



LHC - Cold masses: HELIUM MASS SPECTROMETER LEAK TEST REPORT

ITP Nr.
23
24

Cold Mass Nr. 2064

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

Heat Exch -> Vacuum 4

CM -> Heat Exch. 3

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 nelle linee di test (100%) / Volumetric fraction of tracer gas in the injection envelope

T ambiente / Test temp.

Fuga calibrata con correz. T ed età / Size of calib. leak after corr. for ageing and T)

Segnale residuo prima delle misure di SFR / Residual signal prior SFR meas.

Segnale del LD / Signal given by the calibrated leak

Min. dev. segnale (=2x amp. segn. residuo) / Smallest read. signal dev. (= 2 x ampl. of RFR noise)

Tempo di attesa stabiliz. segnale / Time to achieve stabilised leak signal

$$= \frac{S_m}{S_{FR}} \left(\frac{S_p - R_p}{S_{FR} - R_{FR}} \right) \frac{1}{C}$$

C	1	1	1
T	18,5 °C	18,5 °C	18,5 °C
qFR	2,59E-08 mbar l s-1	2,78E-08 mbar l s-1	4,33E-07 mbar l s-1
RFR	7,63E-09 mbar l s-1	5,36E-10 mbar l s-1	8,01E-10 mbar l s-1
SFR	4,16E-08 mbar l s-1	2,67E-08 mbar l s-1	1,11E-07 mbar l s-1
Sm	2,00E-11 mbar l s-1	2,00E-12 mbar l s-1	2,00E-11 mbar l s-1
3t	700 sec	700 sec	1000 sec
qgm	1,49E-11 mbar l s-1	2,13E-12 mbar l s-1	2,41E-12 mbar l s-1

Condizioni del test / Leak test conditions

Pressione del sistema / System pressure

Segnale residuo dei cercatughe ad inizio test / Residual signal prior to SF measurement

Segnale del LD a fine test / Signal given by the leak after 30 min. (>3)

$$= \frac{q_{LK}}{S_{FR}} \left(\frac{S_p - R_p}{S_{FR} - R_{FR}} \right) \frac{1}{C}$$

CALCOLO DELLA FUGA / Leak evaluation

P	5,50E-05 mbar	mbar	5,30E-05 mbar
Rf	7,38E-09 mbar l s-1	mbar l s-1	6,85E-10 mbar l s-1
Sf	6,88E-09 mbar l s-1	mbar l s-1	6,01E-10 mbar l s-1
qg	<1,0E-09 mbar l s-1	mbar l s-1	<1,0E-09 mbar l s-1

VALORE DI RIFERIMENTO / REF. VALUE (MAX)

1,0E-09 mbar l s-1 at 26 bar	1,0E-10 mbar l s-1 at 26 bar	1,0E-06 mbar l s-1 at 26 bar	1,0E-09 mbar l s-1 at 5 bar
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CONFORMANCE

YES YES YES YES

Doc. di riferimento / Ref. documents

CERN contract number: F302/LHC/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	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		rotary vane pump PFEIFFER DUO 20 m3/h		rotary vane pump PFEIFFER DUO 65 m3/h

Prepared by: Name / Date

PIU S. - Caseira B. 30/01/2004

Approved by: Name / Date

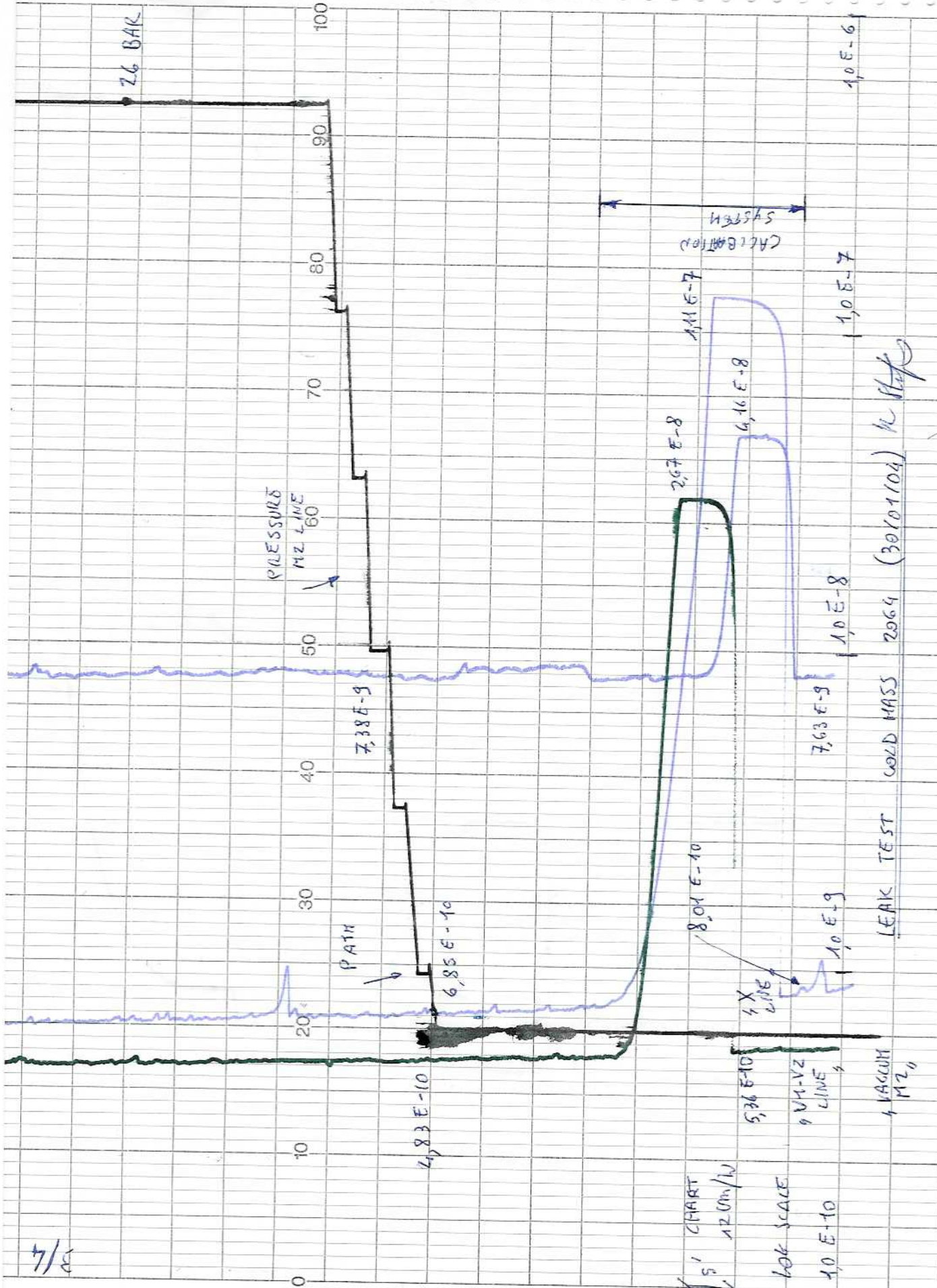
Terzi - 30/01/2004

Checked at CERN by / Signature / Date

P. Gagliardi - 30/01/2004

Note / Remarks

Test performed after welding of flange (Ø100) the capillary tube cold head, installed on the cold mass



B/L

5' CHART
120m/W

10E-10

5.36E-10

1.0E-9

1.0E-8

1.0E-7

1.0E-6

VACUUM
M20

9 M-V2
LINE

X
LINE

8.04E-10

7.63E-9

6.16E-8

2.67E-8

1.0E-7

1.0E-6

6.85E-10

7.38E-9

2.83E-10

Z6 BAK

CALCIBATION
SYSTEM

LEAK TEST COLD MASS 2064 (30101104) K. Hoff

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ZB 597

