

# **MODE CLEANER Tower:** location and coding of electrically connected Devices

**CODING CONVENTION:** The code is divided in 3 fields. The field separator is a dot. The 3<sup>th</sup> 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)

<b>M</b>	Motor
<b>MV</b>	Vertical Motor
<b>MH</b>	Horizontal Motor
<b>MA</b>	Angular Motor
<b>TM</b>	TiltMeter
<b>C</b>	Coil
<b>CV</b>	Vertical Coil
<b>CH</b>	Horizontal Coil
<b>T</b>	Temperature probe
<b>AV</b>	Vert. Accelerometer
<b>AH</b>	Hor. Accelerometer
<b>LV</b>	Vertical LVDT
<b>LH</b>	Horizontal LVDT

<b>F0</b>	Filter #0 or top-stage
<b>F1</b>	Filter #1
<b>F2</b>	Filter #2
<b>F3</b>	Filter #3
<b>F4</b>	Filter #4
<b>F7</b>	Filter #7
<b>MA</b>	Marionette
<b>RM</b>	Reference Mass
<b>BR</b>	Bottom Ring

<b>1, 2, 3, ...</b>	
<b>L</b>	Left
<b>R</b>	Right
<b>U</b>	Up
<b>D</b>	Down
<b>F</b>	Front
<b>B</b>	Back
<b>UL</b>	Up Left
<b>UR</b>	Up Right
<b>DL</b>	Down Left
<b>DR</b>	Down Right
<b>LL</b>	Lateral Left
<b>LR</b>	Lateral Right
<b>TX</b>	$\vartheta_x$ degree of freedom
<b>TZ</b>	$\vartheta_z$ degree of freedom
<b>Z</b>	Z degree of freedom
<b>AH1</b>	Hor. Accelerom. #1
<b>AH2</b>	Hor. Accelerom. #2
<b>AH3</b>	Hor. Accelerom. #3
<b>AV1</b>	Vert. Accelerom. #1
<b>AV2</b>	Vert. Accelerom. #2

## Change History

<i>Version</i>	<i>Date</i>	<i>Changes</i>
<b>v1</b>	1999	initial suspension cabling
<b>v2r1</b>	2may03	added cabling for the marionette gear box
<b>v2r2</b>	29may03	corrections to v2r1
<b>v2r3</b>	01jul08	New cabling of the payload, due to the new payload. The new motors of the marionette are now with standard logic (previously were with inverted logic)
<b>v3r0</b>	aug 2012	Cabling adaptation for AdV: replacement of the pre-existing DB25 with the circular 32-pins peekplugs, added cables for filter F#4. Remains to add cables for IP feet piezos&LVDTs
<b>v3r1</b>	august – sept 2013	Added cables for IP feet piezos&LVDTs
<b>v3r2</b>	Feb 2014	Finalized connector location on flanges, added RefMass schemes by Nikhef

## 19 MOTORS

<b>code</b>	<b>Location</b> (see also drawings in the following)	<b>vacuum cable ID</b>	<b>vacuum cable type</b>	<b>notes</b>
<b>MV.F0.U</b>	top-screw on F#0	<b>J1</b>	STP, AWG26	MV.1 (old code)
<b>MV.F0</b>	fishing-rod on F#0	<b>A1</b>	STP, AWG26	MV.2
<b>MV.F4</b>	fishing-rod on F#4	<b>E1</b>	STP, AWG26	new (AdV)
<b>MV.F7</b>	fishing-rod on F#7	<b>F1</b>	STP, AWG26	MV.3
<b>MH.F0.1</b>	trolley on inner structure	<b>H1</b>	STP, AWG20	MH.1
<b>MH.F0.2</b>	trolley on inner structure	<b>I1</b>	STP, AWG20	MH.2
<b>MH.F0.3</b>	trolley on inner structure	<b>H2</b>	STP, AWG20	MH.3
<b>MH.F7.1</b>	balancing mass on F#7	<b>R1</b>	PP, AWG24	MH.4
<b>MH.F7.2</b>	balancing mass on F#7	<b>R2</b>	PP, AWG24	MH.5
<b>MH.MA.TZ</b>	balanc. mass on marion. (for $\vartheta_z$ motion)	<b>T1</b>	PP, AWG24	MH.6
<b>MH.MA.TX</b>	balanc. mass on marion. (for $\vartheta_x$ motion)	<b>T2</b>	PP, AWG24	MH.7
<b>MH.MA.Z</b>	Marionetta bottom—gear box. (for Z motion)	<b>T3</b>	STP, AWG26	new
<b>MA.F7.U</b>	F#7 top (for rotation)	<b>Q2</b>	PP, AWG24	MA.1
<b>MA.F7.D</b>	F#7 bottom (for rotation)	<b>Q1</b>	PP, AWG24	MA.2
<b>M.F0.AH1</b>	Hor. Accelerometer on top-stage	<b>O2</b>	STP, AWG26	
<b>M.F0.AH2</b>	Hor. Accelerometer on top-stage	<b>M2</b>	STP, AWG26	
<b>M.F0.AH3</b>	Hor. Accelerometer on top-stage	<b>N2</b>	STP, AWG26	
<b>M.F0.AV1</b>	Vert. Accelerometer on F#0	<b>K1</b>	STP, AWG26	
<b>M.F0.AV2</b>	Vert. Accelerometer on F#0	<b>L1</b>	STP, AWG26	

total number of conductors/tower needed for motors:  $19 \times 7 = 133$  plus  $19 \times 2 = 38$  shields (only for phases).

## 19 COILS

<b>code</b>	<b>Location</b> (see also drawings in the following)	<b>vacuum cable ID</b>	<b>vacuum cable type</b>	<b>notes</b>
CH.F0.1 CH.F0.2 CH.F0.3	Safety frame ring	G4 G6 G5	STP, AWG20	CH.1 CH.2 CH.3
CV.F0.1 CV.F0.2	crossbar on F#0 crossbar on F#0 (fish.rod side)	J2 J3	STP, AWG26	CV.1 CV.2
CH.F7.1 CH.F7.2 CH.F7.3 CH.F7.4 CV.F7.1 CV.F7.2 CV.F7.3 CV.F7.4	F#7 legs	S1 S3 S5 S7 S2 S4 S6 S8	STP, AWG20	CH.4 CH.5 CH.6 CH.7 CV.4 CV.5 CV.6 CV.7
C.RM.L C.RM.R C.RM.D C.RM.U C.RM.LL C.RM.LR	reference mass		STP, AWG24, PYRE-ML 0.5mm	new

total number of conductors for coils:  $19 \times 2 = 38$ , plus 19 shields.

## 2 (couple of) THERMAL PROBES

<b>code</b>	<b>location</b>	<b>vacuum cable ID</b>	<b>vacuum cable type</b>	<b>notes</b>
T.F0.1 T.F0.2	antispring back on F#0	A2	STP, AWG24	TP.1
T.F7.1 T.F7.2	antispring back on F#7	F2	STP, AWG24	TP.2

total number of conductors for thermal probes:  $2 \times 4 = 8$ , plus  $2 \times 2 = 4$  shields.

## 5 ACCELEROMETERS

<b>code</b>	<b>Location</b> <i>(see also drawings in the following)</i>	<b>vacuum cable ID</b>	<b>vacuum cable type</b>	<b>notes</b>
<b>AH.F0.1</b>	top-ring	<b>O2</b>	STP, AWG26	AH.1
<b>AH.F0.2</b>	top-ring	<b>M2</b>	STP, AWG26	AH.2
<b>AH.F0.3</b>	top-ring	<b>N2</b>	STP, AWG26	AH.3
<b>AV.F0.1</b>	crossbar F#0	<b>K1</b>	STP, AWG26	AV.1
<b>AV.F0.2</b>	crossbar F#0 (fish.rod side)	<b>L1</b>	STP, AWG26	AV.2

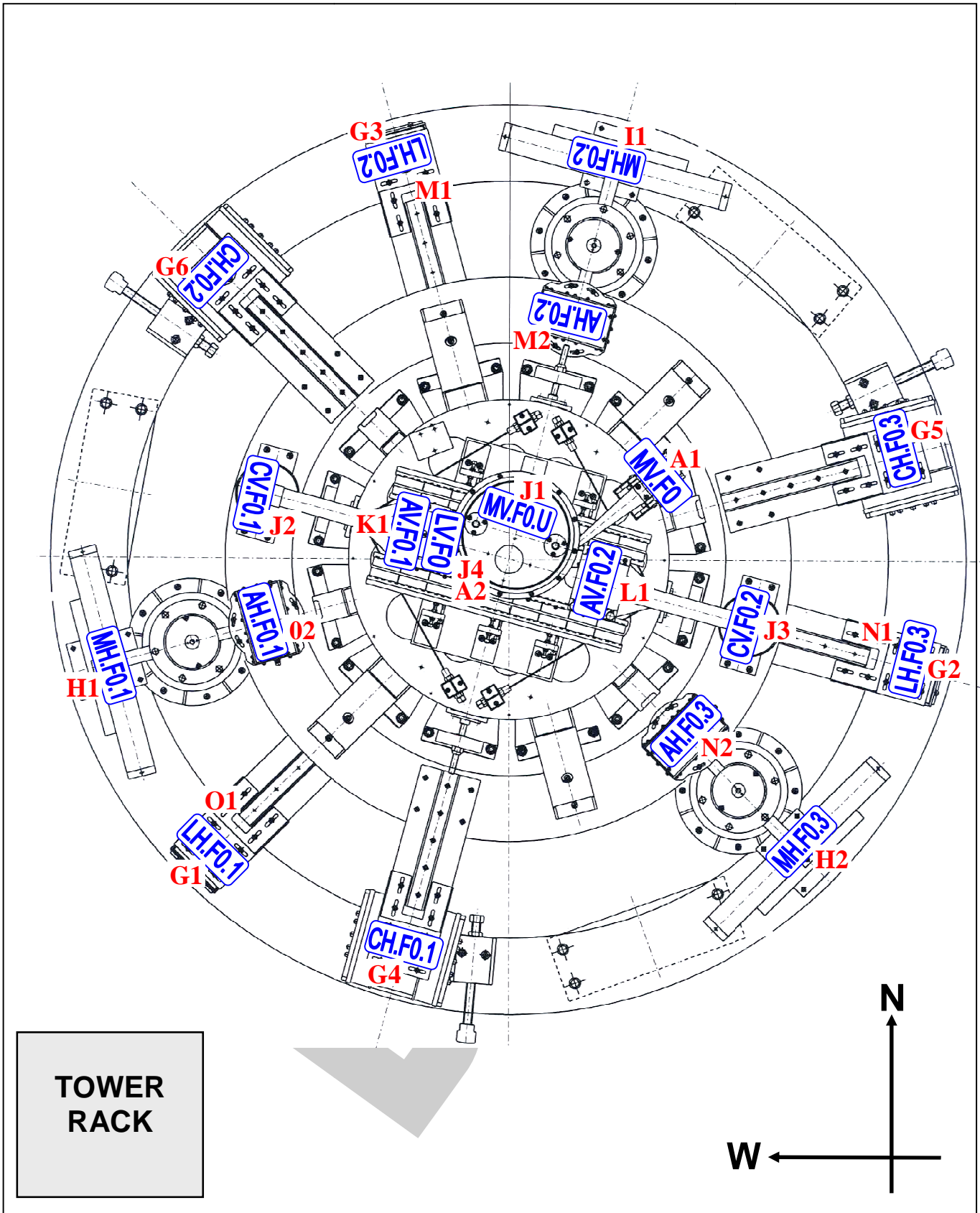
total number of conductors for accelerometers:  $5 \times 13 = 65$ , plus  $5 \times 5 = 25$  shields (motors included).

## 9 LVDTs

<b>code</b>	<b>Location</b> <i>(see also drawings in the following)</i>	<b>vacuum cable ID</b>	<b>vacuum cable type</b>	<b>notes</b>
<b>LH.F0.1</b>	Primary on top-ring Secondary on safety structure	<b>O1</b> <b>G1</b>	STP, AWG26 STP, AWG20	LH.1
<b>LH.F0.2</b>	Primary on top-ring Secondary on safety structure	<b>M1</b> <b>G3</b>	STP, AWG24 STP, AWG24	LH.2
<b>LH.F0.3</b>	Primary on top-ring Secondary on safety structure	<b>N1</b> <b>G2</b>	STP, AWG24 STP, AWG24	LH.3
<b>LV.F0</b>	primary on F#0 crossbar secondary on F#0 body	<b>J4</b> <b>A2</b>	STP, AWG26 STP, AWG26	LV.1
<b>LV.F4</b>	F#4	<b>E2</b>	STP, AWG26	new (AdV)
<b>LV.F7</b>	F#7	<b>F3</b>	STP, AWG26	LV.2
<b>LV.BR.1</b>	Primary on ground Secondary on IP foot	<b>P1</b> <b>P2</b>	STP, AWG26	new (AdV)
<b>LV.BR.2</b>	Primary on ground Secondary on IP foot	<b>P3</b> <b>P4</b>	STP, AWG26	new (AdV)
<b>LV.BR.3</b>	Primary on ground Secondary on IP foot	<b>P5</b> <b>P6</b>	STP, AWG26	new (AdV)

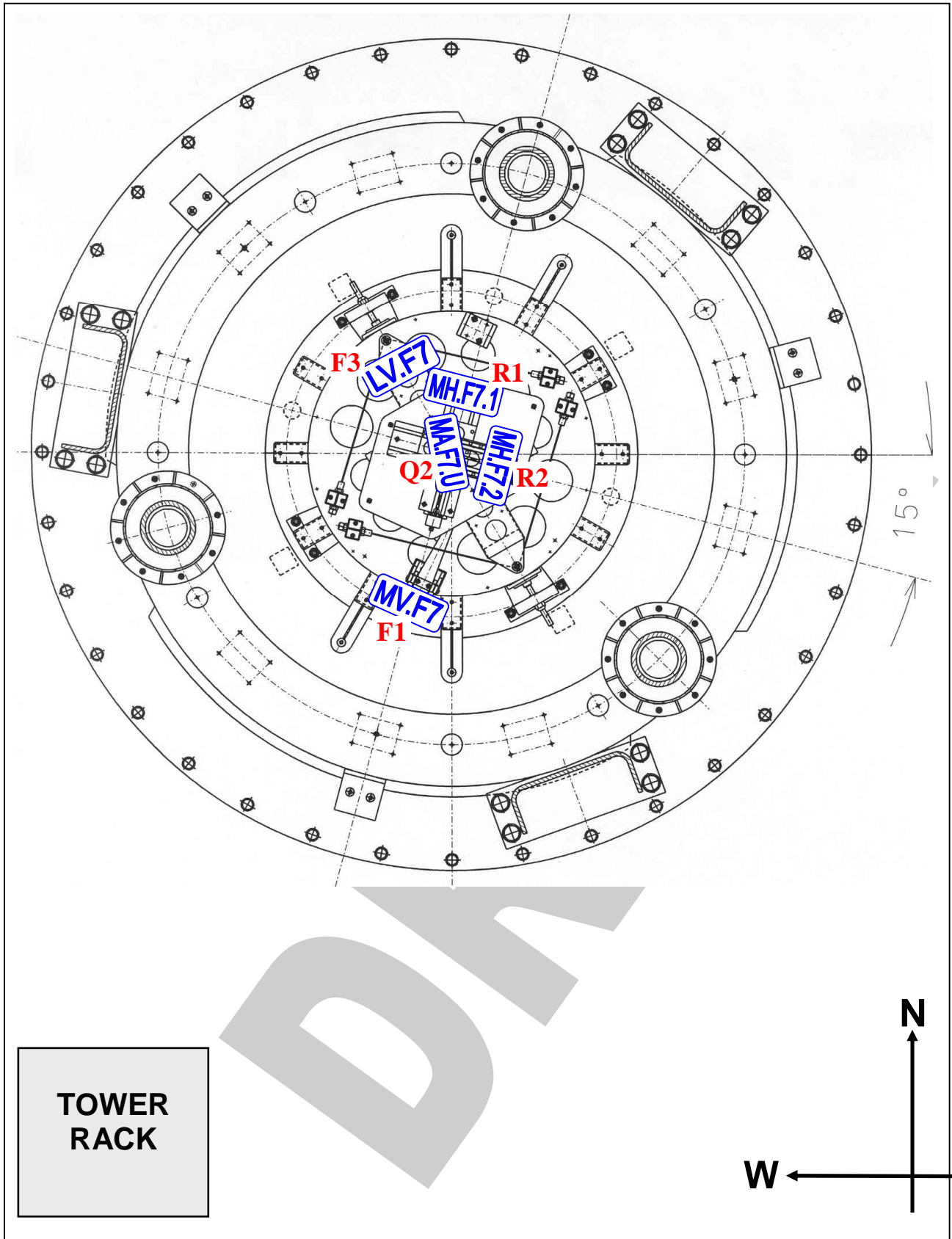
total number of conductors for LVDTs:  $9 \times 4 = 36$ , plus  $9 \times 2 = 18$  shields.

TOP-STAGE devices



**FILTER #7 devices**

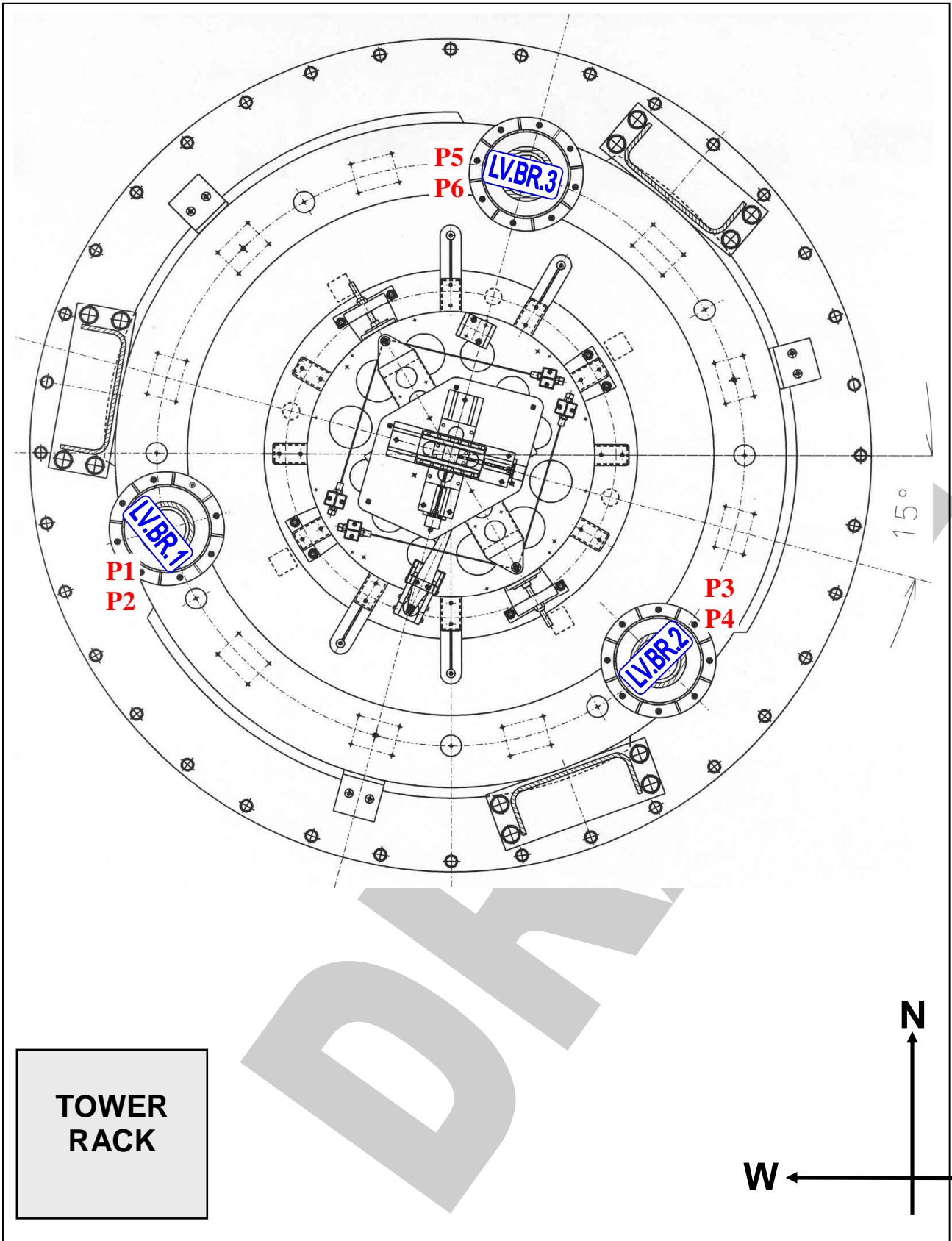
top view





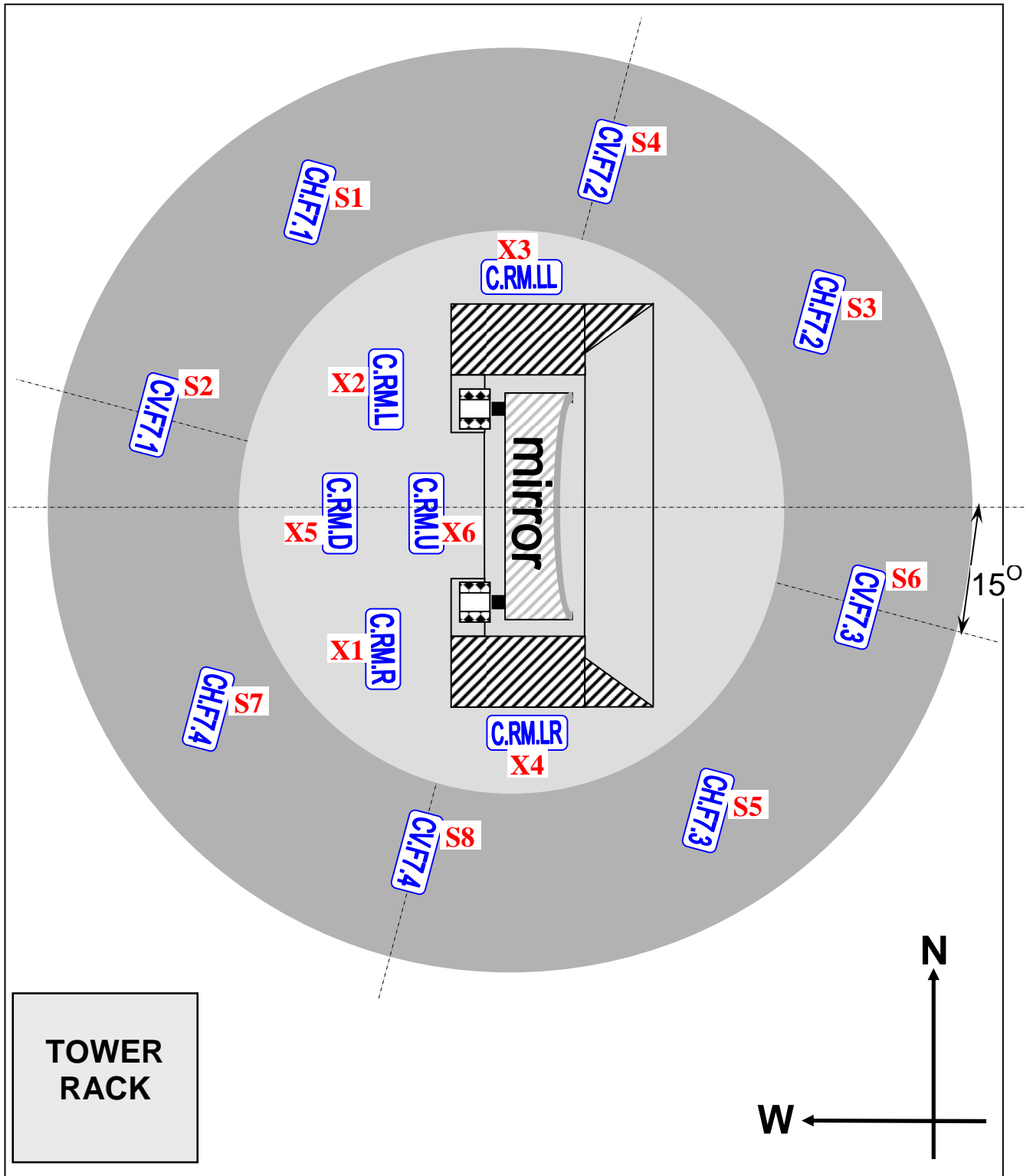
**Bottom Ring devices**

top view



location of F#7 and RefMass coils

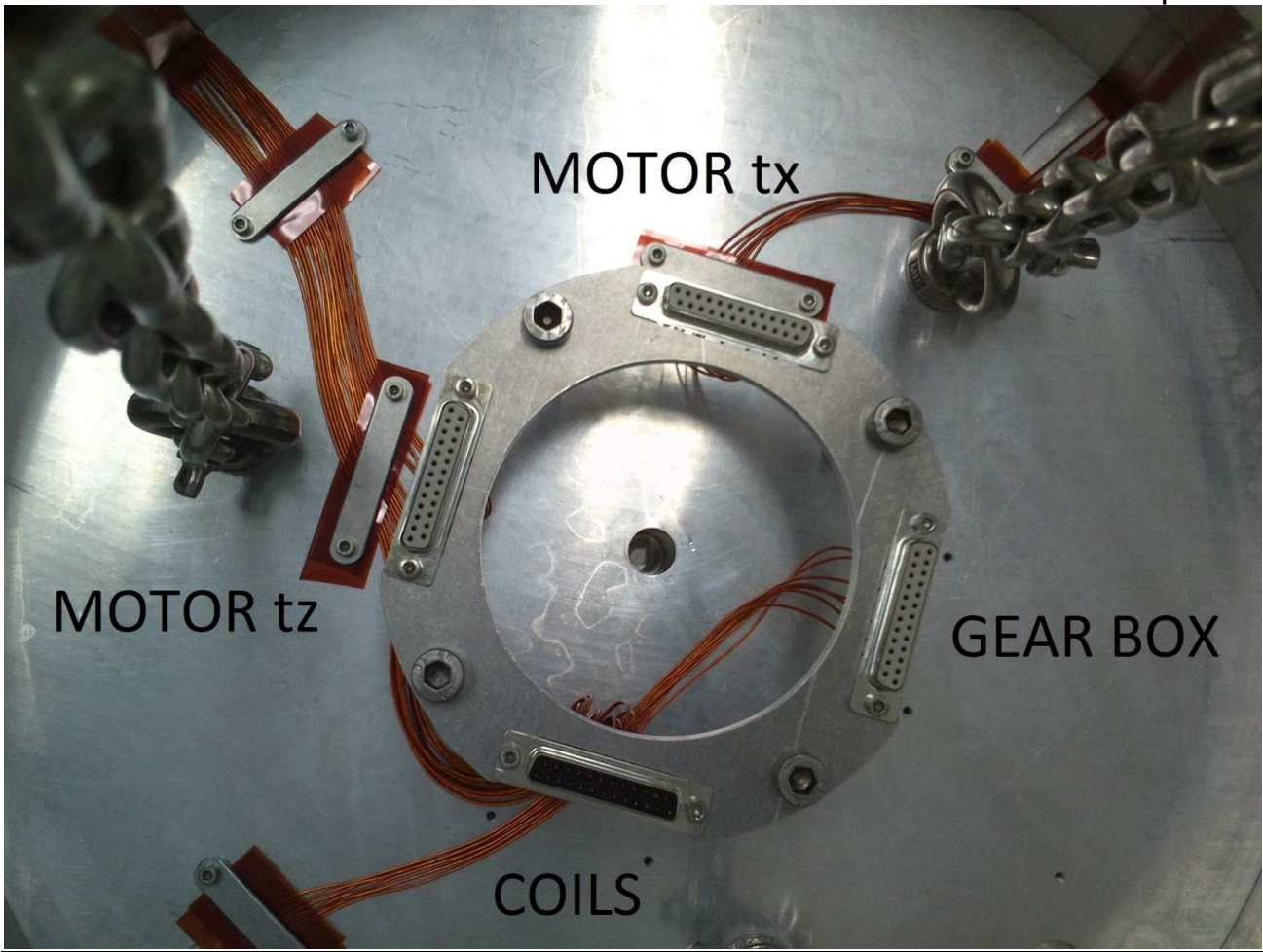
top view



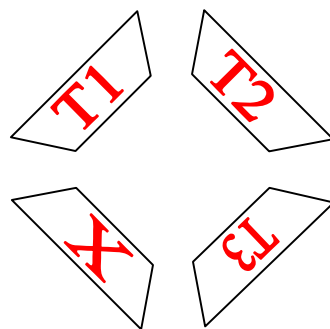


location of Marionette motors and RefMass coils

top view

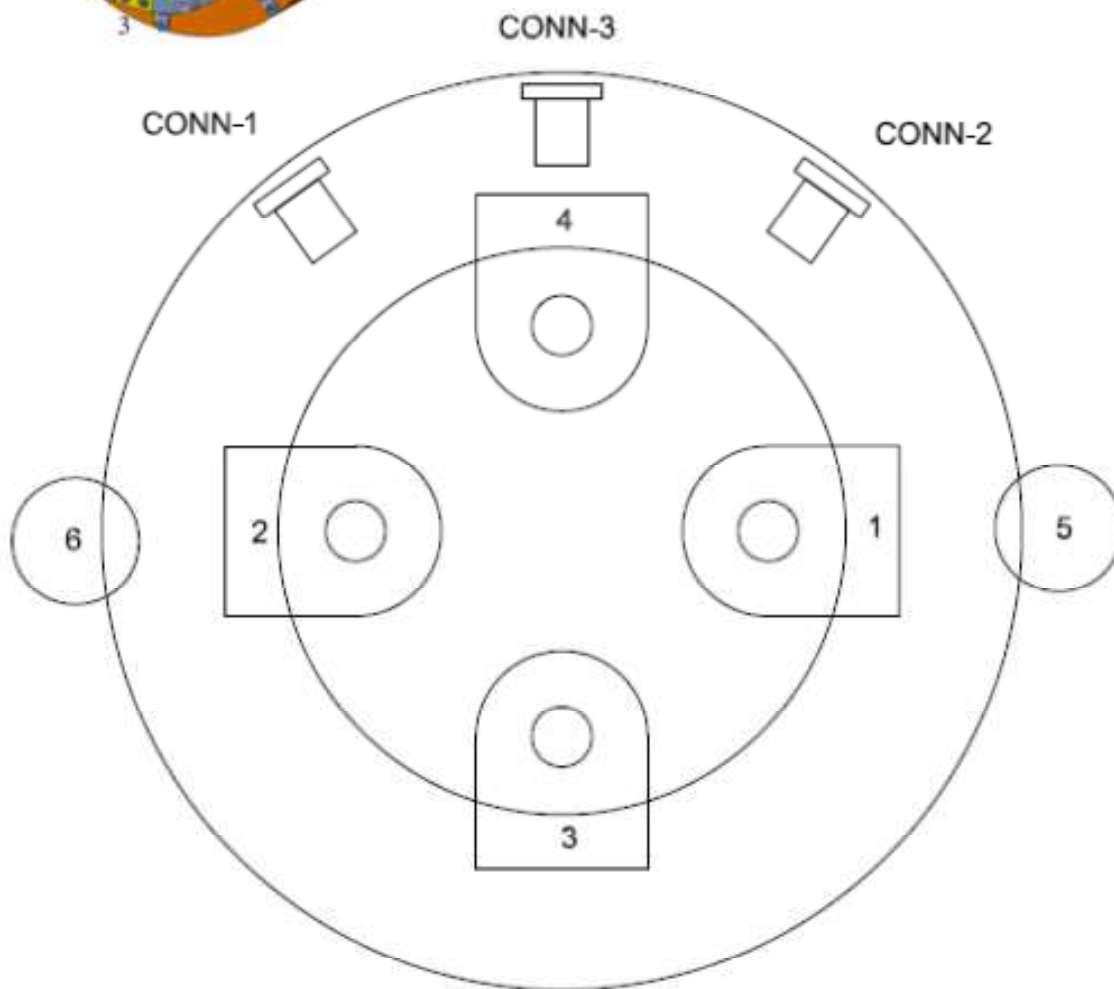
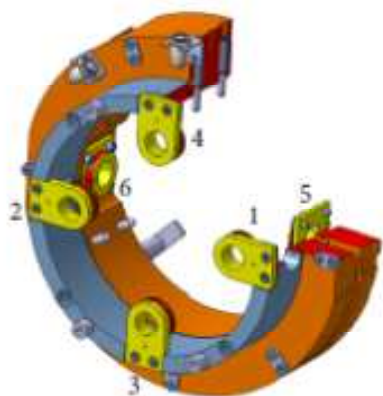


DB25 pinout rearranged and checked on Jan 2014 by F.Berni and F.Gherardini (elog # 31181)



Layout of DB25 connectors on marionetta top

**RefMass coils**

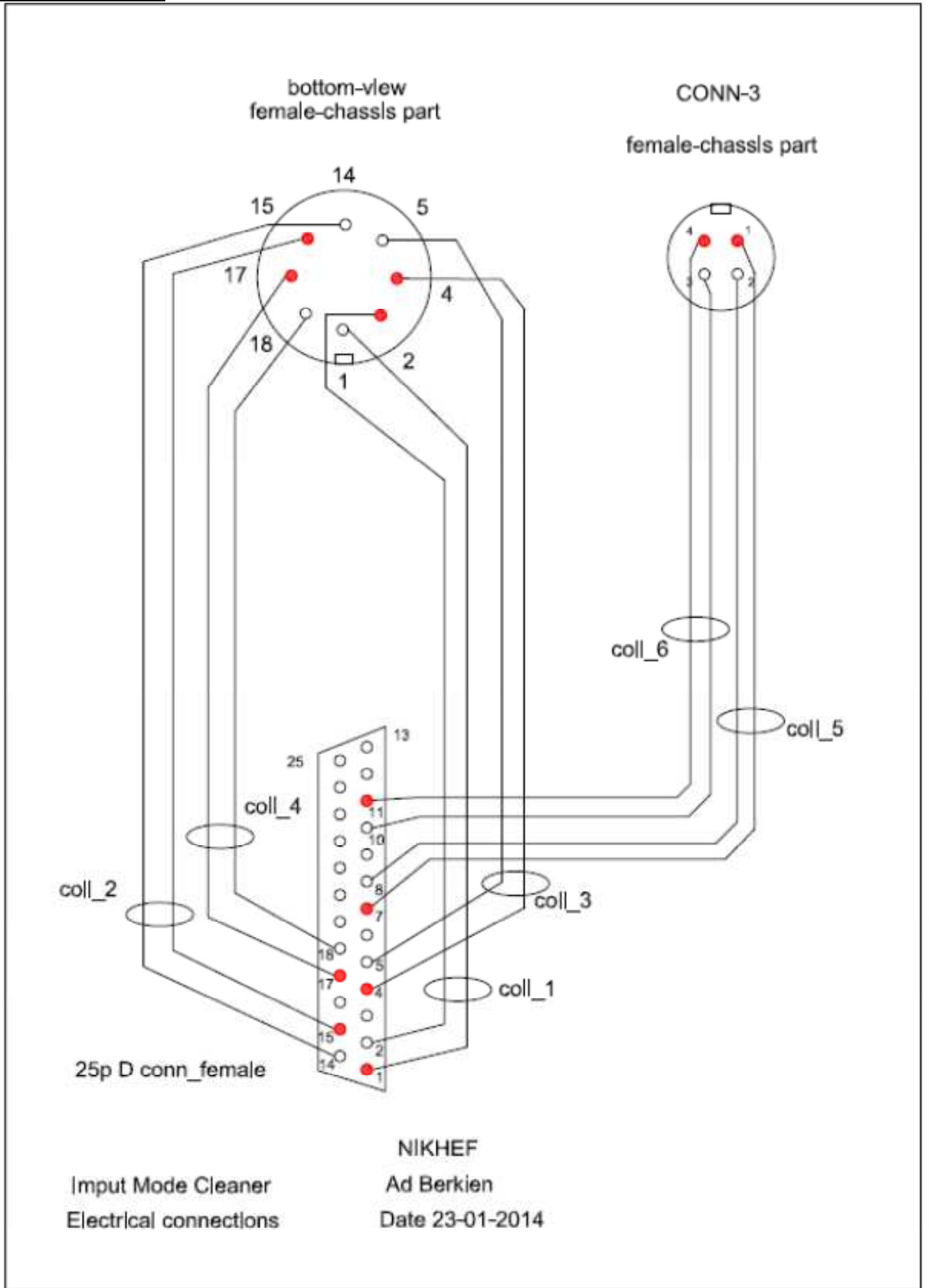


BACK VIEW RM IMC

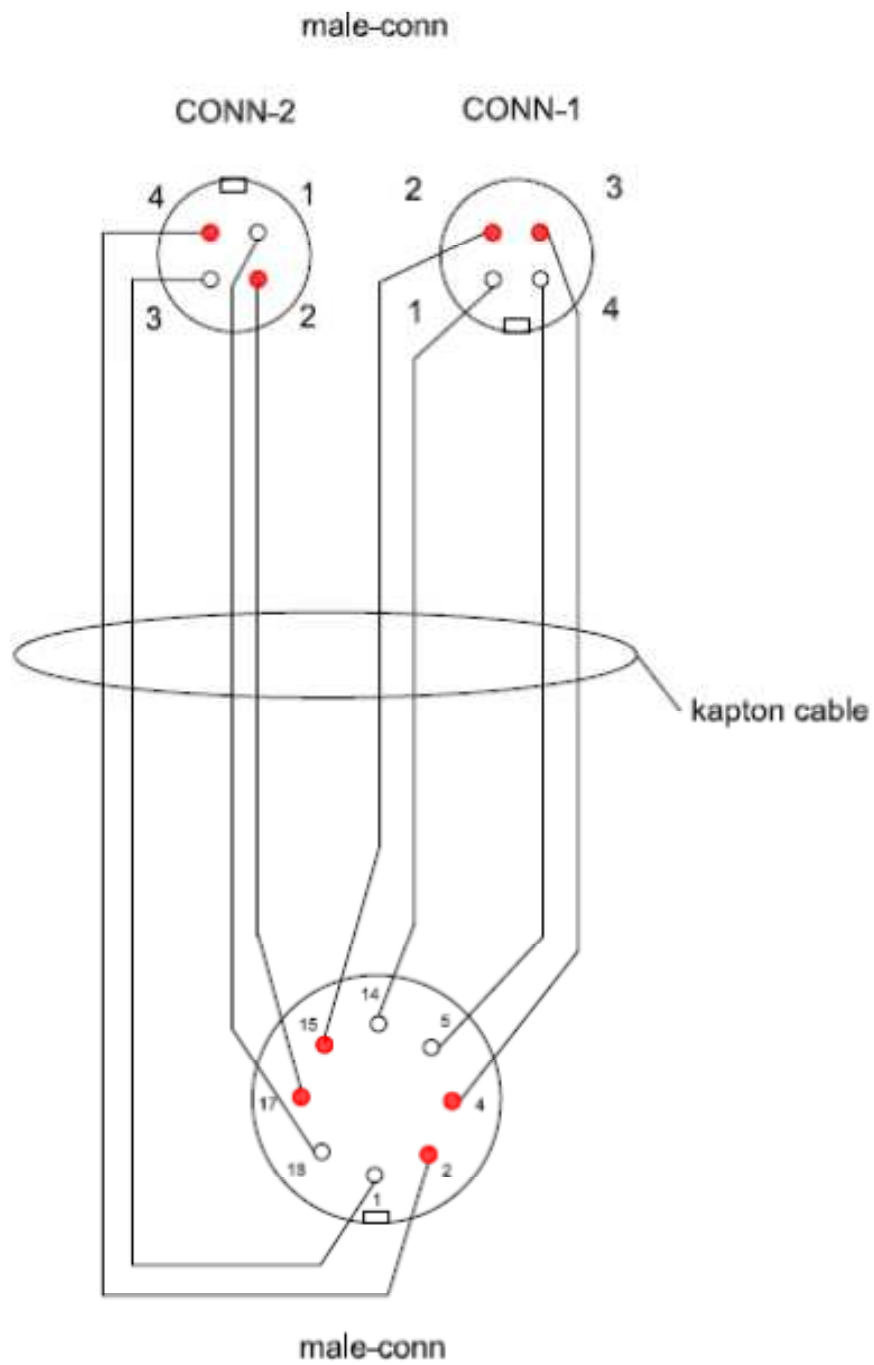
Input Mode Cleaner  
Electrical connections

NIKHEF  
Ad Berklen  
Date 22-01-2014

### RefMass coils



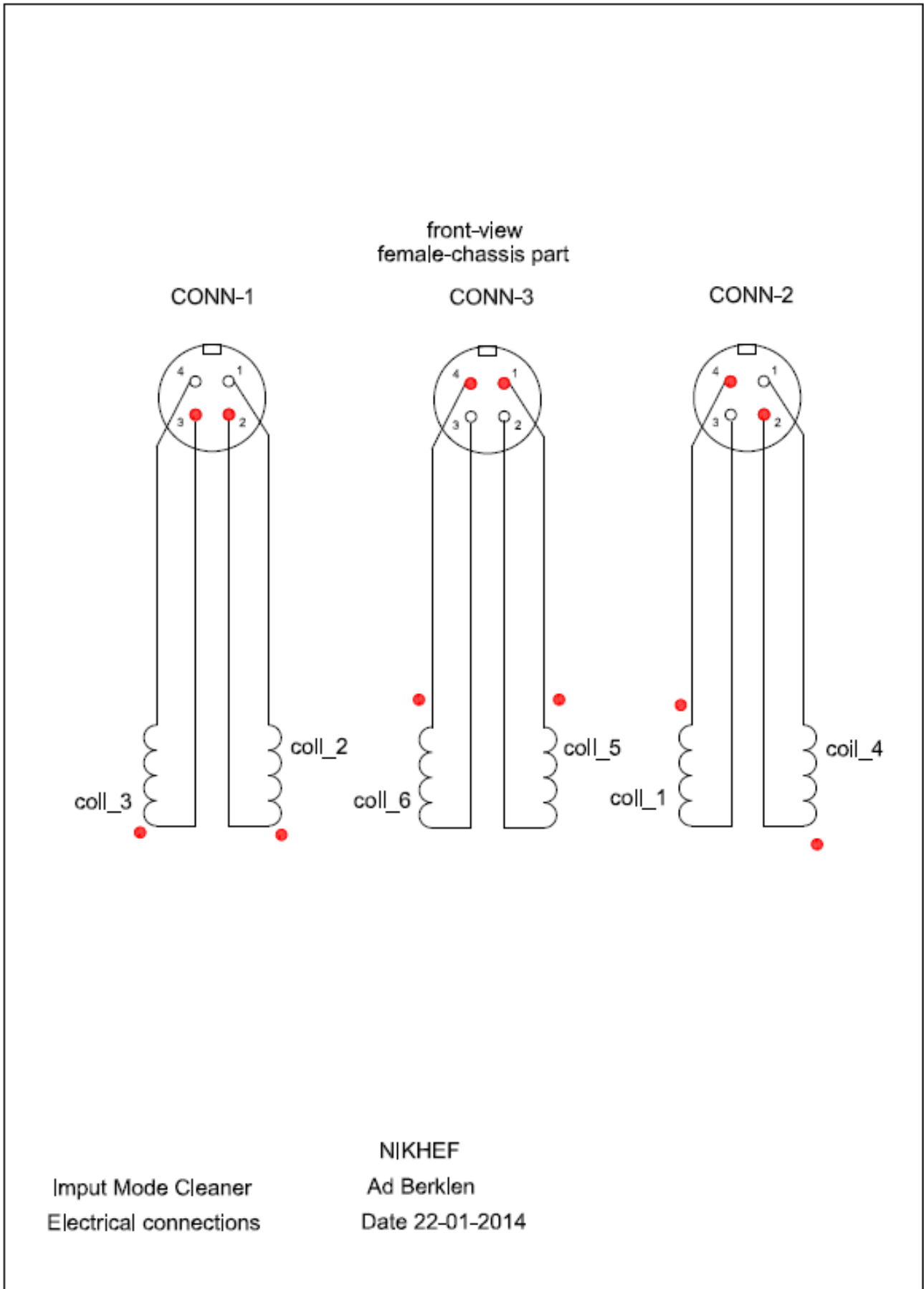
### RefMass coils



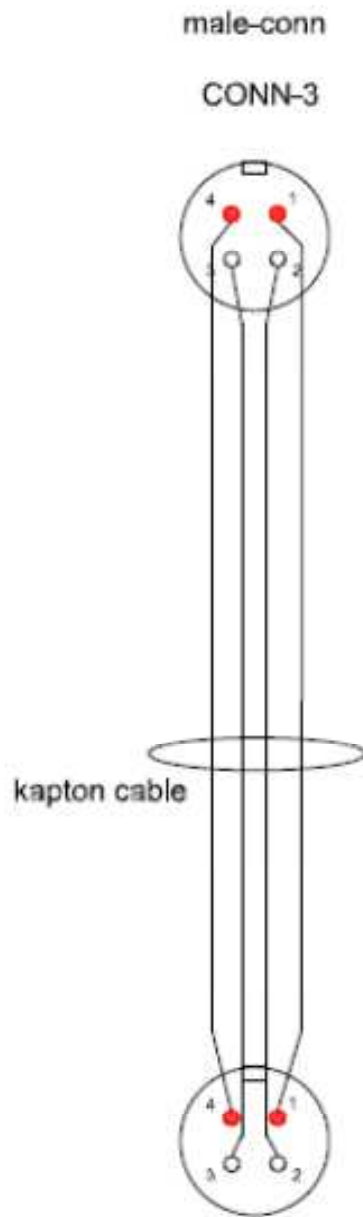
Input Mode Cleaner  
Electrical connections

NIKHEF  
Ad Berklen  
Date 22-01-2014

**RefMass coils**



RefMass coils



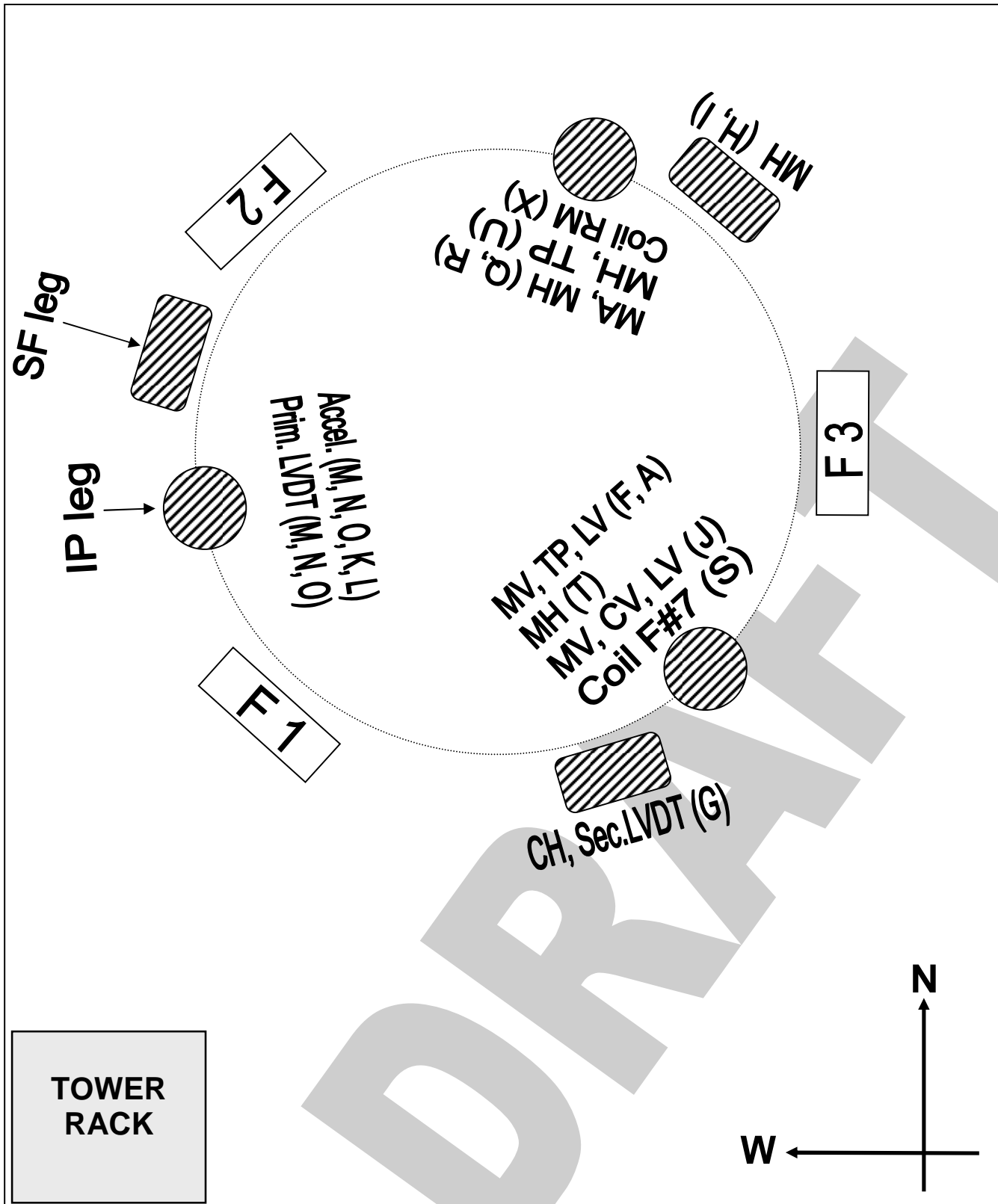
Input Mode Cleaner  
Electrical connections

male-conn

NIKHEF  
Ad Berklen  
Date 23-01-2014

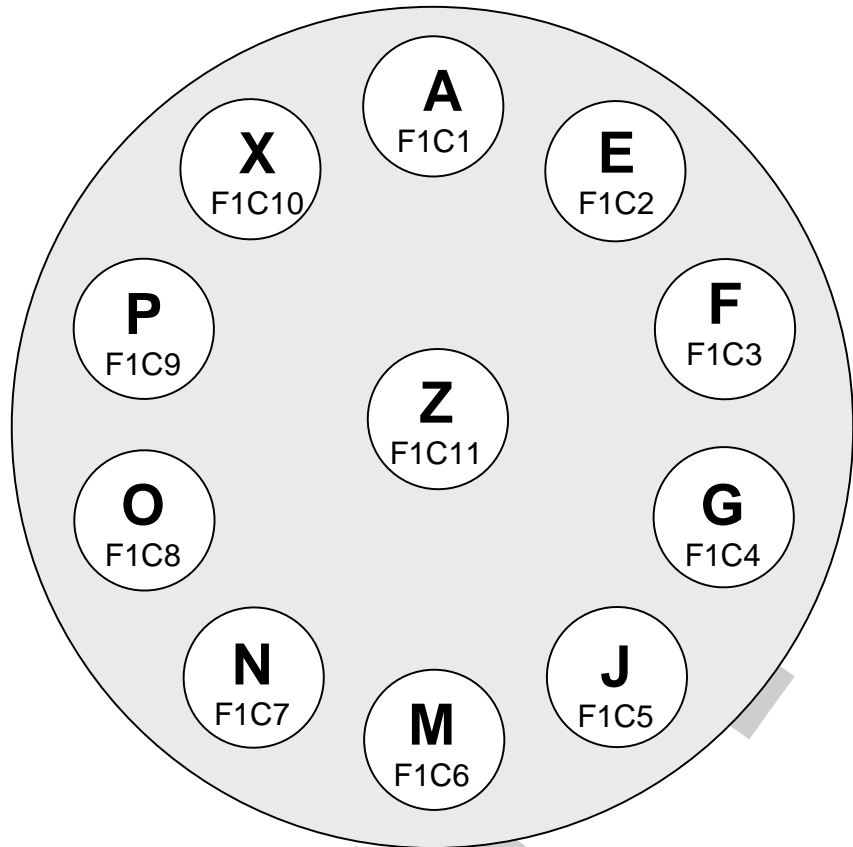


Cable arrangement along IP legs



Connector location on flanges

Flange **F1**  
(air side view)



Flange **F2**  
(air side view)

