right	DL	Down Left	DR	Down Right	LL	Lateral Left	LR	Lateral Righth	TX	ϑ_x degree of freedom	TZ	ϑ_z degree of freedom	AH1	Hor. Accelerom. #1	AH2	Hor. Accelerom. #2	AH3	Hor. Accelerom. #3	AV1	Vert. Accelerom. #1	AV2	Vert. Accelerom. #2
M	Motor																																																																																					
MV	Vertical Motor																																																																																					
MH	Horizontal Motor																																																																																					
MA	Angular Motor																																																																																					
TM	TiltMeter																																																																																					
C	Coil																																																																																					
CV	Vertical Coil																																																																																					
CH	Horizontal Coil																																																																																					
T	Temperature probe																																																																																					
AV	Vert. Accelerometer																																																																																					
AH	Hor. Accelerometer																																																																																					
LV	Vertical LVDT																																																																																					
LH	Horizontal LVDT																																																																																					
F0	Filter #0 or top-stage																																																																																					
F1	Filter #1																																																																																					
F2	Filter #2																																																																																					
F3	Filter #3																																																																																					
F4	Filter #4																																																																																					
F7	Filter #7																																																																																					
MA	Marionette																																																																																					
RM	Reference Mass																																																																																					
TCS	TCS frame																																																																																					
1, 2, 3, ...																																																																																						
L	Left																																																																																					
R	Right																																																																																					
U	Up																																																																																					
D	Down																																																																																					
F	Front																																																																																					
B	Back																																																																																					
UL	Up Left																																																																																					
UR	Up Right																																																																																					
DL	Down Left																																																																																					
DR	Down Right																																																																																					
LL	Lateral Left																																																																																					
LR	Lateral Righth																																																																																					
TX	ϑ_x degree of freedom																																																																																					
TZ	ϑ_z degree of freedom																																																																																					
AH1	Hor. Accelerom. #1																																																																																					
AH2	Hor. Accelerom. #2																																																																																					
AH3	Hor. Accelerom. #3																																																																																					
AV1	Vert. Accelerom. #1																																																																																					
AV2	Vert. Accelerom. #2																																																																																					

DRAFT: still to be cabled LVDTs and Piezos on the IP feet

Change History

<i>Version</i>	<i>Date</i>	<i>Changes/Reasons</i>	<i>Authors</i>
v1	2000	initial suspension cabling	Ceccanti, Dattilo
v2	2003	added cabling of sensors and actuators on Filter #7	Dattilo, Nenci
v3r0	4mar08	added TCS cabling	Berni, Dattilo, Gherardini
v3r1	28mar08	added panel connector layout on TCS motorized frame (rear view); updated the TCS flange layout; changed TCS motor name	Dattilo
v3r2	22feb10	added 2 temperature sensors close to the RefMass	Berni, Dattilo, Gherardini
v4r0	27jul2015	Modified cabling for allow new separating roof and new payload (cables F,R,S,V,Z,U). Suppression of pre-existing cables U and X. No more tiltmeters on F#7, more devices on payload and new F#7 actuation/sensing system.	Berni, Dattilo, Gherardini
v4r1	31jul2015	Added measured resistance values of the connected devices	Dattilo, Sposito

23 MOTORS

	code	Location (see also drawings in the following)	vacuum cable ID	vacuum cable type	notes	Resistance [Ω]		
						On device	On the flange	Just before Dbox
1	MV.F0.U	top-screw on F#0	J1	STP, AWG24	MV.1 (old code)			AB 6 DE 6
2	MV.F0	fishing-rod on F#0	A1	STP, AWG24	MV.2			AB 13 DE 13
3	MV.F1	fishing-rod on F#1	B1	STP, AWG24	MV.3			AB 12 DE 12
4	MV.F2	fishing-rod on F#2	C1	STP, AWG24	MV.4			AB 14 DE 14
5	MV.F3	fishing-rod on F#3	D1	STP, AWG24	MV.5			AB 14 DE 14
6	MV.F4	fishing-rod on F#4	E1	STP, AWG24	MV.6			AB 15 DE 15
7	MV.F7	fishing-rod on F#7	F1	STP, AWG24	MV.7			AB 15 DE 15
8	MH.F0.1	trolley on inner structure	H1	STP, AWG24	MH.1			AB 5 DE 5
9	MH.F0.2	trolley on inner structure	H2	STP, AWG24	MH.2			AB 5 DE 5
10	MH.F0.3	trolley on inner structure	H3	STP, AWG24	MH.3			AB 5 DE 5
11	MH.F7.TZ	balancing mass on F#7	R3	STP, AWG24	MH.4			AB 9 DE 9
12	MH.F7.TX	balancing mass on F#7	R2	STP, AWG24	MH.5			AB 9 DE 9
13	MH.MA.??	balanc. mass on marion. along NW-SE??	V2	STP, AWG24	MH.6			
14	MH.MA.??	balanc. mass on marion. along SW-NE??	V3	STP, AWG24				
15	MA.F7.U	F#7 top (for rotation)	R1	STP, AWG24	MA.1			AB 8 DE 8
16	MA.F7.D	F#7 bottom (for rotation)	F4	STP, AWG24	MA.2			AB 8 DE 8

NORTH INPUT Tower

17	M.F0.AH1	Hor. Accelerometer on top-stage	O2	STP, AWG24				AB 6 DE 6
18	M.F0.AH2	Hor. Accelerometer on top-stage	N2	STP, AWG24				AB 6 DE 6
19	M.F0.AH3	Hor. Accelerometer on top-stage	M2	STP, AWG24				AB 6 DE6
20	M.F0.AV1	Vert. Accelerometer on F#0	K1	STP, AWG24				AB 6 DE 6
21	M.F0.AV2	Vert. Accelerometer on F#0	L1	STP, AWG24				AB 6 DE 6
22	MH.CP.1	Compensation Plate	U3	STP, AWG24	no end-switches			
23	MH.RH	Ring Heater	U2A	STP, AWG24	no end-switches			
24	MV.RH	Ring Heater	U2B	STP, AWG24	no end-switches			

NORTH INPUT Tower

23 COILS

code	Location (see also drawings in the following)	vacuum cable ID	vacuum cable type	notes	Resistance [Ω]		
					On device	On the flange	Just before Dbox
CH.F0.1 CH.F0.2 CH.F0.3	Safety frame ring	G2 G6 G4	STP, AWG24 (double)	CH.1 CH.2 CH.3			15.5 15.2 15.3
CV.F0.1 CV.F0.2	crossbar on F#0 crossbar on F#0 (fish.rod side)	J2 J3	STP, AWG24	CV.1 CV.2			33 34
CH.F7.1	Coil on bottom ring, magnet on F#7	W1	TP, Ø0.6mm, enamel insulat.	Lemo connector on the device is the one toward the center of the tower			8
CH.F7.2	Coil on bottom ring, magnet on F#7	W5	TP, Ø0.6mm, enamel insulat				8
CH.F7.3	Coil on bottom ring, magnet on F#7	W3	TP, Ø0.6mm, enamel insulat				7.8
CV.F7.1	Coil on bottom ring, magnet on F#7	W2	TP, Ø0.6mm, enamel insulat				7.8
CV.F7.2	Coil on bottom ring, magnet on F#7	W4	TP, Ø0.6mm, enamel insulat				7.9
CV.F7.3	Coil on bottom ring, magnet on F#7	W6	TP, Ø0.6mm, enamel insulat				8.1
CV.MA.B CV.MA.L CH.MA.BL CH.MA.FR CV.MA.F CV.MA.R CH.MA.BR CH.MA.FL	coils on F#7 lower frame (cage), magnets on Marionette			cabl e S (see details on NI_LastStageCabling file)			
CH.MI.UR CH.MI.DR CH.MI.UL CH.MI.DL	coils on F#7 lower frame (cage), magnets on Mirror			cabl e V (see details on NI_LastStageCabling file)			

14,5 THERMAL PROBES

code	Location (see also drawings in the following)	vacuum cable ID	vacuum cable type	notes	Resistance [Ω]		
					On device	On the flange	Just before Dbox
T.F0.1 T.F0.2	antispring back on F#0	A2	STP, AWG24	TP.1, AD590			
T.F1.1 T.F1.2	antispring back on F#1	B2	STP, AWG24	TP.2, AD590			
T.F2.1 T.F2.2	antispring back on F#2	C2	STP, AWG24	TP.3, AD590			
T.F3.1 T.F3.2	antispring back on F#3	D2	STP, AWG24	TP.4, AD590			
T.F4.1 T.F4.2	antispring back on F#4	E2	STP, AWG24	TP.5, AD590			
T.F7.1 T.F7.2	hexagon on F#7	F2	STP, AWG24	TP.6, AD590			
T.CH.MIUL	coil horizontal UL acting on mirror	Z2A	STP, AWG24	PT100, RS-2938468			
T.RH	Ring Heater	Z2B	STP, AWG24	PT100, RS-2938496			
Tvolt.CH.MIUL	coil horizontal UL acting on mirror	U2C	STP, AWG24	voltmetric			

5 ACCELEROMETERS

code	Location <i>(see also drawings in the following)</i>	vacuum cable ID	vacuum cable type	notes	Resistance [Ω]		
					<i>On device</i>	<i>On the flange</i>	<i>Just before Dbox</i>
AH.F0.1	top-ring	O2	STP, AWG24	AH.1			Primary 5
AH.F0.2	top-ring	N2	STP, AWG24	AH.2			Primary 5
AH.F0.3	top-ring	M2	STP, AWG24	AH.3			Primary 5
AV.F0.1	crossbar F#0	K1	STP, AWG24	AV.1			Primary 6
AV.F0.2	crossbar F#0 (fish.rod side)	L1	STP, AWG24	AV.2			Primary 6

3 PIEZOs

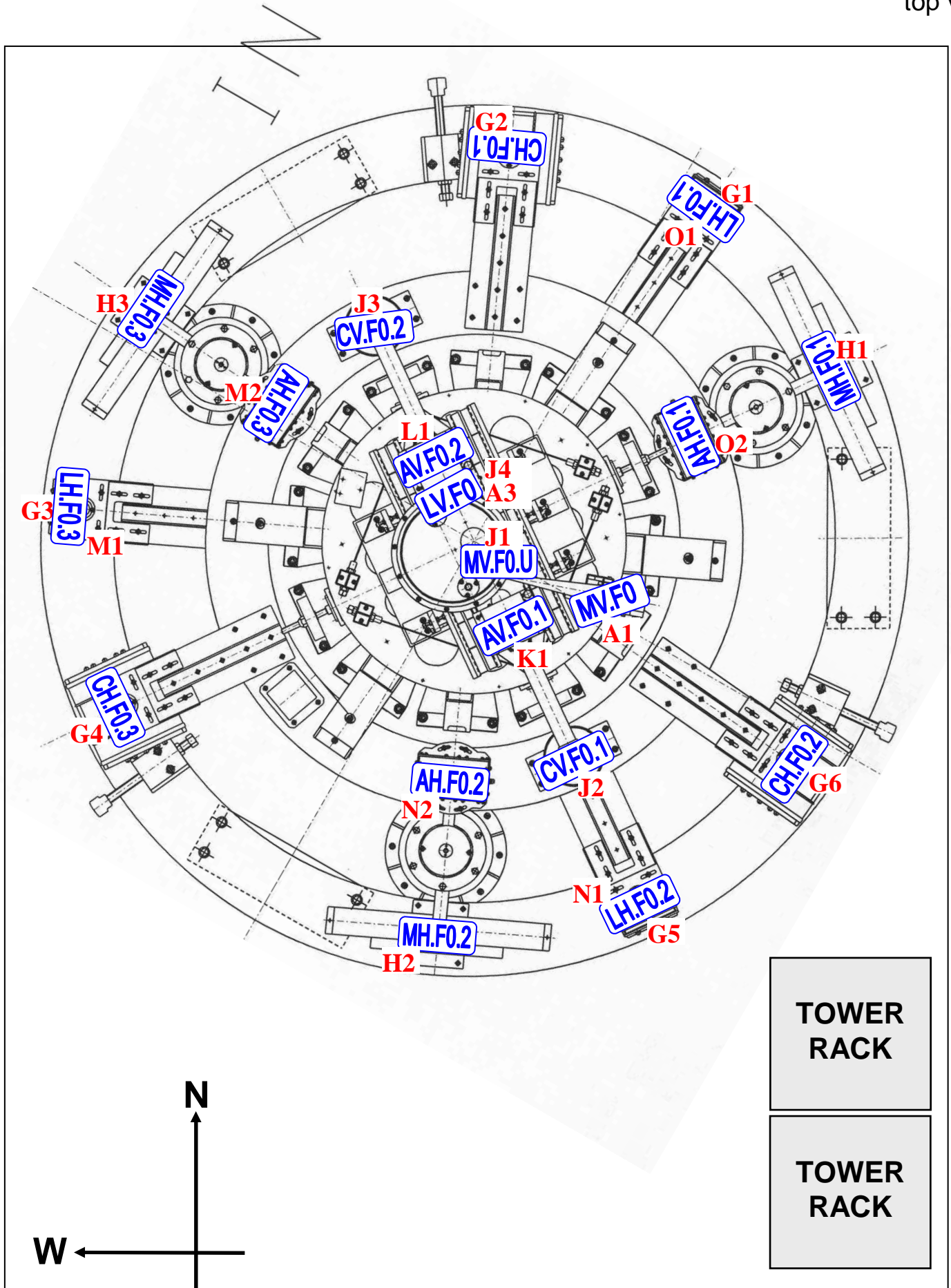
code	Location <i>(see also drawings in the following)</i>	vacuum cable ID	vacuum cable type	notes	Resistance [Ω]		
					<i>On device</i>	<i>On the flange</i>	<i>Just before Dbox</i>
PZ.BR.1	IP foot	Q1	STP, AWG24				
PZ.BR.2	IP foot	Q3	STP, AWG24				
PZ.BR.3	IP foot	Q2	STP, AWG24				

18 LVDTs

	code	Location (see also drawings in the following)	vacuum cable ID	vacuum cable type	notes	Resistance [Ω]		
						On device	On the flange	Just before Dbox
1	LH.F0.1	Primary on top-ring	O1	STP, AWG24	LH.1			5
		Secondary on inner structure	G1	STP, AWG24				13
2	LH.F0.2	Primary on top-ring	N1	STP, AWG24	LH.2			5
		Secondary on inner structure	G5	STP, AWG24				14
3	LH.F0.3	Primary on top-ring	M1	STP, AWG24	LH.3			5
		Secondary on inner structure	G3	STP, AWG24				13
4	LV.F0	primary on F#0 crossbar	J4	STP, AWG24	LV.1			8
		secondary on F#0 body	A3	STP, AWG24				8
5	LV.F1	F#1	B3A	STP, AWG24	LV.2			7.4
			B3B					8.6
6	LV.F2	F#2	C3A	STP, AWG24	LV.3			8.7
			C3B					10
7	LV.F3	F#3	D3A	STP, AWG24	LV.4			9
			D3B					10
8	LV.F4	F#4	E3A	STP, AWG24	LV.5			9.4
			E3B					10.5
9	LV.F7	F#7	F3A	STP, AWG24	LV.6			10.5
			F3B					28
10	LH.F7.1	Primary and ferrites on F#7, Secondary on bottom ring	Z1C	TP, \varnothing 0.6mm, enamel insulat.	T1 Lemo connector on the device is the one toward the wall of the tower			12.4
			T1					43.1
11	LH.F7.2	Primary and ferrites on F#7, Secondary on bottom ring	Z1E	TP, \varnothing 0.6mm, enamel insulat	Z5			12.2
			T5					43.4
12	LH.F7.3	Primary and ferrites on F#7, Secondary on bottom ring	Z1A	TP, \varnothing 0.6mm, enamel insulat	Z1			12.3
			T3					43.3
13	LV.F7.1	Primary and ferrites on F#7,	Z1B	TP, \varnothing 0.6mm, enamel	Z2			12.3

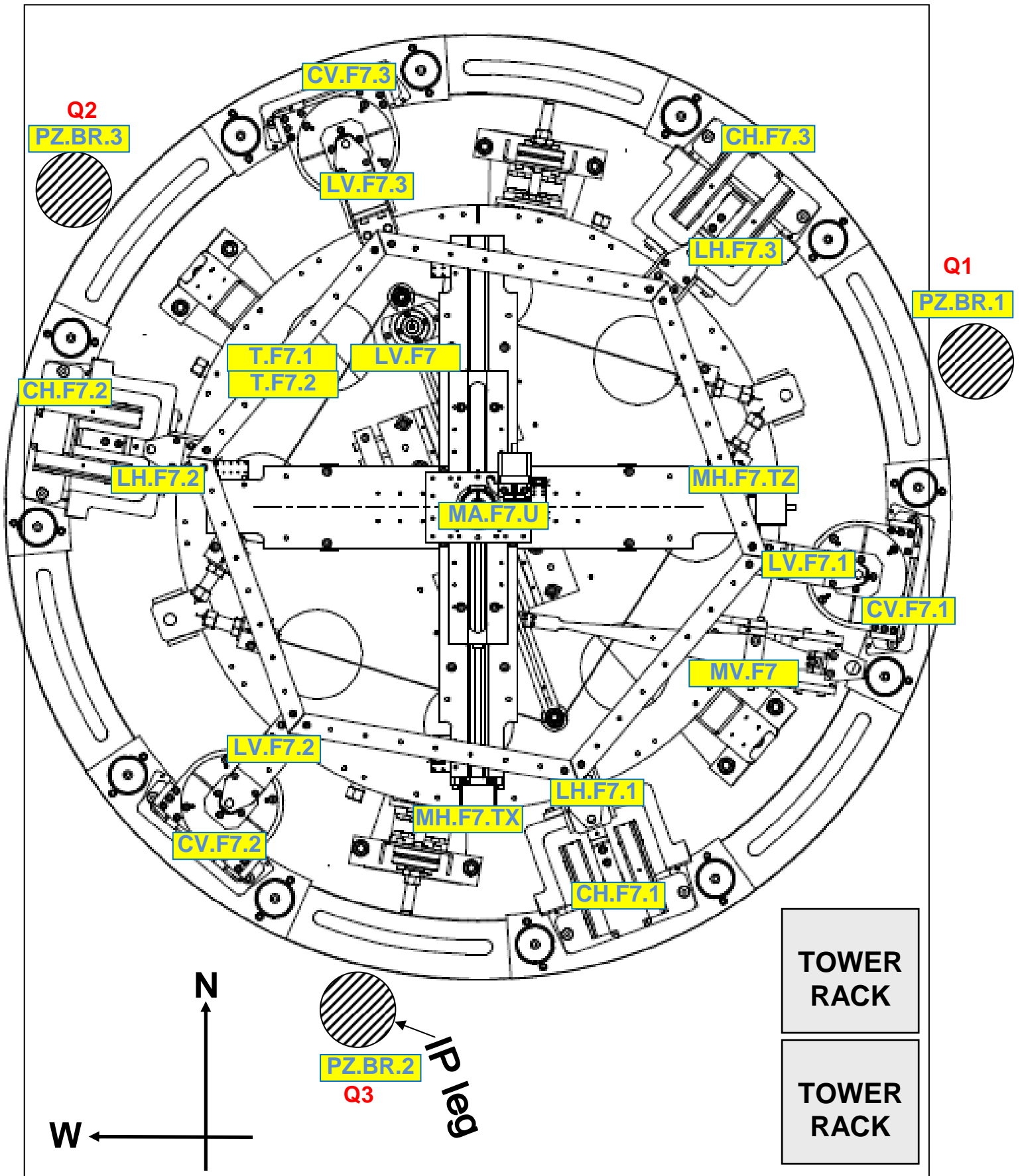
NORTH INPUT Tower

		Secondary on bottom ring	T2	insulat				43.3
14	LV.F7.2	Primary and ferrites on F#7, Secondary on bottom ring	Z1D T4	TP, Ø0.6mm, enamel insulat	Z4			12.4
								43.5
15	LV.F7.3	Primary and ferrites on F#7, Secondary on bottom ring	Z1F T6	TP, Ø0.6mm, enamel insulat	Z6			12.3
								43.8
16	LV.BR.1	Primary on ground Secondary on IP foot	P P	STP, AWG26				
17	LV.BR.2	Primary on ground Secondary on IP foot	P P	STP, AWG26				
18	LV.BR.3	Primary on ground Secondary on IP foot	P P	STP, AWG26				



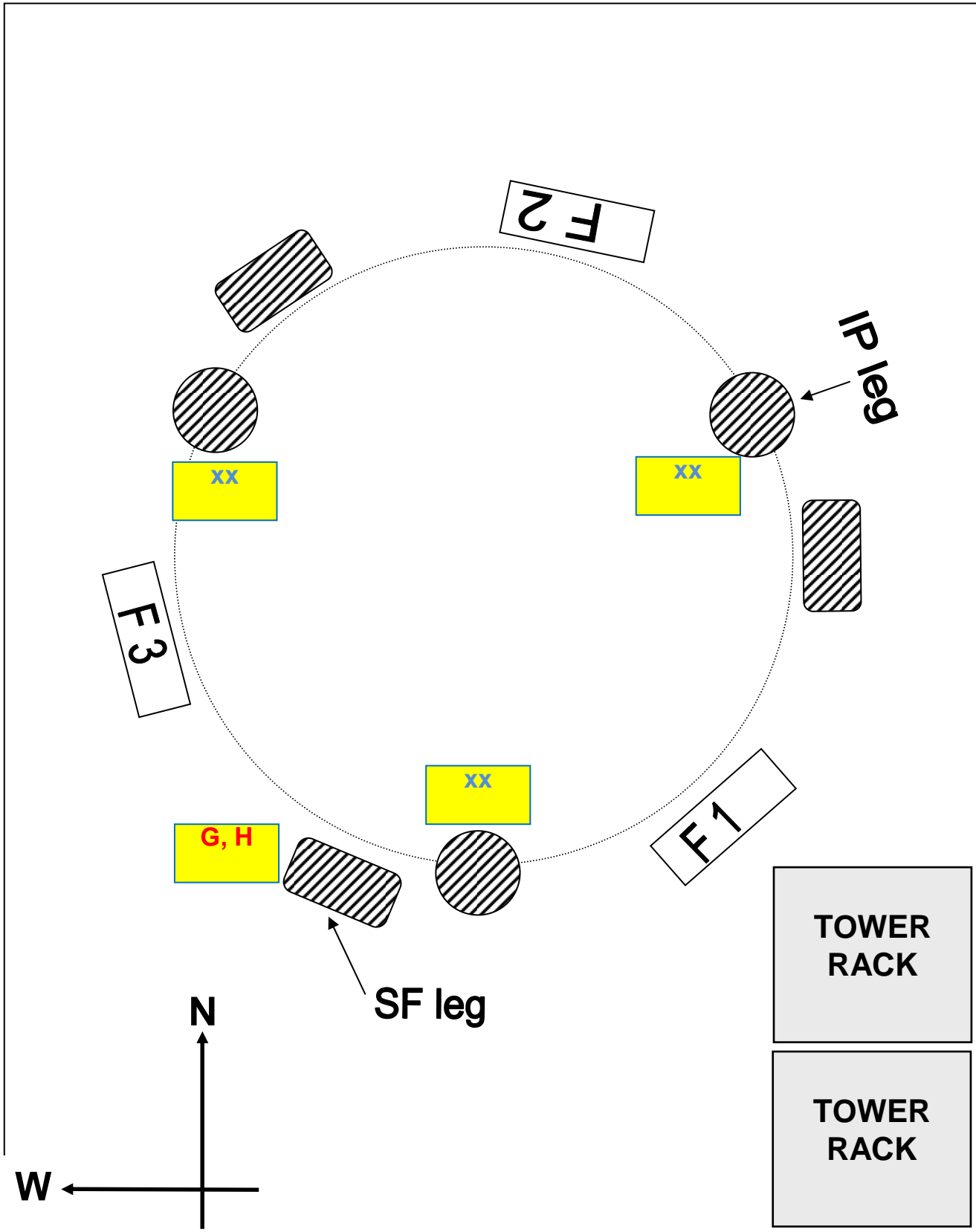
FILTER #7 (upper part) devices

top view



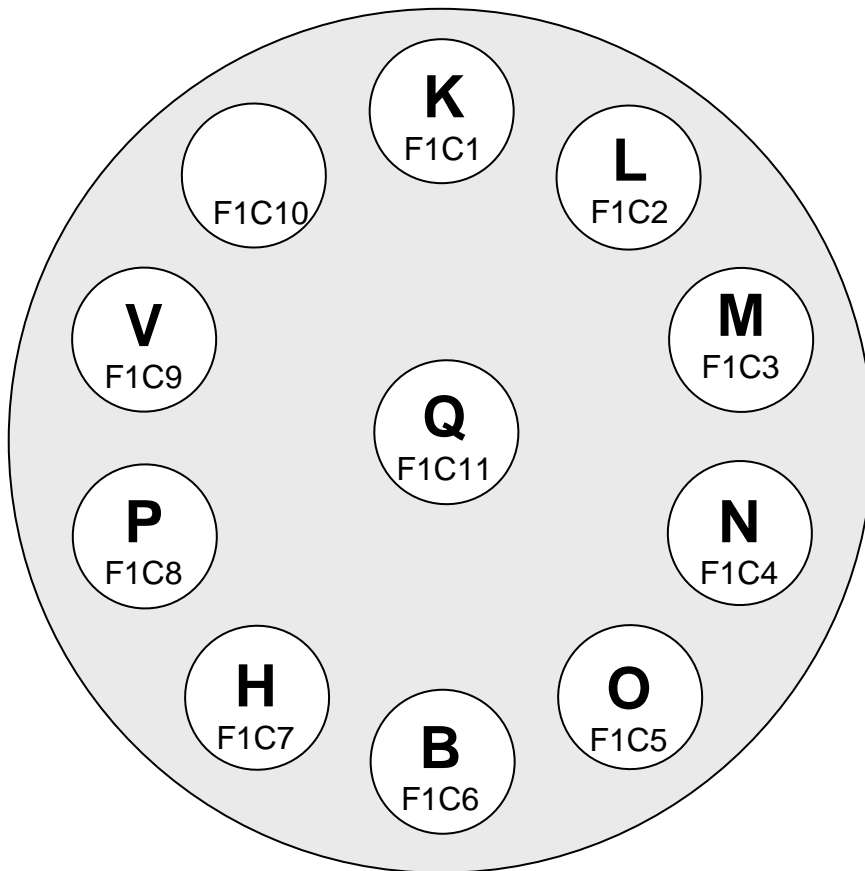
Cable arrangement along inverted pendulum (IP) legs and safety structure (SF) legs

(the position of the flanges of the Technical Ring is also shown)

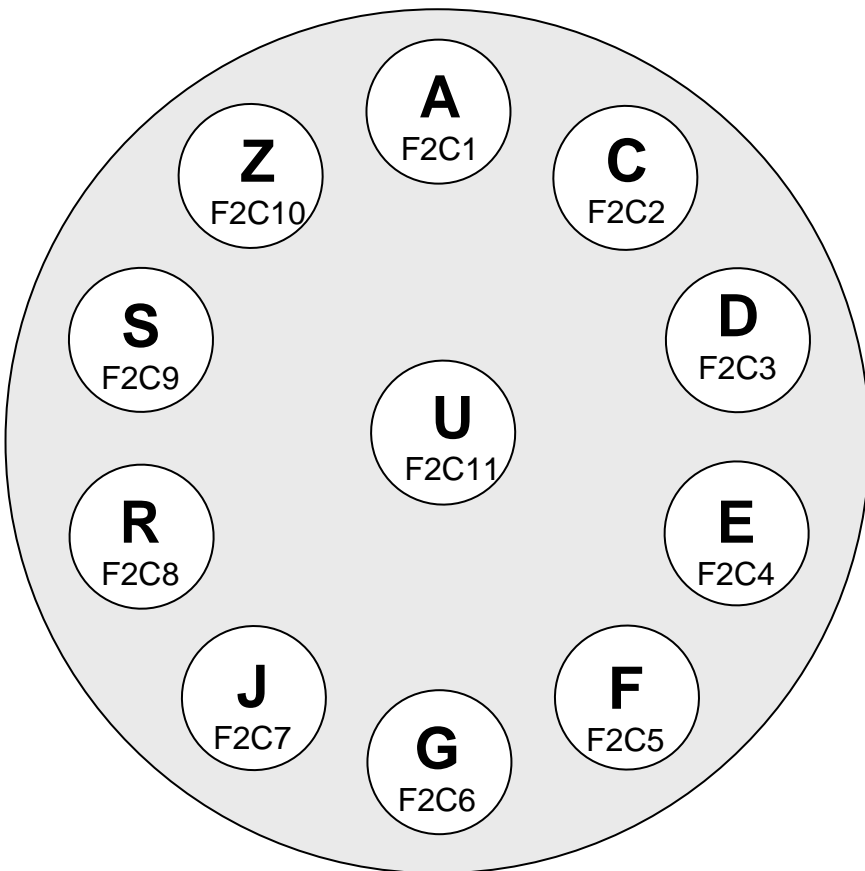


Feed-through location on flanges of the Technical Ring

Flange **F1**
(air side view)



Flange **F3**
(air side view)



Feed-through location on the flange of the tower base

Flange F4

(air side view)

It is located on the East side, corner S, down
(flange labeled “??” by the manufacturer)

