

## LHC - Cold masses: HELIUM MASS SPECTROMETER LEAK TEST REPORT

ITP Nr.  
23  
24

**Cold Mass Nr.** 2060

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

**Fuga calibrata / Calibrated leak parameter**

<p>Calibrated leak N°: <span style="border: 1px solid black; padding: 2px;">4011007195</span></p> <p>Data calibr. / calibration date: <span style="border: 1px solid black; padding: 2px;">08/10/02</span></p> <p>Temp. calibrations fuga / Calibration Temp.: <span style="border: 1px solid black; padding: 2px;">23,0 °C</span></p> <p>Valore nom. fuga calibrata / Calibrated leak nom. value: <span style="border: 1px solid black; padding: 2px;">3,00E-08 mbar l s-1</span></p>	<p><span style="border: 1px solid black; padding: 2px;">4011007225</span></p> <p><span style="border: 1px solid black; padding: 2px;">08/10/02</span></p> <p><span style="border: 1px solid black; padding: 2px;">23,0 °C</span></p> <p><span style="border: 1px solid black; padding: 2px;">3,30E-08 mbar l s-1</span></p>
--	---

**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.: 17,5 °C

Fuga calibrata con correz. T ed età / Size of calib. leak after corr. for ageing and T): 2,42E-08 mbar l s-1

Segnale residuo prima delle misure di SFR / Residual signal prior SFR meas.: 1,18E-08 mbar l s-1

Segnale del LD / Signal given by the calibrated leak: 4,39E-08 mbar l s-1

Min. dev. segnale ( $\approx 2x$  amp. segn. residuo) / Smallest read. signal dev. ( $\approx 2x$  ampl. of RFR noise): 2,00E-10 mbar l s-1

Tempo di attesa stabiliz. segnale / Time to achieve stabilised leak signal: 700 sec

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

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

**Condizioni del test / Leak test conditions**

Pressione del sistema / System pressure: 6,10E-05 mbar

Segnale residuo del cercatughe ad inizio test / Residual signal prior to SF measurement: 1,10E-08 mbar l s-1

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

**CALCOLO DELLA FUGA / Leak evaluation**

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

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

**CONFORMANCE**

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: PFEIFFER HLT 260

Pressure gauge type: full range compact PFEIFFER PKR 251

Pumping group: turbo pump LEYBOLD PT 360 l/s  
rotary vane pump PFEIFFER DUO 65 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

**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

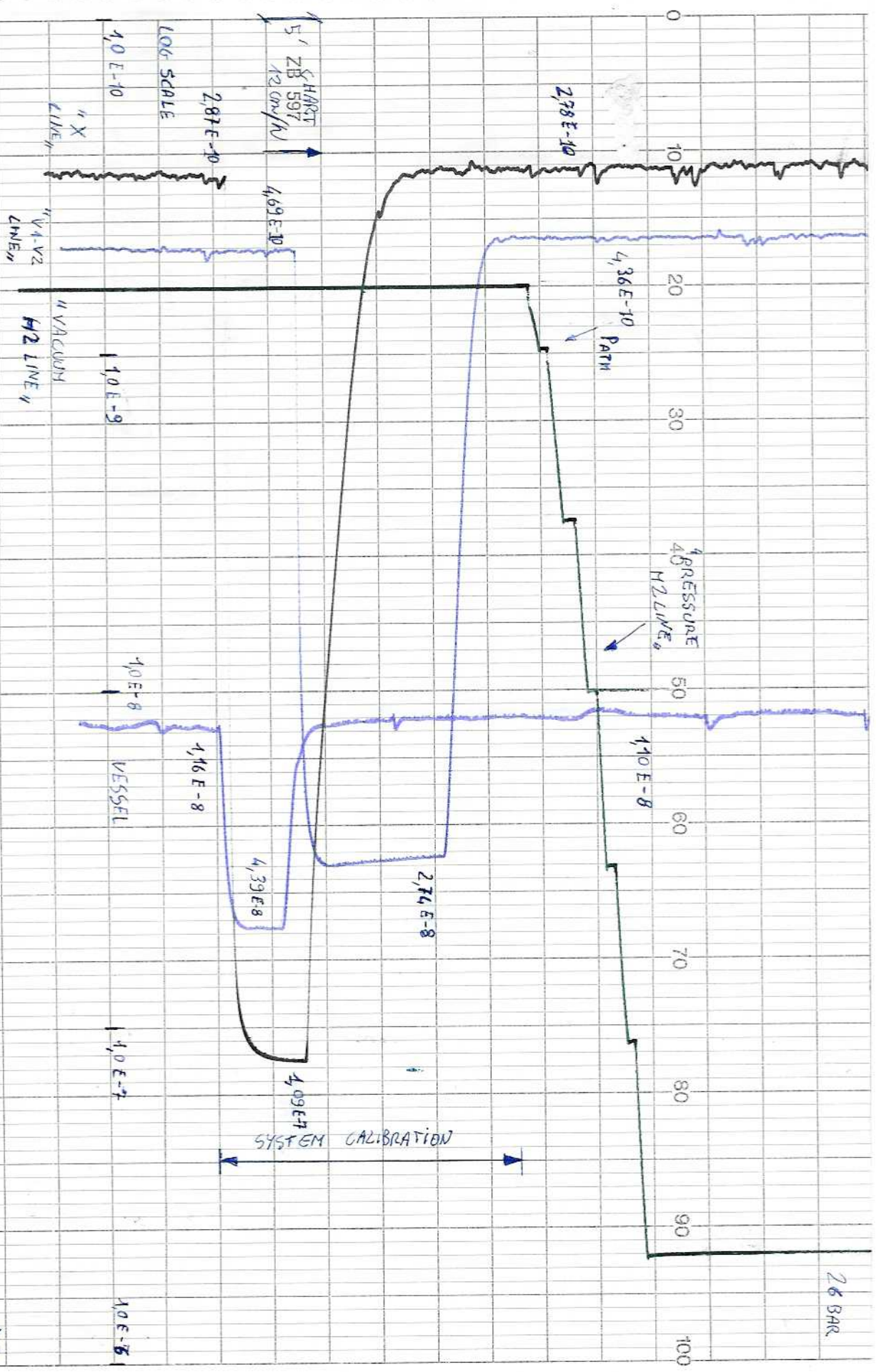
**Note / Remarks**

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

**Prepared by: Name / Date**  
PIU S. - Caserza B. 28/01/2004

**Approved by: Name / Date**  
Terzi - 28/01/2004

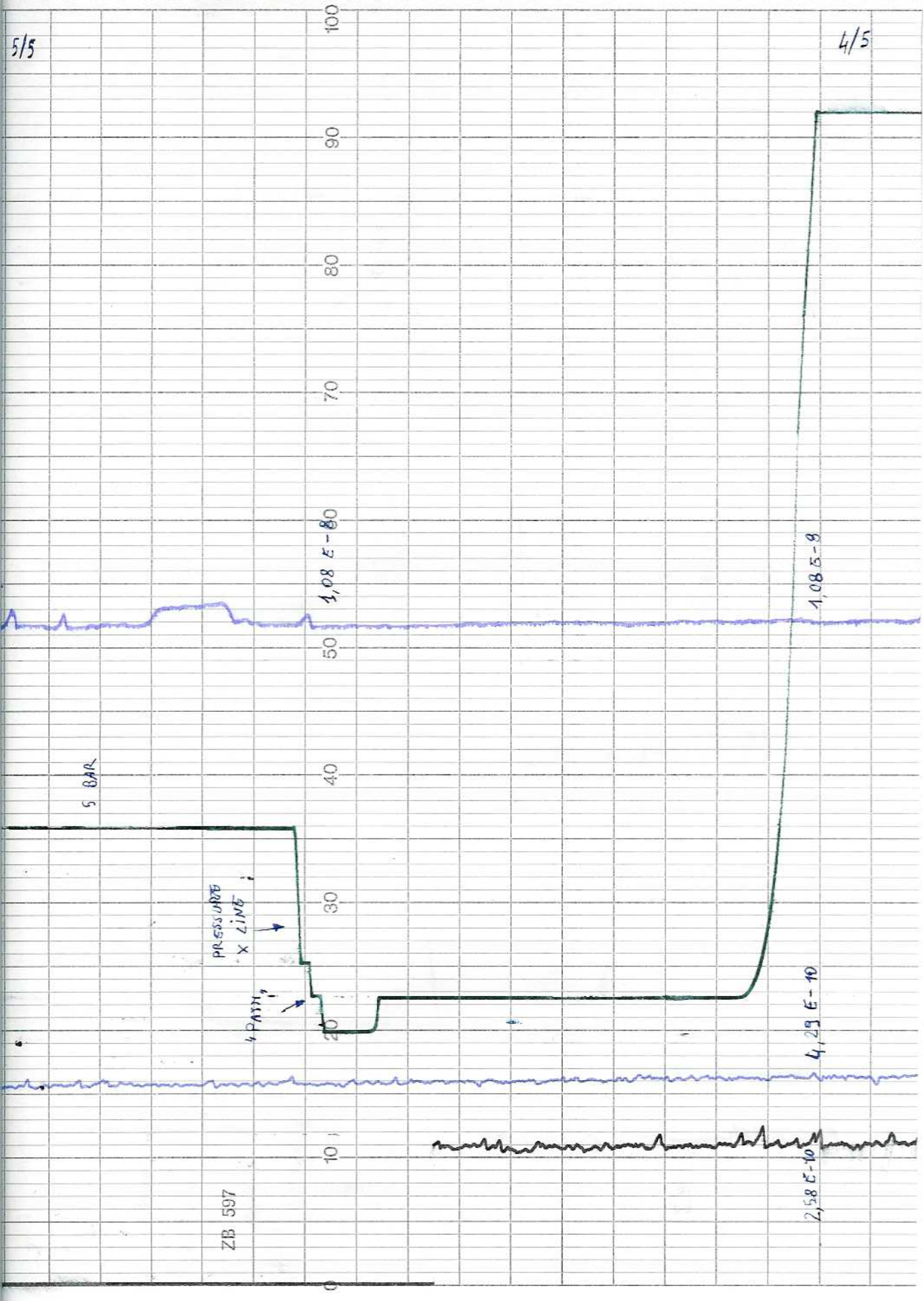
**Checked at CERN by / Signature / Date**  
P. Gagliardi - 28/01/2004





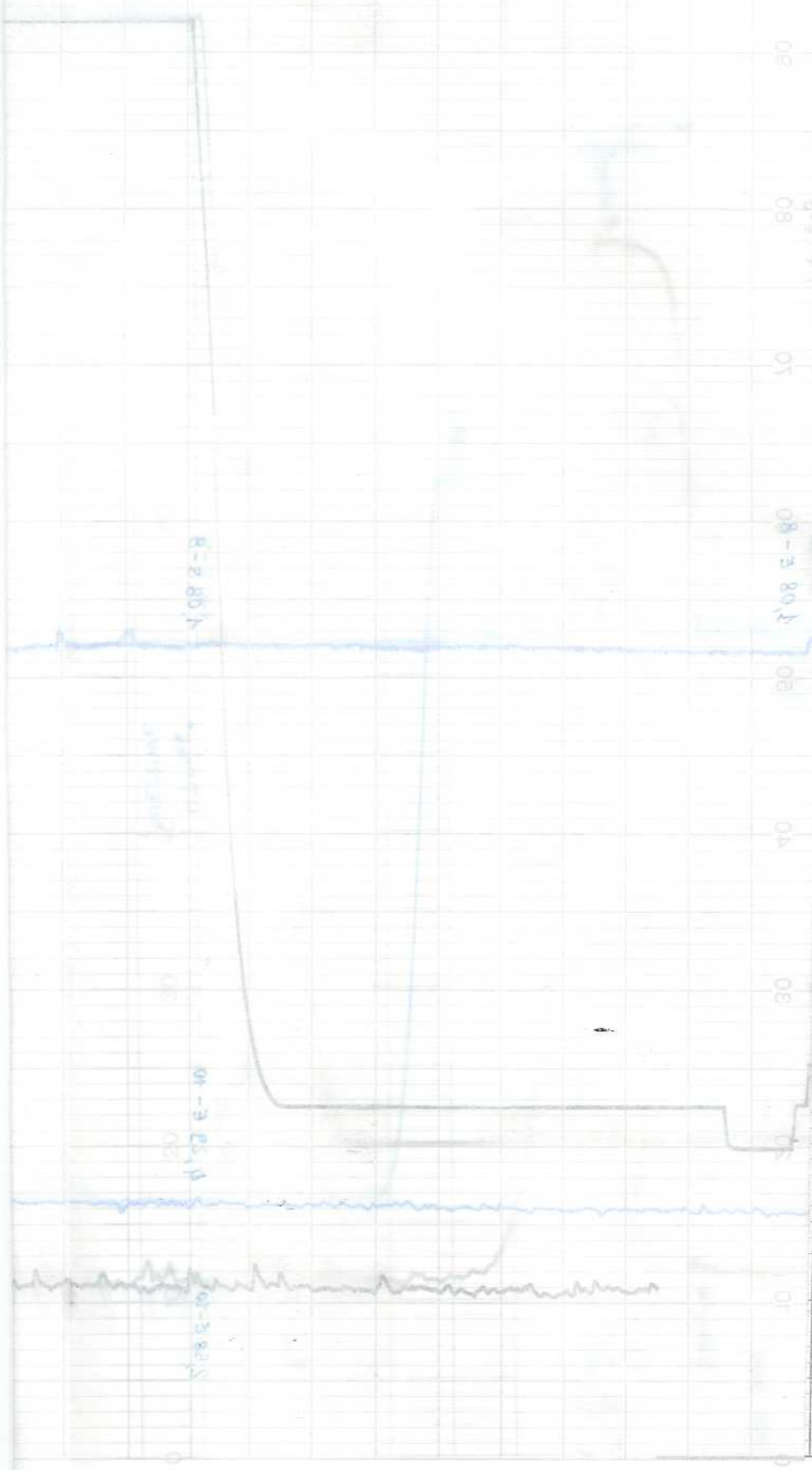
5/5

4/5



2/2

2/1



5/5

