

Cold Mass Nr. **2040**

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

CM -> Heat Exch. **3**
Heat Exch -> Vacuum **4**

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. calibratore 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. C **1** T **19,0 °C**

Fuga calibrata con correz. T ed età / Size of calib. leak after corr. for ageing and T) qFR **2,58E-08 mbar l s-1**

Segnate residuo prima delle misure di SFR / Residual signal prior SFR meas. RFR **7,44E-09 mbar l s-1**

Segnate del LD / Signal given by the calibrated leak SFR **4,08E-08 mbar l s-1**

Min. dev. segnate (-2x amp. segn. residuo) / Smallest read. signal dev. (= 2 x ampl. of RFR noise) Sm **2,00E-11 mbar l s-1**

Tempo di attesa stabiliz. segnate / Time to achieve stabilised leak signal 3t **1200 sec**

SENSIBILITA' DEL TEST / Sensitivity of the leak test

$$= S_{in} \frac{q_{FR}}{S_{FR} - R_{FR} \cdot C}$$

Condizioni del test / Leak test conditions

Pressione del sistema / System pressure P **9,50E-05 mbar**

Segnate residuo del cercatughe ad inizio test / Residual signal prior to SF measurement Rf **7,22E-09 mbar l s-1**

Segnate del LD a fine test / Signal given by the leak after 30 min. (>3t) Sf **7,08E-09 mbar l s-1**

CALCOLO DELLA FUGA / Leak evaluation

$$= \frac{q_{FR} (S_{FR} - R_{FR})}{S_{FR} - R_{FR} \cdot C}$$

VALORE DI RIFERIMENTO / REF. VALUE (MAX) qg **<1,0E-09 mbar l s-1**

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

CONFORMANCE YES YES YES

Doc. di riferimento / Ref. documents

CERN contract number: F302/LHCLHC
 CERN technical spec.: LHC MMS-98-198 rev.2
 Leak test procedure (Ref. N°. Revision): 760RM09442 rev.0

Strumentazione / Test equipment

Helium Mass Spectrometer type: PFEIFFER HLT 260
 Pressure gauge type: full range compact PFEIFFER PKR 251
 Pumping group: turbo pump LEYBOLD PT 360 l/s

on vessel PFEIFFER HLT 260

on heat exchanger line PFEIFFER HLT 260

on c.b.l. lines 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 20 m3/h

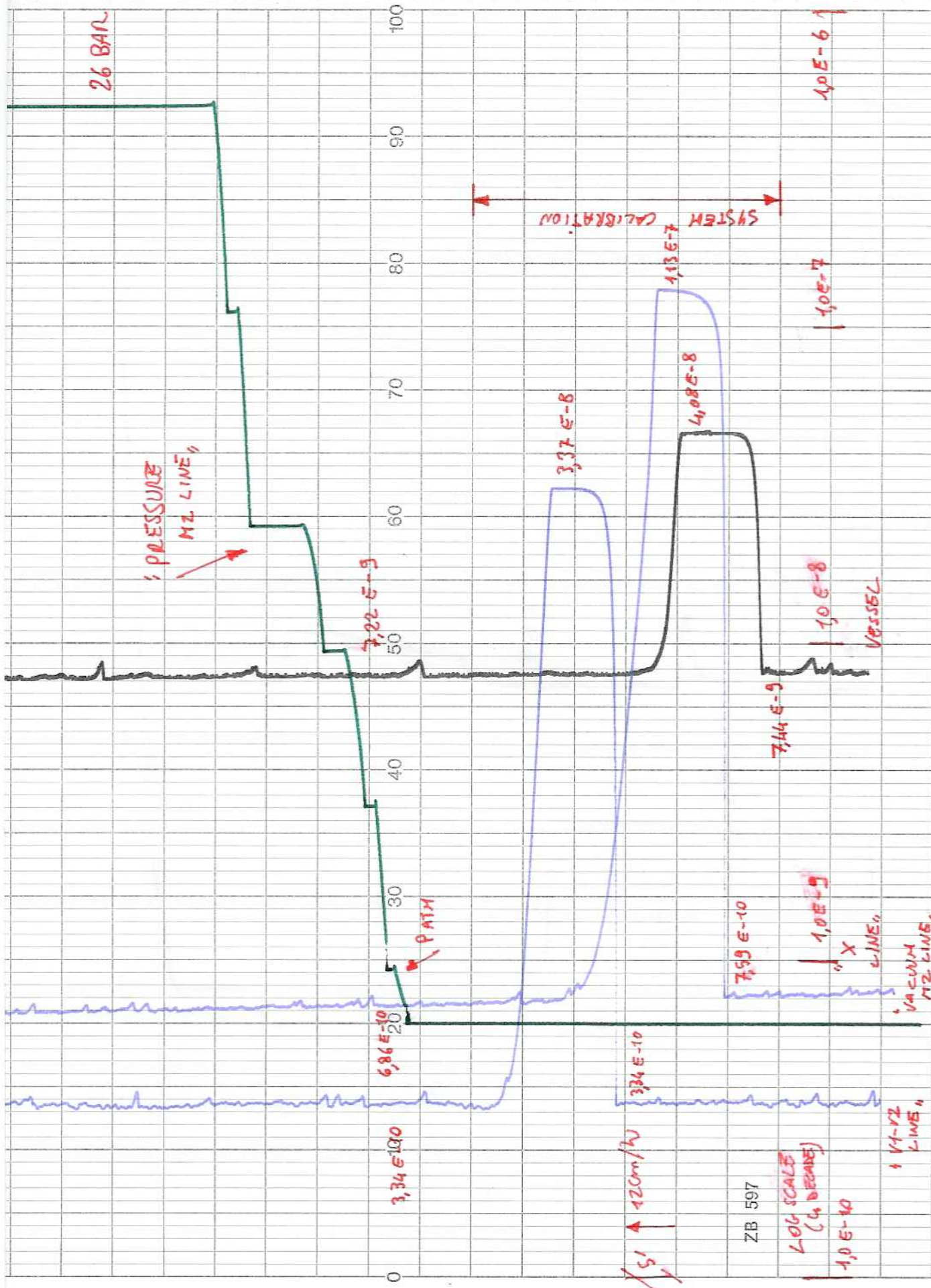
Note / Remarks

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

Prepared by: Name / Date PIU S. - Caserza B. 03/12/2003

Approved by: Name / Date Terzi -03/12/2003

Checked at CERN by / Signature / Date P. Gagliardi -03/12/2003



LEAK TEST COLD MASS 2040 (03-12-03) R Plot 6

ZB 597

LOG SCALE
(4 DECADE)

1.0×10^{-10}

VACUUM
MZ LINE

X
LINE

7.99×10^{-10}

1.0×10^{-8}

VESSEL

7.44×10^{-9}

4.08×10^{-8}

3.37×10^{-8}

1.13×10^{-7}

SYSTEM CALIBRATION

1.0×10^{-7}

1.0×10^{-6}

26 BAR

PRESSURE
MZ LINE

7.22×10^{-9}

6.86×10^{-10}

3.34×10^{-10}

PATH

3.34×10^{-10}

420 m/h

VACUUM
MZ LINE

