

LHC - Cold masses: HELIUM MASS SPECTROMETER LEAK TEST REPORT

ITP Nr.
23
24

Cold Mass Nr. 2032

Step Nr. 1
Volume / Volume to be tested

CM -> Vacuum

CM -> Heat Exch.

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. 17,0 °C 17,0 °C 17,0 °C

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

2,37E-08 mbar l s-1 2,61E-08 mbar l s-1 1,25E-07 mbar l s-1

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

2,91E-09 mbar l s-1 3,91E-10 mbar l s-1 3,24E-10 mbar l s-1

Segnale del LD / Signal given by the calibrated leak

1,98E-08 mbar l s-1 2,58E-08 mbar l s-1 1,08E-07 mbar l s-1

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

2,00E-11 mbar l s-1 2,00E-12 mbar l s-1 2,00E-12 mbar l s-1

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

700 sec 850 sec 900 sec

SENSIBILITA' DEL TEST / Sensitivity of the leak test

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

2,81E-11 mbar l s-1 2,07E-12 mbar l s-1 2,33E-12 mbar l s-1

Condizioni del test / Leak test conditions

Pressione del sistema / System pressure

1,90E-05 mbar mbar mbar

Segnale residuo del cercatighe ad inizio test / Residual signal prior to SF measurement

2,98E-09 mbar l s-1 3,93E-10 mbar l s-1 3,18E-10 mbar l s-1

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

3,13E-09 mbar l s-1 4,15E-10 mbar l s-1 3,94E-10 mbar l s-1

CALCOLO DELLA FUGA / Leak evaluation

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

2,10E-10 mbar l s-1 2,28E-11 mbar l s-1 9,08E-11 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

CONFORMANCE

YES

YES

YES

YES

YES

YES

YES

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): 780RM09442 rev.0

Strumentazione / Test equipment

Helium Mass Spectrometer type:	on vessel	on heat exchanger line	on vessel
Pressure gauge type:	PFEIFFER HLT 260	PFEIFFER HLT 260	PFEIFFER HLT 260
Pumping group:	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. - Caserza B. 01/03/2004 *P. Terzi*

Approved by: Name / Date

Terzi -01/03/2004

P. Gagliardi 01/03/2004

Checked at CERN by / Signature / Date

New pressure gauge installed on M2- line gas control panel

New pressure gauge installed on X- line gas control panel



