

**Cold Mass Nr.** 2015

**Step Nr.** 1 **CM -> Vacuum**

**Volume / Volume to be tested** 2 **CM -> cold bore tubes**

**Heat Exch -> Vacuum** 4

**Fuga calibrata / Calibrated leak parameter**

Calibrated leak N°	4011007195	4011007195	4011007195
Data calibr. / calibration date	08/10/02	08/10/02	08/10/02
Temp. calibr. / 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

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 amp. of RFR noise)

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

$$= S_w \cdot S_{PR} \cdot \frac{1}{R_{PR} \cdot C}$$

C	1	1	1
T	19.0 °C	19.0 °C	19.0 °C
qFR	2.68E-09 mbar l s-1	2.84E-09 mbar l s-1	2.58E-09 mbar l s-1
RFR	4.24E-09 mbar l s-1	3.43E-10 mbar l s-1	6.33E-10 mbar l s-1
SFR	3.08E-09 mbar l s-1	2.88E-09 mbar l s-1	2.80E-09 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	900 sec	700 sec
qGm	1.94E-11 mbar l s-1	1.99E-12 mbar l s-1	1.89E-12 mbar l s-1

**SENSIBILITA' DEL TEST / Sensitivity of the leak test**

**Condizioni del test / Leak test conditions**

Pressione del sistema / System pressure

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

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

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

**CALCOLO DELLA FUGA / Leak evaluation**

P	1.00E-04 mbar	mbar	9.50E-05 mbar
Rf	4.20E-09 mbar l s-1	mbar l s-1	6.39E-10 mbar l s-1
Sf	4.48E-09 mbar l s-1	mbar l s-1	3.60E-10 mbar l s-1
qG	2.52E-10 mbar l s-1	mbar l s-1	4.99E-12 mbar l s-1

VALORE DI RIFERIMENTO / REF. VALUE (MAX)

P	1.0E-09 mbar l s-1 at 26 bar	1.0E-10 mbar l s-1 at 26 bar	1.0E-09 mbar l s-1 at 5 bar
Rf	1.0E-09 mbar l s-1 at 26 bar	1.0E-10 mbar l s-1 at 26 bar	1.0E-09 mbar l s-1 at 26 bar
Sf	1.0E-09 mbar l s-1 at 26 bar	1.0E-10 mbar l s-1 at 26 bar	1.0E-09 mbar l s-1 at 26 bar
qG	1.0E-09 mbar l s-1 at 26 bar	1.0E-10 mbar l s-1 at 26 bar	1.0E-09 mbar l s-1 at 26 bar

CONFORMANCE

YES YES YES YES YES 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 c.b.t. lines	PFEIFFER HLT 260	rotary vane pump PFEIFFER DUO 20 m3/h
on heat exchanger line	PFEIFFER HLT 260	rotary vane pump PFEIFFER DUO 20 m3/h
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

**Note / Remarks**

Test performed after welding of flange (Ø1100) the capillary tube cold head, installed on the cold mass

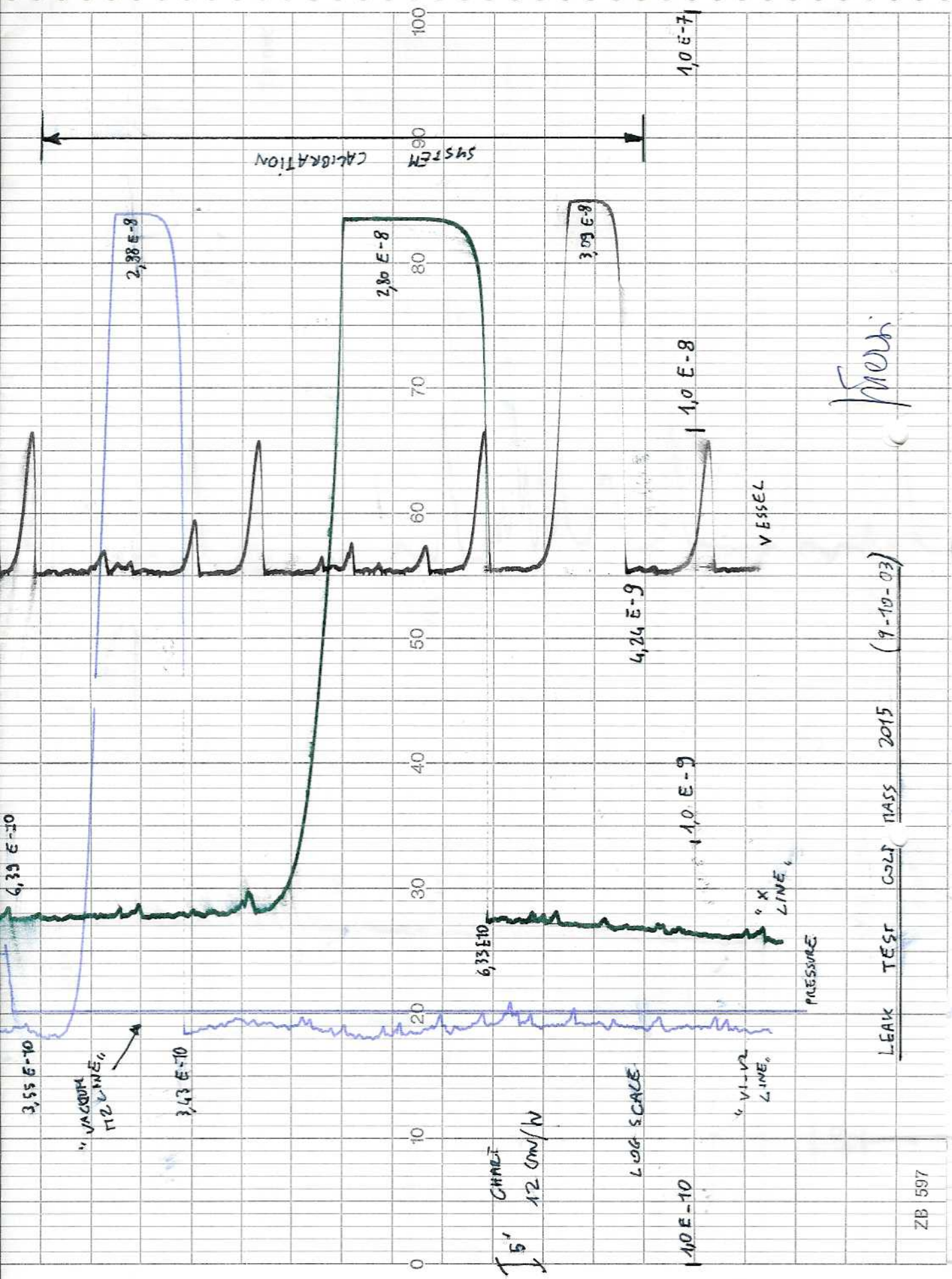
**Prepared by: Name / Date** Caserza 09/10/2003

**Approved by: Name / Date** Terzi - 09/10/2003

**Checked by: Name / Date** P. Gagliardi - 09/10/2003

**Checked at CERN by / Signature / Date**

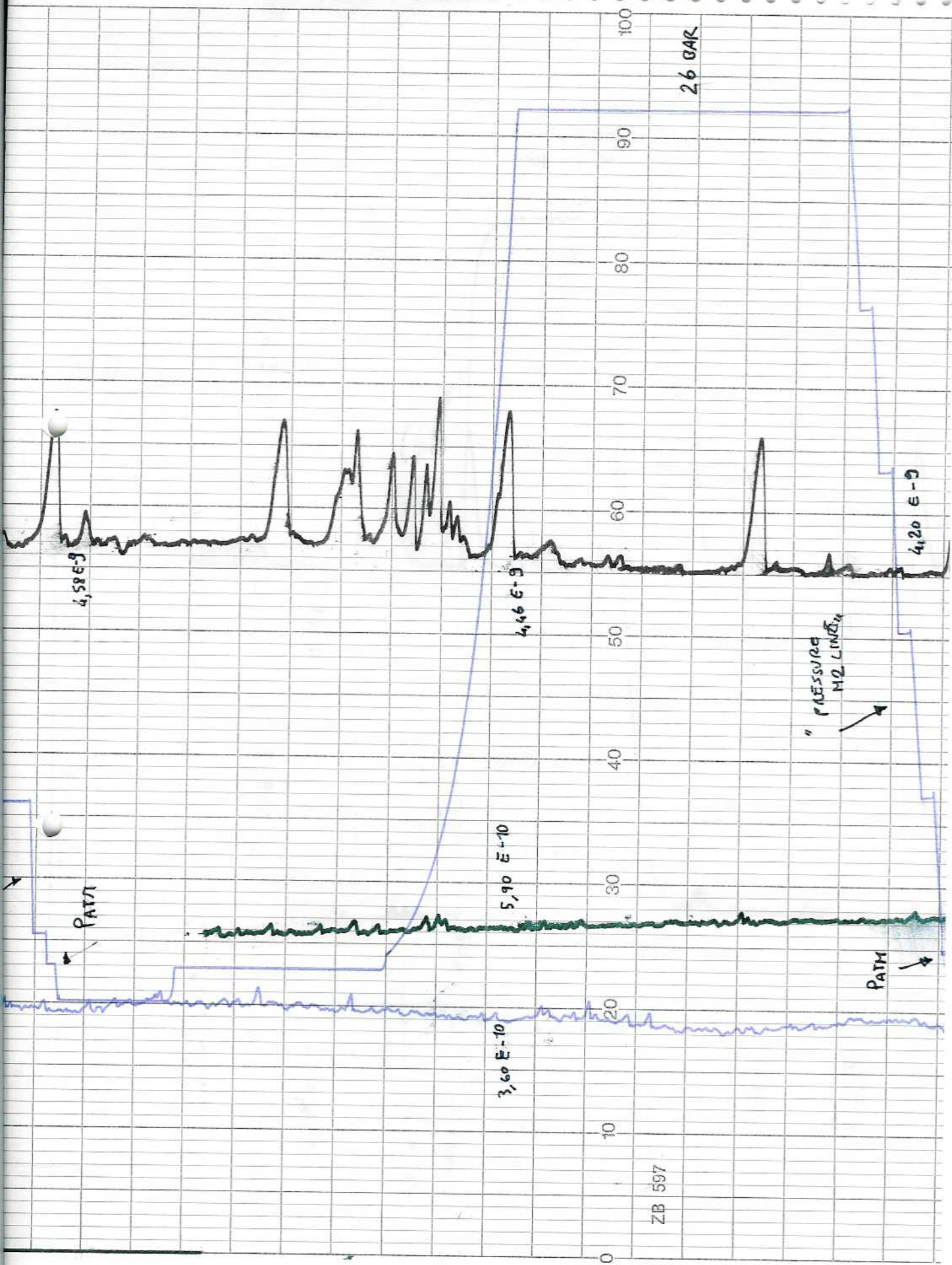




Free

LEAK TEST GOLD PASS 2015 (9-10-03)

ZB 597







ZB 597

