



LHC - Cold masses: HELIUM MASS SPECTROMETER LEAK TEST REPORT

I/P Nr.
23
24

Cold Mass Nr. **2016**

Step Nr. **1**
Volume / Volume to be tested
CM -> Vacuum

2
CM -> cold bore tubes

3
CM -> Heat Exch.

4
Heat Exch -> Vacuum

Fuga calibrata / Calibrated leak parameter

Calibrated leak N°	4011007195	4011007225	4011007195
Data calibr. / calibration date	08/10/02	08/10/02	08/10/02
Temp. calibrazione fuga / Calibration Temp.	23,0 °C	23,0 °C	23,0 °C
Valore nom. fuga calibrata / Calibrated leak nom. value	3,00E-08 mbar l s-1	3,30E-08 mbar l s-1	3,00E-08 mbar l s-1

Calibrazione del sistema / System calibration

Conc. He nella linea di test (100%) / Volumetric fraction of tracer gas in the injection envelope	C	1	C	1
T ambiente / Test temp.	T	27,0 °C	T	27,0 °C
Fuga calibrata con correz. T ed età / Size of calib. leak after corr. for ageing and T)	qFR	3,42E-08 mbar l s-1	qFR	3,42E-08 mbar l s-1
Segnale residuo prima delle misure di SFR / Residual signal prior SFR meas.	RFR	8,92E-09 mbar l s-1	RFR	8,92E-09 mbar l s-1
Segnale del LD / Signal given by the calibrated leak	SFR	4,62E-08 mbar l s-1	SFR	4,62E-08 mbar l s-1
Min. dev. segnale (=2x amp. segn. residuo) / Smallest read. signal dev. (= 2 x ampl. of RFR noise)	Sm	2,00E-11 mbar l s-1	Sm	2,00E-11 mbar l s-1
Tempo di attesa stabiliz. segnale / Time to achieve stabilised leak signal	3t	180 sec	3t	180 sec
SENSIBILITA' DEL TEST / Sensitivity of the leak test	q _{sm}	1,83E-11 mbar l s-1	q _{sm}	1,83E-11 mbar l s-1

$$= S_n \frac{q_{FR}}{S_{FR} - R_{FR}} \frac{1}{C}$$

Condizioni del test / Leak test conditions

Pressione del sistema / System pressure	P	1,00E-04 mbar	P	1,00E-04 mbar
Segnale residuo del cercalogue ad inizio test / Residual signal prior to SF measurement	R _F	8,82E-09 mbar l s-1	R _F	9,15E-09 mbar l s-1
Segnale del LD a fine test / Signal given by the leak after 30 min. (>3)	S _F	8,95E-09 mbar l s-1	S _F	9,17E-09 mbar l s-1
CALCOLO DELLA FUGA / Leak evaluation	q _G	1,19E-10 mbar l s-1	q _G	1,83E-11 mbar l s-1

$$= \frac{q_{FR} (S_F - R_F)}{S_{FR} - R_{FR}} \frac{1}{C}$$

VALORE DI RIFERIMENTO / REF. VALUE (MAX) **1,0E-09 mbar l s-1 at 26 bar** YES

CONFORMANCE YES

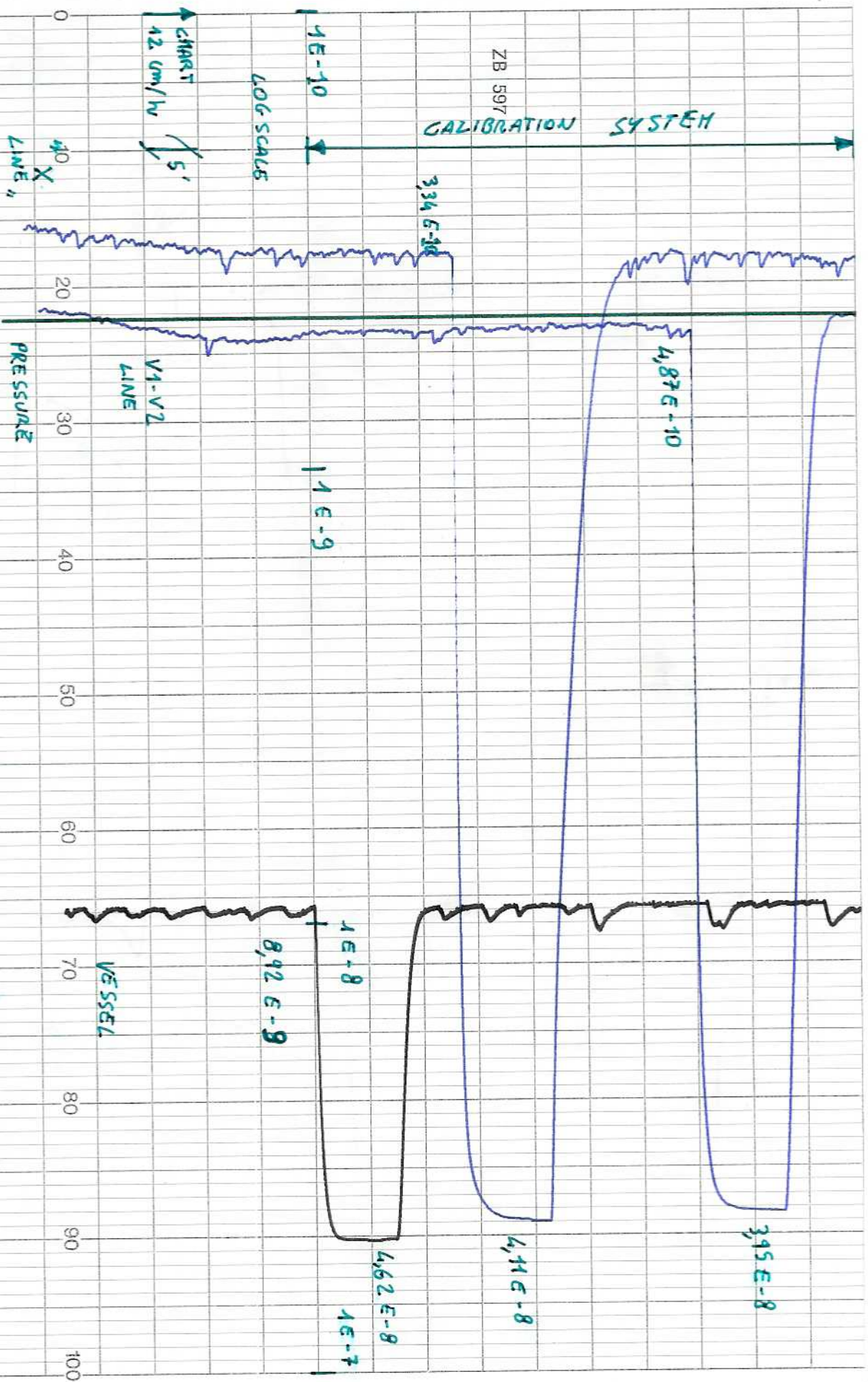
Doc. di riferimento / Ref. documents
 CERN contract number: F302LHC/LHC
 CERN technical spec.: LHC MMS-98-198 rev.2
 Leak test procedure (Ref. N°, Revision): 780RM09442 rev.0

Strumentazione / Test equipment
 Helium Mass Spectrometer type:
 Pressure gauge type:
 Pumping group:

on vessel	PFEIFFER HLT 260 full range compact PFEIFFER PKR 251 turbo pump LEYBOLD PT 360 l/s rotary vane pump PFEIFFER DUO 65 m3/h	on heat exchanger line	PFEIFFER HLT 260	on vessel	PFEIFFER HLT 260 full range compact PFEIFFER PKR 251 turbo pump LEYBOLD PT 360 l/s rotary vane pump PFEIFFER DUO 65 m3/h
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Note / Remarks
 Test performed after welding of flange (Ø100) about the capillary tube cold head, installed on the top of the cold mass

Prepared by: Name / Date	Casazza - 19/08/2003
Approved by: Name / Date	Terzi - 19/08/2003
Checked by: Name / Date	P. Gagliardi - 19/08/2003
Checked at CERN by / Signature / Date	



LEAK TEST COLD MASS 2016 19/08/03

[Signature]

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